

Appendix A

**Rare Plant and Vegetation Surveys
2002 and 2003**

Santa Ysabel Ranch Open Space Preserve

Prepared For

**The Nature Conservancy
San Diego County Field Office**

**The County of San Diego
Department of Parks and Recreation**

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Southeast view from the northern portion of the West Ranch with snow-frosted Volcan Mountain in the background.

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I. Summary

The Santa Ysabel Ranch Open Space Preserve was established in 2001 from a purchase by The Nature Conservancy from the Edwards Family; the Ranch is now owned by the County of San Diego and managed as a Department of Parks and Recreation Open Space Preserve. It totals nearly 5,400 acres and is comprised of two parcels; an "East Ranch" and a "West Ranch". The East Ranch is east of the town of Santa Ysabel (and Highway 79 running north) and is bordered on the east by Farmer's Road in Julian. The "West" Ranch is west of the town of Santa Ysabel (and Highway 79 running north) and is bordered to the north by Mesa Grande road. The East Ranch is 3,894 acres with an elevation gradient that ranges from 2934 to 4292 feet (894-1308 meters). The West Ranch is 1,512 acres with an elevation gradient from 2720 to 3636 feet (829-1108 meters).

Surveys began March 15, 2002 and ended in November 2003. Surveys took place once to twice a week throughout the growing season (March-September) and once every few weeks outside of the growing season.

Survey areas were those that appeared to have a high potential for rare or unique plants ("hot spots"). These species are referred to in this report as plant "Species of Interest" (^{SI}). Plant "Species of Interest" are identified as those species that are federally or state listed or included on the California Department of Fish and Game's "Special Plants" list (CDFG 2003). They may also be species that have a unique distribution for the area or are otherwise worthy of mention. Plant species were confirmed at the Rancho Santa Ana Botanic Garden (RSABG) Herbarium. Voucher specimens were submitted to the RSABG and the San Diego Natural History Herbaria. GPS coordinates were taken for all Plant Species of Interest and provided to the U.S. Geological Survey for mapping.

Eighteen confirmed Species of Interest were located during the surveys: Banner dudleya (*Dudleya saxosa aloides*), bitter gooseberry (*Ribes amarum*), caraway-leaved gilia (*Gilia* (*Saltugilia*) *caruifolia*), Cleveland sage (*Salvia clevelandii*), Descanso (San Diego) milkvetch (*Astragalus oocarpus*), Engelmann Oak (*Quercus engelmannii*), jewelflower (*Caulanthus heterophyllus heterophyllus*), Kern's brodiaea (*Brodiaea terrestris kernensis*), long-spined spineflower (*Chorizanthe polygonoides longispina*), mountain pink currant (*Ribes nevadense*), Palmer's sagewort (*Artemisia palmeri*), Palomar monkeyflower (*Mimulus* (*diffusus*) *palmeri*), prostrate spineflower (*Chorizanthe procumbens*), San Diego gumplant (*Grindelia hirsutula hallii*), San Felipe monardella (*Monardella nana leptosiphon*), western azalea (*Rhododendron occidentale*), Wright's hymenothrix (*Hymenothrix wrightii*), and yellow (velvety) false lupine (*Thermopsis californica semota*). Plant specimens have been or will be submitted to RSABG herbarium and San Diego Natural History Museum herbarium.

In order to map the vegetation, plant communities were identified using Modified Holland (MoH) (Oberbauer 1996) and the California Natural Diversity Database (CNDDDB) Terrestrial Natural Communities classification system. The CNDDDB system is much more "fine-grained" than the Modified Holland system so many more communities were identified under this system. Generally the major plant communities were: mixed oak/coniferous forest, oak woodlands, oak savanna, chaparral, inland sage scrub, wetland, riparian woodland/forest, native grassland, meadow, non-native (annual) grassland, mixed herb, ruderal, and disturbed.

The topography on the East Ranch is more variable, extreme (steep) and closer to the headwaters of Santa Ysabel Creek. The East Ranch contained higher species and plant community diversity. It also had plant species characteristic of higher elevations and montane-type habitats; however, the East Ranch is lower in elevation to Volcan Mountain and lacks the dominant coniferous and montane element of Volcan Mountain. Large areas of montane plant communities as known from Volcan Mountain do not occur on the preserve. Scattered coniferous species are found on the East Ranch but these communities seem more transitional than climax plant communities. Santa Ysabel Creek "flattens out" before it reaches the West Ranch, through the Mesa Grande area and into Sutherland Reservoir. Vegetatively, the West Ranch is more "Mesa Grande-like", whereas the East Ranch is more a 'hybrid' between Julian or "Volcan Mountain-type" vegetation and "Mesa Grande-type" vegetation.

The preserve was recovering from many years of ranching, which was evident in the plant species composition. Non-native herbaceous species are well-established on the preserve, particularly filaree (*Erodium* spp.), ripgut (*Bromus diandrus*) and wild oat (*Avena* sp.). Non-native tree species, such as tree-of-heaven (*Ailanthus altissima*) are also established on the preserve.

Management recommendations for the preserve range from minimal/no management of the natural resources to active management. Future projects proposed include post-fire monitoring, additional biological inventories, experimental treatments for removal of non-native grasses and other invasive species, hydrological studies, and insect studies.

In October 2003, the Cedar Fire burned from Inaja Rest Area northeast towards Farmer's Road. It is estimated about one-third of the East Ranch was burned. The results and most of the management recommendations herein were compiled prior to those fires.

II. Introduction & Methods

Santa Ysabel Preserve was established in 2001 from a purchase by The Nature Conservancy from the Edwards Family. It totals nearly 5,400 acres and is split into two Ranchs; an "East Ranch" and "West Ranch". The East Ranch is east of the town of Santa Ysabel (and Highway 79 running north) and is bordered on the east by Farmer's Road in Julian (Map 1). The "West" Ranch is west of the town of Santa Ysabel (and Highway 79 running north) and is bordered to the north by Mesa Grande road (Map 1).

The East Ranch is 3,894 acres with an elevation gradient that ranges from 2934 to 4292 feet (894-1308 meters). The West Ranch is 1,512 acres with an elevation gradient from 2720 to 3636 feet (829-1108 meters).

Surveys were conducted mid March 2002 through November 2003. The 2002 field season was devoted nearly entirely to surveying the East Ranch which appeared to have higher diversity than the West Ranch. The 2003 field season was devoted to surveying the West Ranch but periodic visits were still made to the East Ranch due to higher rainfall levels in 2003. Surveys took place once to twice a week throughout the growing season (March-September) and thereafter once every few weeks outside of the growing season .

Survey areas were prioritized based on known characteristics of the site (slope, aspect, soils, geology, associate species, disturbance, etc.) as well as “an indefinable combination of intuition, judgement, preparation, and luck.” (USFS 1991). These potential “hot spots” were botanized most heavily. This type of survey is referred to as the “intuitive-focused”, “limited focus” or “intuitive-controlled” survey technique (USFS 1991; BLM 1996). Areas deemed of secondary importance were botanized as the next priority. GPS (Global Positioning System) coordinates were recorded for every species of interest observed and/or collected, using a portable Garmin ETREX, 12 channel GPS unit. Datum used for the GPS unit was WGS 84 and units were UTM (Universal Transverse Mercator).

Guidelines for plant collecting were based on the 1986 guidelines of the WWF/ Plant Conservation Roundtable, the California Native Plant Society Guidelines (<http://www.cnps.org/rareplants/inventory/guidelines.htm>), and California Department of Fish and Game guidelines (<http://www.dfg.ca.gov/whdab/html/cnddb.html>). In cases where population numbers were sufficient and it was deemed necessary to document a population, vouchers were collected. Necessary collecting permits were obtained from the U.S. Fish and Wildlife Service and California Department of Fish and Game.

The identity of all rare plants or plant “Species of Interest” (^{sl}) were confirmed at Rancho Santa Ana Botanic Garden (RSABG) herbarium. Voucher specimens were submitted to the RSABG and the San Diego Natural History Herbaria.

Aerial photos were provided by The Nature Conservancy for the vegetation map. An acetate overlay was created. Plant communities were photographed and ground truthed and if possible, a GPS coordinate was taken from the center of the community type to facilitate more accurate mapping. If necessary, voucher specimens of dominant species were collected. Plant communities were identified using Modified Holland (MoH; Oberbauer 1996) and the classification system established by the California Natural Diversity Database (CNDDB) Terrestrial Plant Communities program.

CNDDB Rare Plant and/or Plant Community forms will be submitted to the California Department of Fish and Game.

NOTE: In late October, 2003, a catastrophic wildfire burned through the Julian area including about one-third of the East Ranch from Inaja Memorial Park northeast towards Farmer's Road. These results cover the 2002 and 2003 field season prior to the 2003 fire.

III. Results

Soil types that are present on the Preserve are summarized in Appendix 1.

Rainfall over the course of this study was lower than average. The 2002 field season was affected by the continuing severe drought and that likely affected the results of the 2002 plant surveys. The 2003 field season proved to be much more prolific due to a higher amount of rainfall prior to and during the field season. The difference between the two years was quite extreme. Plants in 2002 showed severe water stress in the form of premature dropping of leaves, incomplete flower bud formation or bud drop, severe leaf

droop, no growth after a certain point, and mortality. Very few annuals were observed in 2002. Annuals that were not in the forest understory were virtually non-existent on the ridgetops and within the chaparral.

The East Ranch contains plant species characteristic of higher elevation and montane-type habitats that are absent from the West Ranch. The topography on the East Ranch is more variable and extreme (steep) and closer to the headwaters of Santa Ysabel Creek. Therefore, based on the surveys completed, the plant community and species diversity was higher on the East Ranch than the West Ranch (Figures 1 and 2). The East Ranch is lower in elevation to Volcan Mountain and lacks the dominant coniferous and montane elements of Volcan Mountain. Large areas of montane plant communities as known from Volcan Mountain do not occur on the preserve. Scattered coniferous species are found on the East Ranch but these communities seem more transitional than climax plant communities. The lower elevation range of the West Ranch corresponds with lower floral diversity than on the East Ranch and the flora is more "Mesa Grande-like" than "Julian-like" (Figures 3 and 4). Santa Ysabel creek tends to "flatten out" by the time it gets to the West Ranch as expected at the lower elevations as it flows through the Mesa Grande area into Sutherland Reservoir. Vegetatively, the West Ranch is more "Mesa Grande-like" and the East Ranch is more a 'hybrid' between Julian or "Volcan Mountain-type" vegetation and "Mesa Grande-type" vegetation.

Eighteen confirmed rare plants or plant "Species of Interest" were located during the surveys (Appendix 3): Banner dudleya (*Dudleya saxosa aloides*), bitter gooseberry (*Ribes amarum*), caraway-leaved gilia (*Gilia* (*Saltugilia*) *caruifolia*), Cleveland sage (*Salvia clevelandii*), Descanso (San Diego) milkvetch (*Astragalus oocarpus*), Engelmann Oak (*Quercus engelmannii*), jewelflower (*Caulanthus heterophyllus heterophyllus*), Kern's brodiaea (*Brodiaea terrestris kernensis*), long-spined spineflower (*Chorizanthe polygonoides longispina*), mountain pink currant (*Ribes nevadense*), Palmer's sagewort (*Artemisia palmeri*), Palomar monkeyflower (*Mimulus* (*diffusus*) *palmeri*), prostrate spineflower (*Chorizanthe procumbens*), San Diego gumplant (*Grindelia hirsutula hallii*), San Felipe monardella (*Monardella nana leptosiphon*), western azalea (*Rhododendron occidentale*), Wright's hymenothrix (*Hymenothrix wrightii*), and yellow (velvety) false lupine (*Thermopsis californica semota*).

A. East Ranch

East Ranch Species of Interest include:

Banner Dudleya	<i>Dudleya saxosa aloides</i>
Bitter Gooseberry	<i>Ribes amarum</i>
Caraway-leaved Gilia	<i>Gilia</i> (<i>Saltugilia</i>) <i>caruifolia</i>
Cleveland Sage	<i>Salvia clevelandii</i>
Descanso (San Diego) milkvetch	<i>Astragalus oocarpus</i>
Engelmann Oak	<i>Quercus engelmannii</i>
Jewelflower	<i>Caulanthus heterophyllus heterophyllus</i>
Kern's Brodiaea	<i>Brodiaea terrestris kernensis</i>

Long-spined Spineflower	<i>Chorizanthe polygonoides longispina</i>
Mountain pink currant	<i>Ribes nevadense</i>
Palmer's sagewort	<i>Artemisia palmeri</i>
Palomar monkeyflower	<i>Mimulus (diffusus) palmeri</i>
San Diego Gumplant	<i>Grindelia hirsutula hallii</i>
San Felipe Monardella.	<i>Monardella nana leptosiphon</i>
Western Azalea	<i>Rhododendron occidentale</i>
Wright's Hymenothrix	<i>Hymenothrix wrightii</i>
Yellow (Velvety) False Lupine	<i>Thermopsis californica semota</i>

East Ranch Plant Communities include:

Forests and Woodlands

Mixed Oak/Coniferous/Bigcone Fir/Coulter Pine

Coniferous Forest Types

Bigcone Douglas Fir (*Pseudotsuga macrocarpa*)

Coulter Pine (*Pinus coulteri*)

Incense Cedar (*Calocedrus decurrens*)

Oak Woodland/Forest Types

Mixed Oak Woodland/Forest

Black Oak (*Quercus kelloggii*) Woodland/Forest

Coast live oak (*Quercus agrifolia*) woodland/forest

Engelmann Oak (*Quercus engelmannii*) woodland/savanna

Golden cup oak (*Quercus chrysolepis*)

Woodland herb-no types

Shrub-dominated Communities

Chamise (*Adenostoma fasciculatum*)

Mixed-Montane Chaparral

Scrub oak (*Quercus berberidifolia*) dominated chaparral

White sage (*Salvia apiana*) dominated chaparral/scrub

Mountain mahogany (*Cercocarpus betuloides*)

Matchweed (*Gutierrezia sarothrae*)

Matchweed-California Buckwheat (*Eriogonum fasciculatum polifolium* and *fasciculatum*)

Matchweed-Wright's Eriogonum (*Eriogonum wrightii membranaceum*)

Matchweed-Three Awn (*Aristida purpurea longiseta*)-Buckwheat

Wetland

Wetland-Riparian herbaceous

Pacific Rush (*Juncus effusus pacificus*)

Pondweed (*Lemna minuscula*)

Sedge Meadow

Mixed Wet Meadow

Kanaka Flats Alluvial Drainages

Seep or "perched wetlands"

Ponds

Riparian

Coast Live Oak Riparian Woodland

White Alder (*Alnus rhombifolia*) forest

Willow scrub

Upland Herbaceous Communities

Native grassland

Junegrass (*Koeleria macrantha*)/One-sided Bluegrass (*Poa secunda secunda*)

Melica (*Melica imperfecta*) grassland
Forms locally dominant stands.

Needlegrass (*Nassella cernua*)

Giant Stipa (*Achnatherum coronatum*)

Deergrass (*Muhlenbergia rigens*)

Blue Wild Rye (*Elymus glaucus glaucus*)

Squirreltail (*Elymus elymoides*)

Native Grassland (Needlegrass)/Wildflower Meadow

Three Awn Grassland (*Aristida purpurea longisetata*)

Non-native grassland

Non-native Grassland/Wildflower Meadow

Ruderal/Non-native grassland

Wildflower Meadow

Ruderal/Agricultural

Disturbed

Exotic Plants

An impressive "Dudleya rock garden" (*Dudleya edulis*) was discovered in 2003 on outcrops that rise above Highway 79 across from the Inaja Memorial Rest Area. Plants were large and vigorous with many flowering in 2003 (Figure 5). Thousands of Dudleyas occurred in this area growing on and within the fissures and cracks of the granitic outcrops. This area appeared to be burned in the 2003 Cedar Fire. At this time, it is not known how or if the "Dudleya garden" will recover.

In 2003, three genera (*Phacelia*, *Eriogonum*, and *Amsinckia*) were observed with exhibiting unusual growth form of the stems. The stems appeared greatly flattened and thickened. A *Phacelia ramosissima* collected from the "Dudleya rock gardens" area had a stem that was a centimeter thick and seven centimeters wide. The cause of this growth form is not known but a specimen was taken each time one of these plants was observed.

Two new plants species of interest were found on the East Ranch in 2003: dwarf brodiaea (*Brodiaea terrestris kernensis*) (Figure 6) and long-spined spineflower (*Chorizanthe polygonoides longispina*). Neither of these two species were evident in the 2002 field season. There were very few of the long-spined spineflower observed. The bulb plants were more prominent in 2003 than in 2002.

Three western azaleas were located on the East Ranch all along Santa Ysabel Creek (Figure 7). At one location, one western azalea and a population of creek dogwood (*Cornus sericea occidentalis*) occurred within close proximity of one another. Both species are known from moist forest types (Jepson 1996; Munz 1974; McMinn 1974). Western azalea is on the southern edge of its range in San Diego County (Jepson 1996; Munz 1974; McMinn 1974).

As of mid-October, the largest of the three azaleas was affected by a downy mildew-like fungal growth that seemed to be contributing to defoliation of the plant. Rhododendron can take-on an evergreen or deciduous habit so it was hoped the timing of the leaf loss in fall would not prove detrimental to the plant. Of the three azaleas, only one flowered

and this was the one exhibiting the fungal infection. The fungal infection appeared to affect the reproductive success. Capsules were covered with the fungal growth and this appeared to inhibit their development. Of an estimated 400 flowers counted, only 5 capsules appeared to be developing normally (enlarging and not shriveled or dropping off). This plant was also observed developing another set of flower buds, on November 3, 2002. The second blooming cycle may have been a response to the fungal infection and/or due to the late rains.

Members of the Ericaceae including *Rhododendron*, act as host species for the fungus that causes Sudden Oak Death Syndrome (*Phytophthora ramorum*). In an article recently published in *Fremontia* (Swain 2002), it states that most *Rhododendron* species acting as hosts for the fungus in California are "most often not native to California" but are from the horticultural trade.

The Cuyamaca-Laguna Mountains have assemblages of plants in canyon "refugia" that are more typical of a Sierra Nevada flora. (Of these species, those that occur on the preserve are superscripted with "SY"). These species and genera include: California bay (*Umbellularia californica*), big-leaf maple (*Acer macrophyllum*), western azalea^{SY} (*Rhododendron occidentale*), dogwood^{SY} (*Cornus* spp.), Utah serviceberry^{SY} (*Amelanchier utahensis*), and barberry^{SY} (*Berberis* spp., formerly *Mahonia*). Of these "refugia" species, big-leaf maple, rhododendron^{SY}, and California laurel act as hosts for *Phytophthora ramorum*.

Other plants that are currently known to act as hosts for *Phytophthora ramorum* that have generic* or species-specific** representation on the preserve and/or in the Cuyamaca-Laguna Mountain region include: manzanita*^{SY} (*Arctostaphylos*), toyon**^{SY} (*Heteromeles arbutifolia*), honeysuckle*^{SY} (*Lonicera*), Douglas fir*^{SY} (*Pseudotsuga*), coast live**^{SY} and black oak**^{SY} (*Quercus agrifolia* and *kelloggii*, respectively), and coffeeberry*^{SY} (*Rhamnus*). A total of four genera and four species that occur on the preserve are known to act as hosts for *Phytophthora ramorum*.

Although *Phytophthora ramorum* has not been confirmed in San Diego County (Swain 2002), the presence of *Phytophthora* fungi has been confirmed on San Diego oaks (pers. comm., Matteo Garbelotto, Iron Mountain Conservancy oak workshop, May 2001).

B. West Ranch

West Ranch Species of Interest include:

Banner Dudleya	<i>Dudleya saxosa aloides</i>
Cleveland Sage	<i>Salvia clevelandii</i>
Descanso (San Diego) milkvetch	<i>Astragalus oocarpus</i>
Engelmann Oak	<i>Quercus engelmannii</i>
Jewelflower	<i>Caulanthus heterophyllus heterophyllus</i>
Prostrate Spineflower	<i>Chorizanthe procumbens</i>

West Ranch Plant Communities include:

Forest and Woodlands

Coast live oak (*Quercus agrifolia*) woodland/forest

Engelmann Oak (*Quercus engelmannii*) woodland/savanna

Woodland herb-no types

Shrub-dominated Communities

Chamise (*Adenostoma fasciculatum*)

Mixed-Montane Chaparral

Scrub oak (*Quercus berberidifolia*) dominated chaparral

White sage (*Salvia apiana*) dominated chaparral/scrub

Mountain mahogany (*Cercocarpus betuloides*)

Inland Sage Scrub Component

California Sagebrush (*Artemisia californica*)

Matchweed (*Gutierrezia sarothrae*)

Matchweed-California Buckwheat (*Eriogonum fasciculatum polifolium*,
fasciculatum)

Wetland

Wetland-Riparian herbaceous

Pacific Rush (*Juncus effusus pacificus*)

Pondweed (*Lemna minuscula*)

Sedge Meadow

Mixed Wet Meadow

Ponds

Riparian

Coast Live Oak Riparian Woodland

Willow scrub

Upland Herbaceous Communities

Native grassland

Melica (*Melica imperfecta*) grassland

Needlegrass (*Nassella cernua*)

Giant Stipa (*Achnatherum coronatum*)

Deergrass (*Muhlenbergia rigens*)

Blue Wild Rye (*Elymus glaucus glaucus*)

Squirreltail (*Elymus elymoides*)

Native Grassland (Needlegrass)/Wildflower Meadow

Non-native grassland

Non-native Grassland/Wildflower Meadow

Ruderal/Non-native grassland

Wildflower Meadow

Ruderal/Agricultural

Disturbed

Exotic Plants

When the Descanso milkvetch population was found on the West Ranch in 2003, about 75% of it appeared to be dead, quite likely from the 2002 severe drought. A recheck later in the field season confirmed this. New plants were found in the vicinity of the dead plants.

C. Santa Ysabel Ranch Sensitive Resources

Sensitive resources, in addition to *Plant Species of Interest*, include:

Santa Ysabel Creek and floodplain, and associated riparian habitat and wetlands, including all tributaries (Figures 18 and 19)

"Perched wetlands" associated with seeps, occurring on upper slopes of the preserve

"Pocket wetlands" or isolated wetlands that did not appear to be associated with any above-ground (i.e. visible) water source

Kanaka Flats wetlands

All drainages and seeps on the preserve, some of which occur in the outcrops at the higher elevations. (Figure 8)

Native grasslands. Nodding needlegrass (*Nassella cernua*) and three-awn (*Aristida purpurea longiseta*) grasslands/meadows occurred frequently on the preserve, most often as patches or locally dominant stands (Figure 13). Plant Species of Interest were found associated with these community types, such as Wright's Hymenothrix (Figure 10), San Diego gumplant (Figures 15 and 16), and/or dwarf brodiaea (Figure 6). The three-awn-Hymenothrix association is unique for the area (Figures 9 and 10). The herbaceous component of the preserve is quite complex. Native grasslands often co-occur with non-native annual grasses and native/non-native wildflowers (herbs). Other native grasses occur on the preserve as well. It is possible that the total removal of cattle has allowed the non-native grasses and other weedy species to "release" and thrive. This can adversely affect native plant species on the preserve (McPherson 1997). Much acreage on both ranches is covered by non-native ripgut grass (*Bromus diandrus*). This has management implications and is discussed in the Management Recommendation section and in Appendix 6.

Oak woodland and savanna

Old growth. Many old growth coast live oak (*Quercus agrifolia*), sycamore (*Platanus racemosa*) and even Engelmann oak (*Quercus engelmannii*) trees were observed, some which may be the oldest trees in the county (Figures 11 and 12).

V. Discussion

The East Ranch had higher plant community and plant species diversity, as well as more Species of Interest, than the West Ranch.

The highest elevation on the East Ranch is 4,292 feet (1308 meters). If one uses Volcan Mountain (Simmon's Flat) to the east and the location of the Volcan Mountain Preserve as a comparison, the elevation of this area ranges from 3100 (945 m) to 5353 feet (1631 m). Plant communities associated with the higher elevation "montane" habitats known from Volcan Mountain (Sproul 2001) are missing from the East (and West) Ranch(s) of the preserve. These include: bigcone Douglas fir/canyon oak (*Quercus chrysolepis*) forest, canyon live oak forest, Coulter pine (*Pinus coulteri*) forest and Sierran mixed coniferous forest (*Pinus coulteri*, *Pseudotsuga macrocarpa*, Incense Cedar (*Calocedrus decurrens*), and white fir (*Abies concolor*). Though all but one of these species occur on the East Ranch, populations are scattered and these communities seem more transitional than climax plant communities. No white fir was found on the East (or West) Ranch. Vegetatively, the West Ranch is more "Mesa Grande-like" (which makes sense because it is in the Mesa Grande area) and the East Ranch is more a 'hybrid' between Julian or "Volcan Mountain- type" vegetation and "Mesa Grande-type" vegetation.

Generally the presence of montane mid to high elevation plant communities indicates greater precipitation most often from the presence of a rain shadow effect whereby a major air mass hitting a mountain range then cools, condensation occurs, and precipitation falls on the windward (usually western) side of the range. The descending dry air then creates a pronounced desert effect on the eastern slopes of the range (Vankat 1979, Barbour et. al. 1987). Most rare plants in the Cuyamaca/Laguna are found at the higher elevations (4,000-6,500 feet or 1219-1981m; Hirshberg and Clemons 1996). The lack of a dominant or subdominant montane element, lower

precipitation coupled with decades of grazing may be a factor in the potential of occurrence for some rare plants on the Santa Ysabel Preserve.

Native grassland was extensive in some areas on the preserve and included dominant stands of nodding needlegrass (*Nassella cernua*), junegrass (*Coeleria macrantha*) co-occurring with one-sided bluegrass (*Poa secunda secunda*) and a unique though limited plant community of three-awn (*Aristida purpurea longiseta*) co-occurring with the rare plant, Wright's Hymenothrix (*Hymenothrix wrightii*) (Figures 9, 10 and 13). The likelihood of significant stands of native grasslands was expected to be low due to the cattle grazing; however, some stands of native grasses were found where the slopes are steep. Often these slopes have little or no soil layer (exposed bedrock). The ability of these native grass species to grow in these sites may give them a competitive advantage over the non-native aggressive grasses which are predominant on the preserve.

The severe drought no doubt affected the results of the 2002 surveys. Signs of drought stress were common and ranged from premature leaf drop (as observed in coast live oak (*Quercus agrifolia*), manzanita (*Arctostaphylos* spp.), black oak (*Quercus kelloggii*), scrub oak (*Quercus berberidifolia*), and elderberry (*Sambucus mexicana*)), to incomplete flower bud development, flower bud atrophy or drop, or no flower production at all. Some plants appeared to be dying. In many species, dormancy may be induced by severe drought (Harper 1983). Flower buds were observed incompletely developed, shriveled or would drop off at the slightest touch. Species observed with incomplete flowering and flower bud production included snowberry (*Symphoricarpos mollis*), velvety false lupine, and mountain pink currant (*Ribes nevadense*). The Wright's Hymenothrix showed severely stunted growth and produced only a few plants that flowered in 2002 in contrast to 2003 when hundreds of plants flowered.

For plant species that have an asexual reproductive alternative (sprouting from the root system or stolons), the drought may not be as dire a situation as for those species that can only reproduce through flowering (i.e. sexually). Implications of this are reduced fitness and reliance on the existing seed bank for recruitment (if there is one). Drought-stressed plants are also subject to stress from other factors such as disease and insects (Barbour et al. 1999). Mountain pink currant shrubs showed severe insect damage in the form of leaf defoliation. A feedback mechanism may exist between the insect and defoliation. The timing of the defoliation is critical in determining the plant's response (Harper 1983). If the leaves are removed after the inflorescence has been formed, the effect is generally to increase seed abortion or the plant may produce smaller seeds (Harper 1983). Some of these mechanisms and responses were evident in plants observed on the preserve during the 2002 field season.

Plant Communities on the Preserve

The Santa Ysabel Ranch Open Space Preserve contains a rich mosaic of plant communities (Appendix 5). The distribution of plant communities is affected by many past and present factors including but not limited to agricultural uses, cattle grazing, fire, wildlife, human activity such as selective tree removal and road building. The most influential effect on plant distribution in the future may likely be global warming and any subsequent climate change. The characteristics of the plant communities on the preserve should be viewed as the sum of all these factors.

Non-native ripgut grass (*Bromus diandrus*) occurs prolifically on the Preserve. Santa Ysabel Preserve (the Edwards Ranch) had been used for ranching for many years and as of 2001, most of the cattle were removed. The removal of cattle may encourage the spread of non-native grasses and weeds. Most likely, the cattle kept the ripgut (*Bromus diandrus*) in control because they will eat the new sprouts (*pers. observation*); the control of this and other noxious grass may have benefited other native plant species (McPherson 1997). It is not known if deer or other herbivores forage on the ripgut and wild oat sprouts, and, if they do, to what extent this foraging affects survival of the non-native grasses. Removing cattle from a place where they have been for many years has implications for management (see Appendix 6).

East Ranch

Based on the surveys completed, in general, the most predominant plant community types on the East Ranch appeared to be: coast live oak woodland, Engelmann oak (*Quercus engelmannii*) woodland, oak and white alder riparian woodland, ripgut (*Bromus diandrus*) non-native grassland, non-native grassland/meadow, scrub oak chaparral, and chamise chaparral. On the East Ranch, in general, the coast live oak forest was restricted to the lower slopes and valley area while the black oak and canyon live oak occurred higher on the ridge slopes and ridge tops. Ridgetops were often rimmed with chaparral with big cone Douglas fir (*Pseudotsuga macrocarpa*) and Coulter pine (*Pinus coulteri*) stands near the ridgetops. Once cresting the ridge, it opens to the south into non-native grassland/wildflower meadows with scattered occurrences of native grasses and associated herbs. Colonies or locally dominant "rings" of wild rose (*Rosa californica*), squawbush (*Rhus trilobata*), and snowberry occurred in the open grassy areas.

No large dominant stands of conifers were observed on the preserve. All appear to form relatively small isolated stands (generally less than a few acres) or they may be scattered and intergraded within the oak woodland or grassland community types. Many of the oak and sycamore trees are quite old and impressive. Old-growth species include sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*) as well as some old-growth Engelmann oak (*Quercus engelmannii*). An inventory of the old growth, including regeneration, is highly recommended.

The elevational gradient of the various woodland and forest types can be obvious. Generally, one can walk from the coast live oak forest on the lower slopes, into a black oak forest mid-slope, then into a canyon live oak area near the top of the slope and into Coulter pine at the top of the ridge. This type of distribution is fascinating and gives credence to the hypothesis that the Santa Ysabel Preserve comprises a transitional zone in plant communities from the montane, as on Volcan Mountain, to those more resembling lower elevation plant communities, such as Mesa Grande. The East Ranch of the preserve indeed seems to be a "textbook example" of a transitional zone between montane elements and the Mesa Grande "foothills" area which is similar in elevation.

Surveys included an area that had been burned in the past (pre-Cedar and Pines Fire) and the signs were still existent. Species observed in this area included manzanita: (*Arctostaphylos pungens*), coast live oak seedlings and saplings, snowberry, honeysuckle (*Lonicera subspicata*), saw-tooth goldenbush (*Hazardia squarrosa* g.), white sage (*Salvia apiana*), Coulter pine, blue wild rye (*Elymus glaucus glaucus*), june grass (*Koeleria macrantha*), one-sided blue grass (*Poa secunda* s.), narrow-leaf

bedstraw (*Galium angustifolium angustifolium*), checker mallow (*Sidalcea malvaeflora sparsifolia*) and poison oak (*Toxicodendron diversilobum*). Young bigcone Douglas fir trees about 10-18 inches (20-45 cm) in diameter at breast height were also observed in this area.

One of the more predominant features of both ranches is the extensive Engelmann oak savanna (Figure 4). Oak savannas are being displaced by urban growth on a large scale (McPherson 1997). Urbanization has been the major contributor to a recent rapid decrease in the extent of California oak savannas (McPherson 1997). The rate of regeneration of this community type was not assessed during these surveys (beyond anecdotal observations) but a study of this type is strongly recommended and is addressed under the "Possible Future Projects" section of this report.

Two massive wildfires occurred during the course of this study. In August 2002, the 63,000 acre Pines Fire burned much of the neighboring Volcan Mountain ridge system. In October 2003, the Cedar Fire burned over 270,000 acres, in addition to approximately one-third of the East Ranch from Inaja Memorial Park northeast towards Farmer Road in Julian. The effects of this remain to be determined, but the fire in combination with the drought and climate change, may alter vegetation patterns permanently (i.e. type conversion). Fires have been recorded on the East Ranch in 1940, 1947 and 1963 (California Department of Forestry and Fire Protection, Fire Perimeter Data, 2002). Fires occurred on the West Ranch in 1929, 1938, 1956, and 1981.

Approximately 3 miles (~5 km) of the Santa Ysabel Creek corridor occurs on the East Ranch. Waypoint 107 from the East Ranch marks a place where an underground channel meets Santa Ysabel Creek. This is most likely a fracture that is draining into the creek. The Division of Mines report for the Santa Ysabel quadrangle states,

"Santa Ysabel Creek is apparently an exception to the rule of structural control. Although a short section of one branch follows the Elsinore fault, and the west end follows a contact, the creek meanders across the Elsinore fault and other prominent structures. It is one of the largest through-going streams and probably was able to maintain its course regardless of faulting." pp. 19

At times in 2002, the creek on the East Ranch was nearly dry aside from isolated (sometimes eutrophic) pools. White alder forests occur on the East Ranch (Figure 14). Stands of dead white alder (*Alnus rhombifolia*) were evident along the west end of the creek. The root system of alder is shallow; it "likes to keep its feet wet" and does not tolerate drying out (Harlow et. al. 1978). It is a prolific seeder but only if there is plenty of moisture (Harlow et. al. 1978). It also has an actinorhizal relationship which enables it to fix nitrogen, thereby building the soil. Nitrogen-fixing plants are capable of increasing soil nitrogen levels by more than ten times (Vankat 1979). Mortality of alder stands on the creek may continue thus removing from the riparian area a significant forest element. It is not clear at this time whether the low flows were due to natural (e.g., drought conditions) or anthropogenic causes, or a combination of the two. The Julian Water District draws from the Santa Ysabel watershed, cattle have used it for the last ~ 50 years, and the reservation may be drawing from tributaries or the creek itself (a large cement dam exists on the creek where it meanders onto the reservation; Waypoint 112).

West Ranch

The most common plant community types on the West Ranch were coast live oak (*Quercus agrifolia*) woodland/forest, Engelmann Oak (*Quercus engelmannii*) woodland/savanna, chamise (*Adenostoma fasciculatum*), mixed-montane, scrub oak (*Quercus berberidifolia*) dominated chaparral, white sage (*Salvia apiana*) dominated chaparral/scrub, inland sage scrub component with California sagebrush (*Artemisia californica*), mixed wet meadow, willow scrub non-native grassland/wildflower meadow, ruderal/non-native grassland and ruderal/agricultural. No conifers were found on the West Ranch and no montane plant communities were identified as occurring on the West Ranch.

The West Ranch is in Mesa Grande and extends north from Highway 78 to Mesa Grande Road. The vegetation on the West Ranch is typical of the Mesa Grande area--generally an oak savanna type habitat with an herbaceous understory (mostly non-native grasses and mixed herbs). The dominant oak species in this case is Engelmann oak (*Quercus engelmannii* and probably hybrids) and coast live oak (*Quercus agrifolia*). The Engelmann oak savanna on the West Ranch is extensive and the dominant plant community on the West Ranch. (Figure 4).

Only about a half mile or less (or about .5 km) of Santa Ysabel Creek runs through the West Ranch but this has habitats typical of the creek including oak riparian woodland, willow scrub and wet meadow habitats. The grade down to the creek from the south is extremely steep. Populations of the arroyo toad were discovered along this stretch of the creek by USGS. Arroyo toads are known from Witch Creek which is a tributary of Santa Ysabel Creek that occurs west and south of the West Ranch.

IV. Conclusion

Even though the Santa Ysabel Ranch Open Space Preserve comprises one name, the "preserve" is actually two distinct units or "ranches". Each "ranch" is ecologically distinctive. The East Ranch had a higher plant species and plant community diversity including montane elements found on nearby Volcan Mountain, while the West Ranch is more an open oak savanna-type area. Each plays a role in protecting the Santa Ysabel Creek watershed. The differences between these two parcels increase their overall value for preserving biodiversity of local, regional and national significance.

The Santa Ysabel Ranch Open Space Preserve must be one of the finest examples of local and regional biodiversity in San Diego County. Though the plant species composition was affected by years of cattle grazing, the ranch remains in excellent "biological condition". The ranch-turned-preserve has tremendous diversity of habitats and provides a land area contiguous and large enough to support viable populations of wildlife. The preserve is in the process of rebounding from years of cattle grazing and human use. Ranchers call this "resting" an area – an important ecological process that can extend over years as the land establishes a new "homeostasis" in the absence of persistent and long-term disturbance. This "resting period" may help the area better withstand future impacts as an open space reserve.

The preserve is also a functioning system as a whole. Pronouncing one part more important than another part is akin to deciding the alternator is the most important part of a car when this "most important part" is totally useless without the rest of the system. In

light of this, all the elements of the preserve should be protected and managed very carefully and respectfully to maintain the workings of the whole (eco)system.

The Santa Ysabel Preserve is an outstanding example and remnant of San Diego County's, often fragile, biodiversity. Management actions should prioritize habitat conservation goals. Only public uses compatible with those conservation goals should be considered for secondary "uses" of the Preserve.

VI. Management Recommendations

Management prescriptions of the Preserve should be consistent with the maintenance of long-term viability of its native species and communities. Threats to plant resources include physical disturbance (e.g., trampling), invasion by non-native species (including plants, invertebrates, and pathogens), forest and fire management prescriptions, altered fire regime, and unmanaged or incompatible recreation.

Management of the Ecological Mosaic

In general, only non-motorized and non-hoofed recreation (e.g., hiking, nature study, birding, etc.) is recommended for the whole preserve. Horseback riding and mountain biking is not recommended on the preserve, as these uses are frequently associated with difficult-to-regulate off-trail use, and unauthorized trail formation, which can imperil sensitive resources.

Overall, the West Ranch appears to be better suited for human visitation and recreation than the East Ranch. The East Ranch has a greater overall diversity of habitats and plant communities, has the greatest number of rare plants discovered thus far, is of a greater topographic relief which includes a montane element to the flora, has the creek running through the total area, and exhibits a greater fragility than the West Ranch. The East Ranch comprises a transition zone between the flora and characteristics of Mesa Grande and Volcan Mountain. Therefore it has a greater overall diversity. There are areas that are permanently or temporarily particularly delicate (e.g., areas of some slopes with unstable soils, the entire area affected by the Cedar Fire); recreational access in those areas should be restricted.

Elevational gradients do not vary as much on the West Ranch and it is indeed part of the total Mesa Grande region which is more savanna/grassland-like and has very few montane elements. The area has also been used for agricultural uses extensively and, based on the dominant plant species composition, is more disturbed than the East Ranch. Non-native grassland, composed primarily of ripgut (*Bromus diandrus*) and wild oat (*Avena barbata*) dominate the West Ranch herbaceous element, in some areas, forming vast monotypic stands. Engelmann oak is the dominant tree species on the West Ranch but if the existing road system is used for access, impacts to this species should remain low.

Management of Plant Species of Interest

At present, 18 plant "Species of Interest" are known on the preserve, 12 that are known only from the East Ranch, one only known from the West Ranch (though likely on the

East Ranch) and five that occur on both parcels. Plants that may be adversely affected by human activities include

- Banner Dudleya: occurs along the Santa Ysabel Creek on the East Ranch
- Descanso milkvetch: occurs in and along the main access roads on the East Ranch
- Kern's Brodiaea: occurs right next to main access road from Farmer's Road and just above the creek on the East Ranch (Figure 6)
- Long-spined Spineflower: occurs in main access road at one of the exposed Julian schist sites on the East Ranch; very few plants
- San Diego Gumplant: although ubiquitous on the preserve, it does like to grow in disturbed areas including old dirt roads. Common in many of the dirt roads on the preserve (East and West) (Figures 15 and 16)
- Western Azalea: at present, only three shrubs have been located and in 2002, two had been severely grazed (by cattle, deer?). These plants could easily be eliminated. They all grow on the creek on the East Ranch. (Figure 7)

Regarding other resources, an impressive "Dudleya rock garden" (*Dudleya edulis*) was discovered in 2003 on outcrops that rise above Highway 79 across from the Inaja Memorial Rest Area. Plants were large and vigorous with many flowers in 2003 (Figure 5). Thousands of Dudleyas occurred in this area growing on and within the fissures and cracks of the granitic outcrops. This area appeared to be burned in the 2003 Cedar Fire. At this time, it is not known how or if the "Dudleya garden" will recover. These plants may be particularly sensitive to unauthorized rock climbing/bouldering or collecting. Periodic monitoring of these populations should take place to gauge if impacts are occurring to take appropriate protective measures. Priority for monitoring could be those plant species most likely to be subject to human impacts.

The remaining plants all occur in areas quite remote from the main roads and it is unlikely they will suffer adverse effects from human visitors. Rare plant surveys and monitoring of rare plant populations should be continued on the preserve.

Santa Ysabel Creek Protection

The Santa Ysabel Creek attracts human visitors. The whole riparian area is fragile. Bank stability in some areas is low, mostly likely affected by years of cattle use (Figure 17). Targeting humans to a specific area along the creek may be prudent. If the West Ranch is opened, the stretch of creek on this Ranch is shorter than on the East Ranch, which could mean more damage to this stretch of the creek by concentrating the use. In favor of the creek on the West Ranch are the large granite outcrops that occur in the creek on the West Ranch. It is likely visitors will station themselves on these boulders thereby reducing impacts to the wetlands that occur on the banks.

One area on the East Ranch already visited is a naturally eroded "tub", perfect for sitting in. Although some scattered litter was found near this area, the natural construction of the "tub" is out of granite therefore it handles the use impact relatively well. Aside from the litter, I did not observe any serious impacts from this activity but once the reserve is opened to the public, impacts will surely increase. The "tub" location should not be advertised.

Some measures to reduce impacts to the creek and the associated wetlands might include the installation of attractive but unobtrusive foot bridges for creek crossings and/or even elevated wooden walkways to prevent impacts to the wetlands along the creek. The County might also identify "sacrifice zones" that can be rotated over the years and direct the public to these specific areas in order for them to make contact with the creek. These areas should be monitored regularly. Public should be directed to areas that are not surrounded by wetlands, that ideally have exposed bedrock, and can accommodate human visitation/impacts over long periods of time. Selecting 4-5 areas that can be used on a rotational basis may prevent permanent impacts to the creek.

Wetlands Protection

Currently, the main access road from the Farmer's Road entrance bisects a beautiful mosaic of wetlands associated with the creek (Figures 18 and 19). The main ranch roads also bisect the wetlands in the Kanaka Flats. Permanent impacts to this area are highly likely as use increases. Regarding the ranch road from Farmer's Road, options are to relocate this road to the upper slopes, however; the upper southwest-facing slopes north of the creek on the east portion of the East Ranch is where the unique three-awn-Hymenothrix plant community occurs with other Plant Species of Interest. These slopes are also where the perched wetlands occur and where tributaries flow or drain into the creek. The location of this new access road, if built, must be selected very carefully. If drainage patterns are affected, this could also threaten the integrity of the wetlands below the new road. There are areas that are dominated by monotypic stands of ripgut and placing a road within these areas could possibly benefit the surrounding communities if the population of this species is substantially decreased. Again, this decision must be made looking at all the possible environmental effects, including changes in the hydrology. Alternatively, the County could enter into agreement with the Bureau of Indian Affairs to use the road that parallels the Preserve just to the north of the fenceline. This road is not in close proximity to the creek (which would necessitate some walking on the part of the Ranger staff), but it is possibly the cheapest and most environmentally sensible solution. Other than relocating the roads, less invasive options might include the installation of elevated ramps or some type of platforms in those areas with roads that bisect wetlands.

Trash Management

Policy should be to pack it in and pack it out. Trash containers within the preserve could attract wildlife. If trash containers are placed on the preserve, they should be placed in inconspicuous locations to minimize illegal garbage dumping. Unobtrusive bear-proof (wildlife-proof) models are recommended.

Trails Management

The preserve currently has an outstanding and extensive network of ranch roads that can act as trails for visitors. It seems unlikely that new trails would need to be constructed. Maintaining these roads over time should be non-invasive. "Industrial-scale" grading and road widening is not recommended, as that can cause a loss of native habitat, encourage the growth of non-natives weeds, and if berms are created, this can channel the water into the newly graded roads, thereby causing gully erosion and necessitating further grading. It is important to realize that anywhere where the soil is disturbed, cleared, graded, ripped, weeds will appear thereby possibly creating new

management problems. Observed road maintenance by the County on the East Ranch appeared to be effective yet unobtrusive. The areas were weed whipped or mowed but the width of the road was not increased.

Forest Management

A number of conifers on the East Ranch have been killed (Figure 20) by the western bark beetle (*Dendroctonus brevicomis*). Dead trees should be left if not a fire hazard to adjacent landowners, or risk to the safety of visitors engaged in authorized activities. These trees are important to many wildlife and bird species. Some diseased trees may survive this infestation, and therefore be important for the recovery of these populations and communities. Indeed, some may be important for the development of stronger or resistant strains to the beetle and associate fungus. As is evident in the Julian area, some Coulter pines are surviving this attack and these trees should be retained.

Oak Management

Oak woodlands support a whole oak-dependent ecosystem. Numerous animal species depend on oak trees for their survival (recommended: *Oaks of California*. by Bruce Pavlik, Pamela Muick, Sharon Johnson, and Marjorie Popper. Cachuma Press and the California Oak Foundation). The oaks (and sycamores as well as other species) comprise some of the largest (per d.b.h.) trees ever observed by the surveyor. These trees in and of themselves are valuable for protection. As stated in the "Oak Woodland Bird Conservation Plan" produced by the California Partners in Flight Program (2002),

"Protecting sites with a diverse age structure of oak trees will provide a continuum of seeding phenologies, preventing synchronous or wide-scale acorn crop failures (or local extirpation of oak woodlands). Maintaining large old oaks within a diverse age structure will provide decaying limbs necessary for bird nesting sites in addition to high output acorn production. McDonald (1990) demonstrated that Black Oaks (*Quercus kelloggii*) must reach 30 years before producing viable acorns and seldom produce large quantities of acorns until they reach 80-100 years. Good acorn producing trees can continue abundant production up to 200 years."

Visitors to the Preserve may transmit spores of *Phytophthora ramorum* onto the preserve via their shoes, mountain bike tires and possibly in horse hooves. Whether or not the spores germinate and the fungus spreads may ultimately be determined by climatic factors (Swain 2002). At any rate, the possibility of transmitting the SODS fungus onto the preserve cannot be overlooked.

Removal of Non-native Species

Introduced plants and exotic plants should be removed as soon as possible. High priorities would be removal of tamarisk (*Tamarix* sp.) and tree-of-heaven (*Ailanthus altissima*), both growing in and along Santa Ysabel Creek. One of the predominant plant communities on the preserve is extensive stands of ripgut (*Bromus diandrus*). The brome is capable of taking over areas where native species occur. It is aggressive. Filaree (*Erodium botrys* and *E. cicutarium*) is ubiquitous on the preserve also and it also has affected the occurrence of native plant species (Figure 21).. It is not known if removing the cattle from the preserve has allowed these species to spread even more

but this is highly probable (McPherson 1997). Strategies should be developed regarding managing these species (Appendix).

Tree-of heaven (*Ailanthus altissima*), from China, occurs in the Santa Ysabel Creek on the East Ranch. Though it is a weed tree, it has a fascinating history dating back to the Chinese miners that came to the United States and brought the seeds with them. *Ailanthus* "does it all" which makes it quite challenging to eliminate from a natural area. It tolerates growing in the shade, root sprouts prolifically, seeds itself, and the seeds are moved around by birds and other wildlife. It is also allelopathic (produces chemicals that prevent the growth of other plants). It is commonly seen as a ring of giant clones taking over an area (like a fungus).

Tamarisk is currently rare on the Preserve; only a few plants were observed on the East and West Ranch all along Santa Ysabel Creek. Owing to how small the populations are at this time, the County should attempt to remove these plants as soon as possible. The fact that there are only a few plants (and the ones observed on the West Ranch were small) means the County could eliminate this threat/problem soon.

Large areas of non-native grasses -- the most insidious and prolific of which is ripgut (*Bromus diandrus*) -- occur on the preserve. As a supplement to this topic, I have selected an array of scientific papers that illustrate many of the issues related to accepting, managing or attempting to eliminate invasive non-native grasses (Appendix). There are no easy answers and where large amounts of acreage are already covered with these grasses, one has to weigh if attempting to eliminate these grasses is even possible (see Heady's summary in the papers) and a reasonable use of public funds.

Arguments for calling these invasive plants "naturalized" and living with them are:

- paleobotanically, these invasions may be insignificant.
- these grasses have been here for 100 years or longer. It is unlikely they will ever be completely eliminated short of an adverse (for them) catastrophic change in growing conditions.
- unless areas surrounding an "exotics elimination zone" are also managed, seed invariably spreads back into the area and the area is reinvaded. Ripgut is ubiquitous in the Julian/Cuyamaca area along with other invasive grasses that are thriving.
- attempting to eliminate these grasses is cost-intensive (it is not something that can be done with an extra \$1000 grant funding, one year and a college student). These projects can be extremely demanding--demanding of funding, personnel, and time and the successfulness of these projects depends on *long term* (at least five years if not ten) commitment which in light of personnel turnover and budget crises, is not always possible.
- areas where non-native plants occur can act as "sacrifice zones" as far as where to direct public uses. Putting a picnic table into a monotypic stand of ripgut (that has been cut so it cannot set seed and attack the socks of unsuspecting visitors) can be an effective way to keep these species under control. The key is making sure there are no seeds that can transport to other areas, thus the importance of weed removal and/or mowing prior to seed set.

*Arguments for elimination of non-native invasive species, including not only ripgut but also Filaree (*Erodium* spp.)*

- The primary argument for spending funds on eliminating non-native invasive species is that it may enhance and restore local biodiversity by eliminating noxious species that can outcompete native plant species. Non-native annual grasses can outcompete young oak tree seedlings and choke out many other native species. A decline in native plant species diversity can have a domino effect and may result in a decline of other native taxa.

Techniques used for reducing or eliminating non-native grasses/forbs include:

- controlled grazing keeping in mind that the type of grazer can affect outcome
- prescribed burning (not politically acceptable most likely)
- mowing
- disking/grading (this can also encourage weeds other than the "target" weed(s) and adversely affect non-target species. In the "target weed(s)", disking should occur to prevent flowering and/or seed set).
- solarizing (waiting until the seedlings sprout then basically "cooking" them using various coverings including black plastic, canvas, tarps, etc.)
- herbicides
- a combination of these.

There is no one way, technique, method, etc. to do this. One must review the literature then ideally, set up test plots that experientially test the successfulness of each method. As mentioned before, each one of these techniques, including setting up the experimental plots means money, staff, and time. If one of the methods is found to be successful and is implemented, then it must be for the long-term (including monitoring).

Each method has its own regulatory burden. Herbicides require paperwork, approvals, certification to apply, the right weather conditions, etc. Prescribed burns can be a whole other 'challenge' of regulation including CEQA, smoke plans, contacts with nearby residents, etc. Decisions regarding which management method to use often include much paperwork and regulation. This cost should be factored into overall management approach.

Restoration and Revegetation

If a decision is made to seed in an area, seed should be collected from on or near the site to be revegetated. It can be freely broadcast into the area, with proper site preparation, or grown then planted into the area. Absolutely no "Meadow in a Can" or similar products should be used on the Ranch. When a land area is preserved, so is the gene pool or genetic history/integrity of the area. Introducing outside seed sources or genetic variants can threaten the natural integrity of the existing gene pool. Do not seed in "generic" seeds purchased from Home Depot or any other similar vendor. Similarly, do not seed in native species that do not occur on the preserve naturally.

Select the least invasive method (and often the cheapest) and accentuate natural processes. After a disturbance, unless severe erosion is likely, the area should be enabled to revegetate totally on its own. Chemical free excelsior matting can be placed on the site to stabilize the soils, but the site should be "allowed" to rebound on its own

and observed. Compacted sterile soils can be scarified. If mostly weeds and non-natives pop up, then some type of native seeding or planting may be necessary.

Boundary Issues

The property is shared by various landowners, including the Bureau of Indian Affairs. It is prudent to develop a good working relationship with the adjacent landowners in the interest of protection and proper management of the preserve. Regarding this issue, in August 2003, I found a golden eagle that was nearly dead. It was discovered a few days later and had died. (Figure 22). It possibly died of secondary poisoning from rodent poison (Dave Bittner, *pers. comm.*). The bird may have picked up the poison off the preserve but then foraged on the preserve. This "off the preserve" issue could have serious effects on management of the preserve. Education and positive relationships with adjacent landowners can be an important strategy to good resource management of an open space area.

Ecosystem Health and Climate Change

There is near consensus in the scientific community that the global climate is changing. At this time, it is not clear what the future climatic regime will be for the San Diego mountains.

"The rate at which we are changing the atmosphere will produce a much more rapid climate change than most of the climate changes in the past. When there's been a very rapid climate change in the past--for example, at the end of the last glacial period--plant species had a hard time keeping up with the temperature change. Now we may be causing climate changes of several degrees in less than a century. That's an order of magnitude faster than most of the climate changes in the past. In the worst-case scenario, you could have a climate that changed so much during the lifetime of a single tree that the tree was only briefly in the best environment for its growth. This would be tremendously disruptive, even in managed ecosystems; in natural ecosystems it would be devastating. There would be widespread extinction of species."

-- Dr. Margaret Davis, forest paleoecologist

A long-term monitoring program should be launched on the Preserve to assess the short- and long-term dynamics of the species and communities on the Ranch. Such dynamics were evident over the short time-scale of this study. Signs of an ailing ecosystem were present in the vegetation in 2002 primarily from drought stress resulting in premature leaf drop, induced dormancy, lack of flowering/fruitletting, severe insect damage, and even death. Pools observed in 2002 that were drying-out were under tremendous pressure from wildlife owing to the hundreds of tracks observed around the pools. Stands of dead alders occur along the creek on the East Ranch. Many of the Coulter pines are infected with the western pine bark beetle (*Dendroctonus brevicomis*). In some place, ripgut grass is thick and prolific on the preserve. Stands of tree-of-heaven are common also. The year 2003 was a drastic and extreme improvement over the dire conditions evident in 2002.

An adaptive management approach should be adopted for the Preserve. This approach is one that constantly strives to update its land area information (biological and cultural as well as other types of information) and then integrates the new information into the overall management of the area. An "ecosystem health assessment" should be made

on the preserve and should include monitoring water levels and quality along the creek. The creek is the heart of the preserve and if it is not healthy, other ecosystem elements may be affected. Each ecosystem should be evaluated for its "health and viability" in addition to simply identifying them. This information can then be used to make proper management decisions.

Post-Cedar Fire Recommendations

Basically, the recommendation is to leave the area to recover on its own unless landslides are likely that threaten human health or safety or the water quality of Santa Ysabel Creek. Areas damaged from fire fighting activities, in keeping with the recommendations above, should be stabilized especially if slopes are greater than about 30%. Areas should then be allowed to recover on their own. If reseeding is necessary, sites should be seeded with or replanted from stock grown-out from local seed.

VII. Suggested Future Projects

Possible future restoration, monitoring, or management projects for the Preserve include:

- Post-fire recovery monitoring for herbs, shrubs and trees, including plant Species of Interest that may have been affected by the fire.
- An ecosystem health assessment once every five years which includes identifying any diseased trees (e.g., Coulter pines) or possible large scale plant diseases or infestations, includes estimating severity, and further monitoring needs. An ecosystem health assessment can include many of the components mentioned below such as a hydrology element, woody species health, exotic species proliferation, user impacts, etc.
- On-going exotic plant inventory.
- On-going grass species inventory (can be combined with the above).
- Continuation of all inventories to build on baseline knowledge of the wildland area.
- Consider autecological (species-specific) studies on rare plants that occur on the preserve. Monitoring of species most potentially affected by human activity may also be undertaken.
- Hydrological study of creek and long-term monitoring of the creek and water levels. White alder (*Alnus rhombifolia*) trees by default will indicate water levels. These species cannot stand to have their "feet dry" and may respond rapidly to changes in water levels. Dead white alder occur on the East Ranch of the preserve.
- Experimental plots to determine a possible management methodology to eliminate or reduce the spread of ripgut and other noxious invasives.
- Big Trees and Regeneration Study (coast live and Engelmann oaks, sycamores and possibly big-cone Douglas fir). Locate largest trees on the preserve, take d.b.h. and

make assessment of regeneration. Determine age classes of trees and therefore, viability of forest and woodland ecosystems. Monitor oaks for signs of SODS.

- Butterfly Inventory/Insect Inventory. All of the major host plants and most of the known nectar plants for the Quino checkerspot butterfly (*Euphydryas editha quino*) occur on the Preserve making it a possible candidate for reintroduction of the Quino checkerspot butterfly.
- Aquatic invertebrates inventory. These species act as excellent indicators for the overall health of the Creek.

VIII. Acknowledgements

The year 2003 was an extremely difficult one for me and without the help and understanding of the folks listed below, I would not have been able to complete this project. I bid a hearty 'adieu to the year 2003.

As often happens to naturalists and biologists, they develop a deep appreciation for a places they survey. I have grown to love Santa Ysabel Preserve and all its amazing biodiversity which must be protected. I thank The Nature Conservancy for allowing me the chance to survey this very special place.

Hats off to Jeff Rundell and James Stower, Rangers for the Santa Ysabel and Volcan Mountain Preserves whose continual help and support has been important for the completion of these surveys. Thanks also to county parks "mate"/intern, Amber Inwood.

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And finally and most sincerely, thanks for Dr. Scott Morrison of The Nature Conservancy. Scott's gentle and understanding guidance through this project was very much appreciated.

In remembrance: I did not know the Edwards Family but every time I was on the preserve, I thanked them for their tremendous foresight in choosing to preserve this property and I thank The Nature Conservancy for making in possible--what an important and precious gift to the future generations of San Diego County.

Among the scenes which are deeply impressed
on my mind, none exceed in sublimity
the primeval forests undefaced by the hand of man
no one can stand in these solitudes unmoved,
and not feel that there is more in man than
the mere breath of his body.
- Charles Darwin

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X. Maps and Figures

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Figure 1. View of the East Ranch with scrub oak chaparral, mixed montane forest, non-native and native grassland, and Engelmann oak all in one scene.



Figure 2 . View looking southeast from the East Ranch.



Figure 3. Typical view of the northern portion of the West Ranch--chaparral among the outcrops.



Figure 4. Engelmann oak savannah with non-native and native grassland on the West Ranch.-



Figure 5. One of the many large and impressive lady fingers (*Dudleya edulis*) in the “Dudleya Garden” on the East Ranch.



Figure 6. Dwarf brodiaea (*Brodiaea terrestris kernensis*) reaches towards the sun on the East Ranch



Figure 7. Western Azalea (*Rhododendron occidentale*) growing along Santa Ysabel creek on the East Ranch.



Figure 8. Many outcrops on the Preserve had seeps associated with them such as these outcrops on the West Ranch covered with water-loving seep monkeyflower (*Mimulus guttatus*).



Figure 9. Three awn (*Aristida purpurea longiseta*) meadow with other associated species: Wright's eriogonum (*Eriogonum wrightii membranaceum*), nodding needlegrass *Nassella cernua*, and mule ears (*Wyethia ovata*).



Figure 10. Flowering *Hymenothrix wrightii* on the East Ranch



Figure 11. One of the many old-growth oaks (*Quercus agrifolia*) on the preserve.
Taken on West Ranch.



Figure 12. An old growth coast live oak “bustin’ out”.



Figure 13. Native needlegrass and wildflower meadow. Blue eyed grass (*Sisyrinchium bellum*), purple owl's clover (*Castilleja purpurea*), and last year's flowering culms of native needlegrass color the hillside on the East Ranch.



Figure 14. Stands of white alder occurred frequently on the westernmost portion of Santa Ysabel Creek on the East Ranch. Dead stands of alder are found along the creek.



Figure 15. San Diego gumplant (*Grindelia hirsutula hallii*) on the East Ranch “grins” at the camera.



Figure 16. One of San Diego Gumplant's preferred habitats on the East Ranch.



Figure 17. Bank erosion along Santa Ysabel Creek on the East Ranch.



Figure 18. The main ranch road on the East Ranch that bisects the mosaic of wetlands in the valley.



Figure 19. Example of type of wetland that occurs in eastern valley of the East Ranch and is adjacent to one of the main ranch roads.



Figure 20. Dead Coulter Pines on East Parcel of Santa Ysabel Preserve.
Area burned in 2003.



Figure 21. Needlegrass (*Nassella* sp.) drowns in a sea of filaree
(*Erodium* spp.) on the West Ranch.



Figure 22. Dead golden eagle found on the East Ranch, August 2003.

APPENDICES 1-6

Appendix 1

GEOLOGY AND SOILS OF THE SANTA YSABEL RANCH OPEN SPACE PRESERVE

Geology

JM: mixed rocks of quartz diorite and schist

TRI: Julian schist

KS: San Marcos garbo; very little represented on the preserve.

Soils

<u>Type</u>	<u>Derived from:</u>	<u>Name</u>	<u>%Slope</u>
CaB	granitic alluvium	Calpine coarse sandy loam	2-5%
CtE	acid igneous rock and micaceous schist	Crouch coarse sandy loam	5-30%
CtF		Crouch coarse sandy loam	30-50%
CuG		Crouch rocky coarse sandy loam	30-70%
HmD	micaceous schist	Holland fine sandy loam	5-15%
HnE		Holland stony fine sandy loam	5-30%
HnG		Holland stony fine sandy loam	30-60%
HoC		Holland fine sandy loam	2-9%
Rm	riverwash	in association with streams	
SpE2	micaceous schist and gneiss	Sheephead rocky fine sandy loam	9-30%

Information obtained from:

Division of Mines, 1958. Geology and Mineral Resources of Santa Ysabel Quadrangle, San Diego County, California. San Francisco. Bulletin 177.

USDA, 1973. Soil Survey, San Diego Area, California. Soil Conservation Service.

Appendix 2

LIST OF POTENTIAL PLANTS OF INTEREST* ON SANTA YSABEL RANCH OPEN SPACE PRESERVE

Obtained from: Sproul, 2001; J. Hirshberg as cited by Sproul/others; herbarium records; NDDB records; Beauchamp 1986; personal communications with other botanists; and, personal experience.

Compiled by: VIRGINIA MORAN

Name	Abbreviation
<i>Agrostis diegoensis</i>	Agdi
<i>Allium parryi</i>	Alpa
<i>Androsace elongata</i>	Anel
<i>Arabis hirshbergiae</i>	Arhi
<i>Aristida purpurea</i>	Arpu
<i>Arenaria pusilla diffusa</i>	Arpd
<i>Artemisia palmeri</i>	Arpa
<i>Astragalus oocarpus</i>	Asoo
<i>Aspidotus densa</i>	Asde
<i>Boykinia rotundifolia</i>	Boro
<i>Brodiaea orcutii</i>	Bror
<i>Brodiaea terrestris kernensis</i>	Brtk
<i>Calochortus amabilis</i>	Caam
<i>Calochortus dunnii</i>	Cadu
<i>C. invenustus</i>	Cain
<i>Castilleja lasiorhyncha</i>	Cala
<i>Caulanthus pseudosimulans</i>	Caps
<i>Caulanthus heterophyllus h</i>	Cahh
<i>Ceanothus foliosus</i>	Cefo
<i>Celtis reticulata</i>	Cere
<i>Chaenactis parishii</i>	Chpa
<i>Chimaphilia menziesii</i>	Chme
<i>Chorizanthe polygonoides longispina</i>	Chpl
<i>Chorizanthe procumbens</i>	Chpr
<i>Cercis occidentalis</i>	Ceoc
<i>Clarkia delicata</i>	Clde
<i>Cupressus stephensonii</i>	Cust
<i>Delphinium hesperium cuyamaca</i>	Dehc
<i>D. parishii subglobosum</i>	Deps
<i>Downingia concolor brevior</i>	Docb
<i>Dudleya saxosa aloides (alainae)</i>	Dsaa
<i>Echinocereus engelmannii munzii</i>	Ecem
<i>Ericameria cuneata macrocephala</i>	Ercm
<i>Euonymus occidentalis parishii</i>	Euop
<i>Galium angustifolium borregoense</i>	Gaab
<i>Gilia caruifolia</i>	Gica
<i>Grindelia hirsutula hallii</i>	Grhh
<i>Helianthella californica nevadensis</i>	Hecn
<i>Heuchera brevistaminea</i>	Hebr

<i>Heuchera rubescens versicolor</i>	Herv
<i>Horkelia clevelandii</i>	Hocl
<i>Hulsea californica</i>	Huca
<i>Hymenothrix wrightii</i>	Hywr
<i>Juniperus californica</i>	Juca
<i>Lessingia glandulifera tomentosa</i>	Legt
<i>Lewisia brachycalyx</i>	Lebr
<i>Lilium humboldtii ocellatum</i>	Liho
<i>L. pardalinum</i>	Lipa
<i>L. parryi</i>	Lipy
<i>Limnanthes gracilis parishii</i>	Ligp
<i>Linanthus orcuttii</i>	Lior
<i>Machaeranthera asteroides lagunensis</i>	Maal
<i>Malacothamnus aboriginum</i>	Maab
<i>Mimulus palmeri (diffusus)</i>	Mipa
<i>Moehringia macrophylla</i>	Moma
<i>Monardella hypoleuca hypoleuca</i>	Mohh
<i>Monardella macrantha hallii</i>	Momh
<i>Monardella macrantha macrantha</i>	Momm
<i>Monardella nana tenuiflora</i>	Mont
<i>Monardella nana leptosiphon</i>	Monl
<i>Muilla clevelandii</i>	Mucl
<i>Nassella cernua</i>	Nace
<i>Navarretia tagetina</i>	Nata
<i>Poa atropurpurea</i>	Poat
<i>Polygonum parryi</i>	Popa
<i>Potentilla glandulosa</i>	Pogl
<i>P. gracilis fastigata</i>	Pogf
<i>Pseudostuga macrocarpa</i>	Psma
<i>Psoralea rigida</i>	Psri
<i>Quercus engelmannii</i>	Quen
<i>Ranunculus aquatilis hispidulus</i>	Raah
<i>Rhododendron occidentale</i>	Rhoc
<i>Ribes amarum</i>	Riam
<i>Ribes nevadense</i>	Rine
<i>Rosa gymnocarpa</i>	Rogy
<i>Rubus glaucifolius ganderi</i>	Rugg
<i>Salvia clevelandii</i>	Sacl
<i>Salvia sonomensis</i>	Saso
<i>Sanguisorba occdientalis</i>	Saoc
<i>Scutellaria bolanderi austromontana</i>	Scba
<i>Selaginella asprella</i>	Seas
<i>Streptanthus campestris</i>	Stca
<i>Styrax officinalis redivivus</i>	Stor
<i>Thermopsis californica semota</i>	Thcs
<i>Viola lobata integrifolia</i>	Vili
<i>V. l. lobata</i>	Vill

*A "plant of interest" is defined as a federally or state listed plant, a CNPS plant, an endemic species, a plant vulnerable to human impacts, a plant of limited range, the host plants for the Laguna Mt skipper, or otherwise worthy of special note.

Appendix 3

PLANT SPECIES OF INTEREST KNOWN TO OCCUR ON THE PRESERVE AS OF AUGUST 2003

Ranks are those listed by the California Department Fish and Game, California Natural Diversity Database, Special Plants List, October 2003.

East Ranch=**ER**
West Ranch=**WR**

Banner Dudleya *Dudleya saxosa aloides* **ER/WR**
Subspecies *saxosa saxosa* is listed by CNDDDB, but this subspecies is not listed by CNDDDB

Habitat and or plant community where found: rock outcrops adjacent to Santa Ysabel Creek. *Notes:* Locally common along Santa Ysabel Creek in outcrops

Bitter Gooseberry *Ribes amarum* **ER**
CNDDDB lists subspecies *hoffmannii*, but Jepson submerges this into species.
No state or federal status
CNPS List-3

Habitat and/or plant community where found: riparian woodland understory along Santa Ysabel Creek. *Notes:* Uncommon along SY Creek.

Caraway-leaved Gilia *Gilia (Saltugilia) caruifolia* **ER**
No state or federal status
CNPS-List 4

Habitat and/or plant community where found: opening in chaparral and within outcrops.
Notes: Uncommon in openings in chaparral

Cleveland Sage *Salvia clevelandii* **WR/ER**
No longer listed by NDDB

Habitat and/or plant community where found: chamise chaparral

Descanso (San Diego) milkvetch *Astragalus oocarpus* **WR/ER**
No state or federal status
CNPS List-1B

Habitat and/or plant community where found: grassy understory of scrub/Engelmann oak. *Notes:* Large patch found dead in 2002. Confirmed dead in 2003. Infrequently, patches occur.

Engelmann Oak *Quercus engelmannii* **WR/ER**
No state or federal status
CNPS List-4

Habitat and/or plant community where found: forms its own large plant community.
Notes: Dominant species on both Ranches

Jewelflower *Caulanthus heterophyllus heterophyllus* **WR/ER**
Taxonomic conundrum at present.
Synonymous with *Streptanthus heterophyllus* (Rollins)
Considered to be synonymous with *Caulanthus stenocarpus* (Buck-Jepson Manual)
Caulanthus stenocarpus is considered to be synonymous with *Caulanthus lasiophyllus lasiophyllus* (Rollins)
Caulanthus heterophyllus has been split into two subspecies: *heterophyllus* and *pseudosimulans* (Buck).
C. h. pseudosimulans is listed by CNDDDB with no status (January 2003).

Habitat and/or plant community where found: openings in chaparral or within outcrops
Notes: Uncommon; occurs in openings at boulder/chaparral interface

Kern's Brodiaea *Brodiaea terrestris kernensis* **ER**
Not listed by CNDDDB

Habitat and/or plant community where found: matchweed meadow, mixed wildflower /non-native grassland, native grassland, wet meadow and drainages (Kanaka Flats)

Long-spined Spineflower *Chorizanthe polygonoides longispina* **ER**
No state or federal status
CNPS List-1B

Habitat and/or plant community where found: in the road next to junegrass-bluegrass "pebble plain" growing on Julian schist

Mountain pink currant *Ribes nevadense* **ER**
Not listed by CNDDDB

Habitat and/or plant community where found: riparian woodland understory along Santa Ysabel Creek; uncommon.

Palmer's sagewort *Artemisia palmeri* **ER**
No state or federal status
CNPS- List 4

Habitat and/or plant community where found: ruderal field next to Famer's Road; one plant located but not particularly rare in county

Palomar monkeyflower *Mimulus (diffusus) palmeri* **ER**
M. diffusus has been submerged into *M. palmeri* (Thompson-Jepson Manual)
No state or federal status
CNPS List-4

Habitat and/or plant community where found: opening in chaparral and within outcrops.
about 50 plants found in single patch; outcrops in Engelmann oak/chaparral

Prostrate Spineflower *Chorizanthe procumbens* **WR**
Not listed by CNDDB

Habitat and/or plant community where found: openings in chamise chaparral; frequent.

San Diego Gumplant *Grindelia hirsutula hallii* **WR/ER**
No state or federal status
CNPS-List 1B

Habitat and/or plant community where found: meadows, wet areas, grasslands, dirt roads, disturbed areas, native and non-native grasslands, ruderal areas; more common on the East Ranch

San Felipe Monardella *Monardella nana leptosiphon* **ER**
No state or federal status
CNPS List-1B

Habitat and/or plant community where found: mountain mahogany and white sage chaparral on the edge of mixed/oak coniferous forest; scattered patches located in mountain mahogany/chamise chaparral.

Western Azalea *Rhododendron occidentale* **ER**
Not listed by CNDDB

Habitat and/or plant community where found: oak riparian woodland along creek; three plants found on preserve thus far

Wright's Hymenothrix *Hymenothrix wrightii* **ER**
No state or federal status
CNPS List-4

Habitat and/or plant community where found: matchweed meadow and native grassland (three-awn); locally dominant to co-dominant species in three-awn and matchweed meadow; widely distributed on east Ranch

Yellow (Velvety) False Lupine *Thermopsis californica semota* **ER**
No state or federal status
CNPS List-1B

Habitat and/or plant community where found: patch of non-native grass within white sage/buckwheat "scrub"; only one small patch located

Appendix 4

FLORISTICS LIST OF THE SANTA YSABEL PRESERVE BASED ON 2002-2003 SURVEYS

Found on both parcel unless otherwise indicated then EP=East Parcel and WP=West Parcel.

*=Non-native species

^{SI}=Species of Interest

Nomenclature follows that of Simpson and Rebman (2001) and Hickman, 1996 (Jepson Manual).

Monocots

Lycopods

Selaginellaceae-Spike-moss Family

Selaginella bigelovii Bigelow's spike-moss

Sphenopsids

Equisetaceae-Horsetail Family

Equisetum arvense common horsetail
Equisetum hyemale affine scouring Rush

Ferns

Blechnaceae

Woodwardia fimbriata giant chain fern ER

Dennstaedtiaceae (Polypodiaceae)-Bracken Family

Pteridium aquilinum var. *pubescens* western bracken fern

Dryopteridaceae (Polypodiaceae)-Wood Fern Family

Cystopteris fragilis brittle bladder fern
Dryopteris arguta coastal wood fern
Polystichum imbricans imbricans imbricate sword fern

Polypodiaceae-Polypody Family

Polypodium californicum California polypody

Pteridaceae (Polypodiaceae)-Brake Family

Adiantum jordanii California maidenhair
Aspidotis californica California lacefern
Cheilanthes sp. cotton fern
Pellaea andromedifolia coffee fern
Pentagramma (Pityrogramma) goldenback fern
triangularis triangularis

Conifers

Cupressaceae-Cypress Family

Calocedrus decurrens California incense cedar ER

Pinaceae-Pine Family

Pinus coulteri Coulter pine
Pseudotsuga macrocarpa big-cone Douglas fir ER

Dicots

Amaranthaceae-Amaranth Family

* <i>Amaranthus albus</i>	white tumbleweed
* <i>Amaranthus blitoides</i>	prostrate amaranth
<i>Amaranthus californicus</i>	California amaranth

Anacardiaceae-Sumac or Cashew Family

<i>Malosma laurina</i>	laurel sumac
<i>Rhus ovata</i>	sugar bush
<i>Rhus trilobata</i>	basket bush
<i>Toxicodendron diversilobum</i>	poison oak

Apiaceae-Umbel or Carrot Family

<i>Apiastrum angustifolium</i>	mock parsley
<i>Daucus pusillus</i>	rattlesnake weed
* <i>Foeniculum vulgare</i>	wild fennel
<i>Lomatium dasycarpum dasycarpum</i>	woolly fruit lomatium
<i>Lomatium lucidum</i>	shiny lomatium
<i>Oenanthe sarmentosa</i>	Pacific oenanthe
<i>Osmorhiza brachypoda</i>	California sweet-cicely
<i>Sanicula arguta</i>	sharp-tooth sanicle
<i>Sanicula bipinnatifida</i>	purple sanicle

Asclepiadaceae-Milkweed Family

<i>Asclepias californica</i>	California milkweed
<i>Asclepias fascicularis</i>	narrow leaf milkweed

Asteraceae-Sunflower Family

<i>Achillea millefolium</i>	yarrow	
<i>Acourtia microcephala</i>	sacapellote	
<i>Agoseris heterophylla</i>	woodland agoseris	
<i>Agoseris retorsa</i>	spear-leaf agoseris	
<i>Ambrosia psilostachya</i>	western ragweed	
<i>Artemisia californica</i>	California sagebrush	
<i>Artemisia douglasiana</i>	Douglas mugwort	
<i>Artemisia dracunculus</i>	dragon sagewort	
<i>Artemisia ludoviciana ludoviciana</i>	silver wormwood	
^{Sl} <i>Artemisia palmeri</i>	Palmer's sagewort	ER
<i>Aster bernardinus</i>	San Bernardino aster	ER
<i>Baccharis salicifolia</i>	mule-fat	
<i>Baccharis sarothroides</i>	broom baccharis	
<i>Brickellia californica</i>	California brickellbush	
* <i>Centaurea melitensis</i>	totalote	
* <i>Centaurea solstitialis</i>	yellow star thistle	
<i>Chaenactis glabriuscula glabriuscula</i>	yellow pincushion	
<i>Cirsium occidentale</i>	thistle	
<i>Cirsium scariosum</i>	bird's-nest thistle	
* <i>Cirsium vulgare</i>	bull thistle	
* <i>Cnicus benedictus</i>	blessed thistle	
* <i>Conyza canadensis</i>	horseweed	
* <i>Cotula coronopifolia</i>	brass buttons	
<i>Deinandra fasciculata</i>	fascicled tarweed	

<i>Ericameria brachylepis</i>	boundary goldenbush	
<i>Ericameria linearifolia</i>	interior goldenbush	
<i>Ericameria?</i>		
<i>Erigeron foliosus foliosus</i>	leafy daisy	
<i>Eriophyllum confertiflorum confertiflorum</i>	golden yarrow	
<i>Euthamia occidentalis</i>	western goldenrod	
<i>Filago arizonica</i>	filago	
<i>Filago californica</i>	California filago	
<i>Filago depressa</i>	dwarf filago	
<i>*Filago gallica</i>	narrow-leaf filago	
<i>Gnaphalium canescens beneolens</i>	fragrant everlasting	
^{SI} <i>Grindelia hirsutula hallii</i>	San Diego or Hall's gumplant	
<i>Gutierrezia sarothrae</i>	matchweed	
<i>Hazardia squarrosa grindelioides</i>	saw-tooth goldenbush	
<i>*Hedypnois cretica</i>	crete weed (hedypnois)	WR
<i>Helianthus gracilentus</i>	slender sunflower	
<i>Heterotheca grandiflora</i>	telegraph weed	
<i>Heterotheca sessiliflora sessiliflora</i>	golden aster	
^{SI} <i>Hymenothrix wrightii</i>	Wright's hymenothrix	ER
<i>*Hypochaeris glabra</i>	smooth cat's ear	
<i>*Hypochaeris radicata</i>	hairy or rough cat's ear	
<i>Isocoma menziesii menziesii</i>	spreading goldenbush	WR
<i>*Lactuca serriola</i>	prickly lettuce	
<i>Lasthenia californica</i>	goldfields	
<i>Lessingia filaginifolia filaginifolia</i>	cudweed aster	
<i>Madia elegans</i>	elegant madia	
<i>Madia gracilis</i>	slender madia	
<i>Malacothrix californica</i>	desert dandelion	WR
<i>Micropus californicus</i>	slender cottonweed	
<i>Osmadenia tenella</i>	osmadenia	
<i>*Picris echioides</i>	bristly ox-tongue	
<i>Rafinesquia californica check</i>	chicory	
<i>Solidago californica</i>	California goldenrod	
<i>*Sonchus asper</i>	prickly sow-thistle	
<i>*Sonchus oleraceus</i>	common sow-thistle	
<i>Stephanomeria exigua deanei</i>	small wreath-plant	
<i>Stylocline gnaphaloides</i>	everlasting nest-straw	
<i>*Taraxacum officinale</i>	common dandelion	
<i>*Tragopogon dubius</i>	goats-beard	
<i>Uropappus lindleyi</i>	silver puffs	
<i>Wyethia ovata</i>	mule ears	
<i>Xanthium strumarium</i>	cockelbur	

Berberidaceae-Barberry Family

<i>Berberis aquifolium dictyota</i>	California barberry	ER
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Betulaceae-Birch Family

<i>Alnus rhombifolia</i>	white alder	ER
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Bignoniaceae-Catalpa Family

<i>Catalpa bignonioides</i>	catalpa	ER
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Boraginaceae-Borage Family

<i>Amsinckia menziesii intermedia</i>	fiddleneck
<i>Cryptantha affinis</i>	cryptantha
<i>Cryptantha intermedia</i>	nievitas cryptantha
<i>Cryptantha micrantha</i>	purpleroot cryptantha
<i>Cryptantha muricata</i>	prickly cryptantha
<i>Pectocarya pencillata</i>	winged pectocarya
<i>Plagiobotrys</i> sp.	popcornflower
<i>Plagiobotrys bracteatus</i>	bract popcornflower
<i>Plagiobotrys nothofulvus</i>	rusty popcornflower

Brassicaceae-Mustard Family

* <i>Arabis glabra glabra</i>	tower mustard
<i>Arabis puchra pulchra</i>	beautiful rock cross
<i>Arabis sparsiflora californica</i>	purple rock cress
* <i>Barbarea orthoceras</i>	winter cress
* <i>Capsella bursa-pastoris</i>	shepherd's purse
<i>Cardamine californica californica</i>	toothwort
^{sl} <i>Caulanthus heterophyllus heterophyllus</i>	caulanthus
<i>Erysimum capitatum capitatum</i>	western wallflower
<i>Gullenia lasiophylla</i>	California mustard
* <i>Hirschfeldia incana</i>	short-pod mustard
<i>Lepidium lasiocarpum lasiocarpum</i>	sand peppergrass
<i>Lepidium nitidum nitidum</i>	shining peppergrass
* <i>Raphanus sativus</i>	wild radish
<i>Rorippa nasturtium-aquaticum</i>	water cress
* <i>Sisymbrium altissimum</i>	rocket mustard
* <i>Sisymbrium officinale</i>	tumble mustard
<i>Thysanocarpus curvipes</i>	fringedpod

Cactaceae-Cactus Family

<i>Opuntia basilaris basilaris</i>	beavertail cactus
<i>Opuntia phaeacantha</i>	prickly pear

Caprifoliaceae-Honeysuckle Family

<i>Lonicera subspicata denudata</i>	southern honeysuckle
<i>Sambucus mexicana</i>	elderberry
<i>Symphoricarpos mollis</i>	creeping snowberry

Caryophyllaceae-Pink Family

* <i>Cerastium fontanum vulgare</i>	chickweed
* <i>Cerastium glomeratum</i>	mouse-ear chickweed
* <i>Silene gallica</i>	common catchfly
<i>Silene laciniata major</i>	cardinal catchfly
* <i>Spergula arvensis arvensis</i>	starwort
<i>Stellaria nitens</i>	shining chickweed
* <i>Stellaria media</i>	common chickweed

Chenopodiaceae-Goosefoot or Amaranth Family

<i>Chenopodium californicum</i>	California goosefoot
* <i>Salsola tragus</i>	Russian thistle

Cistaceae

<i>Helianthemum scoparium</i>	peak rush-rose
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Convolvulaceae-Morning Glory Family

<i>Calystegia macrostegia</i>	
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Cornaceae-Dogwood Family

<i>Cornus sericea occidentalis</i>	creek dogwood	ER
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Crassulaceae-Stonecrop Family

<i>Crassula connata</i>	pygmy weed
<i>Dudleya edulis</i>	lady's fingers
<i>Dudleya lanceolata</i>	lance-leaf dudleya
^{sl} <i>Dudleya saxosa aloides</i>	Banner dudleya

Cucurbitaceae Family-Cucumber or Gourd Family

<i>Cucurbita palmata</i>	coyote melon
<i>Marah macrocarpus macrocarpus</i>	wild cucumber
<i>Cuscuta</i> sp.	dodder

Datisceae-Datisca Family

<i>Datisca glomerata</i>	Durango root
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Ericaceae-Heath Family

<i>Arctostaphylos glandulosa adamsii</i>	Eastwood manzanita	
<i>Arctostaphylos glauca</i>	big berry manzanita	
<i>Arctostaphylos pungens</i>	Mexican manzanita	
^{sl} <i>Rhododendron occidentale</i>	western azalea	ER

Euphorbiaceae-Spurge Family

<i>Chamaesyce albomarginata</i>	rattlesnake spurge
<i>Croton californicus</i>	California croton
<i>Eremocarpus setigerus</i>	doveweed

Fabaceae-Legume Family

<i>Amorpha fruticosa</i>	false indigo
^{sl} <i>Astragalus oocarpus</i>	Descanso milkvetch
<i>Lathyrus vestitus alefeldii</i>	San Diego sweet pea
<i>Lotus argophyllus argophyllus</i>	silver-leaf lotus
<i>Lotus crassifolius crassifolius</i>	buck lotus
<i>Lotus hamatus</i>	grab lotus
<i>Lotus purshianus purshianus</i>	spanish-clover
<i>Lotus scoparius scoparius</i>	deerweed

<i>Lotus strigosus</i>	Bishop lotus	
<i>Lotus wrangelianus</i>	calf lotus	
<i>Lupinus bicolor</i>	miniature, dove lupine	
<i>Lupinus concinnus</i>	bajada lupine	
<i>Lupinus excubitus austromontanus</i>	grape soda lupine	
<i>Lupinus hirsutissimus</i>	stinging lupine	
<i>Lupinus latifolius parishii</i>	Parish's stream lupine	
<i>Lupinus longifolius</i>	Pauma lupine	
<i>Lupinus sparsiflorus</i>	Coulter lupine	
* <i>Medicago lupulina</i>	black medick	
* <i>Medicago polymorpha</i>	California burclover	
* <i>Melilotus alba</i>	white sweetclover	
* <i>Melilotus indica</i>	Indian sweetclover	
* <i>Melilotus officinalis</i>	yellow sweetclover	
* <i>Robinia pseudoacacia</i>	black locust	
<i>Rupertia rigida</i>	Parish's rupertia	ER
^{Sl} <i>Thermopsis californica semota</i>	velvety false-lupine	ER
<i>Trifolium albopurpureum</i>	rancheria clover	
<i>Trifolium ciliolatum</i>	tree clover	
<i>Trifolium depauperatum amplexens</i>	clover	
<i>Trifolium microcephalum</i>	maiden clover	
<i>Trifolium obtusiflorum</i>	creek clover	
* <i>Trifolium pratense</i>	red clover	
* <i>Trifolium repens</i>	white clover	
<i>Trifolium variegatum</i>	white-tip clover	
<i>Trifolium willdenovii</i>	valley clover	
<i>Trifolium wormskoldii</i>	cow clover	
<i>Vicia americana americana</i>	American vetch	

Fagaceae-Oak Family

<i>Quercus agrifolia agrifolia</i>	coast live oak	
<i>Quercus agrifolia oxyadenia</i>	coast live oak	
<i>Quercus berberidifolia</i>	scrub oak	
<i>Quercus chrysolepis</i>	canyon live oak	ER
<i>Quercus engelmannii</i>	Engelmann oak	
<i>Quercus X ganderi</i>	Gander's oak	WR
<i>Quercus kelloggii</i>	California black oak	
<i>Quercus X morehus</i>	oracle oak	

Frankeniaceae-Frankenia Family

<i>Frankenia salina</i>	Frankenia	
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Garryaceae-Silk Tassel Family

<i>Garrya flavescens</i>	Garrya	
<i>Garrya veatchii</i>	Garrya	

Gentianaceae-Gentian Family

<i>Centaurium venustum</i>	canchalagua	
<i>Swertia parryi</i>	deer's ears	ER

Geraniaceae-Geranium Family

* <i>Erodium botrys</i>	long-beak filaree	
* <i>Erodium cicutarium</i>	red-stem filaree	
* <i>Geranium carolinianum</i>	Carolina geranium	WR

Grossulariaceae-Gooseberry Family

^{Sl} <i>Ribes amarum</i>	bitter gooseberry	ER
<i>Ribes indecorum</i>	white-flower currant	
^{Sl} <i>Ribes nevadense</i>	mountain-pink currant	ER
<i>Ribes quercetorum</i>	oak gooseberry	ER

Hydrophyllaceae-Waterleaf Family

<i>Eriodictyon crassifolium crassifolium</i>	yerba santa	
<i>Eriodictyon trichocalyx lanatum</i>	yerba santa	
<i>Eucrypta chrysanthemifolia</i>		
<i>chrysanthemifolia</i>	eucrypta	
<i>Nemophila menziesii integrifolia</i>	baby blue eyes	
<i>Phacelia cicutaria hispida</i>	caterpillar phacelia	
<i>Phacelia distans</i>	wild heliotrope	
<i>Phacelia parryi</i>	Parry's phacelia	
<i>Phacelia ramosissima</i>		

Juglandaceae-Walnut Family

<i>Juglans californica californica</i>	black walnut	ER
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Lamiaceae-Mint Family

* <i>Marrubium vulgare</i>	horehound	
* <i>Mentha pulegium</i>	pennyroyal	
<i>Monardella lanceolata lanceolata</i>	mustang mint	ER
^{Sl} <i>Monardella nana leptosiphon</i>	San Felipe monardella	ER
<i>Salvia apiana</i>	white sage	
^{Sl} <i>Salvia clevelandii</i>	Cleveland sage	
<i>Salvia columbariae</i>	chia	
<i>Salvia X palmeri</i>	Palmer's sage	
<i>Stachys ajugoides rigida</i>	hedge-nettle	
<i>Trichostema parishii</i>	mountain bluecurls	
<i>Trichostema lanceolatum</i>	vinegar weed	

Linaceae-Flax Family

<i>Linum lewisii lewisii</i>	wild flax	
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Malvaceae-Mallow Family

<i>Malacothamnus fasciculatus</i>	chaparral mallow	
* <i>Malva parviflora</i>	cheeseweed	
<i>Sidalcea malvaeflora sparsifolia</i>	checker-bloom	

Nyctaginaceae-Four-O'clock Family

<i>Mirabilis californica (laevis crassifolia)</i>	wishbone plant	
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Oleaceae-Olive Family

<i>Fraxinus velutina</i>	velvet ash	ER
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Onagraceae-Evening-Primrose Family

<i>Camissonia bistorta</i>	California sun-cup	
<i>Camissonia boothii condensata</i>	desert lantern	
<i>Camissonia californica</i>	false-mustard	
<i>Camissonia confusa</i>	sun cup	
<i>Camissonia hirtella</i>	field sun cup	
<i>Camissonia ignota</i>	camissonia	WR
<i>Camissonia micrantha</i>	camissonia	WR
<i>Clarkia purpurea quadrivulnera</i>	four-spot clarkia	
<i>Clarkia rhomboidea</i>	diamond clarkia	
<i>Epilobium brachycarpum</i>	summer cotton weed	
<i>Epilobium canum latifolium</i>	Zauschneria/California fuschia	
<i>Epilobium ciliatum ciliatum</i>	willow herb	
<i>Epilobium densiflorum</i>	spike primrose	ER
<i>Oenothera elata hookeri</i>	great marsh evening primrose	ER

Orobanchaceae-Broom-Rape Family

<i>Orobanche fasciculata</i>	clustered broom-rape
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Paeoniaceae-Peony Family

<i>Paeonia californica</i>	California peony
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Papaveraceae-Poppy Family

<i>Eschscholzia californica</i>	Californica poppy
<i>Papaver californicum</i>	fire poppy
<i>Platystemon californicus</i>	cream cups

Plantaginaceae-Plantain Family

<i>Plantago patagonica</i>	desert plantain
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Platanaceae-Sycamore Family

<i>Platanus racemosa</i>	western sycamore
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Polemoniaceae Family-Phlox Family

<i>Allophyllum glutinosum</i>	blue false-gilia	ER
<i>Eriastrum densiflorum elongatum</i>	chaparral woolly-star	WR
<i>Eriastrum sapphirinum sapphirinum</i>	woolly-star	
<i>Gilia angelensis</i>	grassland gilia	
<i>Saltugilia australis</i>	southern gilia	
<i>Gilia clivorum</i>		ER
<i>Leptosiphon liniflorus</i>	Great Basin linanthus	
<i>Leptosiphon parviflorus</i>	coast baby-star	
<i>Linanthus dianthiflorus</i>	farinose ground pink	
<i>Navarretia atractyloides</i>	holly-leaved skunkweed	
<i>Navarretia hamata hamata</i>	skunkweed	WR

^{Sl} <i>Saltugilia caruifolia</i>	caraway-leaf gilia	ER
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Polygonaceae-Buckwheat Family

<i>Chorizanthe fimbriata laciniata</i>	lacinate spineflower	
^{Sl} <i>Chorizanthe polygonides longispina</i>	knotweed spineflower	ER
^{Sl} <i>Chorizanthe procumbens</i>	prostrate spineflower	WR
<i>Chorizanthe staticoides</i>	turkish rugging	
<i>Eriogonum elongatum elongatum</i>	tall buckwheat	
<i>Eriogonum fasciculatum fasciculatum</i>	California buckwheat	
<i>Eriogonum fasciculatum polifolium</i>	rosemary flat-top buckwheat	
<i>Eriogonum fasciculatum foliolosum</i>	interior flat-top buckwheat	
<i>Eriogonum gracile gracile</i>	slender buckwheat	
<i>Eriogonum roseum</i>	virgate buckwheat	
<i>Eriogonum wrightii membranaceum</i>	Wright's buckwheat	
<i>Lastarriaea coriacea</i>	Lastarriaea	
* <i>Polygonum arenastrum</i>	common knotweed	
<i>Polygonum lapathifolium</i>	willow smartweed	
* <i>Polygonum ramosissimum</i>	bushy knotweed	ER
<i>Pterostegia drymarioides</i>	granny's hairnet	
* <i>Rumex acetosella</i>	sheep-sorrel	
* <i>Rumex crispus</i>	curly dock	
* <i>Rumex pulcher</i>	fiddle dock	

Portulacaceae-Purslane Family

<i>Calandrinia ciliata</i>	red maids
<i>Calyptridium monandrum</i>	common calyptridium
<i>Claytonia parviflora parviflora</i>	
<i>Claytonia perfoliata perfoliata</i>	miner's lettuce

Primulaceae-Primrose Family

* <i>Anagallis arvensis</i>	scarlet pimpernel
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Ranunculaceae-Buttercup Family

<i>Clematis lasiantha</i>	virgin's bower
<i>Clematis ligusticifolia</i>	yerba de chiva
<i>Delphinium cardinale</i>	cardinal flower
<i>Delphinium parryi parryi</i>	Parry's larkspur
<i>Delphinium patens patens</i>	larkspur
<i>Ranunculus aquatilis</i>	stream buttercup
<i>Ranunculus californicus</i>	California buttercup
<i>Ranunculus cymbalaria saximontanus</i>	desert buttercup
<i>Thalictrum fendleri polycarpum</i>	meadow-rue

Rhamnaceae-Buckthorn Family

<i>Ceanothus greggii perplexans</i>	cupleaf-lilac
<i>Ceanothus leucodermis</i>	chaparral whitethorn
<i>Ceanothus oliganthus oliganthus</i>	hairy-leaf ceanothus
<i>Rhamnus tomentella tomentella (californica t.)</i>	chaparral coffeeberry
<i>Rhamnus ilicifolia</i>	holly-leaved redberry
<i>Rhamnus crocea</i>	spiny redberry

Rosaceae-Rose Family

<i>Adenostoma fasciculatum</i>	chamise	
^{Sl} <i>Amelanchier utahensis</i>	Utah service-berry	ER
<i>Cercocarpus betuloides betuloides</i>	birth-leaf mountain-mahogany	
<i>Fragaria vesca</i>	wild strawberry	
<i>Heteromeles arbutifolia</i>	toyon	
<i>Potentilla glandulosa glandulosa</i>	sticky cinquefoil	
<i>Prunus ilicifolia ilicifolia</i>	holly-leaf cherry	
<i>Prunus virginiana demissa</i>	western choke cherry	ER
<i>Rosa californica</i>	California rose	
* <i>Rubus laciniatus</i>	cut-leaf blackberry	
<i>Rubus ursinus</i>	California blackberry	

Rubiaceae-Madder or Coffee Family

<i>Galium andrewsii andrewsii</i>	phlox-leaf bedstraw	
<i>Galium angustifolium angustifolium</i>	narrow-leaf bedstraw	
<i>Galium aparine</i>	bedstraw	
<i>Galium nuttallii nuttallii</i>	San Diego bedstraw	

Salicaceae-Willow Family

<i>Populus fremontii fremontii</i>	western cottonwood	
<i>Salix exigua</i>	narrow-leaf willow	ER
<i>Salix gooddingii</i>	Goodding's black willow	ER
<i>Salix laevigata</i>	red willow	
<i>Salix lasiolepis</i>	arroyo willow	
<i>Salix lucida lasiandra</i>	shining willow	

Saururaceae – Lizard-tail Family

<i>Anemopsis californica</i>	yerba mansa	
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Saxifragaceae-Saxifrage Family

<i>Lithophragma heterophyllum</i>	woodland star	ER
<i>Lithophragma affine</i>	woodland star	

Scrophulariaceae-Snapdragon Family

<i>Antirrhinum coulterianum</i>	Coulter's snapdragon	
<i>Antirrhinum nuttallianum nuttallianum</i>	Nuttall's snapdragon	
<i>Castilleja applegatei martinii</i>	desert Indian paintbrush	
<i>Castilleja exserta exserta</i>	purple owl's clover	
<i>Collinsia childii</i>	Child's blue-eyed mary	ER
<i>Collinsia heterophylla</i>	Chinese houses	
<i>Collinsia parviflora</i>	blue-eyed mary	
<i>Cordylanthus rigidus setigerus</i>	dark-tip bird' beak	
<i>Keckiella antirrhinoides antirrhinoides</i>	yellow bush penstemon	
<i>Keckiella ternata ternata</i>	summer bush penstemon	
<i>Limosella acaulis</i>	southern mudwort	
<i>Mimulus aurantiacus</i>	bush monkey flower	
<i>Mimulus brevipes</i>	slope semaphore	ER
<i>Mimulus cardinalis</i>	scarlet monkey flower	
<i>Mimulus guttatus</i>	seep monkey flower	
^{Sl} <i>Mimulus palmeri</i>	Palomar monkey flower	ER

<i>Mimulus pilosus</i>	downy monkey flower	
<i>Penstemon centranthifolius</i>	scarlet bugler	
<i>Penstemon spectabilis spectabilis</i>	showy penstemon	
<i>Scrophularia californica floribunda</i>	California bee plant	
<i>Veronica anagallis-aquatica</i>	water speedwell	
<i>Veronica peregrina xalapensis</i>	Mexican speedwell	ER

Simaroubaceae-Quassia or Simarouba Family

<i>Ailanthus altissima</i>	Tree-of-Heaven	ER
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Solanaceae-Tomato Family

<i>Datura wrightii</i>	Jimsonweed	
<i>Solanum parishii</i>	Parish's nightshade	

Tamaricaceae-Tamarisk Family

<i>Tamarix</i> sp.	tamarisk/salt cedar	
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Urticaceae-Nettle Family

<i>Urtica dioica holosericea</i>	hoary nettle	
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Valerianaceae-Valerian Family

<i>Plectritis ciliosa insignis</i>	Plectritis	
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Verbenaceae-Vervain Family

<i>Verbena lasiostachys lasiostachys</i>	vervain	
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Violaceae-Violet Family

<i>Viola douglasii</i>	Douglas violet	
<i>Viola pedunculata</i>	Johnny jump-up	
<i>Viola purpurea</i>	mountain violet	

Monocots

Agavaceae-Agave Family

<i>Yucca whipplei</i>	Our Lord's candle	
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Cyperaceae-Sedge Family

<i>Carex fraxa</i>	fragile-sheath sedge	
<i>Carex multicaulis</i>	many-stem sedge	
<i>Carex prae-gracilis</i>	cluster field sedge	
<i>Carex subfusca</i>	rusty sedge	
<i>Cyperus</i> sp.		
<i>Cyperus squarrosus</i>	beard flatsedge	
<i>Eleocharis acicularis</i>	spike sedge	
<i>Scirpus americanus</i>	American bulrush	
<i>Scirpus microcarpus</i>	small-fruited bulrush	

Hyacinthaceae-Hyacinth Family

Chlorogalum parviflorum soap plant

Iridaceae-Iris Family

Sisyrinchium bellum blue-eyed grass

Juncaceae-Rush Family

<i>Juncus effusus pacificus</i>	Pacific rush	
<i>Juncus macrophyllus</i>	long-leaf rush	
<i>Juncus mexicanus</i>	Mexican rush	
<i>Juncus oxymeris</i>	pointed rush	
<i>Juncus phaeocephalus paniculatus</i>	brown-head rush	
<i>Juncus rugulosus</i>	wrinkled rush	
<i>Juncus tiehmii</i>	Kellogg's dwarf rush	WR
<i>Luzula comosa</i>	common wood-rush	

Juncaginaceae-Arrow-grass Family

Lilaea scilloides flowering quill wort

Lemnaceae-Duckweed Family

Lemna miniuscula duckweed

Liliaceae-Lily Family

<i>Calochortus concolor</i>	golden-bowl mariposa
<i>Calochortus splendens</i>	splendid mariposa lily
<i>Calochortus weedii</i>	Weed's mariposa lily

Orchidaceae-Orchid Family

Corallorhiza maculata spotted coralroot ER

Poaceae-Grass Family

<i>Achnatherum coronatum</i>	giant stipa	
<i>Achnatherum speciosum</i>	desert needlegrass	
* <i>Agrostis viridis</i>	water bent	
* <i>Aira caryophyllea</i>	hairgrass	
<i>Aristida purpurea longiseta</i>	red three-awn	ER
* <i>Avena barbata</i>	slender wild oat	
* <i>Briza minor</i>	quaking grass	ER
<i>Bromus carinatus carinatus</i>	California brome	
* <i>Bromus diandrus</i>	ripgut/foxtail grass	
<i>Bromus grandis</i>	large brome	
* <i>Bromus hordeaceus</i>	soft chess	
* <i>Bromus madritensis rubens</i>	foxtail chess	
* <i>Bromus tectorum</i>	cheat grass	
* <i>Bromus trinii</i>	Chilean chess	ER
* <i>Cynodon dactylon</i>	Bermuda grass	
* <i>Cynosurus echinatus</i>	hedgehog dogtail	
<i>Distichlis spicata</i>	saltgrass	WR

<i>Elymus elymoides</i>	squirreltail	
<i>Elymus glaucus glaucus</i>	blue wildrye	
<i>Elymus multisetus</i>	big squirreltail	
<i>Elymus trachycaulis trachycaulis</i>	slender wheatgrass	ER
* <i>Gastridium ventricosum</i>	nit grass	
<i>Hordeum brachyantherum californicum</i>	California barley	
* <i>Hordeum murinum leporinum</i>	barley	
<i>Koeleria macrantha</i>	junegrass	
* <i>Lamarckia aurea</i>	golden-top	
<i>Leymus condensatus</i>	giant wild rye	
* <i>Lolium perenne</i>	perennial ryegrass	
* <i>Lolium temulentum</i>	darnel	ER
<i>Melica frutescens</i>	tall melic	
<i>Melica imperfecta</i>	melic grass	
<i>Muhlenbergia rigens</i>	deergrass	
<i>Nassella cernua</i>	nodding needlegrass	
<i>Nassella pulchra</i>	purple needlegrass	
* <i>Paspalum dilatatum</i>	Dallis grass	
* <i>Phalaris minor</i>	littleseed canary grass	
<i>Poa pratensis pratensis</i>	Kentucky bluegrass	
<i>Poa secunda secunda</i>	one-sided bluegrass	
* <i>Polypogon interruptus</i>	ditch beard grass	
* <i>Polypogon monspeliensis</i>	annual beard grass	
* <i>Schismus barbatus</i>	Mediterranean beard grass	
* <i>Vulpia myuros hirsuta</i>	vulpia	
<i>Vulpia octoflora</i>	vulpia	

Potamogetonaceae-Pondweed Family

<i>Potamogeton</i> sp.	pondweed	
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Themidaceae-Brodiaea Family

<i>Bloomeria crocea</i>	goldenstar	
^{sl} <i>Brodiaea terrestris kernensis</i>	dwarf brodiaea	ER
<i>Dichlostemma capitatum capitatum</i>	wild blue hyacinth	
<i>Muilla maritima</i>	common muilla	WR

Typhaceae-Cattail Family

<i>Typha domingensis</i>	southern cattail	
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Appendix 5

PRE-2003 CEDAR FIRE PLANT COMMUNITY CLASSIFICATION OF THE SANTA YSABEL RANCH PRESERVE

This community classification is the result of field work conducted on the preserve in the years of 2002 and 2003. As of November 2003, about one-third of the East Ranch had been burned.

Even though this constitutes part of the final product for this project, as with all plant community classifications, they are always a "work in progress" and this one should be considered the same. Refinements, improvements, discussion, etc. are welcome. I hope it at least acts as a more accurate basis for plant community classification for the east "backcountry" of San Diego County.

Major Type and Subcategories

Many of the plant communities listed as subcategories intergrade. Species with * are non-native. Plant Species of Interest are denoted as "SI". The elevation gradient on the East Ranch ranges from 2980-4292 feet (908- 1293 meters) and on the West Ranch, the gradient is 2780-3636 feet (847-1108 meters).

Community types are those that seem to most closely resemble those identified from Modified Holland (MoH) (Oberbauer 1996) and the California Natural Diversity Database (CNDDDB 2002). The CNDDDB classification is much more "fine grained" than Modified Holland and many more CNDDDB types may be listed than MoH types. If there is no CNDDDB or MoH type indicated, it is most likely because at this time, no category is listed for this community type under these two systems.

Forest and Woodlands

Mixed Oak/Coniferous/Bigcone Fir/Coulter Pine-MoH 84500
CNDDDB 71.100.00

Coniferous Forest Types

Found on north-facing slopes as locally dominant and mixed with other tree species listed below.

Bigcone Douglas Fir (*Pseudotsuga macrocarpa*)
CNDDDB 82.100.00

Occurred in scattered stands.

Coulter Pine (*Pinus coulteri*)
CNDDDB-71.010.14, CNDDDB 87.090.00, 87.210.00

Incense Cedar (*Calocedrus decurrens*)
CNDDDB-71.010.21, 85.100.00, 85.100.03, CNDDDB 85.000.00

Associate species: A large locally dominant stand of California barberry (*Mahonia aquifolium dictyota*) occurred on the eastern edge of the cedar forest. This was unique for the area.

Oak Woodland/Forest Types-MoH 71100
CNDDDB 71.000.00

Found on all slope aspects and mixed with other tree species listed above and below.

Mixed Oak Woodland/Forest-MoH 77000 and 81300
CNDDDB 71.010.13, 71.100.00 (includes 13 subcategories; possible subcategories, 71.100.04, 71.100.06, and 71.100.08)

Black Oak (*Quercus kelloggii*)/Woodland Forest-MoH 71120 and 81340
CNDDDB 71.010.00 (this category includes 21 subcategories; possible subcategories, 71.010.01, 71.010.08, 71.010.12, 71.010.13, 71.010.14, 71.010.15, 71.010.18, 71.010.19, 71.010.21)

Observed on north-facing slopes

Associate species include: poison oak (*Toxicodendron diversilobum*), snowberry, (*Symphoricarpos mollis*), California rose (*Rosa californica*), western chokecherry (*Prunus virginiana demissa*), Utah serviceberry (*Amelanchier utahensis*).

Coast live oak (*Quercus agrifolia*) woodland/forest MoH 71160, 71161 and 71162 and 81300 and 81310
CNDDDB 71.060.00 (this category includes 25 subcategories; possible subcategories, 71.060.02, 71.060.09, 71.060.12, 71.060.13, 71.060.14, 71.060.17, 71.060.18, 71.060.19, 71.060.20, 71.060.22, 71.060.23

Primary associate species include: poison oak (*Toxicodendron diversilobum*) and snowberry, (*Symphoricarpos mollis*)

Engelmann Oak (*Quercus engelmannii*)^{Sl} woodland/savanna-MoH 71180 and 71181
CNDDDB 71.070.00 and 71.070.01

Observed on north-east, east, south, and southwest-facing slopes.

Hybrid Engelmann oaks were also observed that appear to have hybridized with scrub oak (*Quercus berberidifolia*).

Golden cup oak (*Quercus chrysolepis*)-MoH 81320
CNDDDB 71.050.00 (includes 19 subcategories; possible subcategories include: 71.050.04, 71.050.11, 71.050.12, 71.050.17, 71.050.19)

Woodland herb-no types
CNDDDB-no types

Occurred in the understory of oak woodland

Dominant species included: shield fern (*Dryopteris arguta*) , sword fern (*Polystichum imbricans*), larkspur (*Delphinium parryi parryi*, syn. with *patens patens*), *bedstraw (*Galium aparine*), Chinese houses (*Collinsia heterophylla*), Child's blue-eyed mary (*C. childii*), baby blue eyes (*Nemophila menziesii integrifolia*), sweet cicely (*Osmorhiza brachypoda*), miner's lettuce (*Claytonia perfoliata perfoliata*), chain fern (*Woodwardia fimbriata*), wild cucumber (*Marah macrocarpus m.*) woodland star (*Lithophragma heterophylla*), Indian paintbrush (*Castilleja applegatei martinii*), honeysuckle (*Lonicera subspicata*), poison oak (*Toxicodendron diversilobum*), snowberry, (*Symphoricarpos mollis*), meadow rue (*Thalictrum fendleri polycarpum*), Johnny jump up (*Viola pedunculata*), clovers (*Trifolium spp.*- tree clover (*Trifolium ciliolatum*), tom-cat clover (*Trifolium willdenovii*)), California buttercup (*Ranunculus californicus*), Douglas microseris (*Microseris douglasii platycarpha*), and silver puffs (*Uropappus lindleyi*).

Shrub-dominated Communities

Chaparral

Chamise (*Adenostoma fasciculatum*)-MoH 37200, 37210

CNDDDB 37.100.00, 37.101.00 (includes 12 subtypes; possible subtypes: 37.101.01, 37.101.03, 37.101.05, 37.101.07, 37.101.09, 37.101.12) 37.103.00, 37.103.01, 37.104.00, 37.104.01, 37.104.02, 37.104.03, 37.104.04, 37.104.06, 37.105.00, 37.105.01, 37.106.00, 37.106.01, 37.106.02, 37.106.03, 37.106.06, 37.106.08

Found on all slope aspects

Co-dominant and associate species include: Cleveland sage (*Salvia clevelandii*)^{SI}, Palmer's sage (*Salvia x palmeri*), white sage (*Salvia apiana*), buckwheat (*Eriogonum fasciculatum* and *polifolium*), manzanita (*Arctostaphylos glandulosa adamsii*), mountain mahogany (*Cercocarpus betuloides*), saw-tooth golden bush (*Hazardia squarrosa*), yellow pincushion plant (*Chaenactis glabriuscula glabriuscula*), silver puffs (*Uropappus lindleyi*), deerweed (*Lotus scoparius*), buck lotus (*Lotus crassifolius crassifolius*), wooly blue curls (*Trichostema parishii*), bush monkey flower (*Mimulus aurantiacus*), sacapellote (*Acourtia microcephala*), California peony (*Paeonia californica*), grassland gilia (*Gilia angelensis*), shining lomatium (*Lomatium lucidum*), wooly-fruit lomatium (*Lomatium dasycarpum*), chaparral pea (*Lathyrus vestitus alfeldii*), stinging lupine (*Lupinus hirsutissimus*), nightshade (*Solanum parishii*), wild cucumber (*Marah macrocarpus m.*), mariposa lily (*Calochortus spp.*), suncups (*Camissonia spp.*), mock parsley (*Apiastrum angustifolium*), wild heliotrope (*Phacelia distans*), Parry's phacelia (*Phacelia parryi*), scarlet bugler (*Penstemon centranthifolius*), clematis (*Clematis spp.*), soap plant or amole (*Chlorogalum parviflorum*). Grasses included Melica (*Melica imperfecta*) and giant stipa (*Achnantherum coronatum*).

"Selaginella balds" were found throughout on granitic outcrops covered with Bigelow's spike-moss (*Selaginella bigelovii*) and other true moss species. Lamarckia or goldentop (*Lamarckia aurea*) was also found in these areas growing in fissures. These "balds" were often associated with seeps.

Fimbriate chorizanthe (*Chorizanthe fimbriata*) and filago (*Filago spp.*) occurred in openings in the chaparral and other habitats.

Mixed-Montane Chaparral-MoH 37510
CNDDB-37.300.00, 37.301.00, 37.301.01

More common on the West Ranch. Species include a higher predominance of manzanita and ceanothus and many listed above. Dominant or co-dominant species include: bigberry manzanita (*Arctostaphylos glauca*), whitebark ceanothus (*Ceanothus leucodermis*), toyon (*Heteromeles arbutifolia*), brickellia (*Brickellia californica*), holly-leaved redberry (*Rhamnus ilicifolia*), holly-leaved cherry (*Prunus ilicifolia* i.), summer bush penstemon (*Keckiella ternata*).

Scrub oak (*Quercus berberidifolia*) dominated chaparral MoH-37900
CNDDB-37.406.00 (six subtypes; possible subtypes: 37.406.01, 37.406.04),
37.407.00 (six subtypes; possible subtypes: 37.407.02, 37.407.03, 37.407.04, 37.407.06)
37.408.00 (four subtypes; possible subtypes: 37.408.01, 37.408.02; 37.409.00
37.409.02, 37.410.00, 37.410.01

Associate species: chamise (*Adenostoma fasciculatum*), mountain mahogany, white-bark ceanothus (*Ceanothus leucodermis*), wild cucumber (*Marah macrocarpa*), nightshade (*Solanum parishii*) and sacapellote (*Acourtia microcephala*).

White sage (*Salvia apiana*) dominated chaparral/scrub
CNDDB 32.030.00

Observed in large locally dominant stands on west and south facing slopes.

Co-dominant and/or associate species: buckwheat (*Eriogonum fasciculatum fasciculatum* and *Eriogonum fasciculatum polifolium*) and mountain mahogany (see below).

Mountain mahogany (*Cercocarpus betuloides*)
CNDDB 37.600.00, 37.600.01, 37.610.00, 37.610.01

Forms locally dominant stands.

Co-dominant and/or associate species: California buckwheat (*Eriogonum fasciculatum fasciculatum* and *E.f. polifolium*) and white sage (*Salvia apiana*).

Inland Sage Scrub Component-Moh 32520
CNDDB-32.010.00

California Sagebrush (*Artemisia californica*)

On the West Ranch, chamise chaparral co-occurred with California sagebrush (*Artemisia californica*). Locally dominant patches of California sagebrush were more common on West Ranch on south-southeast-southwest-facing slopes.

Matchweed (*Gutierrezia sarothrae*)-45100, 45120, 32520
CNDDB-45.310.00

This community type is a challenging one to categorize. It includes elements of chaparral "scrub" and montane meadow and oftentimes would be transitional between meadow

and scrub. Matchweed is the dominant species. Community subtypes would often intergrade. They were observed on south, southwest, south-south-west and east-facing slopes.

Species common within all three subtypes include: white sage (*Salvia apiana*), tall buckwheat (*Eriogonum elongatum elongatum*), cudweed aster (*Lessingia filaginifolia filaginifolia*), California fuchsia (*Epilobium canum latifolium*), *ripgut grass (*Bromus diandrus*), *foxtail chess (*Bromus madritensis rubens*), *wild oat (*Avena barbata*), mule ears (*Wyethia ovata*), *tower mustard (*Arabis glabra glabra*), blue-eyed grass (*Sisyrinchium bellum*), San Diego gumplant (*Grindelia hirsutulla hallii*)^{SI}, white-tipped birds beak (*Cordylanthus rigidus setigerus*), checker mallow (*Sidalcea malvaeflora sparsifolia*), *filaree (*Erodium botrys* and *Erodium cicutarium*), lacinate spineflower (*Chorizanthe fimbriata laciniata*), linanthus (*Linanthus liniflorus*), tree clover (*Trifolium ciliolatum*), yellow pincushion plant (*Chaenactis glabriuscula glabriuscula*), desert plantain (*Plantago patagonica*), purple owl's clover (*Castilleja exserta exserta*), slender cottonweed (*Micropus californicus*), Gilia (*Gilia angelensis*), junegrass (*Koeleria macrantha*), big squirreltail (*Elymus multisetus*), bluegrass (*Poa secunda* and subspecies), *nit grass (*Gastridium ventricosum*), and scattered clumps of needlegrass (*Nassella cernua*).

Matchweed-California Buckwheat (*Eriogonum fasciculatum polifolium* and *fasciculatum*)
No CNDDDB type

California buckwheat is a co-dominant with matchweed.

Matchweed-Wright's Eriogonum (*Eriogonum wrightii membranaceum*)
CNDDDB 32.041.00

Wright's Eriogonum is a co-dominant with matchweed.

Matchweed-Three Awn (*Aristida purpurea longisetata*)-Buckwheat
CNDDDB-no type

The native grass three-awn would co-occur with matchweed. Other associate within this type included Wright's hymenothrix (*Hymenothrix wrightii*)^{SI}. Big squirreltail (*Elymus multisetus*) was observed co-occurring within this type also.

Wetland

Riparian and wetland types intergrade.

Wetland-Riparian herbaceous-MoH 52420 and 52430
CNDDDB-52.000.00 and 52.100.03

Species that tend to be confined to the Santa Ysabel creekbed usually within coast live oak riparian woodland.

Pacific Rush (*Juncus effusus pacificus*)
CNDDDB-45.561.00, 45.560.00, 45.562.02, 45.565.00

Forms major component of riparian habitat and extends into meadow and

woodland at times.

Dominant and associate species include: rushes (*Juncus* spp.), sedges (*Carex* spp.), Pacific oenanth (*Oenanth sarmentosa*), *white water cress (*Rorippa nasturtium-aquaticum*), marsh buttercup (*Ranunculus cymbalaria saximontanus*), *rabbit-foot grass (*Polypogon interruptus* and *Polypogon monospeliensis*), spike-sedge (*Eleocharis* sp), seep monkey flower (*Mimulus guttatus*), chain fern (*Woodwardia fimbriata*), hedge nettle (*Stachys ajugoides rigida*), willow herb (*Epilobium ciliatum ciliatum*, syn. with *adenocaulon*), mint (*Mentha* spp.), speedwell (*Veronica anagallis-aquatica*, **Veronica arvensis*), red maids (*Calandrinia ciliata*), water buttercup (*Ranunculus aquatilis*), California buttercup (*Ranunculus californicus*), Indian sweetclover (*Melilotus indica*), Durango root (*Datisca glomerata*), hoary nettle (*Urtica dioica holosericea*), flatsedge (*Cyperus squarrosus*), *sheep sorrel (*Rumex acetosella*), knotweed (*Polygonum* sp.), cocklebur (*Xanthium strumarium*), small-fruit bulrush (*Scirpus microcarpus*), silver mugwort (*Artemisia ludoviciana ludoviciana*), douglas mugwort (*Artemisia douglasiana*), southern cattail (*Typha domingensis*), scarlet or marsh monkeyflower (*Mimulus cardinalis*), Spanish clover (*Lotus purshianus purshianus*), cudweed aster (*Lessingia filaginifolia* f.), everlasting (*Gnaphalium canescens microcephalum*), Dallis grass (**Paspalum dilatatum*), and little quaking grass (*Briza minor*).

Locally dominant stands of horsetail (*Equisetum hyemale*) occurred.

Flowering quill wort (*Lilaea scilloides*), yerba mansa (*Anemopsis californica*) and saltgrass (*Distichlis spicata*), were found more commonly on the West Ranch.

Pondweed (*Lemna minuscula*)

CNDDB-52.105.00

Forms locally dominant "stands" on open water or pools.

Sedge Meadow-MoH 52440, 52430, 52420

CNDDB-45.100.00

Dominant species include: cluster field sedge (*Carex praegracilis*) and/or fragile-sheath sedge (*Carex fracta*).

Mixed Wet Meadow-MoH 45110

CNDDB-45.565.00, 42.060.00, 42.060.01, 42.060.05, 45.310.12

Mexican or wire rush (*Juncus mexicanus*) was one of the dominant rush species on the preserve and grew in the wettest section of the access roads. Pacific rush was also locally dominant.

Other dominant or associate species include: other rush species, wrinkled rush (*Juncus rugulosus*), Kentucky bluegrass (*Poa pratensis*), meadow barley (*Hordeum brachyantherum californicum*), sedges species listed above, bulrush (*Scirpus* sp.), San Bernardino aster (*Aster bernardinus*), San Diego gumplant (*Grindelia hirsutula hallii*)^{SI}, four-spot clarkia (*Clarkia purpurea quadrivulnera*), dock (*Rumex* spp.), miner's lettuce (*Claytonia parviflora* p.), shining peppergrass (*Lepidium nitidum nitidum*), hoary nettle (*Urtica dioica holosericea*), vervain (*Verbena lasiostachys lasiostachys*), red-maids

(*Calandrinia ciliata*), California buttercup (*Ranunculus californicus*), Johnny jump-up (*Viola pedunculata*), and blue wildrye (*Elymus glaucus* g.),

Kanaka Flats Alluvial Drainages
CNDDB-45.560.00?

Kanaka Flats, which is on the East Ranch, is a large upland terrace system consisting of a series of drainages or draws, some of which drain into small basins or ponds. Species from the mixed wet meadow occur within these areas but also: pointed rush (*Juncus oxymyris*), brown-head rush (*Juncus phaeocephalus paniculatus*), *mustard (*Barbarea* sp.), and dense-flower boisduvalia (*Epilobium densiflorum*).

Seep or "perched wetlands"
CNDDB-45.300.00, 45.700.00

These were isolated wetlands often 'uphill' in between grades of the slope on terraces. Most were located on the upper slopes on the east end of the East Ranch where the property borders BIA and Rutherford property.

Characteristic species include: Pacific rush (*Juncus effusus pacificus*), San Diego gumplant (*Grindelia hirsutula hallii*)^{sl}, bulrush (*Scirpus* spp.), chain fern (*Woodwardia fimbriata*), umbels, seep monkey flower (*Mimulus guttatus*), dock (*Rumex* sp.), California rose (*Rosa californica*), coffeberry (*Rhamnus tomentella tomentella*), and hoary nettle (*Urtica dioica holosericea*).

Ponds-MoH 52440?
CNDDB-?

Various ponds occur on the preserve, all former stock or retention ponds. Additional species found here include: Flowering quill wort (*Lilaea scilloides*), bract popcorn flower (*Plagiobothrys bracteatus*), mudwort (*Limosella acaulis*), and *African brass buttons (*Cotula coronopifolia*).

Riparian

Coast Live Oak Riparian Woodland-MoH 61300 and 61310
CNDDB- 71.060.20

Associate species include: western sycamore (*Platanus racemosa*).
CNDDB- 61.300.00, 61.310.00, 61.312.00, 61.312.01, and 61.312.02
61.312.01

One of the distinguishing features of the preserve is the old-growth trees, sycamores being some of the most impressive. Many of these trees have circumferences greater than 6 feet in diameter. They should be inventoried and protected. Many old growth coast live oak trees have also been observed.

Dominant and associate species include:*cut-leaf blackberry (*Rubus laciniatus*), California blackberry (*Rubus ursinus*), Sierra currant (*Ribes nevadense*), and bitter gooseberry (*Ribes amarum*)^{sl}.

Of note, three western azalea (*Rhododendron occidentale*)^{SI} shrubs have been located on the banks of Santa Ysabel Creek on the East Ranch. One was severely grazed. It could be grazed from cattle, deer or both. A small population of dogwood (*Cornus sericea sericea*) was discovered just to the east of one of the western azalea shrubs (Waypoint 108).

White Alder (*Alnus rhombifolia*) forest-MoH 61510
CNDDDB-61.312.00, 61.400.00, 61.420.00, 61.420.09, and 61.420.10

Forms locally dominant stands. Dead trees are evident in many of these stands.

Willow scrub-MoH 63320
CNDDDB-63.130.00, 63.100.00, 63.900.00

Locally dominant stands of: narrow-leaf willow (*Salix exigua*), arroyo willow (*S. lasiolois*), red willow (*S. laevigata*), Goodding's willow (*S. gooddingii*) and shining willow (*S. lucida lasiandra*).

Co-dominant species include: mulefat (*Baccharis salicifolia*), false indigo (*Amorpha fruticosa*) and coffeeberry (*Rhamnus tomentella tomentella* syn. with *californica* ssp. *tomentella*).

Upland Herbaceous Communities

These plant communities often intergraded.
Native grassland-MoH 42100, 42110, 42400
CNDDDB-41.000.00

All form locally dominant stands.

Junegrass (*Koeleria macrantha*)/One-sided Bluegrass (*Poa secunda secunda*)
CNDDDB-41.180.00, 41.181.00

This type was located on a Julian schist outcrop in a sort of "pebble plains" physiognomy.

Associate species include: matchweed (*Gutierrezia sarothrae*), foothill needlegrass (*Nassella cernua*), blue-eyed grass (*Sisyrinchium bellum*), purple sanicle (*Sanicula bipinnatifida*), four-spot clarkia (*Clarkia purpurea quadrivulnera*), slender cottonweed (*Micropus californicus*), purple owl's clover (*Castilleja exserta exserta*), plectritis (*Plectritis ciliosa*), California buttercup (*Ranunculus californicus*), and San Diego gumplant (*Grindelia hirsutula hallii*)^{SI}.

California brome (*Bromus carinatus carinatus*) occurred infrequently in locally dominant stands.

Melica (*Melica imperfecta*) grassland
Forms locally dominant stands.

Needlegrass (*Nassella cernua*)-MoH 42110
CNDDDB-41.140.00, 41.150.00, 41.150.02, and 41.150.03

Associate species include: blue-eyed grass (*Sisyrinchium bellum*), matchweed (*Gutierrezia sarothrae*), purple sanicle (*Sanicula bipinnatifida*), four-spot clarkia (*Clarkia purpurea quadrivulnera*), slender cottonweed (*Micropus californicus*), purple owl's clover (*Castilleja exserta exserta*), plectritis (*Plectritis ciliosa*), California buttercup (*Ranunculus californicus*), San Diego Gumplant (*Grindelia hirsutula hallii*)^{Sl}, and one-sided bluegrass (*Poa secunda* s.)

Giant Stipa (*Achnatherum coronatum*)
CNDDB- 41.170.00

Forms locally dominant stands in chaparral, scrub and meadow.

Deergrass (*Muhlenbergia rigens*)
Forms locally dominant stands. Found on north-north-west and west facing slopes.

Blue Wild Rye (*Elymus glaucus glaucus*)
CNDDB- 41.640.00 and 41.640.01

Observed on north-east-facing slope in understory of oak forest (coast live, black with scattered Coulter pine).

Squirreltail (*Elymus elymoides*)
CNDDB-41.230.00

Forms locally dominant stands

Native Grassland/Wildflower Meadow

Found on east-facing slopes.

Needlegrass/Wildflower Meadow-MoH 42300
CNDDB-41.000.00, 41.140.00, 41.150.00, and 41.290.00

Dominant species include nodding needlegrass (*Nassella cernua*). Associate species include: matchweed (*Gutierrezia sarothrae*), purple owl's clover (*Castilleja exserta exserta*), desert plantain (*Plantago patagonica*), purple sanicle (*Sanicula bipinnatifida*), blue-eyed grass (*Sisyrinchium bellum*), San Diego gumplant (*Grindelia hirsutula hallii*), lacinate spineflower (*Chorizanthe fimbriata laciniata*), California buttercup (*Ranunculus californicus*), California goldenrod (*Solidago californicus*), and goldenstar (*Bloomeria crocea crocea*).

In 2003, bulb plants were predominant while in 2002, few were observed. Bulb species observed included: splendid mariposa lily (*Calochortus splendens*), Weed's mariposa lily (*C. weedii*), golden-bowl mariposa lily (*C. concolor*), and locally dominant dwarf brodiaea (*Brodiaea terrestris kernensis*)^{Sl}. These species were found in herbaceous and shrub communities.

Three Awn Grassland (*Aristida purpurea longiseta*)
(Also see Matchweed Type)

Found on south south-west facing slopes

Associate species include: matchweed (*Gutierrezia sarothrae*), blue-eyed grass (*Sisyrinchium bellum*), desert plantain (*Plantago patagonica*), purple owl's clover (*Castilleja exserta exserta*), Wright's hymenothrix (*Hymenothrix wrightii*)^{sl}, lacinate spineflower (*Chorizanthe fimbriata laciniata*), San Diego gumplant^R (*Grindelia hirsutula hallii*), mule ears (*Wyethia ovata*), cudweed aster (*Lessingia filaginifolia* f.), and white-tipped birds beak (*Cordylanthus rigidus setigerus*). Big squirreltail (*Elymus multisetus*) co-occurred with some populations of three-awn.

Non-native grassland-MoH 42200

CNDDb: 42.000.00, 42.026.00, 42.026.01, 42.026.03, 42.040.02

Dominant species include: *ripgut grass (*Bromus diandrus*). Probably the most predominant plant community on the preserve. In some areas, forms extensive monotypic stands.

Non-native Grassland/Wildflower Meadow-MoH 42300

CNDDb: 41.290.00, 42.026.00, 42.026.01, 42.026.03, 45.100.00?

Observed on north-east-facing slope

Dominant species include: *ripgut grass (*Bromus diandrus*), *soft chess (*B. hordeaceus*), *foxtail chess (*B. madritensis rubens*), wild barley (*Hordeum murinum leporinum*), and *wild oat (*Avena barbata*).

Associate species include: *filaree (*E. botrys* and *E. cicutarium*), matchweed (*Gutierrezia sarothrae*), blue dicks (*Dichlosterma capitatum capitatum*), checker mallow (*Sidalcea malvaeflora sparsifolia*), San Diego sweet pea (*Lathyrus vestitus alfeldii*), woolly-fruit lomatium (*Lomatium dasycarpum dasycarpum*), western wallflower (*Erysimum capitatum capitatum*), *bedstraw (*Galium aparine*), fringe-pod (*Thysanocarpus curvipes*), lotus (*Lotus hamatus*), clovers (*Trifolium* spp.- tree clover (*Trifolium ciliolatum*), tom-cat clover (*Trifolium willdenovii*)), purple owl's clover (*Castilleja exserta exserta*), plectritis (*Plectritis ciliosa*), California buttercup (*Ranunculus californicus*), meadow rue (*Thalictrum fendleri polycarpum*), mule ears (*Wyethia ovata*), goldenrod (*Solidago californica*), yarrow, (*Achillea millefolium*), four-spot clarkia (*Clarkia purpurea quadrivulnera*), San Diego gumplant (*Grindelia hirsutula hallii*)^{sl}, goldenstars (*Bloomeria crocea*), heliotrope (*Phacelia imbricata patula*), elegant madia (*Madia elegans elegans*), silver puffs (*Uropappus lindleyi*), Douglas microseris (*Microseris douglasii platycarpa*), white-tipped birds beak (*Cordylanthus rigidus setigerus*), linanthus (*Linanthus liniflorus*), cudweed aster (*Lessingia filaginifolia* f.), Johnny jump-up (*Viola pedunculata*), purple fleabane (*Erigeron foliosus foliosus*), larkspur (*Delphinium parryi parryi*, syn. with *patens patens*) sweet cicely (*Osmorhiza brachypoda*), *squirreltail grass (*Cynosurus echinatus*), nodding needlegrass (*Nassella cernua*) and wild blue rye (*Elymus glaucus* g.).

Ruderal/Non-native grassland-MoH 11300 and 18310

CNDDb- 42.026.00 (01-03), 42.020.00 (01.02), 42.025.00, 45.100.00?

Dominant and associate species include: *filaree (*E. botrys* and *E. cicutarium*), *ripgut grass (*Bromus diandrus*), *foxtail chess (*Bromus madritensis rubens*), cheatgrass (*Bromus tectorum*), wild barley (*Hordeum murinum leporinum*), bluegrass (*Poa* sp.),

*western ragweed (*Ambrosia psilostachya*), *squirreltail grass (*Cynosurus echinatus*), *smooth cat's ear (*Hypochaeris glabra*), *hairy cats-ear (*Hypochaeris radicata*), *short-pod mustard (*Hirschfeldia incana*), California mustard (*Guillenia lasiophylla*), checker mallow (*Sidalcea malvaeflora sparsifolia*), four-spot clarkia (*Clarkia purpurea quadrivulnera*), white-tipped birds beak (*Cordylanthus rigidus setigerus*, California buttercup (*Ranunculus californicus*), purple sanicle (*Sanicula bipinnatifida*), fringe-pod (*Thysanocarpus curvipes*), Johnny jump-up (*Viola pedunculata*), *tower mustard (*Arabis glabra glabra*), red maids (*Calandrinia ciliata*), purple owl's clover (*Castilleja exserta exserta*), yarrow (*Achillea millefolium*), goldenrod (*Solidago californica*), narrow-leaf milkweed (*Asclepias fascicularis*) and California milkweed (*Asclepias californica*), California thistle (*Cirsium occidentale*), bird's nest thistle (*Cirsium scariosum* syn. with *tioganum*), silver mugwort (*Artemisia ludoviciana ludoviciana*), lotus (*Lotus* spp.- *Lotus hamatus*), clovers (*Trifolium* spp.), miniature lupine (*Lupinus bicolor*), and grape soda lupine (*Lupinus excubitus austromontanus*).

Locally dominant species that form "colonies" or "thickets" within this community type include California rose (*Rosa californica*), snowberry (*Symphoricarpos mollis*), and squawbush (*Rhus trilobata*).

Fascicled tarweed (*Deinandra fasciculata*) formed locally dominant populations in this and other herbaceous communities. It was evident only in 2003.

Wildflower Meadow-MoH 42300
CNDDDB-41.290.00 and 45.100.00?

Dominant species include: cudweed aster (*Lessingia filaginifolia filaginifolia*), yarrow (*Achillea millefolium*), checker mallow (*Sidalcea malvaeflora sparsifolia*), goldenrod (*Solidago californica*), silver mugwort (*Artemisia ludoviciana* L.), Indian paintbrush (*Castilleja applegatei martinii*), shiny lomatium (*Lomatium lucidum*), *squirreltail grass (*Cynosurus echinatus*).

Ruderal/Agricultural-MoH 11300 and 18310

Dominant species include: *western ragweed (*Ambrosia psilostachya*)

Associate species: *filaree (*E. botrys* and *E. cicutarium*), *ripgut grass (*Bromus diandrus*), *cheatgrass (*Bromus tectorum*), wild barley (*Hordeum murinum leporinum*), silver mugwort (*Artemisia ludoviciana* L.), blue elderberry (*Sambucus mexicana*), *short-pod mustard (*Hirschfeldia incana*), *tumble mustard (*Sisymbrium officinale*), *horehound (*Marrubium vulgare*), *tower mustard (*Arabis glabra glabra*), doveweed (*Eremocarpus setigerus*), *black medick (*Medicago lupulina*), bracken fern (*Pteridium aquilinum pubescens*), California buttercup (*Ranunculus californicus*), vinegar weed (*Trichostema lanceolatum*), yarrow (*Achillea millefolium*), narrow-leaf milkweed (*Asclepias fascicularis*), California milkweed (*Asclepias californica*), California thistle (*Cirsium occidentale*), bird's nest thistle (*Cirsium scariosum* syn. with *tioganum*), white-tipped bird's beak (*Cordylanthus rigidus setigerus*), Spanish clover (*Lotus purshianus* p.), and coyote melon (*Cucurbita foetidissima*).

Species of interest in this type: Palmer's sagewort (*Artemisia palmeri*)^{SI}. Locally dominant species that form "colonies" or "thickets" within this community type include California rose (*Rosa californica*) and squawbush (*Rhus trilobata*).

Disturbed-MoH 11300

Includes areas currently or historically disturbed from cattle or human activity Includes all dirt access roads.

Filaree is literally everywhere on the preserve and includes **Erodium botrys* and **E. cicutarium*.

Other non-native grasses include *Bermuda grass (*Cynodon dactylon*) which occurs in small patches near dirt roads and *vulpia (*Vulpia myuros hirsuta*).

*Crete head (*Hedypnois cretica*) was commonly distributed on the West Ranch. Pockets of *Schismus grass (*Schismus barbatus*) were appearing in the west Ranch. This plant can become a serious pest and dominant.

The dirt roads were being recolonized by successional species. Desert plantain (*Plantago patagonica*) was dominant in the dirt roads on the preserve. It co-occurred with slender cottonweed (*Micropus californicus*), laciniate spineflower (*Chorizanthe fimbriata laciniata*), linanthus (*Linanthus liniflorus*), navarretia (*Navarretia atractyloides*), and white-tipped birds beak (*Cordylanthus rigidus setigerus*).

White tipped birds beak (*Cordylanthus rigidus setigerus*) is dominant along the road edges on the preserve.

San Diego gumplant (*Grindelia hirsutula hallii*)^{SI} grows in the dirt roads and was far more common on the East Ranch than the West Ranch. Descanso milkvetch (*Astragalus oocarpus*)^{SI} was also found growing in the dirt roads on the East Ranch. It was not observed within the dirt roads on the West Ranch.

Exotic Plants

*Tree-of-Heaven (*Ailanthus altissima*) occurs in large dominant stands within Santa Ysabel Creek and in the adjacent areas.

*Tamarisk (*Tamarix* sp.) Only a few plants were observed but all were on Santa Ysabel Creek. It was found on both Ranchs. At this point, can probably be removed from the preserve completely if these are eradicated soon.

*One Catalpa tree (*Catalpa speciosa*) was observed along the creek growing near a stand of Ailanthus (Waypoint 106).

Unique Types

Unique plant communities are Three-awn-Hymenothrix meadows, the upper terrace mosaic of wetland/drainages on Kanaka Flats, wet meadows, perched wetlands, and those plant communities associated with the exposed outcrops of Julian schist. These communities included Koeleria-Bluegrass(Poa)-Needlegrass grassland with Matchweed-Wright's buckwheat. Monotypic stands of western choke cherry (*Prunus virginiana demissa*) were found on exposed Julian schist outcrops.

Appendix 6

Summary of selected publications on native grasslands, non-native grasses and proper management of both

There exists considerable debate concerning goals of and methods for the management of southern California grasslands. One area of particular contention is the debate concerning the use of prescribed grazing as a management tool. Some ranchers and rangeland managers claim that cows are good for the land. Some biologists disagree. The summary below suggest that cattle grazing may be an effective ecological management tool, but that it must be done carefully and with constant monitoring.

This summary is premised upon two central assumptions: 1) that grazing by cattle can severely alter riparian and wildland areas; and 2) that management actions that favor native grasses are preferable over those that encourage introduced annual grasses. Native grass genera represented on the preserve and some mentioned in the paper summaries below are: the needlegrasses (*Nassella* spp. or still called *Stipa* by some), wild ryes (*Elymus* spp.), native barley (*Hordeum brachyantherum*), deergrass (*Muhlenbergia rigens*), melic grass (*Melica* spp.), desert needlegrasses (*Achnatherum* spp.), a native brome (*Bromus carinatus*), native poas such as Malpais grass (*Poa secunda*), and the native bent grasses (*Agrostis* spp.).

Selected Papers

Publication: Proceedings: California Exotic Pest Plant Council Symposium--Vol 4. 1998

Author: Andrew Sanders, UC-Riverside Herbarium

Title: Invasive Exotics in California: a perspective from inland S. California

Bromus rubens and *Bromus diandrus* were introduced in S. California in grain fields near San Bernardino in 1886 and 1888. They have spread rapidly in this time and now seriously threaten wildlands.

"I'm always surprised to hear comments that imply that exotics may not be all the serious, or that the threat by some of the commoner species has not been established. A case in point is the influence of the annual grasses, particularly *Bromus diandrus* and *B. rubens* and *Avena barbata* on the vegetation and flora of southern California. None of the three abundant weeds is included on the CalEPPC weed lists, yet all are among the most severe pest species in southern California and are plants that we need to draw the most attention to and for which control measures most need to be found."

Publication: Terrestrial Vegetation of California, Chapter 14, John Wiley and Sons, New York.

Authors: Editors: M. Barbour and J. Major

Chapter 14 is by Harold Heady, UC-Berkeley

Title: Valley Grassland, pp.491-510

"I believe that plant succession tended toward perennial bunch grass dominants on nearly all well-drained upland sites, that numerous annual species were present, and that they dominated intermediate and low successional stages just as they do in many other grasslands. Also, I believe that introduced annual plants prevent many perennial grasses from attaining their dominance, that annuals are now a large part of the climax

on many sites (if not all of it) and that alien species should be considered as new and permanent members of the grassland rather than as aliens. Their elimination from the California prairie is inconceivable."

"Into this situation came the introduced annuals, which were widely adapted to the Mediterranean climate and to the local soil, which were resistant to grazing, and which offered high competition to the perennials (citation). Their passage through the dry summers in the seed stage enhanced their advantage over the perennials, especially during the dry years. Evidence exists that some of the grassland became dominated by *Avena* (wild oat) before heavy grazing by domestic livestock occurred. Cultivation and other types of soil disturbance completely removed the perennials from many areas. The introduced annuals returned quickly after the abandonment of cultivation and held the land, preventing return of the perennials. Many factors contributed to the replacement of the perennials with introduced annuals, not the least being the competitive ability of the annuals under varying conditions of weather and grazing (citation). Replacement of the perennial grassland resulted not from a single cause of sequence, but from several causes operating together.

Complete absence of livestock is about the only situation that sometimes permits the reinvasion of perennial grasses. No livestock means no grazing by any large animals as herd of elk and pronghorn antelope no longer exist. Removal of all livestock now may be as disruptive to pristine conditions as the presence of too many livestock (citation). Whether the perennial grasses will return on all ungrazed sites remain a question. Other than *Poa scabrella*, few perennial grass species can be found after 40 yr. without grazing in the livestock-free area on the San Joaquin Experimental Range. Scattered plants and small stands of several perennial species developed in 10-15 yr. without livestock grazing on the Hopland Field Station. *Stipa pulchra* (purple needlegrass) cannot be found in areas with abundant annual grasses on Hastings reservation, although it does occur in oak woodland. The stands of *S. pulchra* in La Jolla Valley near Oxnard remained after many decades of various kinds of use and have invaded the former cultivated fields and pastures in the valley center (citation). *Stipa pulchra* abundantly appeared in one pasture on the Hopland Field Station after restriction of sheep grazing to the winter season. It decreased in the same pasture after spring, summer, and fall grazing a few years later.

Determination of the characteristics of the pristine valley grassland must not overshadow concern for the present and the future. Grassland ecologists should recognize that species labeled as "introduced" and "alien" cannot be removed and perhaps not even reduced from their present state. For example, *Bromus mollis* (soft chess) and *Avena fatua* (wild oat) usually increase when heavy grazing is reduced. They dominate on numerous soil types and over large areas. Regardless of whether managerial concerns consider them desirable or undesirable, they cannot be eliminated under any known range management practice. Cultivation may remove them from the center of the field, but they remain at the edges. Ecologists and others should recognize these as "new natives".

Publication: Fremontia 20:1 pp. 3-11

Author: S. W. Edwards

Title: Observation on the Prehistory and Ecology of Grazing in California

Objective of author is to show that livestock grazing can be ecologically beneficial, "if specific strategies are devised on the basis of site-by-site needs."

California grasslands were historically grazed by native ungulates and therefore have evolved with grazers.

Bunchgrasses can benefit from grazing in many ways. Grazing, mowing, cutting, or burning prevents accumulation of thatch. This benefits native grasses. One advantage non-native annual grasses have over native perennials is they can grow through this thatch layer. Observations in the Bay Area showed that with total exclusion of livestock, the areas converted to dominance by *Bromus diandrus* (foxtail or ripgut) and wild oats (*Avena* spp.). These tall fast-growing plants shade out the natives and snuff out native seedlings with thatch.

"It is unfortunate that overgrazing, which destroys biodiversity, gives grazing a bad name. But it is important to recognize that the livestock themselves are not culpable for inadequate land management practices."

Publication: Journal of the American Society of Agronomy, 1944, 36:699-703

Authors: R. Merton Love

Title: Preliminary Trials on the Effect of Management on the Establishment of Perennial Grasses and Legumes at Davis, California

Different grazing treatment in the spring following seeding of perennial grasses and legumes led to the following results:

- Early, intensive grazing, before the annuals set seed reduced competition for the perennials. Animals were then removed. A short period of grazing in the fall did not harm the young perennial plants.
- Late grazing, beginning when annuals were maturing (setting seed) reduced stands of perennial grasses by about 80% and perennial legumes by about 50%. Prolonged grazing into the dry season had negative effects on species seeded-in.
- Late mowing, following by prolong grazing, resulted in the poorest stand of perennials.

Publication: Madrono, 50:1, Jan-March 03, pp. 8-14

Authors: J.S. Fehmi and J.W. Bartolome

Title: Impacts of livestock and burning on the spatial patterns of the grass, *Nassella pulchra* (Purple Needlegrass)

Effects of different treatments produced:

- burning significantly increased clump size.
- grazing decreased clump size.
- litter impedes growth of purple needlegrass.
- burning can decrease total populations of adjacent exotic annual grasses.
- selective grazing increases heterogeneity of spatial environment.
- simple management approach does not work.
- a mix is suggested (grazing, foot traffic, exclosures, burning).

Publication: Grasslands (Publication of the California Native Grass Association, 13:3, Summer 03

Author: W. James Barry, Senior State Park Ecologist, Calif State Parks and Rec

Title: California Primeval Grasslands and Management in the State Parks System.

"Restoration of native grassland ecosystems requires careful site specific analysis of soil, aspect, microclimate, and existing vegetation. Also important are historical uses and regional flora and fauna."

Publication: Madrono, 2002, 49:4, pp.274-284

Authors: J.G. Hamilton, J.R. Griffin and M.R. Stromberg, Hamilton-Dept of Ecology, UC-SB and Griffin and Stromberg-Museum of Vertebrate Zoology, UC, Carmel Valley

Title: Long-term Population Dynamics of Native Nassella (Poaceae) Bunchgrasses in Central California.

"California bunchgrass communities are one of the most endangered ecosystem types in the U.S."

Study focuses on observations of *Nassella* in unmanaged stands (i.e. natural). Landscape level, *Nassella* has increased. Population dynamics are related to land-use history. Non-native annuals did not seem to affect *Nassella* stands. Light grazing did. Cultivated areas showed decreased coverage of *Nassella*. Small plants died most often. No active management of *Nassella* stands in areas uncultivated may be needed while active management may be needed for those areas that have historically undergone cultivation.

Publication: Madrono, 2001, 48:4, pp. 230-235

Author: S. Reynolds, J.D. Corbin, C. D'Antonio

Title: The Effects of Litter and Temperature on the Germination of Native and Exotic Grasses in a Coastal California Grassland.

Paper explored effects of litter and temperature on seed germination of both kinds of grasses. Non-native species used were perennials, *Festuca arundinacea* and *Holcus lanatus*. Most common annual species were *Avena barbata* (on preserve), *Bromus diandrus* (on preserve-most serious non-native pest grass on preserve) , and *Vulpia myuros m.* (on preserve) Native species were *Deschampsia caespitosa holciformis*, *Festuca rubra*, *Calamagrostis nutkaensis* and *Nassella pulchra*.

The exotic perennial species exhibited superior germination percentages compared to native perennial species in all three litter treatments (bare, light and heavy). *Festuca arundinacea* had the greatest germination over all four of the native species. Regarding germination, exotic annual grasses had the highest germination and exotic and native perennial species had the lowest in all three temperature treatments (warm, normal and cold). *Vulpia m.m.* and *Bromus diandrus* and one native perennial, *Festuca rubra*, had the greatest germination rates while *H. lanatus* had the lowest germination rate in all three treatments. Temperatures 5° C below the average temperatures for the region substantially reduced the germination response of *Bromus diandrus* and *Festuca arundinacea* relative to the other species.

Species specific patterns of germination over time were observed. In warm and average temperatures, the three exotic annual species were the fastest to germinate. In cold temps, two of the three (*Vulpia* and *Avena*) were still the first to germinate. *Bromus diandrus* had extremely low germination. The two exotic perennials (*Festuca* and *Holcus*) germinated more rapidly than the native perennials. In an interesting finding, though the native perennial *Festuca rubra* showed a 60% higher germination rate than *Holcus lanatus*, the *Holcus* seedlings emerged more quickly than the *Festuca rubra* seedlings.

"While the germination percentage of exotic species seed was consistently higher than that of native species, we predict that individual species capacity to germinate and therefore, to become established, will vary from year to year and habitat to habitat according to differences in litter cover and climatic conditions."

Publication: Fremontia, 1998, 26:4, pp. 13-18

Authors: C M. D'Antonio and K. Haubensak

Title: Community and Ecosystem Impacts of Introduced Species

Certain plant species can permanently alter the local fire regime. These species in the intermountain west are the brome grasses (such as *Bromus tectorum* and *Bromus madritensis rubens*). It was 30-40 years ago that ecologists noted the invasion of *B. tectorum* (cheatgrass) increased fire frequencies leading to an increased invasion of more cheatgrass. This has been recently confirmed by Steve Whisenant at Texas A & M University. Red brome (*B. madritensis rubens*) and other annual invasive increase fire frequencies in the western Mojave desert. Dr. Rich Minnich and his students at UC-Riverside have documented destructive fires fueled by these grasses in areas where fire was previously rare.

(Moran's observational note: many of the areas along Sunrise Highway burned in last years massive fire have now been recolonized by red brome and cheatgrass where there once was chaparral. Moran has been hiking and observing this area as a recreational hiker for about 15 years. These invasive exotics are definitely increasing their local range since the fires. Whether it will equal a type conversion will be determined over time).

Publication: Fremontia, 1998, 26:4, pp.39-43

Authors: J. Gerlach, A. Dyer, and K. Rice

Title: Grassland and Foothill Woodland Ecosystems of the Central Valley

Recent experiments have shown purple needlegrass seedlings (*Nassella pulchra*) growing with annual grasses die in much greater numbers, grow more slowly, and take much longer to reproduce than they do when growing without competition from annual grasses. Early studies by Heady, Young and Evans suggest that annual grasses are strong competitors for light and soil moisture. Dyer's results show that annual grasses rapidly increase in height and leaf area during early spring and commonly reduce light levels at the soil surface to less than 10% of full sunlight. Purple needlegrass could not grow under these conditions and many died soon after germination. Others lingered but succumbed to the summer drought. Annual grasses have to do their thing quickly and exploit the environment prior to the dry season while it typically takes native perennials longer to establish and thrive. These different strategies when the two co-occur has implications for "who wins."

Publication: Madrono, 1999, 46:1 pp. 13-19

Author: M. Brooks, UC-Riverside

Title: Alien Annual Grasses and Fire in the Mojave Desert

"Alien annual grasses contributed most to the continuity and amount of dead annual plants and to the spread of summer fires. Fire spread rapidly (12 m/min) and continuously across interspaces with *Bromus*..."

Publication: Madrono, 1999, 46:1 pp. 25-37

Author: M.D. Meyer and P. M. Schiffman, CSU-Northridge

Title: Fire Season and Mulch Reduction in a California Grassland: a comparison of restoration strategies

Late-spring and fall burning significantly increased the cover and diversity of native vegetation and decreased the cover and seed viability of alien grasses relative to the controls. Winter burns and reduction in mulch cover did not innerves the cover or diversity of native plants and were only moderately effective in reducing non-native plant cover. Fire season is a significant factor in grassland restoration and fire seasons must be determined by plant phenology, season-specific fire intensities and the potential removal of all mulch biomass. Warm-season burning, not cool-season burning or grazing, was the most effective approach for restoring native annual vegetation to California grasslands. Proper burning can eliminate the stored seeds of many non-native species (such as filaree [*Erodium*]).

Publication: Grasslands (Publication of the California Native Grass Association, 11:1, Spring 01

Author: P. Kephart, Rana Creek Habitat Restoration

Title: Resource Management Demonstration at Russian Ridge Preserve

Used five combinations of treatments including: hand control, tractor mowing, herbicides, grazing, burning, and planting native seed in combination with some of these treatments. Results:

- hand control is expensive and effects nearly incidental
- tractor mowing: reduced the non-natives
- herbicide: cost effective and reduced non-natives
- grazing: reduced target species (yellow star thistle-not a problem on the preserve, thank goodness) but increased other non-natives. Increased some natives. Results unclear
- burning: expensive, bureaucratic, paperwork but successful in bringing back natives. copy provided

Publication: same as above

Author: Kent Reeves, Board of Directors for the Society for Range Management, California Section, Lodi, CA

Presents two ecological premises: Premise 1: California perennial grasses need to be grazed to be healthy. Argument is these grasses evolved with "large herds of grazing ungulates" such as elk, pronghorn antelope and bighorn sheep. Argues livestock can be used as a tool to restore native perennial grasses. Premise 2: Trampling by hooves of cattle is very good for grasslands. Argument is can be beneficial if managed carefully. "Holistic (cattle) management or biological planning is not for everyone. People can choose to use it or not. It requires a dramatic change in management, and a commitment to understand the process and monitor it."

Publication: same as above, 12:4, Fall 2002

Author: Shannon Peters, Director of Research and Education, Reforestation Technologies International

Title: Mycorrhizal Inoculum: Evaluating Need and Performance in Revegetation and Reclamation Projects.

"The presence of mycorrhizae is believed to be a key factor in the succession of native grasses and their successful competition with alien weeds. In fact, the recruitment of seedlings and overall species diversity has been shown to decline in the absence of AM

(arbuscular mycorrhizal) fungi." Soil microflora, characteristics, nutrients, etc. are extremely important for the establishment of native flora including grasses.

Publication: same as above, 10:1, Winter 2000

Authors: C. S. Brown, K.J. Rice, V. Claassen, UC-Davis

Title: The effects of soil amendments and mulches on establishment of California native perennial grasses: a summary of selected results

Studied the effects of different types of straw mulch, compost and slow-release nitrogen fertilizer on the establishment and growth of California native perennial grasses. Species responded differently to the different treatments. "In summary, perennial grass performance was best with rice straw, was improved by the addition of nitrogen fertilizer in the presence of weeds and was not greatly affected by the addition of compost."

Publication: same as above, 9:3, Fall 1999

Authors: Wirka, J.

Title: The State of the Art: prescribed burning in California grasslands

"Like medical doctors who must consider all aspects of a patient's health, history, and sensitivity to drugs before prescribing treatment, managers and restoration ecologists will always have to take into account the particularities of their site before prescribing fire."

Publication: same as above, 6:4, December 1996

Authors: C.S. Brown and K.J. Rice

Title: Suppressive effects of Zorro fescue (*Vulpia myuros*) on California native perennial grasses.

"The evidence which has accumulated over the years clearly indicates that native perennial grasses are negatively affected by annual grasses.:

Stemming the Invasive Tide, USDA, USFS

Livestock Grazing on Western Riparian Areas, July 1990, Environmental Protection Agency



Western Azalea growing along Santa Ysabel Creek
on the East Ranch.

Appendix B

**Post-Cedar Fire
Ecosystem and Rare Plant Impact Survey
2004**

**Santa Ysabel Ranch Open Space Preserve
East Ranch**

Prepared For

**The Nature Conservancy
San Diego County Field Office**

**The County of San Diego
Department of Parks and Recreation**

July 2004

By

**Virginia Moran, M.S. Botany
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Summary

California Department of Forestry BAER (Burned Area Emergency Response) maps show the portion of the East Ranch that was burned as having 76%+ vegetation mortality just weeks after the fire. Woody shrub vegetation (mainly chaparral) was the most seriously affected by the fire. The herbaceous layer was recovering though local biodiversity of the herb layer may be threatened by the prolific germination of non-native grasses following the fire. The vegetation types most seriously affected include: chaparral, Engelmann oak, mixed oak/coniferous/bigcone Douglas fir/Coulter pine forest, and black oak woodland/forest. Wetlands in the Santa Ysabel Creek valley and Santa Ysabel creek were more severely affected by illegal cattle grazing.

Many of the Coulter pines that burned had already died or were dying from the pine bark beetle. Only the outer bark and lower branches of the larger broadleaf trees appeared to be burned. Many of the burned branches were resprouting. Mortality to the larger trees appeared to be low.

One rare plant (*Monardella nana leptosiphon*) suffered significant population loss and another rare plant (*Thermopsis californica semota*) benefited from the fire. Population size of *Thermopsis* increased through rhizomatous sprouting and/or seed germination. Prolific growth of non-native grasses often surrounded areas of more severe burns (where nothing but shrub stumps are visible). Areas where the fire burned cooler and faster (on the edges of the more severely burned areas) may have resulted in actually stimulating germination of the non-native grasses. Erosion on the steeper, burned slopes was occurring and soils in these areas were unstable. Illegal cattle grazing exacerbated the fire damage by accelerating erosion on steep slopes and possibly adversely affecting remaining populations of *Monardella nana leptosiphon* which is found on the steeper slopes. Cattle also damaged wetlands, Santa Ysabel creek and the streambank. A noxious weed (*Cirsium vulgare*) was observed in a former high quality wetland. The wetland had been burned then grazed and used extensively for “wallowing” in by the cattle. The combination of the fire damage and the cattle activity has adversely affected the East Ranch. The East Ranch was previously recovering from 75 years of grazing activity and at least two previous fires prior to the Cedar Fire.

Introduction

After acquisition of the Edwards Ranch by The Nature Conservancy, the East Ranch was recovering from 75 years of grazing activity and at least two previous fires prior to the 2003 Cedar fire (Figure 1; *note paper figures attached*)

In October and November 2003, devastating fires raged through Southern California. An estimated 300,000 + acres were burned in the “Cedar Fire” in San Diego County. This was a firestorm that played by its own rules, not those of the many “fire models” familiar to fire-fighters. Approximately one-third of the East Ranch of the Santa Ysabel Preserve was burned in the Cedar Fire. The West Ranch did not burn. This report records general observations related to the recovery of the East Ranch from the fire.

California Department of Forestry BAER maps show the portion of the East Ranch that was burned as having 76%+ vegetation mortality just weeks after the fire (Figure 2 a, b, c).

Methods

Surveys were conducted on the East Ranch. The West Ranch did not burn. Surveys were conducted through the week of June 14- June 19, 2004. Only burned areas were visited. Surveys were conducted by vehicle and on foot. Areas surveyed are indicated on the enclosed maps (Figures 3, 4, 5).

Observations were made regarding:

- species recolonizing the burned areas
- fire effects on the Plant Species of Interest on the East Ranch
- fire effects on the sensitive habitats on the East Ranch
- plant communities affected by the fire
- new plant species observed since the fire
- native and non-native grass response to the fires
- fire effects on old growth trees
- fire effects on the Engelmann oak which is a dominant in some areas on the East Ranch
- erosion
- impacts exacerbated by the presence of large cattle on the East Ranch

Results and Discussion

General Observations

Woody shrub vegetation was the most seriously affected by the fire. The herbaceous layer was recovering though local biodiversity of the herb layer may be threatened by the prolific germination of non-native grasses following the fire. The vegetation types most seriously affected include: chaparral, Engelmann oak (*Quercus engelmannii*), mixed oak (*Quercus* spp.)/coniferous (*Pinus*, *Calocedrus*) /bigcone Douglas fir (*Pseudotsuga macrocarpa*)/Coulter pine (*Pinus coulteri*) forest, and black oak (*Quercus kelloggii*) woodland/forest. Wetlands in the Santa Ysabel Creek valley and Santa Ysabel creek were more severely affected by illegal cattle grazing.

Most of the Coulter pines on the east and southeast portion of the East Ranch burned (Figures 3 & 5). Many of these were dead or dying from the western pine bark beetle. Bigcone Douglas fir populations were also reduced. Of those populations revisited, estimated at about 50 trees, about half were severely burned. Only the outer bark and lower branches of the larger broadleaf trees (coast live oak (*Quercus agrifolia*), canyon live oak (*Quercus chrysolepis*), and sycamore (*Platanus racemosa*) appeared to be

burned. Many of the burned branches were resprouting. Mortality to the larger trees appeared to be lower.

One rare plant (*Monardella nana leptosiphon*) suffered significant population loss and another rare plant (*Thermopsis californica semota*) benefited from the fire. Population size of *Thermopsis* increased through rhizomatous sprouting and/or seed germination. Prolific growth of non-native grasses often surrounded areas of more severe burns (where nothing but shrub stumps are visible) leading one to hypothesize that where the non-native grasses were growing the most prolifically may have been in areas where the fire burned cooler and faster resulting in actually stimulating germination of these species. Erosion on the steeper, burned slopes was occurring and soils in these areas were unstable. Illegal cattle grazing exacerbated the fire damage by accelerating erosion on steep slopes and possibly adversely affecting remaining populations of *Monardella nana leptosiphon* which is found on the steeper slopes. Cattle also damaged wetlands, Santa Ysabel creek, and the streambank. A noxious weed (*Cirsium vulgare*) was observed in a former high quality wetland. The wetland had been burned then grazed and used extensively for “wallowing” in by the cattle. The combination of the fire damage and the cattle activity has adversely affected the East Ranch. The East Ranch was previously recovering from 75 years of grazing activity and at least two fires previous to the Cedar fire (Figure 1).

Species Recolonizing the Burned Areas

(^N indicates new species not observed before the fire; * indicates a non-native species):

South and Western Portion of the East Ranch (Figure 3)

Species observed recolonizing the burned areas from resprouts and/or seed in this portion of the ranch include:

chamise (*Adenostoma fasciculatum*), buckwheat (*Eriogonum fasciculatum*), spiny redberry (*Rhamnus crocea*), white sage (*Salvia apiana*), chaparral whitethorn (*Ceanothus leucodermis*), saw-tooth goldenbush (*Hazardia squarrosa grindelioides*), Eastwood manzanita (*Arctostaphylos glandulosa*), poison oak (*Toxicodendron diversilobum*), basket bush (*Rhus trilobata*), acourtia (*Acourtia microcephala*), cryptantha (*Cryptantha* spp.), capitate gilia (*Gilia capitata*)^N, camissonia (*Camissonia hirtella*), caterpillar phacelia (*Phacelia cicutaria hispida*), wild heliotrope (*Phacelia distans*), Parry's phacelia (*Phacelia parryi*), branched phacelia (*Phacelia ramosissima latifolia*), white chaenactis (*Chaenactis artemisiifolia*)^N, yellow pincushion (*Chaenactis glabriuscula glabriuscula*), slender wild oat (*Avena barbata*)*, nemacladus (*Nemacladus rubescens*)^N, scarlet larkspur (*Delphinium cardinale*)^N, blessed thistle (*Cnicus benedictus*)*, slender sunflower (*Helianthus gracilentus*), slope semaphore (*Mimulus brevipes*), whispering bells (*Emmenanthe penduliflora*)^N, stinging lupine (*Lupinus hirsutissimus*), scarlet bugler (*Penstemon centranthifolius*), California peony (*Paeonia californica*), Coulter's snapdragon (*Antirrhinum coulterianum*), Fremont's monkeyflower (*Mimulus fremontii*)^N, splendid mariposa lily (*Calochortus splendens*), and Weed's mariposa lily (*Calochortus weedii*).

On one burned east-facing slope, hundreds of *Calochortus* flowering stems had been clipped and eaten. Based on the tracks and scat present, this was most likely due to mule deer (*Odocoileus hemionus*) that may have been displaced from the valley by the

cattle. The display would have been spectacular if this had not happened and possibly new *Calochortus* species would have been discovered.

The Outcrops (Figures 3 & 4)

Species observed recolonizing the burned areas from resprouts and/or seed in this portion of the ranch include:

scrub oak (*Quercus berberidifolia*), chamise (*Adenostoma fasciculatum*), spiny redberry (*Rhamnus crocea*), holly-leaf cherry (*Prunus ilicifolia ilicifolia*), white sage (*Salvia apiana*), chaparral whitethorn (*Ceanothus leucodermis*), bush monkeyflower (*Mimulus aurantiacus*), elderberry (*Sambucus mexicana*), saw-tooth goldenbush (*Hazardia squarrosa grindelioides*), California peony (*Paeonia californica*), wild cucumber (*Marah macrocarpus macrocarpus*), lotus (*Lotus* sp.), clover (*Trifolium* sp.), Parish's nightshade (*Solanum parishii*), poison oak (*Toxicodendron diversilobum*), acourtia (*Acourtia microcephala*), cryptantha (*Cryptantha* spp.), granny's hairnet (*Pterostegia drymarioides*), camissonia (*Camissonia hirtella*), phacelia (*Phacelia brachyloba*)^N, caterpillar phacelia (*Phacelia cicutaria hispida*), wild heliotrope (*Phacelia distans*), branched phacelia (*Phacelia ramosissima latifolia*), bee plant (*Scrophularia californica floribunda*), shiny lomatium (*Lomatium lucidum*), cardinal catchfly (*Silene laciniata major*), western wallflower (*Erysimum capitatum capitatum*), leafy daisy (*Erigeron foliosus foliosus*), downy monkey flower (*Mimulus pilosus*), Nuttall's snapdragon (*Antirrhinum nuttallianum nuttallianum*), our-lord's-candle (*Yucca whipplei*), wild blue hyacinth (*Dichlostemma capitatum capitatum*), Weed's mariposa lily (*Calochortus weedii*), foxtail chess (*Bromus madritensis rubens*)* and cultivated sunflower (*Helianthus annuus*)^N.

Calochortus flowering stems were also clipped in this burned area.

Burned North, Northeast, Northwest Slopes Above Santa Ysabel Creek (Figure 5)

chamise (*Adenostoma fasciculatum*), mountain mahogany (*Cercocarpus betuloides betuloides*), snowberry (*Symphoricarpos mollis*), scrub oak (*Quercus berberidifolia*), spiny redberry (*Rhamnus crocea*), white sage (*Salvia apiana*), chaparral whitethorn (*Ceanothus leucodermis*), saw-tooth goldenbush (*Hazardia squarrosa grindelioides*), California peony (*Paeonia californica*), Eastwood manzanita (*Arctostaphylos glandulosa*), poison oak (*Toxicodendron diversilobum*), basket bush (*Rhus trilobata*), acourtia (*Acourtia microcephala*), wild cucumber (*Marah macrocarpus macrocarpus*), lotus (*Lotus* sp.), clover (*Trifolium* sp.), cryptantha (*Cryptantha* spp.), camissonia (*Camissonia hirtella*), caterpillar phacelia (*Phacelia cicutaria hispida*), branched phacelia (*Phacelia ramosissima latifolia*), Nuttall's snapdragon (*Antirrhinum nuttallianum nuttallianum*), , goldenrod (*Solidago californica*), slender sunflower (*Helianthus gracilentus*), stinging lupine (*Lupinus hirsutissimus*), splendid mariposa lily (*Calochortus splendens*), and Weed's mariposa lily (*Calochortus weedii*). foxtail chess (*Bromus madritensis rubens*)* slender wild oat (*Avena barbata*)*

Mugwort (*Artemisia douglasiana*) was dominant on a few steep, north-facing slopes which is atypical for it. It was not growing in a lowland, near a creek or otherwise wet area.

Fire Effects on the Plant Species of Interest on the East Ranch

Ranks are those listed by the California Department Fish and Game, California Natural Diversity Database, Special Plants List, October 2003.

PREFIRE CONDITION = **Prefire**
POSTFIRE CONDITION = **Post Fire**

Bitter Gooseberry *Ribes amarum*

CNDDDB lists subspecies *hoffmannii*, but Jepson submerges this into species.

No state or federal status

CNPS List-3

Prefire: Habitat and/or plant community where found: riparian woodland understory along Santa Ysabel Creek. *Notes:* Uncommon along SY Creek.

Postfire: Plants were relocated and no damage observed

Caraway-leaved Gilia *Gilia (Saltugilia) caruifolia*

No state or federal status

CNPS-List 4

Prefire: Habitat and/or plant community where found: opening in chaparral and within outcrops. *Notes:* Uncommon in openings in chaparral

Postfire: No plants observed. Plants were observed by the author growing in new burns in Julian (Kentwood in the Pines) and the Laguna Mountains 2003 and 2004.

Cleveland Sage *Salvia clevelandii*

No longer listed by NDDB

Prefire: Habitat and/or plant community where found: chamise chaparral

Postfire: Estimated 100 plants burned based on areas surveyed and resprouting was evident. *Salvias* are fire-adapted plants and this population should recover.

Descanso (San Diego) milkvetch *Astragalus oocarpus*

No state or federal status

CNPS List-1B

Prefire: Habitat and/or plant community where found: grassy understory of scrub/Engelmann oak. *Notes:* Large patch found dead in 2002. Confirmed dead in 2003. Infrequently, patches occur.

Postfire: New location for plants was discovered. It is not thought existing locations on the East Ranch were affected by the fire therefore these sites were not visited.

Engelmann Oak *Quercus engelmannii*

No state or federal status

CNPS List-4

PreFire: Habitat and/or plant community where found: forms its own large plant community. Notes: Dominant species on both Ranches

Postfire: Approximately 70 % of the observed Engelmann oaks showed severe to moderate impacts. This loss can be considered significant.

Jewelflower *Caulanthus heterophyllus heterophyllus*

Taxonomic conundrum at present.

Synonymous with *Streptanthus heterophyllus* (Rollins)

Considered to be synonymous with *Caulanthus stenocarpus* (Buck-Jepson Manual)

Caulanthus stenocarpus is considered to be synonymous with *Caulanthus lasiophyllus lasiophyllus* (Rollins)

Caulanthus heterophyllus has been split into two subspecies: *heterophyllus* and *pseudosimulans* (Buck).

C. h. pseudosimulans is listed by CNDDDB with no status (January 2003).

Prefire: Habitat and/or plant community where found: openings in chaparral or within outcrops Notes: Uncommon; occurs in openings at boulder/chaparral interface. Estimated number of plants prior to the fire was at four locations was 115.

Postfire: Estimated dead fruiting plants observed was 90. Germination of *Caulanthus heterophyllus* seed is induced by fire (Keeley et. al. 1998). Other species of *Caulanthus* are also positively affected by fire. *Caulanthus amplexicaulis var. barbarae* also benefits from fire (Danielson 1993).

Kern's Brodiaea *Brodiaea terrestris kernensis*

Not listed by CNDDDB

Prefire: Habitat and/or plant community where found: matchweed meadow, mixed wildflower /non-native grassland, native grassland, wet meadow and drainages (Kanaka Flats). Total estimate on whole ranch is thousands of plants.

Postfire: No flowering plants were observed in the Santa Ysabel creek valley area (seen in the hundreds there in 2003) but an estimated 200 flowering plants were observed on Kanaka Flats.

Long-spined Spineflower *Chorizanthe polygonoides longispina*

No state or federal status

CNPS List-1B

Prefire: Habitat and/or plant community where found: in the road next to junegrass-bluegrass "pebble plain" growing on Julian schist. Very few plants

Postfire: No plants relocated.

Mountain pink currant *Ribes nevadense*

Not listed by CNDDDB

Prefire: Habitat and/or plant community where found: riparian woodland understory along Santa Ysabel Creek; uncommon.

Postfire: Plants were relocated and no damage observed

Palomar monkeyflower *Mimulus (diffusus) palmeri*

M. diffusus has been submerged into *M. palmeri* (Thompson-Jepson Manual)

No state or federal status

CNPS List-4

Prefire: Habitat and/or plant community where found: opening in chaparral and within outcrops. about 50 plants found in single patch; outcrops in Engelmann oak/chaparral

Postfire: no plants relocated

San Diego Gumplant *Grindelia hirsutula hallii*

No state or federal status

CNPS-List 1B

Prefire: Habitat and/or plant community where found: meadows, wet areas, grasslands, dirt roads, disturbed areas, native and non-native grasslands, ruderal areas; more common on the East Ranch

Postfire: Plants in the Santa Ysabel creek valley suffered impacts most likely from vehicle access as these plants grow in the dirt roads. This species is common on the East Ranch and serious impacts are not expected.

San Felipe Monardella *Monardella nana leptosiphon*

No state or federal status

CNPS List-1B

Prefire: Habitat and/or plant community where found: mountain mahogany and white sage chaparral on the edge of mixed/oak coniferous forest; scattered patches located in mountain mahogany/chamise chaparral. Prefire population estimate was 500 plants.

Postfire: All populations were in the fire. Impacts from cattle trampling and possible grazing could affect recovery of populations. Estimated population size was 115 plants.

Western Azalea *Rhododendron occidentale*

Not listed by CNDDB

Prefire: Habitat and/or plant community where found: oak riparian woodland along creek; three plants found on preserve thus far.

Postfire: All three plants were relocated and showed no signs of fire damage though impact from illegal cattle grazing is highly possible. Cattle had grazed and were grazing adjacent to all three plant locations.

Wright's Hymenothrix *Hymenothrix wrightii*

No state or federal status

CNPS List-4

Prefire: Habitat and/or plant community where found: matchweed meadow and native grassland (three-awn); locally dominant to co-dominant species in three-awn and matchweed meadow; widely distributed on East Ranch.

Postfire: Populations in the Santa Ysabel Creek Valley were not affected but two populations of three on the eastern edge of the Kanaka Flats area were eliminated either through direct burning or vehicle access. In these specific areas the soil was charred, loose and vegetation recovery had not begun. Cattle activity was evident in these areas.

Yellow (Velvety) False Lupine *Thermopsis californica semota*
No state or federal status
CNPS List-1B

Prefire: Habitat and/or plant community where found: patch of non-native grass within white sage/buckwheat "scrub"; only one small patch was located with approximately 100 plants.

Postfire: This species appears to have benefited from the fire. In the area where the population was burned and an adjacent area, an estimated 1500 vegetative plants were observed. Prior to the fire, this population occurred within an area where there was a predominance of white sage. The genus *Salvia* is known to have an allelopathic affect on adjacent vegetation (Barbour et. al 1999). Removal of the white sage by the fire may have also facilitated increased germination and regrowth of *Thermopsis* by removing allelopathic substances in the soil and removing the shrub canopy

Thermopsis macrophylla angina, another rare species of *Thermopsis* that occurs in the Santa Ynez Mountains near Santa Barbara responds positively to fire through rhizomatous resprouting and heat-simulated germination of refractory seed (Borchert 1989). This study also found that this species relies on seed production by resprouts to maintain a significant amount of seed in the seed bank. They also determined the interfire period is critical in the life history of the population biology of the species. "Recruits that survive both the interfire period and the next fire show marked increases in stem production, seed output, and survivorship." Other species of *Thermopsis* resprout from rhizomes following fire. There is a possibility the eastern species, *Thermopsis mollis* responds in the same manner including the germination of fire-scarred buried seed (USFS 2004).

Fire Effects on the Sensitive Habitats on the East Ranch

The "Dudleya rock garden" (*Dudleya edulis*) was discovered in 2003 on outcrops that rise above Highway 79 across from the Inaja Memorial Rest Area. Plants were large and vigorous with many flowering in 2003. Thousands of Dudleyas occurred in this area growing on and within the fissures and cracks of the granitic outcrops:

approximately 50% of the dudleya "garden" was destroyed from the fire. There was limited recovery observed of the remaining plants whose leaf tips were brown and curled

Santa Ysabel Creek and floodplain, and associated riparian habitat and wetlands, including all tributaries:

minimally affected by the fire but impacts from cattle have exacerbated the impacts and include grazing of wetland vegetation, trampling and "wallowing". Native wetland vegetation within the creek had been grazed and the streambank was damaged. One of the highest quality wetlands in Santa Ysabel creek valley had been grazed and "wallowed" in and the native rushes, sedges and native wet meadow grass (*Hordeum brachyantherum californicum*) were being displaced by the noxious weed, bull thistle (*Cirsium vulgare*).

"Perched wetlands" associated with seeps, occurring on upper slopes of the preserve:

Impact from the fire was probably minimal but seep of high value on the upper slope of the north and east section of the East Ranch had also suffered cattle damage similar to above.

"Pocket wetlands" or isolated wetlands that did not appear to be associated with any above-ground (i.e. visible) water source:

due to the limits of this survey, these sites were not checked but serious damage is not expected and these may be ephemeral locations dependent on precipitation and surface water.

Kanaka Flats wetlands:

impacts from fire were minimal but impacts from cattle were evident.

All drainages and seeps on the preserve, some of which occur in the outcrops at the higher elevations:

due to the limits of this survey, these sites were not checked but serious damage is not expected and these may be ephemeral locations dependent on precipitation and surface water. Annual and perennial flora associated with these outcrops may have been affected.

Native grasslands: Nodding and purple needlegrass (*Nassella cernua* and *purpurea*, respectively) and three-awn (*Aristida purpurea longiseta*) grasslands/meadows occurred frequently on the East Ranch, most often as patches or locally dominant stands. Other native grasses occur on the East Ranch as well:

no severe impacts from the fire are expected to the native grasses and of those populations burned, recovery was high. Non-native grasses are a more serious threat to these species than the fire and the non-native grasses may have increased their range on the East Ranch as a result of the fire. In high quality wetlands in the Santa Ysabel creek valley, the native wet meadow grass (*Hordeum brachyantherum californicum*) was being displaced by the noxious weed, bull thistle (*Cirsium vulgare*).

Plant Communities Affected by the Fire

The shrub layer suffered the greatest impacts from the fire. The herb layer will recover though non-native grasses seemed to have benefited from the fire. Engelmann oak mortality is estimated at 30%, big-cone Douglas fir trees were seriously affected as were

Coulter pines and all pines in the burn areas. Like Coulter pine, big cone Douglas fir has a restricted range and naturally occurring populations are not known outside of S. California. Julian is the southern-most edge of its range. During surveys in 2002, a small burned area was located ("waypoint 65") and it appeared as if it had burned more recently than the data from the California Department of Forestry indicated (CDF, FRAP database) which as of 2002, was in 1940 (Figure 1). Many of the same species as those listed above were observed in this area but this area also included the largest stand of bigcone Douglas fir we had found on the preserve (we estimated about 20 trees). The d.b.h. (diameter at breast height) of these young trees was very similar (15-20 cm d.b.h.) leading us to conclude that quite possibly these were trees that germinated after the fire.

Reports of fire ecology for this species are mixed but bigcone Douglas fir is generally not favored by fires, especially repeated fire. Repeated fire kills bigcone Douglas-fir (McDonald, no date, USFS 2004, Minnich 1980) and their seeds are also killed from fire (USFS 2004, Minnich 1980). Minnich (1980), reports that long distance seed dispersal by wind may not be efficient because the seeds are heavy. Reproduction may also be inhibited by the lack of shade due to the combustion of canyon live oak. He found that reproduction occurred in the least disturbed habitats free of fire for 50 years. Resprouting and seedling development does occur (Little 1992, McDonald, no date and USFS 2004) but generally postfire regeneration can take decades (USFS 2004). It may be prudent to protect all remaining populations from fire as part of an overall forest management plan (Sproul 2001).

Of the plant communities observed during the surveys, the following ratings were issued. Note these are ratings that estimate % burn prior to recovery based on charred wood still present, soil color and condition, and adjacent burned vegetation.

Impact Level: Low—10% or less of ecosystem burned
 Moderate—10-50% of ecosystem burned
 High—greater than 50% of ecosystem burned

Plant Community	Impact level
Forests and Woodlands	
Mixed Oak/Coniferous/Bigcone Fir/Coulter Pine	M-H
<i>Coniferous Forest Types</i>	
Bigcone Douglas Fir (<i>Pseudotsuga macrocarpa</i>)	M-H
Coulter Pine (<i>Pinus coulteri</i>)	H
Incense Cedar (<i>Calocedrus decurrens</i>)	M
<i>Oak Woodland/Forest Types</i>	
Mixed Oak Woodland/Forest	M-H
Black Oak (<i>Quercus kelloggii</i>) Woodland/Forest	M-H

Coast live oak (<i>Quercus agrifolia</i>) woodland/forest	M
Engelmann Oak (<i>Quercus engelmannii</i>) woodland/savanna	H
Golden cup oak (<i>Quercus chrysolepis</i>)	M
Woodland herb-no types	H

Shrub-dominated Communities

Chamise (<i>Adenostoma fasciculatum</i>)	H
Mixed-Montane Chaparral	H
Scrub oak (<i>Quercus berberidifolia</i>) dominated chaparral	H
White sage (<i>Salvia apiana</i>) dominated chaparral/scrub	H
Mountain mahogany (<i>Cercocarpus betuloides</i>)	H
Matchweed (<i>Gutierrezia sarothrae</i>)	M
Matchweed-California Buckwheat (<i>Eriogonum fasciculatum polifolium and fasciculatum</i>)	M
Matchweed-Wright's Eriogonum (<i>Eriogonum wrightii membranaceum</i>)	M
Matchweed-Three Awn (<i>Aristida purpurea longiseta</i>)-Buckwheat	L-M

Wetland

More serious damage to wetlands has occurred from illegal cattle grazing since the fire greatly affecting recovery of these areas and local hydrology.

Wetland-Riparian herbaceous	M
Pacific Rush (<i>Juncus effusus pacificus</i>)	M
Pondweed (<i>Lemna minuscula</i>)	L
Sedge Meadow	M
Mixed Wet Meadow	M
Kanaka Flats Alluvial Drainages	L-M
Seep or "perched wetlands"	M
Ponds	L

Riparian

Coast Live Oak Riparian Woodland	L
White Alder (<i>Alnus rhombifolia</i>) forest	L
Willow scrub	L

Upland Herbaceous Communities

Native grassland Junegrass (<i>Koeleria macrantha</i>)/One-sided Bluegrass (<i>Poa secunda secunda</i>)	M
Melica (<i>Melica imperfecta</i>) grassland (Forms locally dominant stands).	M
Needlegrass (<i>Nassella cernua</i>)	M
Giant Stipa (<i>Achnatherum coronatum</i>)	M-H
Deergrass (<i>Muhlenbergia rigens</i>)	M-H
Blue Wild Rye (<i>Elymus glaucus glaucus</i>)	M-H
Squirreltail (<i>Elymus elymoides</i>)	M-H
Native Grassland (Needlegrass)/Wildflower Meadow	M
Three Awn Grassland (<i>Aristida purpurea longiseta</i>)	L-M
Non-native grassland	H
Non-native Grassland/Wildflower Meadow	H
Ruderal/Non-native grassland	H
Wildflower Meadow	H
Ruderal/Agricultural	H

Disturbed

Exotic Plants	M-H
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New Plant Species Observed Since the Fire

The following new species were observed: white chaenactis (*Chaenactis artemisiifolia*)^N, scarlet larkspur (*Delphinium cardinale*)^N, whispering bells (*Emmenanthe penduliflora*)^N, capitate gilia (*Gilia capitata*)^N, Fremont's monkeyflower (*Mimulus fremontii*)^N, nemacladus (*Nemacladus rubescens*)^N, phacelia (*Phacelia brachyloba*)^N, and cultivated sunflower (*Helianthus annuus*)^N.

Native and Non-native Grass Response to the Fires

Non-native (annual) grasses are the 'wave' of the future if fire frequency continues to increase. The combination of repeated fires, drought, and increased development under the umbrella of climate change makes type conversions from native ecosystems to non-native weedy ones highly likely.

It has been clearly documented that repeated fires favor the establishment of non-native weedy grasses such as cheatgrass (*Bromus tectorum*), ripgut (*Bromus diandrus*), soft chess (*Bromus secundus*), foxtail chess (*Bromus madritensis rubens*) and wild oat (*Avena* spp.), (Minnich and Scott, no date, AllReference, no date, USDA 1999, UCDavis 1992, BLM 2001, D'Antonio and Haubensak 1998, Bossard et. al. 2000). Annual grasses also compete for resources needed by native grasses and other native species (D'Antonio and Haubensak 1998, Schierenbeck et. al. 1998, Dudley 1998, Kemp and Brooks 1998, Gerlach et. al. 1998, and Bossard et. al. 2000).

Isolated stands of native *Nassella* were observed in the burn areas primarily as resprouts. Native grasslands appeared to be fully recovering.

Non-native grasses did not occur in the areas where the burn seemed to be the most severe, possibly killing the seed bank. Non-native grasses were prolific in areas around the most severely burned sites. In many of these places, non-native grass species occurred there prior to the fire so no extreme shifts of the distribution of these species on the Ranch were observed. As mentioned above, a greater threat is as a result of the prolific postfire germination of the non-native grasses, they may encroach even more upon remaining native plant habitats.

Species observed were: cheatgrass (*Bromus tectorum*), ripgut (*Bromus diandrus*), soft chess (*Bromus secundus*), foxtail chess (*Bromus madritensis rubens*) and wild oat (*Avena barbata*).

Fire Effects on Old Growth Trees

Species of old growth trees on the East Ranch primarily include: coast live oak, a few Engelmann oak and sycamore. Old growth coast live oak and sycamores were observed that suffered some impacts but mainly to the bark and lower branches and many of these trees were resprouting. Mortality of old growth from the fires appeared to be low.

Fire Effects on the Engelmann Oak--a dominant plant community on the East Ranch

Estimated mortality of the Engelmann oak based on the areas visited were 30% of the Engelmann oak were killed in the fire, 40% were burned but were resprouting either from the crown or from the branches and 30% remained unburned. Of the oak tree species, Engelmann oak suffered the most damage and mortality from the fire. All other oak species (mostly coast live oak trees observed) appeared to have only their lower limbs and outer bark burned and mortality appeared to be lower with these species. Similarly, other live oak tree species attain greater height and the crown of these trees was rarely burned. The Engelmann oak appeared to be at the height limit of the fire based on the fire scars seen on the bark of the taller oak trees.

Engelmann oak inhabits the smallest range of any oak tree in the southwestern U.S. (Scott 1990). Scott cites observations by others that Engelmann oak hybrids (x scrub oak) survive fire and drought more frequently than the pure species. Large numbers of hybrid Engelmann oaks were observed on the East and West Ranches of the preserve. Whether they show greater survivorship from the fires requires further investigation and was not part of this survey. Scott cites evidence that Engelmann oak seedlings subjected to fire survive at a higher rate than live oak seedlings. Lathrop (1990) reports that 40 of 42 burned Engelmann oak saplings recovered by resprouting but mortality was then suffered from dehydration. This changes when one compares Engelmann oak to mature live oaks. Engelmann oaks have thinner bark and are less resistant to fire than those oak species that have thicker bark. Live oaks often resprout from the trunk and branches after fire. Scott mentions that the heat of brush fires can kill Engelmann oaks down to the root crown even when the bark is not charred. This may affect the distribution of Engelmann on a regional scale.

Erosion

Soil was darkened following the fire and less stable. Slopes of 20% or greater that had been burned with most of the vegetation burned were extremely unstable for walking on and slippage occurred easily while walking on these slopes. All the north and northeast/west slopes above Santa Ysabel Creek (on the Julian 7.5" topo, Figure 5) were severely affected by cattle and cattle traffic had significantly loosened and accelerated erosion on these slopes.

A fire line was bulldozed from Santa Ysabel Creek up a slope of 30% or higher. The county has installed erosion fencing at this site and it appears to be effective. The road is being allowed to revegetate naturally according to the rangers.

In other areas where erosion fencing has been installed, it has been effective.

Impacts Exacerbated by the Presence of Large Cattle on the East Ranch

It was not anticipated that this report would require a category of this type but upon arriving to conduct the surveys, a herd of extremely large cattle (Angus?) was found on the preserve and they had done extensive damage. Based on how widely distributed and old the "cow patties" were, it was obvious the cattle had been grazing there illegally for at least a month or longer. The combination of fire and cattle activity can hinder the recovery of an area from fire and this was evident during our surveys.

Cattle exacerbated the following:

- increased erosion on the steeper slopes
- possible assistance in extirpating postfire populations of *Monardella nana leptosiphon*
- streambank erosion on Santa Ysabel Creek
- degradation of wetlands in the valley
- possible displacement of deer from preferred grazing sites

These ecosystems were in the process of recovering from cattle activity since the acquisition of the preserve but have now been "set-back" yet again and without

precipitation and strict protective measures from grazers and non-native noxious grasses, a type conversion from native to non-native ecosystems may occur.

The oaks need a chance to regenerate but with the illegal grazing and possible deer browsing, this may not be possible. Lathrop and Osborne found in a study they conducted at the Santa Rosa Plateau that mortality among Engelmann oak seedlings was 82% when grazing was allowed and 32% when cattle were excluded. "Frequency and density comparisons of oak age/size categories with respect to grazing regime suggest cattle profoundly limit seedling survival on grazed areas within the Santa Rosa Plateau." Their study also found that deer graze on oak seedlings. Other causes of mortality to seedling oaks were drought, rodents, and insects. Drought played a significant role in seedling mortality.

Cattle have and continue to play a critical role in ecosystem management. If timed correctly and strictly monitored, cattle can help control non-native grasses and even the fire danger they present (Pavlik et. al.) but if this not done, they can do serious damage to ecosystems including eating seedlings of young oak trees and compacting soil (Pavlik et.al).

Conclusion

Cattle should be removed then kept off of the preserve so that fire-impacted ecosystems can recover. The Engelmann oak population may drop on the East Ranch so all precautions to protect seedlings should be taken which further reinforces the need to remove the cattle from the preserve. Non-native grasses may have increased their local range on the East Ranch. Wetlands were damaged severely by cattle with the subsequent invasion of a noxious thistle, bull thistle. This thistle should be removed from this wetland area as soon as possible. Portions of the Santa Ysabel creekbed were damaged from cattle and the native wetland vegetation grazed. Weeds often follow this activity.

Conifers are all but eliminated from the East Ranch. The bigcone Douglas fir population may have dropped by 50% and the population on the preserve was not large to begin with (an estimated 100 trees?).

Overall, the East Ranch is recovering from the fires but some permanent changes in species composition are likely (native herbaceous flora displaced by increased non-native grasses, loss of conifers on the east side, some loss of big- cone Douglas fir, *Mondardella* population declines, and Engelmann oak declines). Wetlands in the valley are threatened primarily from illegal grazing activity.

Global warming which is causing extreme climate change may result in permanent changes in precipitation levels thereby prolonging the "drought". This could favor the spread of non-native grasses. The proliferation of these species can continue the fire cycle and cause permanent type conversions of native vegetation to non-native vegetation and thereby permanently affect local biodiversity.

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Appendix C

***California Department of Fish and Game
Natural Diversity Database***

***SPECIAL VASCULAR PLANTS,
BRYOPHYTES, AND LICHENS
LIST***

July 2005

Citation: California Department of Fish and Game, Natural Diversity Database. July 2005. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication, Mimeo. 87 pp.

SPECIAL PLANTS

“Special Plants” is a broad term used to refer to all the plant taxa inventoried by the Department of Fish and Game’s California Natural Diversity Database (CNDDDB), regardless of their legal or protection status. Special Plants include vascular plants and high priority bryophytes (mosses, liverworts, and hornworts) which are a recent addition. Special Plant taxa are species, subspecies, or varieties that fall into one or more of the following categories:

- Officially listed by California or the Federal Government as Endangered, Threatened, or Rare;
- A candidate for state or federal listing as Endangered, Threatened, or Rare;
- Taxa which meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the California Environmental Quality Act (CEQA) Guidelines;
- A Bureau of Land Management, U.S. Fish and Wildlife Service, or U.S. Forest Service Sensitive Species;
- Taxa listed in the California Native Plant Society’s *Inventory of Rare and Endangered Plants of California*;
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range but not currently threatened with extirpation;
- Population(s) in California that may be peripheral to the major portion of a taxon’s range but are threatened with extirpation in California; and
- Taxa closely associated with a habitat that is declining in California at a significant rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands, valley shrubland habitats, vernal pools, etc.).

This list contains taxa that are actively inventoried by the CNDDDB (Note: a “yes” in the right column of the list) as well as an almost equal number of taxa which it tracks but as yet has no computerized site information. For the latter taxa, we maintain site and other information in manual files. These plants will be added to the computerized inventory as time permits or when we have enough information to determine that they fulfill our rarity and/or endangerment criteria. For more copies of this list or other CNDDDB information, call (916) 324-3812 or email Karen Bates, Information Services, at kbates@dfg.ca.gov.

NOTE: We have removed the designation “**Federal Species of Concern.**” Please do not be concerned; the federal species of concern list was an internal FWS list maintained by their Sacramento office of taxa that were formerly designated C1 and C2 plus some other miscellaneous taxa. Once we discovered that the list was seldom updated and generated only from Sacramento without review by other FWS offices, we decided we were not doing you a service by including this designation. The taxa are just as important as before and should be given consideration in your environmental work.

SPECIAL LICHENS

There are a few lichens in California for which we have adequate information to place them on the list of Special taxa. They appear after the bryophytes at the beginning of the list. We are not including lichens for which little is known, even if they are only known from a few sites in California because the level of information is not developed enough. As information on individual taxa becomes better developed, more lichens may be added.

Note that lichens are not plants, but a symbiotic relationship between a fungus and either green algae or cyanobacteria.

ELEMENT RANKING

GLOBAL RANKING

The *global rank* (G-rank) is a reflection of the overall condition of an element throughout its global range.

SPECIES OR NATURAL COMMUNITY LEVEL

- G1** = Less than 6 viable element occurrences (Eos) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-80 Eos OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

SUBSPECIES LEVEL

Subspecies receive a **T-rank** attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety. For example: *Chorizanthe robusta* var. *hartwegii*. This plant is ranked G2T1. The G-rank refers to the whole species range i.e., *Chorizanthe robusta*. The T-rank refers only to the global condition of var. *hartwegii*.

STATE RANKING

The *state rank* (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

- S1** = Less than 6 viable Eos OR less than 1,000 individuals OR less than 2,000 acres
S1.1 = very threatened
S1.2 = threatened
S1.3 = no current threats known
S2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres
S2.1 = very threatened
S2.2 = threatened
S2.3 = no current threats known
S3 = 21-80 Eos or 3,000-10,000 individuals OR 10,000-50,000 acres
S3.1 = very threatened
S3.2 = threatened
S3.3 = no current threats known
S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.
S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.
-

Notes:

- | | |
|--|---|
| 1. Other considerations used when ranking a species or natural community include the pattern of distribution of the element on the landscape, fragmentation of the population/stands, and historical extent as compared to its modern range. It is important to take a bird's eye or aerial view when ranking sensitive elements rather than simply counting Eos. | 3. Other symbols |
| 2. Uncertainty about the rank of an element is expressed in two major ways: | GH All sites are historical ; the element has not been seen for at least 20 years, but suitable habitat still exists (SH = All California sites are historical). |
| By expressing the rank as a range of values: e.g., S2S3 means the rank is somewhere between S2 and S3. | GX All sites are extirpated ; this element is extinct in the wild (SX = All California sites are extirpated). |
| By adding a ? to the rank: e.g., S2? This represents more certainty than S2S3, but less than S2. | GXC Extinct in the wild; exists in cultivation. |
| | G1Q The element is very rare, but there are taxonomic questions associated with it. |
| | T Rank applies to a subspecies or variety. |

The California Native Plant Society's (CNPS) Lists and R-E-D Code

Excerpted from CNPS's *Inventory of Rare and Endangered Plants of California* (Sixth edition. CNPS. 2001. David Tibor, Convening Editor. X + 388pp). For complete document, see pp. 54-56.

- 1A. Presumed extinct in California
- 1B. Rare or Endangered in California and elsewhere
- 2. Rare or Endangered in California, more common elsewhere
- 3. Plants for which we need more information - Review list
- 4. Plants of limited distribution - Watch list

List 1A: Plants Presumed Extinct in California

The 29 plants of List 1A are presumed extinct because they have not been seen or collected in the wild in California for many years. Although most of them are restricted to California, a few are found in other states as well. In many cases, repeated attempts have been made to rediscover these plants by visiting known historical locations. Even after such diligent searching, we are constrained against saying that they are extinct, since for most of them rediscovery remains a distinct possibility. Note that care should be taken to distinguish between "extinct" and "extirpated." A plant is extirpated if it has been locally eliminated, but it may be doing well elsewhere in its range.

The R-E-D code for List 1A plants does not exist, but is designated by an "*" as a placeholder.

List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere.

The 1021 plants of List 1B are rare throughout their range. All but a few are endemic to California. All of them are judged to be vulnerable under present circumstances or to have a high potential for becoming so because of their limited or vulnerable habitat, their low numbers of individuals per population (even though they may be wide ranging), or their limited number of populations. Most of the plants of List 1B have declined significantly over the last century.

List 2: Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere

Except for being common beyond the boundaries of California, the 417 plants of List 2 would have appeared on List 1B. From the federal perspective, plants common in other states or countries are not eligible for consideration under the provisions of the Endangered Species Act. Until 1979, a similar policy was followed in California. However, after the passage of the Native Plant Protection Act, plants were considered for protection without regard to their distribution outside the state.

List 3: Plants About Which We Need More Information - A Review list

The 52 plants that comprise List 3 are united by one common theme--we lack the necessary information to assign them to one of the other lists or to reject them. Nearly all of the plants remaining on List 3 are taxonomically problematic.

List 4: Plants of Limited Distribution - A Watch list

The 554 plants in this category are of limited distribution or infrequent throughout a broader area in California, and their vulnerability or susceptibility to threat appears low at this time. While we cannot call these plants "rare" from a statewide perspective, they are uncommon enough that their status should be monitored regularly. Should the degree of endangerment or rarity of a List 4 plant change, we will transfer it to a more appropriate list or deleted from consideration.

CNPS R-E-D Code

With the five CNPS Lists we maintain a simple classification that reflects an overall level of conservation concern. However, rarity and endangerment are not strictly correlated, and our approach to protecting plants that occur only in California is somewhat different from our approach to protecting plants that also occur elsewhere. Developing effective conservation strategies requires that we distinguish among the separate factors that contribute to our List assignments. These are: **rarity**, which addresses numbers of individuals and distribution within California; **endangerment**, which addresses the plant's vulnerability to extinction for any reason; and **distribution**, which describes the overall range of the plant. Together these three elements form the **R-E-D Code**. Each element in the code is divided into three classes or degrees of concern, represented by the number 1, 2, or 3. In each case, higher numbers indicate greater concern. The system is summarized as follows:

R - Rarity

- 1 Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time
- 2 Distributed in a limited number of occurrences, occasionally more if each occurrence is small
- 3 Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported

E - Endangerment

- 1 Not endangered
- 2 Endangered in a portion of its range
- 3 Endangered throughout its range

D - Distribution

- 1 More or less widespread outside California
- 2 Rare outside California
- 3 Endemic to California

For example, an R-E-D Code of 3-3-3 indicates that the plant in question is limited to one population or several restricted ones, that it is endangered throughout its range, and that it is endemic to California.

Note that the R-E-D Code for List 1A plants does not exist; an "*" indicates this is a placeholder.

Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities

State of California
THE RESOURCES AGENCY
Department of Fish and Game
December 9, 1983
Revised May 8, 2000

The following recommendations are intended to help those who prepare and review environmental documents determine **when** a botanical survey is needed, **who** should be considered qualified to conduct such surveys, **how** field surveys should be conducted, and **what** information should be contained in the survey report. The Department may recommend that lead agencies not accept the results of surveys that are not conducted according to these guidelines.

1. Botanical surveys are conducted in order to determine the environmental effects of proposed projects on all rare, threatened, and endangered plants and plant communities. Rare, threatened, and endangered plants are not necessarily limited to those species which have been "listed" by state and federal agencies but should include any species that, based on all available data, can be shown to be rare, threatened, and/or endangered under the following definitions:

A species, subspecies, or variety of plant is "endangered" when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition, or disease. A plant is "threatened" when it is likely to become endangered in the foreseeable future in the absence of protection measures. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens.

Rare natural communities are those communities that are of highly limited distribution. These communities may or may not contain rare, threatened, or endangered species. The most current version of the California Natural Diversity Database's List of California Terrestrial Natural Communities may be used as a guide to the names and status of communities.

2. It is appropriate to conduct a botanical field survey to determine if, or to the extent that, rare, threatened, or endangered plants will be affected by a proposed project when:

- a. Natural vegetation occurs on the site, it is unknown if rare, threatened, or endangered plants or habitats occur on the site, and the project has the potential for direct or indirect effects on vegetation; or
- b. Rare plants have historically been identified on the project site, but adequate information for impact assessment is lacking.

3. Botanical consultants should possess the following qualifications:

- a. Experience conducting floristic field surveys;
- b. Knowledge of plant taxonomy and plant community ecology;
- c. Familiarity with the plants of the area, including rare, threatened, and endangered species;
- d. Familiarity with the appropriate state and federal statutes related to plants and plant collecting; and
- e. Experience with analyzing impacts of development on native plant species and communities.

4. Field surveys should be conducted in a manner that will locate any rare, threatened, or endangered species that may be present. Specifically, rare, threatened, or endangered plant surveys should be:

- a. Conducted in the field at the proper time of year when rare, threatened, or endangered species are both evident and identifiable. Usually, this is when the plants are flowering.

When rare, threatened, or endangered plants are known to occur in the type(s) of habitat present in the project area, nearby accessible occurrences of the plants (reference sites) should be observed to determine that the species are identifiable at the time of the survey.

- b. Floristic in nature. A floristic survey requires that every plant observed be identified to the extent necessary to determine its rarity and listing status. In addition, a sufficient number of visits spaced throughout the growing season are necessary to accurately determine what plants exist on the site. In

order to properly characterize the site and document the completeness of the survey, a complete list of plants observed on the site should be included in every botanical survey report.

c. Conducted in a manner that is consistent with conservation ethics. Collections (voucher specimens) of rare, threatened, or endangered species, or suspected rare, threatened, or endangered species should be made only when such actions would not jeopardize the continued existence of the population and in accordance with applicable state and federal permit requirements. A collecting permit from the Habitat Conservation Planning Branch of DFG is required for collection of state-listed plant species. Voucher specimens should be deposited at recognized public herbaria for future reference. Photography should be used to document plant identification and habitat whenever possible, but especially when the population cannot withstand collection of voucher specimens.

d. Conducted using systematic field techniques in all habitats of the site to ensure a thorough coverage of potential impact areas.

e. Well documented. When a rare, threatened, or endangered plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form, accompanied by a copy of the appropriate portion of a 7.5 minute topographic map with the occurrence mapped, should be completed and submitted to the Natural Diversity Database. Locations may be best documented using global positioning systems (GPS) and presented in map and digital forms as these tools become more accessible.

5. Reports of botanical field surveys should be included in or with environmental assessments, negative declarations and mitigated negative declarations, Timber Harvesting Plans (THPs), EIR's, and EIS's, and should contain the following information:

- a. Project description, including a detailed map of the project location and study area.
- b. A written description of biological setting referencing the community nomenclature used and a vegetation map.
- c. Detailed description of survey methodology.
- d. Dates of field surveys and total person-hours spent on field surveys.
- e. Results of field survey including detailed maps and specific location data for each plant population found. Investigators are encouraged to provide GPS data and maps documenting population boundaries.
- f. An assessment of potential impacts. This should include a map showing the distribution of plants in relation to proposed activities.
- g. Discussion of the significance of rare, threatened, or endangered plant populations in the project area considering nearby populations and total species distribution.
- h. Recommended measures to avoid impacts.
- i. A list of all plants observed on the project area. Plants should be identified to the taxonomic level necessary to determine whether or not they are rare, threatened or endangered.
- j. Description of reference site(s) visited and phenological development of rare, threatened, or endangered plant(s).
- k. Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms.
- l. Name of field investigator(s).
- m. References cited, persons contacted, herbaria visited, and the location of voucher specimens.

Special Vascular Plants, Bryophytes, and Lichens List

California Department of Fish and Game Natural Diversity Database

Bryophytes

Anomobryum julaceum

slender silver-moss
NBMUS80010
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDb: Yes

Atractylocarpus flagellaceus

flagella-like
attractylocarpus
NBMUS84010
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Bruchia bolanderi

Bolander's bruchia
NBMUS13010
Fed: None
State: None
RANK: G2G3/S2.2
CNPS List: 2
Records in CNDDb: Yes

Didymodon norrisii

Norris's beard-moss
NBMUS2C0H0
Fed: None
State: None
RANK: G2G3/S2.2
CNPS List: 2
Records in CNDDb: Yes

Discelium nudum

naked flag-moss
NBMUS2E010
Fed: None
State: None
RANK: G3G4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Entosthodon kochii

Koch's cord-moss
NBMUS2P050
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Fissidens aphelotaxifolius

brook pocket-moss
NBMUS2W290
Fed: None
State: None
RANK: GU/S1.2
CNPS List: 2
Records in CNDDb: Yes

Fissidens pauperculus

minute pocket-moss
NBMUS2W0U0
Fed: None
State: None
RANK: G3?/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Geothallus tuberosus

Campbell's liverwort
NBHEP1C010
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Helodium blandowii

Blandow's bog-moss
NBMUS3C010
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Meesia triquetra

three-ranked hump-moss
NBMUS4L020
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDb: Yes

Meesia uliginosa

broad-nerved hump-moss
NBMUS4L030
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Mielichhoferia elongata

elongate copper-moss
NBMUS4Q022
Fed: None
State: None
RANK: G4?/S2.2
CNPS List: 2
Records in CNDDb: Yes

Mielichhoferia tehamensis

Lassen Peak copper-moss
NBMUS4Q030
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Myurella julacea

small mousetail-moss
NBMUS4U010
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Orthotrichum shevockii

Shevock's bristle-moss
NBMUS56150
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Orthotrichum spjutii

Spjut's bristle-moss
NBMUS56160
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Pohlia tundrae

tundra thread-moss
NBMUS5S1B0
Fed: None
State: None
RANK: G2G3/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Pterygoneurum californicum

California chalk-moss
NBMUS65020
Fed: None
State: None
RANK: GH/SH
CNPS List: 1B
Records in CNDDb: Yes

Schizymenium shevockii

Shevock's copper-moss
NBMUSA1010
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Scopelophila cataractae

tongue-leaf copper-moss
NBMUS6U010
Fed: None
State: None
RANK: G3/S1.2
CNPS List: 2
Records in CNDDb: Yes

Sphaerocarpos drewei

bottle liverwort
NBHEP35030
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Sphagnum strictum

pale peat-moss
NBMUS6Z170
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Tortella alpicola

alpine crisp-moss
NBMUS7K100
Fed: None
State: None
RANK: GNR/S1.3
CNPS List: 2
Records in CNDDb: Yes

Tortula californica

California screw-moss

NBMUS7L090

Fed: None

State: None

RANK: G2G4/S2.2

CNPS List: 1B

Records in CNDDb: Yes

Trichodon cylindricus

cylindrical trichodon

NBMUS7N020

Fed: None

State: None

RANK: G4G5/S2.2

CNPS List: 2

Records in CNDDb: Yes

Triquetrella californica

coastal triquetrella

NBMUS7S010

Fed: None

State: None

RANK: G1/S1.2

CNPS List: 1B

Records in CNDDb: Yes

Lichens

Graphis saxorum

Baja rock lichen
NLTES29470
Fed: None
State: None
RANK: G1G3/S1S3
CNPS List:
Records in CNDDb: Yes

Mobergia calculiformis

light gray lichen
NLTES41770
Fed: None
State: None
RANK: G1 /S1.1
CNPS List:
Records in CNDDb: Yes

Sulcaria isidiifera

splitting yarn lichen
NLTEST0020
Fed: None
State: None
RANK: G1/S1.1
CNPS List:
Records in CNDDb: Yes

Texosporium sancti-jacobi

woven-spored lichen
NLTEST7980
Fed: None
State: None
RANK: G2/S1.1
CNPS List:
Records in CNDDb: Yes

Thamnolia vermicularis

thamnolia lichen
NLTES43860
Fed: None
State: None
RANK: G3G5/S1.1
CNPS List:
Records in CNDDb: Yes

Usnea longissima

long-beard lichen
NLLEC5P420
Fed: None
State: None
RANK: G4/S3.1
CNPS List:
Records in CNDDb: Yes

Vascular Plants

Abies amabilis

Pacific silver fir
PGPIN01010
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 2
Records in CNDDDB: Yes

Abies bracteata

bristlecone fir
PGPIN01030
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Abies lasiocarpa var. *lasiocarpa*

subalpine fir
PGPIN01072
Fed: None
State: None
RANK: G5T5/S3.3
CNPS List: 2
Records in CNDDDB: Yes

Abronia alpina

Ramshaw Meadows
abronia
PDNYC01020
Fed: Candidate
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Abronia maritima

red sand-verbena
PDNYC010E0
Fed: None
State: None
RANK: G4?/S3?
CNPS List: 4
Records in CNDDDB: No

Abronia nana ssp. *covillei*

Coville's dwarf abronia
PDNYC010H1
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Abronia umbellata ssp. *breviflora*

pink sand-verbena
PDNYC010N2
Fed: None
State: None
RANK: G4G5T2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Abronia villosa var. *aurita*

chaparral sand-verbena
PDNYC010P1
Fed: None
State: None
RANK: G5T2T3/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Abutilon parvulum

dwarf indian-mallow
PDMAL020F0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Acanthomintha duttonii

San Mateo thorn-mint
PDLAM01040
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Acanthomintha ilicifolia

San Diego thorn-mint
PDLAM01010
Fed: Threatened
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Acanthomintha lanceolata

Santa Clara thorn-mint
PDLAM01020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Acanthomintha obovata ssp. *cordata*

heart-leaved thorn-mint
PDLAM01033
Fed: None
State: None
RANK: G3T3?/S3.2?
CNPS List: 4
Records in CNDDDB: No

Acanthomintha obovata ssp. *obovata*

San Benito thorn-mint
PDLAM01032
Fed: None
State: None
RANK: G3T3/S3.2?
CNPS List: 4
Records in CNDDDB: No

Achnatherum aridum

Mormon needle grass
PMPOA5X010
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDDB: Yes

Achnatherum diegoense

San Diego County
needle grass
PMPOA5X0B0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Achnatherum lemmonii ssp. *pubescens*

pubescent needle grass
PMPOA5X0F2
Fed: None
State: None
RANK: G5T1T2Q/S1.2
CNPS List: 3
Records in CNDDDB: No

Acleisanthes longiflora

angel trumpets
PDNYC02040
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Adolphia californica

California adolphia
PDRHA01010
Fed: None
State: None
RANK: G3G4/S3.1
CNPS List: 2
Records in CNDDDB: Yes

Agave shawii

Shaw's agave
PMAGA010P0
Fed: None
State: None
RANK: G2G3/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Agave utahensis var. *eborispina*

ivory-spined agave
PMAGA010S1
Fed: None
State: None
RANK: G4T3Q/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Agave utahensis var. *nevadensis*

Clark Mountain agave
PMAGA010S3
Fed: None
State: None
RANK: G4T3Q/S3.2
CNPS List: 4
Records in CNDDDB: No

Ageratina herbacea

desert ageratina
PDASTBX0J0
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Ageratina shastensis

Shasta ageratina
PDASTBX0R0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Agrostis blasdalei

Blasdale's bent grass
PMPOA04060
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Agrostis clivicola* var. *clivicola

coastal bluff bent grass
PMPOA040A1
Fed: None
State: None
RANK: G3?T3?Q/S3?
CNPS List:
Records in CNDDDB: No

Agrostis clivicola* var. *punta-reyesensis

Point Reyes bent grass
PMPOA040A2
Fed: None
State: None
RANK: G3?T1Q/S1.2
CNPS List:
Records in CNDDDB: Yes

Agrostis hendersonii

Henderson's bent grass
PMPOA040K0
Fed: None
State: None
RANK: G1Q/S1.1
CNPS List: 3
Records in CNDDDB: Yes

Agrostis hooveri

Hoover's bent grass
PMPOA040M0
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Agrostis humilis

mountain bent grass
PMPOA040P0
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Aliciella ripleyi

Ripley's aliciella
PDPLM041E0
Fed: None
State: None
RANK: G3/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Alisma gramineum

narrow-leaved water-plantain
PMALI01010
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDDB: Yes

Allium atrorubens* var. *atorubens

Great Basin onion
PMLIL02061
Fed: None
State: None
RANK: G4T4/S3.3
CNPS List: 2
Records in CNDDDB: Yes

Allium atrorubens* var. *cristatum

Inyo onion
PMLIL02063
Fed: None
State: None
RANK: G4T3?/S3.3
CNPS List: 4
Records in CNDDDB: No

Allium bolanderi* var. *mirabile

wonderful onion
PMLIL02093
Fed: None
State: None
RANK: G4T3?/S2?
CNPS List:
Records in CNDDDB: No

Allium fimbriatum* var. *purdyi

Purdy's onion
PMLIL020Y7
Fed: None
State: None
RANK: G4G5T3/S3.3?
CNPS List: 4
Records in CNDDDB: No

Allium hickmanii

Hickman's onion
PMLIL02140
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Allium hoffmanii

Beegum onion
PMLIL02150
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Allium howellii* var. *clokeyi

Mt. Pinos onion
PMLIL02161
Fed: None
State: None
RANK: G4T3?/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Allium jepsonii

Jepson's onion
PMLIL022V0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Allium marvinii

Yucaipa onion
PMLIL02130
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Allium munzii

Munz's onion
PMLIL022Z0
Fed: Endangered
State: Threatened
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Allium nevadense

Nevada onion
PMLIL021J0
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Allium parishii

Parish's onion
PMLIL021N0
Fed: None
State: None
RANK: G3/S3.3?
CNPS List: 4
Records in CNDDDB: No

Allium peninsulare* var. *franciscanum

Franciscan onion
PMLIL021R1
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Allium sanbornii* var. *congdonii

Congdon's onion
PMLIL02211
Fed: None
State: None
RANK: G3T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Allium sanbornii* var. *sanbornii

Sanborn's onion
PMLIL02212
Fed: None
State: None
RANK: G3T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Allium sharsmithiae

Sharsmith's onion
PMLIL02310
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Allium shevockii

Spanish Needle onion
PMLIL022M0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Allium siskiyouense

Siskiyou onion
PMLIL02280
Fed: None
State: None
RANK: G4/S3.3?
CNPS List: 4
Records in CNDDDB: No

Allium tribracteatum

three-bracted onion
PMLIL022D0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Allium tuolumnense

Rawhide Hill onion
PMLIL022W0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Allium yosemitense

Yosemite onion
PMLIL022L0
Fed: None
State: Rare
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

***Alopecurus aequalis*
*var. sonomensis***

Sonoma alopecurus
PMPOA07012
Fed: Endangered
State: None
RANK: G5T1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Aloysia wrightii

oreganillo
PDVER02040
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Amaranthus watsonii

Watson's amaranth
PDAMA04170
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDDB: No

***Ambrosia*
*chenopodiifolia***

San Diego bur-sage
PDAST0C080
Fed: None
State: None
RANK: G5/S2.1
CNPS List: 2
Records in CNDDDB: Yes

Ambrosia pumila

San Diego ambrosia
PDAST0C0M0
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Ammoselinum*
*giganteum***

desert sand-parsley
PDAPI05020
Fed: None
State: None
RANK: G2G3/SH
CNPS List: 2
Records in CNDDDB: Yes

***Amorpha californica* *var.*
*napensis***

Napa false indigo
PDFAB08012
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Amsinckia grandiflora

large-flowered fiddleneck
PDBOR01050
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Amsinckia lunaris

bent-flowered fiddleneck
PDBOR01070
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Amsinckia vernicosa*
*var. furcata***

forked fiddleneck
PDBOR01030
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Androsace elongata*
*ssp. acuta***

California androsace
PDPRI02031
Fed: None
State: None
RANK: G5?T3T4/S3.2?
CNPS List: 4
Records in CNDDDB: No

Androsace filiformis

slender-stemmed
androsace
PDPRI02040
Fed: None
State: None
RANK: G4/S1?
CNPS List: 2
Records in CNDDDB: Yes

***Androsace occidentalis*
*var. simplex***

simple androsace
PDPRI02051
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

***Androstephium*
*breviflorum***

small-flowered
androstephium
PMLIL06010
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Angelica callii

Call's angelica
PDAPI07060
Fed: None
State: None
RANK: G3/S3.3?
CNPS List: 4
Records in CNDDDB: No

Angelica kingii

King's angelica
PDAPI070D0
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDDB: No

Angelica lucida

sea-watch
PDAPI070G0
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 4
Records in CNDDDB: No

Anisocarpus scabridus

scabrid alpine tarplant
PDASTDU020
Fed: None
State: None
RANK: G2G3/S2S3
CNPS List: 1B
Records in CNDDDB: Yes

Antennaria flagellaris

stoloniferous pussy-toes
PDAST0H0W0
Fed: None
State: None
RANK: G5?/S3.2
CNPS List: 4
Records in CNDDDB: No

Antennaria lanata

woolly pussy-toes
PDAST0F0B0
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Antennaria marginata

white-margined
everlasting
PDAST0H1G0
Fed: None
State: None
RANK: G4G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Antennaria pulchella

beautiful pussy-toes
PDAST0H1H0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Antennaria suffrutescens

evergreen everlasting
PDAST0H0S0
Fed: None
State: None
RANK: G4/S3.3?
CNPS List: 4
Records in CNDDDB: No

Antirrhinum cyathiferum

Deep Canyon
snapdragon
PDSCR2R010
Fed: None
State: None
RANK: G4?/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Antirrhinum ovatum

oval-leaved snapdragon
PDSCR2K010
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Antirrhinum subcordatum

dimorphic snapdragon
PDSCR2S070
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Antirrhinum virga

tall snapdragon
PDSCR2S090
Fed: None
State: None
RANK: G3/S3.3?
CNPS List: 4
Records in CNDDDB: No

Aphanisma blitoides

aphanisma
PDCHE02010
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Arabis aculeolata

Waldo rock cress
PDBRA06010
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Arabis blepharophylla

coast rock cress
PDBRA06040
Fed: None
State: None
RANK: G3/S3.3?
CNPS List: 4
Records in CNDDDB: No

Arabis bodiensis

Bodie Hills rock cress
PDBRA06240
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Arabis breweri var. pecuniaria

San Bernardino rock cress
PDBRA06053
Fed: None
State: None
RANK: G4?T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Arabis cobrensis

Masonic rock cress
PDBRA06080
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDDB: Yes

Arabis constancei

Constance's rock cress
PDBRA06090
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Arabis dispar

pinyon rock cress
PDBRA060F0
Fed: None
State: None
RANK: G3/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Arabis fernaldiana var. stylosa

stylose rock cress
PDBRA060K2
Fed: None
State: None
RANK: G3G4T3/S1.3?
CNPS List: 3
Records in CNDDDB: Yes

Arabis hirshbergiae

Hirshberg's rock cress
PDBRA064D0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Arabis hoffmannii

Hoffmann's rock cress
PDBRA060V0
Fed: Endangered
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Arabis johnstonii

Johnston's rock cress
PDBRA060Y0
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Arabis koehleri var. stipitata

Koehler's stipitate rock cress
PDBRA060Z2
Fed: None
State: None
RANK: G3T3/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Arabis macdonaldiana

Mcdonald's rock cress
PDBRA06150
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Arabis microphylla var. microphylla

small-leaved rock cress
PDBRA06162
Fed: None
State: None
RANK: G5T4?/S3.3
CNPS List: 4
Records in CNDDDB: No

Arabis modesta

modest rock cress
PDBRA06180
Fed: None
State: None
RANK: G3Q/S3.3?
CNPS List: 4
Records in CNDDDB: No

Arabis oregana

Oregon rock cress
PDBRA061A0
Fed: None
State: None
RANK: G3G4Q/S3.3?
CNPS List: 4
Records in CNDDDB: No

Arabis parishii

Parish's rock cress
PDBRA061C0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Arabis pinzliae

Pinzl's rock cress
PDBRA06270
Fed: None
State: None
RANK: G2/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

***Arabis pulchra* var.
*munciensis***

Darwin rock cress
PDBRA061M3
Fed: None
State: None
RANK: G5T4?/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Arabis pygmaea

Tulare County rock cress
PDBRA061N0
Fed: None
State: None
RANK: G1G2/S1S2
CNPS List: 4
Records in CNDDDB: No

***Arabis repanda* var.
*greenei***

Greene's rock cress
PDBRA061Q1
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 4
Records in CNDDDB: No

***Arabis rigidissima* var.
*demota***

Carson Range rock cress
PDBRA061R1
Fed: None
State: None
RANK: G3T2Q/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arabis rigidissima* var.
*rigidissima***

Trinity Mountains rock cress
PDBRA061R2
Fed: None
State: None
RANK: G3T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Arabis shockleyi

Shockley's rock cress
PDBRA061V0
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Arabis tiehmii

Tiehm's rock cress
PDBRA06280
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Arctomecon merriamii

white bear poppy
PDPAP02030
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 2
Records in CNDDDB: Yes

***Arctostaphylos*
*andersonii***

Santa Cruz manzanita
PDERI04030
Fed: None
State: None
RANK: G2/S2?
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*auriculata***

Mt. Diablo manzanita
PDERI04040
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos bakeri*
*ssp. bakeri***

Baker's manzanita
PDERI04221
Fed: None
State: Rare
RANK: G2T2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos bakeri*
*ssp. sublaevis***

The Cedars manzanita
PDERI04222
Fed: None
State: Rare
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
canescens ssp.
*sonomensis***

Sonoma manzanita
PDERI04066
Fed: None
State: None
RANK: G3G4T2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos catalinae

Santa Catalina Island manzanita
PDERI04070
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*confertiflora***

Santa Rosa Island manzanita
PDERI040A0
Fed: Endangered
State: None
RANK: G1/S1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*cruzensis***

Arroyo de la Cruz manzanita
PDERI040B0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*densiflora***

Vine Hill manzanita
PDERI040C0
Fed: None
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*edmundsii***

Little Sur manzanita
PDERI04260
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*gabrielensis***

San Gabriel manzanita
PDERI042P0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
glandulosa ssp.
*crassifolia***

Del Mar manzanita
PDERI040E8
Fed: Endangered
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos glutinosa

Schreiber's manzanita
PDERI040G0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos hispidula

Howell's manzanita
PDERI04230
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Arctostaphylos hookeri*
*ssp. franciscana***

Franciscan manzanita
PDERI040J3
Fed: None
State: None
RANK: G3TXC/SX
CNPS List: 1A
Records in CNDDDB: Yes

***Arctostaphylos hookeri*
*ssp. hearstiorum***

Hearst's manzanita
PDERI040J4
Fed: None
State: Endangered
RANK: G3T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos hookeri*
*ssp. hookeri***

Hooker's manzanita
PDERI040J1
Fed: None
State: None
RANK: G3T2?/S2?
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos hookeri*
*ssp. montana***

Mt. Tamalpais manzanita
PDERI040J5
Fed: None
State: None
RANK: G3T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos hookeri*
*ssp. ravenii***

Presidio manzanita
PDERI040J2
Fed: Endangered
State: Endangered
RANK: G3T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos hooveri

Hoover's manzanita
PDERI040K0
Fed: None
State: None
RANK: G3/S3.3?
CNPS List: 4
Records in CNDDDB: No

Arctostaphylos imbricata

San Bruno Mountain manzanita
PDERI040L0
Fed: None
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*klamathensis***

Klamath manzanita
PDERI041R0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos luciana

Santa Lucia manzanita
PDERI040N0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos malloryi

Mallory's manzanita
PDERI04065
Fed: None
State: None
RANK: G3/S3.3?
CNPS List: 4
Records in CNDDDB: No

***Arctostaphylos*
*manzanita ssp. elegans***

Konocti manzanita
PDERI04271
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*manzanita ssp. laevigata***

Contra Costa manzanita
PDERI04273
Fed: None
State: None
RANK: G5T2/S2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*mendocinoensis***

pygmy manzanita
PDERI04280
Fed: None
State: None
RANK: G1/S1?
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*mewukka ssp. truei***

True's manzanita
PDERI041P0
Fed: None
State: None
RANK: G4?T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Arctostaphylos*
*montaraensis***

Montara manzanita
PDERI040L2
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*montereyensis***

Monterey manzanita
PDERI040R0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*morroensis***

Morro manzanita
PDERI040S0
Fed: Threatened
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos myrtifolia

lone manzanita
PDERI04240
Fed: Threatened
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*nissenana***

Nissenan manzanita
PDERI040V0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos nortensis

Del Norte manzanita
PDERI04092
Fed: None
State: None
RANK: G4?/S3.3?
CNPS List: 4
Records in CNDDDB: No

***Arctostaphylos*
*obispoensis***

Bishop manzanita
PDERI040X0
Fed: None
State: None
RANK: G3?/S3?
CNPS List: 4
Records in CNDDDB: No

Arctostaphylos osoensis

Oso manzanita
PDERI042S0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*otayensis***

Otay manzanita
PDERI040Y0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos pacifica

Pacific manzanita
PDERI040Z0
Fed: None
State: Endangered
RANK: G1Q/S?
CNPS List:
Records in CNDDDB: No

***Arctostaphylos*
*pajaroensis***

Pajaro manzanita
PDERI04100
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos pallida

pallid manzanita
PDERI04110
Fed: Threatened
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos parryana*
*ssp. tumescens***

interior manzanita
PDERI042A1
Fed: None
State: None
RANK: G3?T2T3/S2S3
CNPS List: 4
Records in CNDDDB: No

***Arctostaphylos*
*pechoensis***

Pecho manzanita
PDERI04140
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
peninsularis ssp.
*peninsularis***

Peninsular manzanita
PDERI04151
Fed: None
State: None
RANK: G2?T2?/S2?
CNPS List: 2
Records in CNDDDB: Yes

Arctostaphylos pilosula

Santa Margarita
manzanita
PDERI04160
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos pumila

sandmat manzanita
PDERI04180
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*purissima***

La Purisima manzanita
PDERI041A0
Fed: None
State: None
RANK: G2?/S2?
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*rainbowensis***

Rainbow manzanita
PDERI042T0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*refugioensis***

Refugio manzanita
PDERI041B0
Fed: None
State: None
RANK: G2/S2?
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*regismontana***

Kings Mountain
manzanita
PDERI041C0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos rudis

sand mesa manzanita
PDERI041E0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Arctostaphylos silvicola

Bonny Doon manzanita
PDERI041F0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
stanfordiana ssp.
*decumbens***

Rincon manzanita
PDERI041G4
Fed: None
State: None
RANK: G3T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*stanfordiana ssp. raichei***

Raiche's manzanita
PDERI041G2
Fed: None
State: None
RANK: G3T2?/S2?
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
tomentosa ssp.
*daciticola***

dacite manzanita
PDERI041HD
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
tomentosa ssp.
*eastwoodiana***

Eastwood's manzanita
PDERI041H4
Fed: None
State: None
RANK: G4T2?/S2?
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
tomentosa ssp.
*insulicola***

island manzanita
PDERI041H5
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Arctostaphylos*
tomentosa ssp.
*subcordata***

Santa Cruz Island
manzanita
PDERI041H7
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Arctostaphylos virgata

Marin manzanita
PDERI041K0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Arctostaphylos*
*viridissima***

white-haired manzanita
PDERI041L0
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 4
Records in CNDDDB: No

Arctostaphylos wellsii

Wells's manzanita
PDERI042B0
Fed: None
State: None
RANK: G2/S2.1?
CNPS List: 1B
Records in CNDDDB: Yes

***Arenaria congesta var.*
*charlestonensis***

Charleston sandwort
PDCAR0405B
Fed: None
State: None
RANK: G5T2?/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

***Arenaria lanuginosa*
*ssp. saxosa***

rock sandwort
PDCAR040E4
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

***Arenaria macradenia*
*var. kuschei***

Kusche's sandwort
PDCAR040K4
Fed: None
State: None
RANK: G5T2?/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Arenaria paludicola

marsh sandwort
PDCAR040L0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Arenaria ursina

Big Bear Valley sandwort
PDCAR040R0
Fed: Threatened
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Argyrochosma limitanea*
*var. limitanea***

cloak fern
PPADI0N051
Fed: None
State: None
RANK: G4G5T3T4/S2.
CNPS List: 2
Records in CNDDDB: Yes

Aristocapsa insignis

Indian Valley spineflower
PDPGN0U010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Arnica cernua

serpentine arnica
PDAST0Q040
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Arnica fulgens

hillside arnica
PDAST0Q090
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Arnica spathulata

Klamath arnica
PDAST0Q0M0
Fed: None
State: None
RANK: G3?/S3.3
CNPS List: 4
Records in CNDDDB: No

Arnica venosa

Shasta County arnica
PDAST0Q0Q0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Arnica viscosa

Mt. Shasta arnica
PDAST0Q0R0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Artemisia nesiotica

island sagebrush
PDAST0S120
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Artemisia palmeri

San Diego sagewort
PDAST0S160
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Asarum marmoratum

marbled wild-ginger
PDARI02070
Fed: None
State: None
RANK: G3G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Asclepias asperula* *ssp. asperula

antelope-horns
PDASC02051
Fed: None
State: None
RANK: G5T5/S3.3
CNPS List: 4
Records in CNDDDB: No

Asclepias nyctaginifolia

Mojave milkweed
PDASC02190
Fed: None
State: None
RANK: G4G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Asclepias solanoana

serpentine milkweed
PDASC021R0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Aspidotis carlotta-halliae

Carlotta Hall's lace fern
PPADI07020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Asplenium*
*septentrionale***

northern spleenwort
PPASP021F0
Fed: None
State: None
RANK: G4G5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

***Asplenium trichomanes*
*ssp. trichomanes***

maidenhair spleenwort
PPASP021K2
Fed: None
State: None
RANK: G5T5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

***Asplenium trichomanes-*
*ramosum***

green spleenwort
PPASP02250
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Asplenium vespertinum

western spleenwort
PPASP021P0
Fed: None
State: None
RANK: G3?/S3.2
CNPS List: 4
Records in CNDDDB: No

Aster greatae

Greata's aster
PDAST0T1F0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Aster lentus

Suisun Marsh aster
PDAST0T540
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Astragalus agnicidus

Humboldt milk-vetch
PDFAB0F080
Fed: None
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Astragalus agrestis

purple milk-vetch
PDFAB0F090
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Astragalus albens

Cushenbury milk-vetch
PDFAB0F0A0
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus allochrous*
*var. playanus***

playa milk-vetch
PDFAB0F0C1
Fed: None
State: None
RANK: G4T3?/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Astragalus anxius

Ash Valley milk-vetch
PDFAB0FBD0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus argophyllus*
*var. argophyllus***

silver-leaved milk-vetch
PDFAB0F0S1
Fed: None
State: None
RANK: G5T4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Astragalus atratus* *var. mensanus

Darwin Mesa milk-vetch
PDFAB0F0Z3
Fed: None
State: None
RANK: G4G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Astragalus bicristatus

crested milk-vetch
PDFAB0F1A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Astragalus brauntonii

Braunton's milk-vetch
PDFAB0F1G0
Fed: Endangered
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Astragalus breweri

Brewer's milk-vetch
PDFAB0F1J0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Astragalus cimae* *var. cimae

Cima milk-vetch
PDFAB0F231
Fed: None
State: None
RANK: G2T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Astragalus cimae* *var. sufflatus

inflated milk-vetch
PDFAB0F232
Fed: None
State: None
RANK: G2T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Astragalus claranus

Clara Hunt's milk-vetch
PDFAB0F240
Fed: Endangered
State: Threatened
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Astragalus clevelandii

Cleveland's milk-vetch
PDFAB0F250
Fed: None
State: None
RANK: G3/S3.3?
CNPS List: 4
Records in CNDDb: No

Astragalus crotalariae

Salton milk-vetch
PDFAB0F2K0
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDb: No

Astragalus deaneii

Dean's milk-vetch
PDFAB0F2R0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Astragalus didymocarpus* *var. milesianus

Miles's milk-vetch
PDFAB0F2X3
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus douglasii*
*var. perstrictus***

Jacumba milk-vetch
PDFAB0F303
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus ertterae

Walker Pass milk-vetch
PDFAB0FB30
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus funereus

black milk-vetch
PDFAB0F3K0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus geyeri* *var. geyeri

Geyer's milk-vetch
PDFAB0F3M1
Fed: None
State: None
RANK: G4T4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Astragalus gilmanii

Gilman's milk-vetch
PDFAB0F3R0
Fed: None
State: None
RANK: G2G3/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus insularis* *var. harwoodii

Harwood's milk-vetch
PDFAB0F491
Fed: None
State: None
RANK: G5T3/S2.2?
CNPS List: 2
Records in CNDDb: Yes

Astragalus inversus

Susanville milk-vetch
PDFAB0F4A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Astragalus inyoensis

Inyo milk-vetch
PDFAB0F4B0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Astragalus iodanthus*
*var. diaphanoides***

transparent milk-vetch
PDFAB0F4C3
Fed: None
State: None
RANK: G4T4/S3.3
CNPS List: 4
Records in CNDDb: No

Astragalus jaegerianus

Lane Mountain milk-vetch
PDFAB0F4F0
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Astragalus johannis-howellii

Long Valley milk-vetch
PDFAB0F4H0
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus kentrophyta*
*var. danaus***

Sweetwater Mountains milk-vetch
PDFAB0F4J2
Fed: None
State: None
RANK: G5T2T3/S?
CNPS List: 4
Records in CNDDb: No

***Astragalus kentrophyta*
*var. elatus***

spiny-leaved milk-vetch
PDFAB0F4J4
Fed: None
State: None
RANK: G5T4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Astragalus lemmonii

Lemmon's milk-vetch
PDFAB0F4N0
Fed: None
State: None
RANK: G3?/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus lentiformis

lens-pod milk-vetch
PDFAB0F4P0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus lentiginosus*
*var. antonius***

San Antonio milk-vetch
PDFAB0FB92
Fed: None
State: None
RANK: G5T1/S1?
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus lentiginosus*
*var. borreganus***

Borrego milk-vetch
PDFAB0FB95
Fed: None
State: None
RANK: G5T4T5/S3.3
CNPS List: 4
Records in CNDDb: No

***Astragalus lentiginosus*
*var. coachellae***

Coachella Valley milk-vetch
PDFAB0FB97
Fed: Endangered
State: None
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus lentiginosus*
*var. kernensis***

Kern Plateau milk-vetch
PDFAB0FB98
Fed: None
State: None
RANK: G5T3?/S2.2?
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus lentiginosus*
*var. micans***

shining milk-vetch
PDFAB0FB9C
Fed: None
State: None
RANK: G5T1Q/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus lentiginosus*
*var. piscinensis***

Fish Slough milk-vetch
PDFAB0FB9E
Fed: Threatened
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus lentiginosus*
*var. sesquimetalis***

Sodaville milk-vetch
PDFAB0FB9K
Fed: None
State: Endangered
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus lentiginosus*
*var. sierrae***

Big Bear Valley milk-vetch
PDFAB0FB9L
Fed: None
State: None
RANK: G5T1/S1?
CNPS List: 1B
Records in CNDDb: Yes

Astragalus leucolobus

Big Bear Valley woollypod
PDFAB0F4T0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus macrodon

Salinas milk-vetch
PDFAB0F520
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Astragalus magdalenae*
*var. peirsonii***

Peirson's milk-vetch
PDFAB0F532
Fed: Threatened
State: Endangered
RANK: G3G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus miguelensis

San Miguel Island milk-vetch
PDFAB0F5C0
Fed: None
State: None
RANK: G3/S3.3?
CNPS List: 4
Records in CNDDb: No

***Astragalus mohavensis*
*var. hemigyrys***

curved-pod milk-vetch
PDFAB0F5J1
Fed: None
State: None
RANK: G3G4T2T3/SH
CNPS List: 1A
Records in CNDDb: Yes

***Astragalus monoensis*
*var. monoensis***

Mono milk-vetch
PDFAB0F5N1
Fed: None
State: Rare
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus monoensis*
*var. ravenii***

Raven's milk-vetch
PDFAB0F5N2
Fed: None
State: None
RANK: G1Q/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus nevinii

San Clemente Island milk-vetch
PDFAB0F5X0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Astragalus nutans

Providence Mountains milk-vetch
PDFAB0F620
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Astragalus nuttallii*
*var. nuttallii***

Nuttall's milk-vetch
PDFAB0F641
Fed: None
State: None
RANK: G3T3/S3.2
CNPS List: 4
Records in CNDDb: No

Astragalus oocarpus

San Diego milk-vetch
PDFAB0F6B0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus oophorus*
*var. lavinii***

Lavin's milk-vetch
PDFAB0F6C4
Fed: None
State: None
RANK: G4T2/S1
CNPS List: 1B
Records in CNDDb: Yes

***Astragalus oophorus*
*var. oophorus***

egg milk-vetch
PDFAB0F6C6
Fed: None
State: None
RANK: G4T3T4/S3.3
CNPS List: 4
Records in CNDDb: No

***Astragalus pachypus*
*var. jaegeri***

Jaeger's milk-vetch
PDFAB0F6G1
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Astragalus pauperculus

depauperate milk-vetch
PDFAB0F6N0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Astragalus platytropis

broad-keeled milk-vetch
PDFAB0F6X0
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDDB: Yes

***Astragalus preussii*
*var. laxiflorus***

Lancaster milk-vetch
PDFAB0F721
Fed: None
State: None
RANK: G4T2T3/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus preussii*
*var. preussii***

Preuss's milk-vetch
PDFAB0F722
Fed: None
State: None
RANK: G4T4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

***Astragalus*
*pseudiodanthus***

Tonopah milk-vetch
PDFAB0F750
Fed: None
State: None
RANK: G2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus pulsiferae*
*var. coronensis***

Modoc Plateau milk-vetch
PDFAB0F784
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List:
Records in CNDDDB: No

***Astragalus pulsiferae*
*var. pulsiferae***

Pulsifer's milk-vetch
PDFAB0F783
Fed: None
State: None
RANK: G4T2/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus pulsiferae*
*var. suksdorfii***

Suksdorf's milk-vetch
PDFAB0F782
Fed: None
State: None
RANK: G4T3/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus*
pycnostachyus
*var. lanosissimus***

Ventura Marsh milk-vetch
PDFAB0F7B1
Fed: Endangered
State: Endangered
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus*
pycnostachyus
*var. pycnostachyus***

coastal marsh milk-vetch
PDFAB0F7B2
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus rattanii*
*var. jepsonianus***

Jepson's milk-vetch
PDFAB0F7E1
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus rattanii*
*var. rattanii***

Rattan's milk-vetch
PDFAB0F7E2
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Astragalus serenoii*
*var. shockleyi***

naked milk-vetch
PDFAB0F802
Fed: None
State: None
RANK: G4T3/S2?
CNPS List: 2
Records in CNDDDB: Yes

Astragalus shevockii

Shevock's milk-vetch
PDFAB0F850
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Astragalus subvestitus

Kern County milk-vetch
PDFAB0F8M0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Astragalus tener*
*var. ferrisiae***

Ferris's milk-vetch
PDFAB0F8R3
Fed: None
State: None
RANK: G1T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus tener*
*var. tener***

alkali milk-vetch
PDFAB0F8R1
Fed: None
State: None
RANK: G1T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus tener*
*var. titi***

coastal dunes milk-vetch
PDFAB0F8R2
Fed: Endangered
State: Endangered
RANK: G1T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Astragalus traskiae

Trask's milk-vetch
PDFAB0F910
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Astragalus tricarinatus

triple-ribbed milk-vetch
PDFAB0F920
Fed: Endangered
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Astragalus umbraticus

Bald Mountain milk-vetch
PDFAB0F990
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Astragalus webberi

Webber's milk-vetch
PDFAB0F9J0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Astragalus whitneyi*
*var. lenophyllus***

woolly-leaved milk-vetch
PDFAB0F9L6
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Astrolepis cochisensis*
*ssp. cochisensis***

scaly cloak fern
PPAD10P013
Fed: None
State: None
RANK: G5?T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

***Atriplex argentea* var.
*hillmanii***

Hillman's silverscale
PDCHE04055
Fed: None
State: None
RANK: G5T3?/S2.2
CNPS List: 2
Records in CNDDb: Yes

Atriplex cordulata

heartscale
PDCHE040B0
Fed: None
State: None
RANK: G2?/S2.2?
CNPS List: 1B
Records in CNDDb: Yes

***Atriplex coronata* var.
*coronata***

crownscale
PDCHE040C3
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDb: No

***Atriplex coronata* var.
*notator***

San Jacinto Valley
crownscale
PDCHE040C2
Fed: Endangered
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Atriplex coulteri

Coulter's saltbush
PDCHE040E0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Atriplex depressa

brittlescale
PDCHE042L0
Fed: None
State: None
RANK: G2Q/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Atriplex erecticaulis

Earlimart orache
PDCHE042V0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Atriplex gardneri* var.
*falcata***

falcate saltbush
PDCHE040J0
Fed: None
State: None
RANK: G4Q/S2.2
CNPS List: 2
Records in CNDDb: Yes

Atriplex joaquiniana

San Joaquin spearscale
PDCHE041F3
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Atriplex minuscula

lesser saltscale
PDCHE042M0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Atriplex pacifica

South Coast saltscale
PDCHE041C0
Fed: None
State: None
RANK: G3G4/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Atriplex parishii

Parish's brittlescale
PDCHE041D0
Fed: None
State: None
RANK: G1G2/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Atriplex persistens

vernal pool smallscale
PDCHE042P0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Atriplex serenana* var.
*davidsonii***

Davidson's saltscale
PDCHE041T1
Fed: None
State: None
RANK: G5T2?/S2?
CNPS List: 1B
Records in CNDDb: Yes

Atriplex subtilis

subtle orache
PDCHE042T0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Atriplex tularensis

Bakersfield smallscale
PDCHE04240
Fed: None
State: Endangered
RANK: G1Q/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Atriplex vallicola

Lost Hills crownscale
PDCHE04250
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Ayenia compacta

ayenia
PDSTE01020
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 2
Records in CNDDb: Yes

Azolla mexicana

Mexican mosquito fern
PPAZO01030
Fed: None
State: None
RANK: G5/S3.2?
CNPS List: 4
Records in CNDDb: No

Baccharis malibuensis

Malibu baccharis
PDAST0W0W0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Baccharis plummerae*
*ssp. glabrata***

San Simeon baccharis
PDAST0W0D1
Fed: None
State: None
RANK: G3T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Baccharis plummerae*
*ssp. plummerae***

Plummer's baccharis
PDAST0W0D2
Fed: None
State: None
RANK: G3T3/S3.2
CNPS List: 4
Records in CNDDb: No

Baccharis vanessae

Encinitas baccharis
PDAST0W0P0
Fed: Threatened
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Balsamorhiza lanata

woolly balsamroot
PDAST11047
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Balsamorhiza*
macrolepis var.
*macrolepis***

big-scale balsamroot
PDAST11061
Fed: None
State: None
RANK: G3G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Balsamorhiza sericea

silky balsamroot
PDAST110C0
Fed: None
State: None
RANK: G4Q/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Balsamorhiza serrata

serrated balsamroot
PDAST110A0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Bensoniella oregona

bensoniella
PDSAX02010
Fed: None
State: Rare
RANK: G3/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Berberis fremontii

Fremont barberry
PDBER06060
Fed: None
State: None
RANK: G5/S2?
CNPS List: 3
Records in CNDDb: Yes

Berberis nevini

Nevin's barberry
PDBER060A0
Fed: Endangered
State: Endangered
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Berberis pinnata ssp. insularis

island barberry
PDBER060B2
Fed: Endangered
State: Endangered
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Bergerocactus emoryi

golden-spined cereus
PDCAC11010
Fed: None
State: None
RANK: G2G3/S2.1
CNPS List: 2
Records in CNDDb: Yes

Betula pumila var. glandulifera

resin birch
PDBET020H2
Fed: None
State: None
RANK: G5T5/S2.2
CNPS List: 2
Records in CNDDb: Yes

Blennosperma bakeri

Sonoma sunshine
PDAST1A010
Fed: Endangered
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Blennosperma nanum var. robustum

Point Reyes blennosperma
PDAST1A022
Fed: None
State: Rare
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Blepharidachne kingii

King's eyelash grass
PMPOA0X020
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDb: Yes

Blepharizonia plumosa

big tarplant
PDAST1C011
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Bloomeria humilis

dwarf goldenstar
PMLIL0B020
Fed: None
State: Rare
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Bolandra californica

Sierra bolandra
PDSAX03010
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Boschniakia hookeri

small groundcone
PDORO01010
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDb: Yes

Botrychium ascendens

upswept moonwort
PPOPH010S0
Fed: None
State: None
RANK: G2G3/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Botrychium crenulatum

scalloped moonwort
PPOPH010L0
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 2
Records in CNDDb: Yes

Botrychium lineare

slender moonwort
PPOPH01120
Fed: Candidate
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Botrychium lunaria

common moonwort
PPOPH01080
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDb: Yes

Botrychium minganense

mingan moonwort
PPOPH010R0
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Botrychium montanum

western goblin
PPOPH010K0
Fed: None
State: None
RANK: G3/S1.1
CNPS List: 2
Records in CNDDb: Yes

Botrychium pinnatum

northwestern moonwort
PPOPH010V0
Fed: None
State: None
RANK: G4?/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Botrychium virginianum

rattlesnake fern
PPOPH010H0
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Bouteloua eriopoda

black grama
PMPOA10080
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDb: No

Bouteloua trifida

red grama
PMPOA100L0
Fed: None
State: None
RANK: G4G5/S2?
CNPS List: 2
Records in CNDDb: Yes

Brodiaea californica var. leptandra

narrow-anthered California brodiaea
PMLIL0C090
Fed: None
State: None
RANK: G4?T2T3/S2S3
CNPS List: 1B
Records in CNDDb: Yes

Brodiaea coronaria ssp. rosea

Indian Valley brodiaea
PMLIL0C032
Fed: None
State: Endangered
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Brodiaea filifolia

thread-leaved brodiaea
PMLIL0C050
Fed: Threatened
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Brodiaea insignis

Kaweah brodiaea
PMLIL0C060
Fed: None
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Brodiaea kinkiensis

San Clemente Island brodiaea
PMLIL0C080
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Brodiaea orcuttii

Orcutt's brodiaea
PMLIL0C0B0
Fed: None
State: None
RANK: G3/S3.1
CNPS List: 1B
Records in CNDDb: Yes

Brodiaea pallida

Chinese Camp brodiaea
PMLIL0C0C0
Fed: Threatened
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Bulbostylis capillaris

thread-leaved beakseed
PMCYP02020
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDb: No

Bursera microphylla

elephant tree
PDBUR01020
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Calamagrostis bolanderi

Bolander's reed grass
PMPOA17010
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Calamagrostis crassiglumis

Thurber's reed grass
PMPOA17070
Fed: None
State: None
RANK: G3Q/S1.2
CNPS List: 2
Records in CNDDb: Yes

Calamagrostis foliosa

leafy reed grass
PMPOA170C0
Fed: None
State: Rare
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Calamagrostis ophitidis

serpentine reed grass
PMPOA170V0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Calandrinia breweri

Brewer's calandrinia
PDPOR01020
Fed: None
State: None
RANK: G4/S3.2?
CNPS List: 4
Records in CNDDb: No

Calandrinia maritima

seaside calandrinia
PDPOR09020
Fed: None
State: None
RANK: G3G4/S3.2
CNPS List: 4
Records in CNDDb: No

Calliandra eriophylla

fairyduster
PDFAB0N040
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Calochortus catalinae

Catalina mariposa lily
PMLIL0D080
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Calochortus clavatus var. avius

Pleasant Valley mariposa lily
PMLIL0D095
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus clavatus var. clavatus

club-haired mariposa lily
PMLIL0D091
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Calochortus clavatus var. gracilis

slender mariposa lily
PMLIL0D096
Fed: None
State: None
RANK: G4T1/S1.1?
CNPS List: 1B
Records in CNDDb: Yes

Calochortus clavatus var. recurvifolius

Arroyo de la Cruz mariposa lily
PMLIL0D098
Fed: None
State: None
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus dunnii

Dunn's mariposa lily
PMLIL0D0C0
Fed: None
State: Rare
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Calochortus excavatus

Inyo County star-tulip
PMLIL0D0F0
Fed: None
State: None
RANK: G3/S3.1
CNPS List: 1B
Records in CNDDb: Yes

Calochortus greenii

Greene's mariposa lily
PMLIL0D0H0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus longebarbatus var. longebarbatus

long-haired star-tulip
PMLIL0D0R1
Fed: None
State: None
RANK: G4T4/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus monanthus

single-flowered mariposa lily
PMLIL0D0W0
Fed: None
State: None
RANK: GH/SH
CNPS List: 1A
Records in CNDDb: Yes

Calochortus obispoensis

San Luis mariposa lily
PMLIL0D110
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Calochortus palmeri* var. *munzii

Munz's mariposa lily
PMLIL0D121
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus palmeri* var. *palmeri

Palmer's mariposa lily
PMLIL0D122
Fed: None
State: None
RANK: G2T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Calochortus* *panamintensis

Panamint mariposa lily
PMLIL0D130
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Calochortus persistens

Siskiyou mariposa lily
PMLIL0D140
Fed: None
State: Rare
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Calochortus plummerae

Plummer's mariposa lily
PMLIL0D150
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus pulchellus

Mt. Diablo fairy-lantern
PMLIL0D160
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Calochortus raichei

The Cedars fairy-lantern
PMLIL0D1L0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus simulans

San Luis Obispo mariposa lily
PMLIL0D170
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Calochortus striatus

alkali mariposa lily
PMLIL0D190
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus syntrophus

Callahan's mariposa lily
PMLIL0D1S0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 3
Records in CNDDb: No

Calochortus* *tiburonensis

Tiburon mariposa lily
PMLIL0D1C0
Fed: Threatened
State: Threatened
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus umbellatus

Oakland star-tulip
PMLIL0D1E0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Calochortus weedii* var. *intermedius

intermediate mariposa lily
PMLIL0D1J1
Fed: None
State: None
RANK: G3?T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus weedii* var. *vestus

late-flowered mariposa lily
PMLIL0D1J2
Fed: None
State: None
RANK: G3?T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Calochortus westonii

Shirley Meadows star-tulip
PMLIL0D1M0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Calycadenia hooveri

Hoover's calycadenia
PDAST1P040
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Calycadenia oppositifolia

Butte County calycadenia
PDAST1P070
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Calycadenia villosa

dwarf calycadenia
PDAST1P0B0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Calyptridium parryi* var. *hesseae

Santa Cruz Mountains pussypaws
PDPOR09052
Fed: None
State: None
RANK: G3G4TNR/S?
CNPS List: 3
Records in CNDDb: No

Calyptridium pulchellum

Mariposa pussypaws
PDPOR09060
Fed: Threatened
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Calyptridium* *quadripetalum

four-petaled pussypaws
PDPOR09080
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Calystegia atriplicifolia* ssp. *buttensis

Butte County morning-glory
PDCON04012
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Calystegia collina* ssp. *oxyphylla

Mt. Saint Helena morning-glory
PDCON04032
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDb: No

Calystegia collina ssp. venusta

South Coast Range
morning-glory
PDCON04034
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDb: No

Calystegia macrostegia ssp. amplissima

island morning-glory
PDCON04081
Fed: None
State: None
RANK: G4G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Calystegia malacophylla var. berryi

Berry's morning-glory
PDCON040K2
Fed: None
State: None
RANK: G4G5T3Q/S3?
CNPS List: 3
Records in CNDDb: No

Calystegia peirsonii

Peirson's morning-glory
PDCON040A0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Calystegia purpurata ssp. saxicola

coastal bluff morning-glory
PDCON040D2
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Calystegia sepium ssp. binghamiae

Santa Barbara morning-glory
PDCON040E6
Fed: None
State: None
RANK: G5TH/SH
CNPS List: 1A
Records in CNDDb: Yes

Calystegia stebbinsii

Stebbins's morning-glory
PDCON040H0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Calystegia subacaulis ssp. episcopalis

Cambria morning-glory
PDCON040J1
Fed: None
State: None
RANK: G3T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Camissonia arenaria

sand evening-primrose
PDONA03020
Fed: None
State: None
RANK: G4?/S3.3
CNPS List: 4
Records in CNDDb: No

Camissonia benitensis

San Benito evening-primrose
PDONA03030
Fed: Threatened
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Camissonia boothii ssp. alyssoides

Pine Creek evening-primrose
PDONA03051
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDb: No

Camissonia boothii ssp. boothii

Booth's evening-primrose
PDONA03052
Fed: None
State: None
RANK: G5T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Camissonia boothii ssp. intermedia

hairy evening-primrose
PDONA03056
Fed: None
State: None
RANK: G5T3T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Camissonia claviformis ssp. cruciformis

cruciform evening-primrose
PDONA030D4
Fed: None
State: None
RANK: G5T4/S2S3
CNPS List: 2
Records in CNDDb: Yes

Camissonia guadalupensis ssp. clementina

San Clemente Island
evening-primrose
PDONA030M1
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Camissonia hardhamiae

Hardham's evening-primrose
PDONA030N0
Fed: None
State: None
RANK: G1Q/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Camissonia integrifolia

Kern River evening-primrose
PDONA030T0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 1B
Records in CNDDb: Yes

Camissonia kernensis ssp. kernensis

Kern County evening-primrose
PDONA030V2
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Camissonia lewisii

Lewis's evening-primrose
PDONA030X0
Fed: None
State: None
RANK: G2G3/S?
CNPS List: 3
Records in CNDDb: No

Camissonia minor

Nelson's evening-primrose
PDONA03110
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Camissonia sierrae ssp. alticola

Mono Hot Springs
evening-primrose
PDONA031H1
Fed: None
State: None
RANK: G3T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Camissonia sierrae ssp. sierrae

Yosemite evening-primrose
PDONA031H2
Fed: None
State: None
RANK: G3T3/S3.3
CNPS List: 4
Records in CNDDb: No

Camissonia tanacetifolia ssp. quadriperforata

Sierra Valley evening-primrose
PDONA031M1
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Campanula californica

swamp harebell
PDCAM02060
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Campanula exigua

chaparral harebell
PDCAM020A0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Campanula scabrella

rough harebell
PDCAM020U0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Campanula sharsmithiae

Sharsmith's harebell
PDCAM02100
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Campanula shetleri

Castle Crags harebell
PDCAM020W0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Campanula wilkinsiana

Wilkin's harebell
PDCAM020Z0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Canbya candida

pygmy poppy
PDPAP05020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Cardamine bellidifolia*
*var. pachyphylla***

fleshy toothwort
PDBRA0K022
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDb: No

Cardamine nuttallii* *var. gemmata

yellow-tubered toothwort
PDBRA0K0R3
Fed: None
State: None
RANK: G5T3/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Cardamine pachystigma*
*var. dissectifolia***

dissected-leaved
toothwort
PDBRA0K1B1
Fed: None
State: None
RANK: G3G5T3/S3
CNPS List: 3
Records in CNDDb: No

Carex albida

white sedge
PMCYP030D0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Carex arcta

northern clustered sedge
PMCYP030X0
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDb: Yes

Carex atherodes

awned sedge
PMCYP03160
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Carex buxbaumii

Buxbaum's sedge
PMCYP032B0
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDb: No

Carex californica

California sedge
PMCYP032D0
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDb: Yes

Carex comosa

bristly sedge
PMCYP032Y0
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDb: Yes

Carex congdonii

Congdon's sedge
PMCYP03320
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Carex davayi

Davy's sedge
PMCYP033H0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Carex eleocharis

spikerush sedge
PMCYP03450
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDb: Yes

Carex geyeri

Geyer's sedge
PMCYP03540
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDb: No

Carex gigas

Siskiyou sedge
PMCYP03560
Fed: None
State: None
RANK: G3Q/S3.3?
CNPS List: 4
Records in CNDDb: No

Carex halliana

Hall's sedge
PMCYP035M0
Fed: None
State: None
RANK: G4G5/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Carex hystericina

bottlebrush sedge
PMCYP036D0
Fed: None
State: None
RANK: G5/S1.1
CNPS List: 2
Records in CNDDb: Yes

Carex incurviformis* *var. danaensis

Dana's sedge
PMCYP036G1
Fed: None
State: None
RANK: G4G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Carex inops* *ssp. inops

long-stoloned sedge
PMCYP036H1
Fed: None
State: None
RANK: G5T4?/S3?
CNPS List: 3
Records in CNDDb: No

Carex lasiocarpa

slender sedge
PMCYP03720
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Carex leptalea

flaccid sedge
PMCYP037E0
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDb: Yes

Carex limosa

shore sedge
PMCYP037K0
Fed: None
State: None
RANK: G5/S3?
CNPS List: 2
Records in CNDDb: Yes

Carex livida

livid sedge
PMCYP037L0
Fed: None
State: None
RANK: G5/SH
CNPS List: 1A
Records in CNDDb: Yes

Carex lyngbyei

Lyngbye's sedge
PMCYP037Y0
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDb: Yes

Carex norvegica

Scandinavian sedge
PMCYP039D0
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Carex obispoensis

San Luis Obispo sedge
PMCYP039J0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Carex occidentalis

western sedge
PMCYP039M0
Fed: None
State: None
RANK: G4/S2S3
CNPS List: 2
Records in CNDDb: No

Carex parryana* var. *hallii

Parry's sedge
PMCYP035N0
Fed: None
State: None
RANK: G4?Q/S1.3
CNPS List: 2
Records in CNDDb: Yes

Carex petasata

Liddon's sedge
PMCYP03AE0
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDb: Yes

Carex praticola

meadow sedge
PMCYP03B20
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Carex saliniformis

deceiving sedge
PMCYP03BY0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Carex scirpoidea* ssp. *pseudoscirpoidea

single-spiked sedge
PMCYP03B80
Fed: None
State: None
RANK: G5T5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Carex scoparia

pointed broom sedge
PMCYP03C90
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Carex serpenticola

serpentine sedge
PMCYP03KM0
Fed: None
State: None
RANK: G3?/S2.3
CNPS List: 2
Records in CNDDb: Yes

Carex sheldonii

Sheldon's sedge
PMCYP03CE0
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Carex tahoensis

Tahoe sedge
PMCYP03DG0
Fed: None
State: None
RANK: G3G4Q/S3.3
CNPS List: 4
Records in CNDDb: No

Carex tiogana

Tioga Pass sedge
PMCYP03GP0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Carex tompkinsii

Tompkins's sedge
PMCYP03DR0
Fed: None
State: Rare
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Carex vallicola

valley sedge
PMCYP03EA0
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Carex viridula* var. *viridula

green sedge
PMCYP03EM3
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Carex vulpinoidea

fox sedge
PMCYP03EN0
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDb: Yes

Carlowrightia arizonica

Arizona carlowrightia
PDACA07010
Fed: None
State: None
RANK: G4G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Carlquistia muirii

Muir's tarplant
PDASTDU010
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Carnegiea gigantea

saguaro
PDCAC12010
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Carpenteria californica

tree-anemone
PDHDR04010
Fed: None
State: Threatened
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Castela emoryi

crucifixion thorn
PDSIM03030
Fed: None
State: None
RANK: G3/S1.2
CNPS List: 2
Records in CNDDb: Yes

Castilleja affinis* ssp. *litoralis

Oregon coast Indian paintbrush
PDSCR0D1V0
Fed: None
State: None
RANK: G4G5T4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Castilleja affinis* ssp. *neglecta

Tiburon Indian paintbrush
PDSCR0D260
Fed: Endangered
State: Threatened
RANK: G4G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Castilleja ambigua* ssp. *humboldtensis

Humboldt Bay owl's-clover
PDSCR0D402
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Castilleja campestris*
*ssp. succulenta***

succulent owl's-clover
PDSCR0D3Z1
Fed: Threatened
State: Endangered
RANK: G4?T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Castilleja cinerea

ash-gray Indian
paintbrush
PDSCR0D0H0
Fed: Threatened
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Castilleja densiflora ssp.*
*obispoensis***

Obispo Indian paintbrush
PDSCR0D453
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Castilleja gleasonii

Mt. Gleason Indian
paintbrush
PDSCR0D140
Fed: None
State: Rare
RANK: G2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Castilleja grisea

San Clemente Island
Indian paintbrush
PDSCR0D160
Fed: Endangered
State: Endangered
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Castilleja hispida ssp.*
*brevilobata***

short-lobed Indian
paintbrush
PDSCR0D181
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Castilleja lanata ssp.*
*hololeuca***

white-felted Indian
paintbrush
PDSCR0D1L1
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Castilleja lasiorhyncha

San Bernardino
Mountains owl's-clover
PDSCR0D410
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Castilleja latifolia

Monterey Indian
paintbrush
PDSCR0D1P0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Castilleja mendocinensis

Mendocino coast Indian
paintbrush
PDSCR0D3N0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Castilleja miniata ssp.*
*elata***

Siskiyou Indian
paintbrush
PDSCR0D0T0
Fed: None
State: None
RANK: G5T3/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Castilleja mollis

soft-leaved Indian
paintbrush
PDSCR0D230
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Castilleja montigena

Heckard's Indian
paintbrush
PDSCR0D3G0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Castilleja plagiotoma

Mojave Indian paintbrush
PDSCR0D2J0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Castilleja rubicundula*
*ssp. rubicundula***

pink creamsacs
PDSCR0D482
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Castilleja schizotricha

split-hair Indian
paintbrush
PDSCR0D2Y0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Castilleja uliginosa

Pitkin Marsh Indian
paintbrush
PDSCR0D380
Fed: None
State: Endangered
RANK: GXQ/SX
CNPS List: 1A
Records in CNDDDB: Yes

***Caulanthus*
amplexicaulis var.
*barbarae***

Santa Barbara jewel-
flower
PDBRA0M012
Fed: None
State: None
RANK: G3?T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Caulanthus californicus

California jewel-flower
PDBRA31010
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Caulanthus coulteri* var.
*lemmonii***

Lemmon's jewelflower
PDBRA0M0E0
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Caulanthus major* var.
*nevadensis***

slender jewelflower
PDBRA0M0F1
Fed: None
State: None
RANK: G4T3?/S3.3
CNPS List: 4
Records in CNDDDB: No

Caulanthus simulans

Payson's jewel-flower
PDBRA0M0H0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Caulanthus stenocarpus

slender-pod jewel-flower
PDBRA0M0J0
Fed: None
State: Rare
RANK: G5TNRQ/S?
CNPS List:
Records in CNDDDB: No

Caulostramina jaegeri

Jaeger's caulostramina
PDBRA0N010
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus confusus

Rincon Ridge ceanothus
PDRHA041K0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Ceanothus cuneatus*
*var. fascicularis***

Lompoc ceanothus
PDRHA04066
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Ceanothus cuneatus*
*var. rigidus***

Monterey ceanothus
PDRHA04067
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Ceanothus cyaneus

Lakeside ceanothus
PDRHA04070
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus divergens

Calistoga ceanothus
PDRHA04161
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus ferrisiae

Coyote ceanothus
PDRHA040C0
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Ceanothus foliosus* *var.*
*vineatus***

Vine Hill ceanothus
PDRHA040D6
Fed: None
State: None
RANK: G3T1/S1?
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus fresnensis

Fresno ceanothus
PDRHA040E0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Ceanothus gloriosus*
*var. exaltatus***

glory brush
PDRHA040F4
Fed: None
State: None
RANK: G3G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Ceanothus gloriosus*
*var. gloriosus***

Point Reyes ceanothus
PDRHA040F2
Fed: None
State: None
RANK: G3G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Ceanothus gloriosus*
*var. porrectus***

Mt. Vision ceanothus
PDRHA040F7
Fed: None
State: None
RANK: G3G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus hearstiorum

Hearst's ceanothus
PDRHA040J0
Fed: None
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus maritimus

maritime ceanothus
PDRHA040T0
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus masonii

Mason's ceanothus
PDRHA040F6
Fed: None
State: Rare
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

***Ceanothus megacarpus*
*var. insularis***

island ceanothus
PDRHA040W1
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Ceanothus ophiocylus

Vail Lake ceanothus
PDRHA041M0
Fed: Threatened
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus otayensis

Otay Mountain
ceanothus
PDRHA041V0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus pinetorum

Kern ceanothus
PDRHA04130
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Ceanothus purpureus

holly-leaved ceanothus
PDRHA04160
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus roderickii

Pine Hill ceanothus
PDRHA04190
Fed: Endangered
State: Rare
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus sonomensis

Sonoma ceanothus
PDRHA04068
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Ceanothus verrucosus

wart-stemmed ceanothus
PDRHA041J0
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 2
Records in CNDDDB: Yes

***Centromadia parryi* *ssp.*
*australis***

southern tarplant
PDAST4R0P4
Fed: None
State: None
RANK: G4?T2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Centromadia parryi* *ssp.*
*congdonii***

Congdon's tarplant
PDAST4R0P1
Fed: None
State: None
RANK: G4?T3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Centromadia parryi* ssp. *parryi

pappose tarplant
PDAST4R0P2
Fed: None
State: None
RANK: G4?T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Centromadia pungens* ssp. *laevis

smooth tarplant
PDAST4R0R4
Fed: None
State: None
RANK: G3G4T2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Cercidium microphyllum

little-leaved palo verde
PDFAB2Z030
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Cercocarpus betuloides* var. *blancheae

island mountain-mahogany
PDROS08022
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Cercocarpus traskiae

Catalina Island mountain-mahogany
PDROS08030
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Chaenactis carphoclinia* var. *peirsonii

Peirson's pincushion
PDAST20042
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Chaenactis douglasii* var. *alpina

alpine dusty maidens
PDAST20065
Fed: None
State: None
RANK: G5T5/S2.3?
CNPS List: 2
Records in CNDDDB: Yes

Chaenactis glabriuscula* var. *orcuttiana

Orcutt's pincushion
PDAST20095
Fed: None
State: None
RANK: G5T3/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Chaenactis parishii

Parish's chaenactis
PDAST200D0
Fed: None
State: None
RANK: G3/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Chaenactis suffrutescens

Shasta chaenactis
PDAST200H0
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 1B
Records in CNDDDB: Yes

Chaetadelpa wheeleri

dune broom
PDAST21010
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Chamaebatia australis

southern mountain misery
PDROS0A010
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDDB: No

Chamaesyce abramsiana

Abrams's spurge
PDEUP0D010
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Chamaesyce arizonica

Arizona spurge
PDEUP0D060
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Chamaesyce hooveri

Hoover's spurge
PDEUP0D150
Fed: Threatened
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Chamaesyce ocellata* ssp. *rattanii

Stony Creek spurge
PDEUP0D1P1
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 1B
Records in CNDDDB: Yes

Chamaesyce parryi

Parry's spurge
PDEUP0D1T0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Chamaesyce platysperma

flat-seeded spurge
PDEUP0D1X0
Fed: None
State: None
RANK: G3/S1.2?
CNPS List: 1B
Records in CNDDDB: Yes

Chamaesyce revoluta

revolute spurge
PDEUP0D230
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Chamaesyce vallis-mortae

Death Valley sandmat
PDEUP0D2G0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Cheilanthes wootonii

Wooton's lace fern
PPADI090S0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Chenopodium simplex

large-seeded goosefoot
PDCHE091P0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Chlorogalum grandiflorum

Red Hills soaproot
PMLIL0G020
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Chlorogalum pomeridianum* var. *minus

dwarf soaproot
PMLIL0G042
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Chlorogalum purpureum*
*var. purpureum***

purple amole
PMLIL0G051
Fed: Threatened
State: None
RANK: G1T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Chlorogalum purpureum*
*var. reductum***

Camatta Canyon amole
PMLIL0G052
Fed: Threatened
State: Rare
RANK: G1T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe biloba* *var. immemora

San Benito spineflower
PDPGN04025
Fed: None
State: None
RANK: G3T1?/S1?
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe blakleyi

Blakley's spineflower
PDPGN04030
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe breweri

Brewer's spineflower
PDPGN04050
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Chorizanthe cuspidata*
*var. cuspidata***

San Francisco Bay
spineflower
PDPGN04081
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Chorizanthe cuspidata*
*var. villosa***

woolly-headed
spineflower
PDPGN04082
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe douglasii

Douglas's spineflower
PDPGN040A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Chorizanthe howellii

Howell's spineflower
PDPGN040C0
Fed: Endangered
State: Threatened
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe leptotheca

Peninsular spineflower
PDPGN040D0
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

Chorizanthe orcuttiana

Orcutt's spineflower
PDPGN040G0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe palmeri

Palmer's spineflower
PDPGN040H0
Fed: None
State: None
RANK: G3?/S3.2?
CNPS List: 4
Records in CNDDb: No

Chorizanthe parryi* *var. fernandina

San Fernando Valley
spineflower
PDPGN040J1
Fed: Candidate
State: Endangered
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe parryi* *var. parryi

Parry's spineflower
PDPGN040J2
Fed: None
State: None
RANK: G2T2/S2.1
CNPS List: 3
Records in CNDDb: Yes

***Chorizanthe*
polygonoides *var.*
*longispina***

long-spined spineflower
PDPGN040K1
Fed: None
State: None
RANK: G5T3/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Chorizanthe pungens*
*var. hartwegiana***

Ben Lomond spineflower
PDPGN040M1
Fed: Endangered
State: None
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Chorizanthe pungens*
*var. pungens***

Monterey spineflower
PDPGN040M2
Fed: Threatened
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe rectispina

straight-awned
spineflower
PDPGN040N0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Chorizanthe robusta*
*var. hartwegii***

Scott's Valley
spineflower
PDPGN040Q1
Fed: Endangered
State: None
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Chorizanthe robusta*
*var. robusta***

robust spineflower
PDPGN040Q2
Fed: Endangered
State: None
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe spinosa

Mojave spineflower
PDPGN040R0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Chorizanthe valida

Sonoma spineflower
PDPGN040V0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Chorizanthe ventricosa

potbellied spineflower
PDPGN040W0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Chorizanthe wheeleri

Wheeler's spineflower
PDPGN040Y0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Chorizanthe xanti* var.
*leucotheca***

white-bracted
spineflower
PDPGN040Z1
Fed: None
State: None
RANK: G4T3/S1S2.2
CNPS List: 1B
Records in CNDDb: Yes

Chrysothamnus albidus

white-flowered
rabbitbrush
PDAST2C010
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

***Chrysothamnus*
*gramineus***

Panamint rock-goldenrod
PDAST2C0H0
Fed: None
State: None
RANK: G4?/S2.3
CNPS List: 2
Records in CNDDb: Yes

Chrysothamnus greenei

Greene's rabbitbrush
PDAST2C030
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 2
Records in CNDDb: Yes

Cinna bolanderi

Bolander's woodreed
PMPOA1H040
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Cirsium andrewsii

Franciscan thistle
PDAST2E050
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Cirsium ciliolatum

Ashland thistle
PDAST2E0P0
Fed: None
State: Endangered
RANK: G2/S1.2
CNPS List: 2
Records in CNDDb: Yes

Cirsium crassicaule

slough thistle
PDAST2E0U0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Cirsium fontinale* var.
*campylon***

Mt. Hamilton thistle
PDAST2E0F0
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Cirsium fontinale* var.
*fontinale***

fountain thistle
PDAST2E161
Fed: Endangered
State: Endangered
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Cirsium fontinale* var.
*obispoense***

Chorro Creek bog thistle
PDAST2E162
Fed: Endangered
State: Endangered
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Cirsium hydrophilum*
var. *hydrophilum***

Suisun thistle
PDAST2E1G1
Fed: Endangered
State: None
RANK: G1T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Cirsium hydrophilum*
var. *vaseyi***

Mt. Tamalpais thistle
PDAST2E1G2
Fed: None
State: None
RANK: G1T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Cirsium loncholepis

La Graciosa thistle
PDAST2E1N0
Fed: Endangered
State: Threatened
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Cirsium occidentale* var.
*compactum***

compact cobwebby
thistle
PDAST2E1Z1
Fed: None
State: None
RANK: G3G4T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Cirsium praeteriens

lost thistle
PDAST2E2B0
Fed: None
State: None
RANK: GX/SX
CNPS List: 1A
Records in CNDDb: Yes

Cirsium rathophilum

Surf thistle
PDAST2E2J0
Fed: None
State: Threatened
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Clarkia amoena* ssp.
*whitneyi***

Whitney's farewell-to-
spring
PDONA05025
Fed: None
State: None
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia australis

Small's southern clarkia
PDONA05040
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Clarkia biloba* ssp.
*australis***

Mariposa clarkia
PDONA05051
Fed: None
State: None
RANK: G4G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Clarkia biloba* ssp.
*brandegeeae***

Brandegee's clarkia
PDONA05053
Fed: None
State: None
RANK: G4G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Clarkia borealis* ssp.
*arida***

Shasta clarkia
PDONA05061
Fed: None
State: None
RANK: G3T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Clarkia borealis* ssp.
*borealis***

northern clarkia
PDONA05062
Fed: None
State: None
RANK: G3T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Clarkia breweri

Brewer's clarkia
PDONA05080
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Clarkia concinna ssp. automixa

Santa Clara red ribbons
PDONA050A1
Fed: None
State: None
RANK: G5?T3/S3.3
CNPS List: 4
Records in CNDDb: No

Clarkia concinna ssp. raichei

Raiche's red ribbons
PDONA050A2
Fed: None
State: None
RANK: G5?T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia delicata

delicate clarkia
PDONA050D0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Clarkia exilis

slender clarkia
PDONA050G0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Clarkia franciscana

Presidio clarkia
PDONA050H0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia gracilis ssp. albicaulis

white-stemmed clarkia
PDONA050J1
Fed: None
State: None
RANK: G5T2/S2.2?
CNPS List: 1B
Records in CNDDb: Yes

Clarkia gracilis ssp. tracyi

Tracy's clarkia
PDONA050J4
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Clarkia imbricata

Vine Hill clarkia
PDONA050K0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia jolonensis

Jolon clarkia
PDONA050L0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Clarkia lewisii

Lewis's clarkia
PDONA050N0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Clarkia lingulata

Merced clarkia
PDONA050P0
Fed: None
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia mildrediae ssp. lutescens

golden-anthered clarkia
PDONA050Q1
Fed: None
State: None
RANK: G3T3/S3.2
CNPS List: 4
Records in CNDDb: No

Clarkia mildrediae ssp. mildrediae

Mildred's clarkia
PDONA050Q2
Fed: None
State: None
RANK: G3T3/S3.3
CNPS List: 1B
Records in CNDDb: Yes

Clarkia mosquinii

Mosquin's clarkia
PDONA050S0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia rostrata

beaked clarkia
PDONA050Y0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia speciosa ssp. immaculata

Pismo clarkia
PDONA05111
Fed: Endangered
State: Rare
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia springvillensis

Springville clarkia
PDONA05120
Fed: Threatened
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia tembloriensis ssp. calientensis

Vasek's clarkia
PDONA05141
Fed: None
State: None
RANK: G3T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Clarkia virgata

Sierra clarkia
PDONA05160
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Clarkia xantiana ssp. parviflora

Kern Canyon clarkia
PDONA05181
Fed: None
State: None
RANK: G4?T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Claytonia lanceolata var. peirsonii

Peirson's spring beauty
PDOR03097
Fed: None
State: None
RANK: G5T1Q/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Claytonia megarhiza

fell-fields claytonia
PDOR030A0
Fed: None
State: None
RANK: G4?S2S3
CNPS List: 2
Records in CNDDb: Yes

Claytonia palustris

marsh claytonia
PDOR030S0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Claytonia umbellata

Great Basin claytonia
PDOR030P0
Fed: None
State: None
RANK: G5?S1.3
CNPS List: 2
Records in CNDDb: Yes

Cleomella brevipes

short-pedicelled
cleomella
PDCPP04020
Fed: None
State: None
RANK: G3G4/S3.2
CNPS List: 4
Records in CNDDb: No

Cleomella hillmanii

Hillman's cleomella
PDCPP04030
Fed: None
State: None
RANK: G4G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

***Cochlearia officinalis*
*var. arctica***

arctic spoonwort
PDBRA0S032
Fed: None
State: None
RANK: G5T3T4/S1.3
CNPS List: 2
Records in CNDDb: Yes

Collinsia antonina

San Antonio collinsia
PDSCR0H010
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Collinsia corymbosa

round-headed chinese
houses
PDSCR0H060
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Collinsia multicolor

San Francisco collinsia
PDSCR0H0B0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Collomia diversifolia

serpentine collomia
PDPLM02020
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Collomia larsenii

talus collomia
PDPLM02014
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Collomia rawsoniana

flaming trumpet
PDPLM02080
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Collomia tracyi

Tracy's collomia
PDPLM020B0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Colubrina californica

Las Animas colubrina
PDRHA05030
Fed: None
State: None
RANK: G4/S2S3.3
CNPS List: 2
Records in CNDDb: Yes

***Comarostaphylis*
diversifolia ssp.
*diversifolia***

summer holly
PDERIOB011
Fed: None
State: None
RANK: G3?T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Condalia globosa* var.
*pubescens***

spiny abrojo
PDRHA06031
Fed: None
State: None
RANK: G5T3T4/S3.2
CNPS List: 4
Records in CNDDb: No

Constancea nevini

Nevin's woolly sunflower
PDAST3N090
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Convolvulus simulans

small-flowered morning-
glory
PDCON05060
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Corallorhiza trifida

northern coralroot
PMORCOM050
Fed: None
State: None
RANK: G5/S1.1
CNPS List: 2
Records in CNDDb: Yes

Cordylanthus capitatus

Yakima bird's-beak
PDSCR0J030
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDb: Yes

***Cordylanthus eremicus*
ssp. *eremicus***

desert bird's-beak
PDSCR0J042
Fed: None
State: None
RANK: G3T3?/S3?
CNPS List: 4
Records in CNDDb: No

***Cordylanthus eremicus*
ssp. *kernensis***

Kern Plateau bird's-beak
PDSCR0J043
Fed: None
State: None
RANK: G3T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Cordylanthus maritimus*
ssp. *maritimus***

salt marsh bird's-beak
PDSCR0J0C2
Fed: Endangered
State: Endangered
RANK: G4?T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Cordylanthus maritimus*
ssp. *palustris***

Point Reyes bird's-beak
PDSCR0J0C3
Fed: None
State: None
RANK: G4?T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Cordylanthus mollis*
ssp. *hispidus***

hispid bird's-beak
PDSCR0J0D1
Fed: None
State: None
RANK: G2T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Cordylanthus mollis*
ssp. *mollis***

soft bird's-beak
PDSCR0J0D2
Fed: Endangered
State: Rare
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Cordylanthus nidularius

Mt. Diablo bird's-beak
PDSCR0J0F0
Fed: None
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Cordylanthus
orcuttianus***

Orcutt's bird's-beak
PDSCR0J0G0
Fed: None
State: None
RANK: G2?/S1.1
CNPS List: 2
Records in CNDDDB: Yes

Cordylanthus palmatus

palmate-bracted bird's-beak
PDSCR0J0J0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Cordylanthus parviflorus

purple bird's-beak
PDSCR0J0K0
Fed: None
State: None
RANK: G4G5/S1S2
CNPS List: 2
Records in CNDDDB: Yes

***Cordylanthus rigidus
ssp. brevibracteatus***

short-bracted bird's-beak
PDSCR0J0P3
Fed: None
State: None
RANK: G5T3?/S3.3
CNPS List: 4
Records in CNDDDB: No

***Cordylanthus rigidus
ssp. littoralis***

seaside bird's-beak
PDSCR0J0P2
Fed: None
State: Endangered
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Cordylanthus tecopensis

Tecopa bird's-beak
PDSCR0J0Q0
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Cordylanthus tenuis
ssp. barbatus***

Fresno County bird's-beak
PDSCR0J0S4
Fed: None
State: None
RANK: G4T3/S3.3?
CNPS List: 4
Records in CNDDDB: No

***Cordylanthus tenuis
ssp. brunneus***

serpentine bird's-beak
PDSCR0J0S1
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Cordylanthus tenuis
ssp. capillaris***

Pennell's bird's-beak
PDSCR0J0S2
Fed: Endangered
State: Rare
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Cordylanthus tenuis
ssp. pallescens***

pallid bird's-beak
PDSCR0J0S3
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Coreopsis hamiltonii

Mt. Hamilton coreopsis
PDAST2L0C0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Coreopsis maritima

sea dahlia
PDAST2L0L0
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 2
Records in CNDDDB: Yes

***Corethrogyne
filaginifolia var. incana***

San Diego sand aster
PDAST2M025
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Corethrogyne
filaginifolia var. linifolia***

Del Mar Mesa sand aster
PDAST2M027
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Corethrogyne
leucophylla***

branching beach aster
PDAST2M030
Fed: None
State: None
RANK: G3Q/S3.2
CNPS List: 3
Records in CNDDDB: No

Coryphantha alversonii

foxtail cactus
PDCAC0X060
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Coryphantha vivipara
var. rosea***

viviparous foxtail cactus
PDCAC0X0G8
Fed: None
State: None
RANK: G5T3/S2.2
CNPS List: 2
Records in CNDDDB: Yes

***Crepis runcinata ssp.
hallii***

Hall's meadow
hawksbeard
PDAST2R0KB
Fed: None
State: None
RANK: G5T3?/S2?
CNPS List: 2
Records in CNDDDB: Yes

***Crossosoma
californicum***

Catalina crossosoma
PDCR002020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Croton wigginsii

Wiggins's croton
PDEUP0H140
Fed: None
State: Rare
RANK: G2G3/S1.2
CNPS List: 2
Records in CNDDDB: Yes

***Cryptantha clevelandii
var. dissita***

serpentine cryptantha
PDBOR0A0H2
Fed: None
State: None
RANK: G5TH/SH
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha clokeyi

Clokey's cryptantha
PDBOR0A211
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha costata

ribbed cryptantha
PDBOR0A0M0
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Cryptantha crinita

silky cryptantha
PDBOR0A0Q0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha crymophila

subalpine cryptantha
PDBOR0A0R0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha excavata

deep-scarred cryptantha
PDBOR0A0W0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Cryptantha ganderi

Gander's cryptantha
PDBOR0A120
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha glomeriflora

clustered-flower
cryptantha
PDBOR0A130
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Cryptantha holoptera

winged cryptantha
PDBOR0A180
Fed: None
State: None
RANK: G3G4/S?
CNPS List: 4
Records in CNDDDB: No

Cryptantha hooveri

Hoover's cryptantha
PDBOR0A190
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha incana

Tulare cryptantha
PDBOR0A1D0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha mariposae

Mariposa cryptantha
PDBOR0A1Q0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha rattanii

Rattan's cryptantha
PDBOR0A2H0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Cryptantha roosiorum

bristlecone cryptantha
PDBOR0A2L0
Fed: None
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha scoparia

gray cryptantha
PDBOR0A2Q0
Fed: None
State: None
RANK: G4?/S3.3
CNPS List: 4
Records in CNDDDB: No

Cryptantha traskiae

Trask's cryptantha
PDBOR0A370
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Cryptantha tumulosa

New York Mountains
cryptantha
PDBOR0A380
Fed: None
State: None
RANK: G4?/S3.3
CNPS List: 4
Records in CNDDDB: No

Cupressus abramsiana

Santa Cruz cypress
PGCUP04080
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Cupressus arizonica*
*ssp. nevadensis***

Piute cypress
PGCUP04012
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Cupressus bakeri

Baker's cypress
PGCUP04020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Cupressus forbesii

Tecate cypress
PGCUP040C0
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Cupressus goveniana*
*ssp. goveniana***

Gowen cypress
PGCUP04031
Fed: Threatened
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Cupressus goveniana*
*ssp. pigmaea***

pygmy cypress
PGCUP04032
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Cupressus macrocarpa

Monterey cypress
PGCUP04060
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Cupressus nootkatensis

Alaska cedar
PGCUP03020
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Cupressus stephensonii

Cuyamaca cypress
PGCUP040B0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Cusickiella quadricostata

Bodie Hills cusickiella
PDBRA2V010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Cymopterus deserticola

desert cymopterus
PDAPI0U090
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Cymopterus gilmanii

Gilman's cymopterus
PDAPI0U0C0
Fed: None
State: None
RANK: G3?/S2.2
CNPS List: 2
Records in CNDDDB: Yes

***Cymopterus ripleyi* var.
*saniculoides***

sanicle cymopterus
PDAPI0U0X1
Fed: None
State: None
RANK: G3G4T3Q/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Cynanchum utahense

Utah vine milkweed
PDASC050M0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Cypripedium californicum

California lady's-slipper
PMORC0Q040
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Cypripedium fasciculatum

clustered lady's-slipper
PMORC0Q060
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

Cypripedium montanum

mountain lady's-slipper
PMORC0Q080
Fed: None
State: None
RANK: G4/S4.2
CNPS List: 4
Records in CNDDb: No

Dalea ornata

ornate dalea
PDFAB1A150
Fed: None
State: None
RANK: G4G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Darlingtonia californica

California pitcherplant
PDSAR01010
Fed: None
State: None
RANK: G3G4/S3.2
CNPS List: 4
Records in CNDDb: No

Dedeckera eurekaensis

july gold
PDPGN06010
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Deinandra arida

Red Rock tarplant
PDAST4R010
Fed: None
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Deinandra bacigalupii

Livermore tarplant
PDAST4R0V0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Deinandra clementina

island tarplant
PDAST4R040
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Deinandra conjugens

Otay tarplant
PDAST4R070
Fed: Threatened
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Deinandra floribunda

Tecate tarplant
PDAST4R0B0
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Deinandra halliana

Hall's tarplant
PDAST4R0C0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Deinandra increscens ssp. foliosa

leafy tarplant
PDAST4R0U4
Fed: None
State: None
RANK: G4G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Deinandra increscens ssp. villosa

Gaviota tarplant
PDAST4R0U3
Fed: Endangered
State: Endangered
RANK: G4G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Deinandra minthornii

Santa Susana tarplant
PDAST4R0J0
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Deinandra mohavensis

Mojave tarplant
PDAST4R0K0
Fed: None
State: Endangered
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Deinandra paniculata

paniculate tarplant
PDAST4R0N0
Fed: None
State: None
RANK: G3G4/S3.2
CNPS List: 4
Records in CNDDb: No

Delphinium bakeri

Baker's larkspur
PDRAN0B050
Fed: Endangered
State: Rare
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Delphinium californicum ssp. interius

Hospital Canyon larkspur
PDRAN0B0A2
Fed: None
State: None
RANK: G3T2?/S2?
CNPS List: 1B
Records in CNDDb: Yes

Delphinium gypsophilum ssp. gypsophilum

gypsum-loving larkspur
PDRAN0B0S1
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDb: No

Delphinium gypsophilum ssp. parviflorum

small-flowered gypsum-loving larkspur
PDRAN0B0S2
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Delphinium hansenii ssp. ewaniamum

Ewan's larkspur
PDRAN0B0T2
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDb: No

Delphinium hesperium ssp. cuyamaca

Cuyamaca larkspur
PDRAN0B0U1
Fed: None
State: Rare
RANK: G4T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Delphinium hutchinsoniae

Hutchinson's larkspur
PDRAN0B0V0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Delphinium inopinum

unexpected larkspur
PDRAN0B0W0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Delphinium luteum

yellow larkspur
PDRAN0B0Z0
Fed: Endangered
State: Rare
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Delphinium parishii* ssp. *subglobosum

Colorado Desert larkspur
PDRAN0B1A3
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Delphinium parryi* ssp. *blochmaniae

dune larkspur
PDRAN0B1B1
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Delphinium parryi* ssp. *purpureum

Mt. Pinos larkspur
PDRAN0B1B5
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Delphinium purpusii

Kern County larkspur
PDRAN0B1G0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Delphinium recurvatum

recurved larkspur
PDRAN0B1J0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Delphinium stachydeum

spiked larkspur
PDRAN0B1Q0
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Delphinium uliginosum

swamp larkspur
PDRAN0B1V0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Delphinium umbraculorum

umbrella larkspur
PDRAN0B1W0
Fed: None
State: None
RANK: G2G3/S2S3.3
CNPS List: 1B
Records in CNDDDB: Yes

Delphinium variegatum* ssp. *kinkiense

San Clemente Island larkspur
PDRAN0B1X3
Fed: Endangered
State: Endangered
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Delphinium variegatum* ssp. *thornei

Thorne's royal larkspur
PDRAN0B1X2
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Dendromecon harfordii* var. *harfordii

Channel Island tree poppy
PDPAP08020
Fed: None
State: None
RANK: G3Q/S3.2
CNPS List: 4
Records in CNDDDB: No

Dendromecon harfordii* var. *rhamnoides

island tree poppy
PDPAP08012
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Deschampsia atropurpurea

mountain hair grass
PMPOA6M010
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Dicentra formosa* ssp. *oregana

Oregon bleeding heart
PDFUM04052
Fed: None
State: None
RANK: G5T4/S3.2
CNPS List: 4
Records in CNDDDB: No

Dicentra nevadensis

Tulare County bleeding heart
PDFUM04060
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Dichanthelium lanuginosum* var. *thermale

Geysers dichanthelium
PMPOA24025
Fed: None
State: Endangered
RANK: G5T1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Dichondra occidentalis

western dichondra
PDCON08060
Fed: None
State: None
RANK: G4?/S3.2
CNPS List: 4
Records in CNDDDB: No

Dimeresia howellii

doublet
PDAST2Z010
Fed: None
State: None
RANK: G4?/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Dirca occidentalis

western leatherwood
PDTHY03010
Fed: None
State: None
RANK: G2G3/S2S3
CNPS List: 1B
Records in CNDDDB: Yes

Dissanthelium californicum

California dissanthelium
PMPOA29010
Fed: None
State: None
RANK: GH/SH
CNPS List: 1A
Records in CNDDDB: Yes

Ditaxis claryana

glandular ditaxis
PDEUP080L0
Fed: None
State: None
RANK: G4G5/S1S2
CNPS List: 2
Records in CNDDDB: Yes

Ditaxis serrata* var. *californica

California ditaxis
PDEUP08050
Fed: None
State: None
RANK: G5T2?/S2.2
CNPS List: 3
Records in CNDDDB: Yes

Dithyrea maritima

beach spectaclepod
PDBRA10020
Fed: None
State: Threatened
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Dodecahema leptoceras

slender-horned
spineflower
PDPGN0V010
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Dodecatheon pulchellum

beautiful shootingstar
PDPRI030D0
Fed: None
State: None
RANK: G5/S2S3.2
CNPS List: 4
Records in CNDDb: No

Downingia concolor var. brevior

Cuyamaca Lake
downingia
PDCAM06041
Fed: None
State: Endangered
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Downingia laeta

Great Basin downingia
PDCAM06080
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDb: Yes

Downingia pusilla

dwarf downingia
PDCAM060C0
Fed: None
State: None
RANK: G3/S3.1
CNPS List: 2
Records in CNDDb: Yes

Draba asterophora var. asterophora

Tahoe draba
PDBRA110D1
Fed: None
State: None
RANK: G4T2/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Draba asterophora var. macrocarpa

Cup Lake draba
PDBRA110D2
Fed: None
State: None
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Draba aureola

golden draba
PDBRA110F0
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Draba breweri var. cana

hoary draba
PDBRA110M0
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Draba californica

California draba
PDBRA11380
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Draba carnosula

Mt. Eddy draba
PDBRA112T0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Draba corrugata var. saxosa

rock draba
PDBRA110Q2
Fed: None
State: None
RANK: G2T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Draba cruciata

Mineral King draba
PDBRA110U0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Draba howellii

Howell's draba
PDBRA11150
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Draba incrassata

Sweetwater Mountains
draba
PDBRA113G0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 1B
Records in CNDDb: Yes

Draba lonchocarpa var. lonchocarpa

spear-fruited draba
PDBRA111F1
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Draba monoensis

White Mountains draba
PDBRA113B0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Draba praealta

subalpine draba
PDBRA11210
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Draba pterosperma

winged-seed draba
PDBRA11230
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Draba sharsmithii

Mt. Whitney draba
PDBRA113F0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Draba sierrae

Sierra draba
PDBRA112A0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Draba subumbellata

mound draba
PDBRA11370
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Drosera anglica

English sundew
PDDRO02010
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Dryopteris filix-mas

male fern
PPDRY0A0B0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Dudleya abramsii ssp. affinis

San Bernardino
Mountains dudleya
PDCRA04013
Fed: None
State: None
RANK: G3T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Dudleya abramsii ssp. bettinae

San Luis Obispo
serpentine dudleya
PDCRA04011
Fed: None
State: None
RANK: G3T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Dudleya abramsii ssp. murina

San Luis Obispo dudleya
PDCRA04012
Fed: None
State: None
RANK: G3T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Dudleya alainae

banner dudleya
PDCRA040X0
Fed: None
State: None
RANK: G1?Q/S1?
CNPS List: 3
Records in CNDDb: No

Dudleya attenuata ssp. orcuttii

Orcutt's dudleya
PDCRA04031
Fed: None
State: None
RANK: G4T2/S1.1
CNPS List: 2
Records in CNDDb: Yes

Dudleya blochmaniae ssp. blochmaniae

Blochman's dudleya
PDCRA04051
Fed: None
State: None
RANK: G2T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya blochmaniae ssp. insularis

Santa Rosa Island
dudleya
PDCRA04052
Fed: None
State: None
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya brevifolia

short-leaved dudleya
PDCRA04060
Fed: None
State: Endangered
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya calcicola

limestone dudleya
PDCRA04014
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Dudleya candelabrum

candleholder dudleya
PDCRA04080
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Dudleya cymosa ssp. agourensis

Agoura Hills dudleya
PDCRA040A7
Fed: Threatened
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Dudleya cymosa ssp. costafolia

Pierpoint Springs
dudleya
PDCRA040A2
Fed: None
State: None
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya cymosa ssp. crebrifolia

San Gabriel River
dudleya
PDCRA040A8
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Dudleya cymosa ssp. marcescens

marcescent dudleya
PDCRA040A3
Fed: Threatened
State: Rare
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Dudleya cymosa ssp. ovatifolia

Santa Monica
Mountains dudleya
PDCRA040A5
Fed: Threatened
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Dudleya densiflora

San Gabriel Mountains
dudleya
PDCRA040B0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya gnoma

munchkin dudleya
PDCRA040W0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya greenei

Greene's dudleya
PDCRA040E0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Dudleya multicaulis

many-stemmed dudleya
PDCRA040H0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya nesiotica

Santa Cruz Island
dudleya
PDCRA040J0
Fed: Threatened
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Dudleya parva

Conejo dudleya
PDCRA040I6
Fed: Threatened
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya saxosa ssp. saxosa

Panamint dudleya
PDCRA040N2
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 1B
Records in CNDDb: Yes

Dudleya setchellii

Santa Clara Valley
dudleya
PDCRA040AC
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya stolonifera

Laguna Beach dudleya
PDCRA040P0
Fed: Threatened
State: Threatened
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Dudleya traskiae

Santa Barbara Island
dudleya
PDCRA040Q0
Fed: Endangered
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Dudleya variegata

variegated dudleya
PDCRA040R0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Dudleya verityi

Verity's dudleya
PDCRA040U0
Fed: Threatened
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Dudleya virens ssp. insularis

island green dudleya
PDCRA040S2
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Dudleya virens ssp. virens

bright green dudleya
PDCRA040S3
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Dudleya viscida

sticky dudleya
PDCRA040T0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Echinocereus engelmannii var. howei

Howe's hedgehog cactus
PDCAC06035
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Eleocharis parvula

small spikerush
PMCYP091G0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Eleocharis quadrangulata

four-angled spikerush
PMCYP091J0
Fed: None
State: None
RANK: G4/S1S2
CNPS List: 2
Records in CNDDDB: Yes

Eleocharis torticulmis

California twisted
spikerush
PMCYP092E0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Elymus californicus

California bottle-brush
grass
PMPOA2H0W0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Elymus scribneri

Scribner's wheat grass
PMPOA2H170
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDDB: Yes

Empetrum nigrum ssp. hermaphroditum

black crowberry
PDEMP03021
Fed: None
State: None
RANK: G5T5/S2?
CNPS List: 2
Records in CNDDDB: Yes

Enceliopsis covillei

Panamint daisy
PDAST3G020
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 1B
Records in CNDDDB: Yes

Enceliopsis nudicaulis var. corrugata

Ash Meadows daisy
PDAST3G031
Fed: Threatened
State: None
RANK: G5T2/S1.3?
CNPS List: 3
Records in CNDDDB: No

Enceliopsis nudicaulis var. nudicaulis

naked-stemmed daisy
PDAST3G032
Fed: None
State: None
RANK: G5T5/S3.3
CNPS List: 4
Records in CNDDDB: No

Enneapogon desvauxii

nine-awned pappus
grass
PMPOA2J010
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDDB: Yes

Epilobium howellii

subalpine fireweed
PDONA06180
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Epilobium luteum

yellow willowherb
PDONA060H0
Fed: None
State: None
RANK: G5/S2?
CNPS List: 2
Records in CNDDDB: Yes

Epilobium nivium

Snow Mountain
willowherb
PDONA060M0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Epilobium oreganum

Oregon fireweed
PDONA060P0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Epilobium palustre

marsh willowherb
PDONA060R0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Epilobium rigidum

Siskiyou Mountains
willowherb
PDONA060V0
Fed: None
State: None
RANK: G3G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Epilobium septentrionale

Humboldt County fuchsia
PDONA06110
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Epilobium siskiyouense

Siskiyou fireweed
 PDONA06100
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Equisetum palustre

marsh horsetail
 PPEQU01050
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 3
Records in CNDDDB: No

Eremalche kernensis

Kern mallow
 PDMAL0C031
Fed: Endangered
State: None
RANK: G3?T1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Eriastrum brandegeae

Brandegee's eriastrum
 PDPLM03020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Eriastrum densifolium ssp. sanctorum

Santa Ana River
 woollystar
 PDPLM03035
Fed: Endangered
State: Endangered
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Eriastrum hooveri

Hoover's eriastrum
 PDPLM03070
Fed: Delisted
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Eriastrum luteum

yellow-flowered
 eriastrum
 PDPLM03080
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Eriastrum tracyi

Tracy's eriastrum
 PDPLM030C0
Fed: None
State: Rare
RANK: G1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Eriastrum virgatum

virgate eriastrum
 PDPLM030D0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Ericameria cuneata var. macrocephala

Laguna Mountains
 goldenbush
 PDAST3L062
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Ericameria fasciculata

Eastwood's goldenbush
 PDAST3L080
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Ericameria gilmanii

Gilman's goldenbush
 PDAST3L0P0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Ericameria nana

dwarf goldenbush
 PDAST3L0B0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Ericameria ophitidis

serpentine goldenbush
 PDAST3L0S0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Ericameria palmeri ssp. palmeri

Palmer's goldenbush
 PDAST3L0C1
Fed: None
State: None
RANK: G4T2T3/S1.1
CNPS List: 2
Records in CNDDDB: Yes

Erigeron aequifolius

Hall's daisy
 PDAST3M030
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Erigeron angustatus

narrow-leaved daisy
 PDAST3M5G0
Fed: None
State: None
RANK: G1/S1.2?
CNPS List: 1B
Records in CNDDDB: Yes

Erigeron biolettii

streamside daisy
 PDAST3M5H0
Fed: None
State: None
RANK: G3?/S3?
CNPS List: 3
Records in CNDDDB: No

Erigeron blochmaniae

Blochman's leafy daisy
 PDAST3M5J0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Erigeron bloomeri var. nudatus

Waldo daisy
 PDAST3M0M2
Fed: None
State: None
RANK: G4T4/S2?
CNPS List: 2
Records in CNDDDB: Yes

Erigeron breweri var. jacinteus

San Jacinto Mountains
 daisy
 PDAST3M0P3
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Erigeron calvus

bald daisy
 PDAST3M083
Fed: None
State: None
RANK: G1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Erigeron cervinus

Siskiyou daisy
 PDAST3M0U0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Erigeron compactus var. compactus

cushion daisy
 PDAST3M0X1
Fed: None
State: None
RANK: G2G3/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Erigeron decumbens var. robustior

robust daisy
 PDAST3M134
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Erigeron disparipilus

Snake River daisy
PDAST3M150
Fed: None
State: None
RANK: G5/S1.1
CNPS List: 2
Records in CNDDb: Yes

Erigeron elegantulus

volcanic daisy
PDAST3M190
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDb: No

Erigeron inornatus var. calidipetris

hot rock daisy
PDAST3M1Z1
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Erigeron inornatus var. keilii

keil's daisy
PDAST3M1Z2
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Erigeron mariposanus

Mariposa daisy
PDAST3M5L0
Fed: None
State: None
RANK: GH/SH
CNPS List: 1A
Records in CNDDb: Yes

Erigeron miser

starved daisy
PDAST3M2K0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Erigeron multiceps

Kern River daisy
PDAST3M2N0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Erigeron nevadincola

Nevada daisy
PDAST3M2U0
Fed: None
State: None
RANK: G5T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Erigeron parishii

Parish's daisy
PDAST3M310
Fed: Threatened
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Erigeron petrophilus var. sierrensis

northern Sierra daisy
PDAST3M351
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Erigeron petrophilus var. viscidulus

Klamath daisy
PDAST3M352
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Erigeron sanctarum

Saint's daisy
PDAST3M3R0
Fed: None
State: None
RANK: G3/S2.3
CNPS List: 4
Records in CNDDb: No

Erigeron serpentinus

serpentine daisy
PDAST3M5M0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Erigeron supplex

supple daisy
PDAST3M3Z0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Erigeron uncialis var. uncialis

limestone daisy
PDAST3M452
Fed: None
State: None
RANK: G3G4T2?/S1
CNPS List: 2
Records in CNDDb: Yes

Erigeron utahensis

Utah daisy
PDAST3M480
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDb: Yes

Eriodictyon altissimum

Indian Knob mountainbalm
PDHYD04010
Fed: Endangered
State: Endangered
RANK: G2Q/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Eriodictyon angustifolium

narrow-leaved yerba santa
PDHYD04020
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Eriodictyon capitatum

Lompoc yerba santa
PDHYD04040
Fed: Endangered
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum alpinum

Trinity buckwheat
PDPGN08060
Fed: None
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum apricum var. apricum

lone buckwheat
PDPGN080F1
Fed: Endangered
State: Endangered
RANK: G2T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum apricum var. prostratum

Irish Hill buckwheat
PDPGN080F2
Fed: Endangered
State: Endangered
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum argillosum

clay-loving buckwheat
PDPGN080J0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Eriogonum baileyi var. praebens

Bailey's woolly buckwheat
PDPGN080M2
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDb: No

Eriogonum bifurcatum

forked buckwheat
PDPGN080R0
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDb: Yes

**Eriogonum breedlovei
var. breedlovei**

Breedlove's buckwheat
PDPGN080V1
Fed: None
State: None
RANK: G3T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

**Eriogonum breedlovei
var. shevockii**

The Needles buckwheat
PDPGN080V2
Fed: None
State: None
RANK: G3T3/S3.3
CNPS List: 4
Records in CNDDb: No

**Eriogonum
butterworthianum**

Butterworth's buckwheat
PDPGN080X0
Fed: None
State: Rare
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum collinum

hill buckwheat
PDPGN08160
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Eriogonum congdonii

Congdon's buckwheat
PDPGN081A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Eriogonum contiguum

Reveal's buckwheat
PDPGN081B0
Fed: None
State: None
RANK: G2?/S2?
CNPS List: 2
Records in CNDDb: Yes

Eriogonum crocatum

Conejo buckwheat
PDPGN081G0
Fed: None
State: Rare
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum diclinum

Jaynes Canyon
buckwheat
PDPGN081S0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

**Eriogonum
eastwoodianum**

Eastwood's buckwheat
PDPGN081V0
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDb: No

Eriogonum eremicola

Wildrose Canyon
buckwheat
PDPGN08210
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

**Eriogonum ericifolium
var. thornei**

Thorne's buckwheat
PDPGN08233
Fed: None
State: Endangered
RANK: G3T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum foliosum

leafy buckwheat
PDPGN08290
Fed: None
State: None
RANK: G3/SH
CNPS List: 1B
Records in CNDDb: Yes

**Eriogonum giganteum
var. compactum**

Santa Barbara Island
buckwheat
PDPGN082A1
Fed: None
State: Rare
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

**Eriogonum giganteum
var. formosum**

San Clemente Island
buckwheat
PDPGN082A2
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

**Eriogonum giganteum
var. giganteum**

Santa Catalina Island
buckwheat
PDPGN082A3
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 4
Records in CNDDb: No

Eriogonum gilmanii

Gilman's buckwheat
PDPGN082B0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum gossypinum

cottony buckwheat
PDPGN082E0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

**Eriogonum grande var.
grande**

island buckwheat
PDPGN082J1
Fed: None
State: None
RANK: G3T3/S3.2
CNPS List: 4
Records in CNDDb: No

**Eriogonum grande var.
rubescens**

red-flowered buckwheat
PDPGN082J2
Fed: None
State: None
RANK: G3T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

**Eriogonum grande var.
timorum**

San Nicolas Island
buckwheat
PDPGN082J3
Fed: None
State: Endangered
RANK: G3T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

**Eriogonum heermannii
var. floccosum**

Clark Mountain
buckwheat
PDPGN082P3
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

**Eriogonum heermannii
var. occidentale**

western Heermann's
buckwheat
PDPGN082P6
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

**Eriogonum heracleoides
var. heracleoides**

parsnip-flowered
buckwheat
PDPGN082R2
Fed: None
State: None
RANK: G5T5/S3.3
CNPS List: 4
Records in CNDDb: No

Eriogonum hirtellum

Klamath Mountain
buckwheat
PDPGN082T0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum hoffmannii*
*var. hoffmannii***

Hoffmann's buckwheat
PDPGN082V1
Fed: None
State: None
RANK: G3T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum hoffmannii*
*var. robustius***

robust Hoffmann's
buckwheat
PDPGN082V2
Fed: None
State: None
RANK: G3T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum intrafractum

jointed buckwheat
PDPGN08360
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum kelloggii

Kellogg's buckwheat
PDPGN083A0
Fed: Candidate
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum kennedyi*
*var. alpigenum***

southern alpine
buckwheat
PDPGN083B1
Fed: None
State: None
RANK: G4T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum kennedyi*
*var. austromontanum***

southern mountain
buckwheat
PDPGN083B2
Fed: Threatened
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum kennedyi*
*var. pinicola***

Kern buckwheat
PDPGN083B4
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum libertini

Dubakella Mountain
buckwheat
PDPGN083M0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Eriogonum luteolum*
*var. caninum***

Tiburon buckwheat
PDPGN083S1
Fed: None
State: None
RANK: G5T3Q/S3.2
CNPS List: 3
Records in CNDDb: No

***Eriogonum*
microthecum var.
*alpinum***

northern limestone
buckwheat
PDPGN083WA
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

***Eriogonum*
microthecum var.
*johnstonii***

Johnston's buckwheat
PDPGN083W5
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum*
microthecum var.
*lapidicola***

Inyo Mountains
buckwheat
PDPGN083W6
Fed: None
State: None
RANK: G5T3T4/S3.3
CNPS List: 4
Records in CNDDb: No

***Eriogonum*
microthecum var.
*panamintense***

Panamint Mountains
buckwheat
PDPGN083W9
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum nervulosum

Snow Mountain
buckwheat
PDPGN08440
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Eriogonum nortonii

Pinnacles buckwheat
PDPGN08470
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum nudum var.*
*decurrens***

Ben Lomond buckwheat
PDPGN08492
Fed: None
State: None
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum nudum var.*
*indictum***

protruding buckwheat
PDPGN08494
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

***Eriogonum nudum var.*
*murinum***

mouse buckwheat
PDPGN08495
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum nudum var.*
*paralinum***

Del Norte buckwheat
PDPGN08498
Fed: None
State: None
RANK: G5T2T4/S2?
CNPS List: 2
Records in CNDDb: Yes

***Eriogonum nudum var.*
*regirivum***

Kings River buckwheat
PDPGN0849F
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Eriogonum nutans var.*
*nutans***

nodding buckwheat
PDPGN084B2
Fed: None
State: None
RANK: G5T3T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

***Eriogonum*
ochrocephalum var.
*alexanderae***

Alexander's buckwheat
PDPGN084C5
Fed: None
State: None
RANK: G5T3/S2?
CNPS List: 2
Records in CNDDb: Yes

***Eriogonum*
ochrocephalum var.
*ochrocephalum***

ochre-flowered
buckwheat
PDPGN084C6
Fed: None
State: None
RANK: G5T4/S1.2
CNPS List: 2
Records in CNDDb: Yes

***Eriogonum ovalifolium*
*var. eximium***

brown-margined
buckwheat
PDPGN084FD
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Eriogonum ovalifolium*
*var. monarchense***

Monarch buckwheat
PDPGN084FJ
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

***Eriogonum ovalifolium*
*var. vineum***

Cushenbury buckwheat
PDPGN084F8
Fed: Endangered
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Eriogonum pendulum

Waldo buckwheat
PDPGN084Q0
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Eriogonum polypodium

Tulare County
buckwheat
PDPGN084U0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Eriogonum*
*prattenianum var. avium***

Kettle Dome buckwheat
PDPGN084V1
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Eriogonum prociduum

prostrate buckwheat
PDPGN084W0
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Eriogonum puberulum

downy buckwheat
PDPGN084X0
Fed: None
State: None
RANK: G3?/S1.3
CNPS List: 2
Records in CNDDDB: Yes

***Eriogonum pyrolifolium*
*var. pyrolifolium***

pyrola-leaved buckwheat
PDPGN084Z2
Fed: None
State: None
RANK: G4T4/S2.3
CNPS List: 2
Records in CNDDDB: Yes

***Eriogonum shockleyi*
*var. shockleyi***

Shockley's buckwheat
PDPGN085E2
Fed: None
State: None
RANK: G5T4?/S3.3
CNPS List: 4
Records in CNDDDB: No

Eriogonum siskiyouense

Siskiyou buckwheat
PDPGN085F0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Eriogonum spectabile

Barron's buckwheat
PDPGN08750
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Eriogonum strictum var.*
*greenei***

Greene's buckwheat
PDPGN085L3
Fed: None
State: None
RANK: G5T3Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Eriogonum tembloreense

Temblor buckwheat
PDPGN085P0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Eriogonum ternatum

ternate buckwheat
PDPGN085R0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Eriogonum tripodum

tripod buckwheat
PDPGN085Y0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Eriogonum truncatum

Mt. Diablo buckwheat
PDPGN085Z0
Fed: None
State: None
RANK: GH/SH
CNPS List: 1A
Records in CNDDDB: Yes

***Eriogonum*
*twisselmannii***

Twisselmann's
buckwheat
PDPGN08610
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Eriogonum umbellatum*
*var. bahiiforme***

bay buckwheat
PDPGN086UB
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Eriogonum umbellatum*
*var. glaberrimum***

green buckwheat
PDPGN086U2
Fed: None
State: None
RANK: G5T2?/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

***Eriogonum umbellatum*
*var. humistratum***

Mt. Eddy buckwheat
PDPGN086U4
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Eriogonum umbellatum*
*var. juniporinum***

juniper buckwheat
PDPGN086U6
Fed: None
State: None
RANK: G5T3?/S1S2
CNPS List: 2
Records in CNDDDB: Yes

***Eriogonum umbellatum*
*var. minus***

alpine sulfur-flowered
buckwheat
PDPGN086U7
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Eriogonum umbellatum*
*var. torreyanum***

Donner Pass buckwheat
PDPGN086U9
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Eriogonum vestitum

Idria buckwheat
PDPGN08640
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDb: No

Eriogonum wrightii* var. *olanchense

Olancha Peak buckwheat
PDPGN086D3
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Erioneuron pilosum

hairy erioneuron
PMPOA2S020
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Eriophyllum confertiflorum* var. *tanacetiflorum

tansy-leaved woolly sunflower
PDAST3N0D0
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDb: No

Eriophyllum congdonii

Congdon's woolly sunflower
PDAST3N030
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Eriophyllum jepsonii

Jepson's woolly sunflower
PDAST3N040
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 4
Records in CNDDb: No

Eriophyllum lanatum* var. *hallii

Fort Tejon woolly sunflower
PDAST3N058
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Eriophyllum lanatum* var. *obovatum

southern Sierra woolly sunflower
PDAST3N05D
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Eriophyllum latilobum

San Mateo woolly sunflower
PDAST3N060
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Eriophyllum mohavense

Barstow woolly sunflower
PDAST3N070
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Eriophyllum nubigenum

Yosemite woolly sunflower
PDAST3N0A0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Erodium macrophyllum

round-leaved filaree
PDGER01070
Fed: None
State: None
RANK: G4/S2.1
CNPS List: 2
Records in CNDDb: Yes

Eryngium aristulatum* var. *hooveri

Hoover's button-celery
PDAPI0Z043
Fed: None
State: None
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Eryngium aristulatum* var. *parishii

San Diego button-celery
PDAPI0Z042
Fed: Endangered
State: Endangered
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Eryngium constancei

Loch Lomond button-celery
PDAPI0Z0W0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Eryngium pendletonensis

Pendleton button-celery
PDAPI0Z120
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Eryngium pinnatisectum

Tuolumne button-celery
PDAPI0Z0P0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Eryngium racemosum

Delta button-celery
PDAPI0Z0S0
Fed: None
State: Endangered
RANK: G2Q/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Eryngium spinosepalum

spiny-sepal button-celery
PDAPI0Z0Y0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Erysimum ammodendrum

coast wallflower
PDBRA16010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Erysimum capitatum* ssp. *angustatum

Contra Costa wallflower
PDBRA16052
Fed: Endangered
State: Endangered
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Erysimum capitatum* ssp. *lompocense

San Luis Obispo wallflower
PDBRA160M3
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Erysimum franciscanum

San Francisco wallflower
PDBRA160A0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Erysimum insulare* ssp. *insulare

island wallflower
PDBRA160D1
Fed: None
State: None
RANK: G3T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Erysimum insulare ssp. suffrutescens

suffrutescent wallflower
PDBRA160D2
Fed: None
State: None
RANK: G3T3/S3.2
CNPS List: 4
Records in CNDDb: No

Erysimum menziesii ssp. eurekaense

Humboldt Bay wallflower
PDBRA160E2
Fed: Endangered
State: Endangered
RANK: G3?T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Erysimum menziesii ssp. menziesii

Menzies's wallflower
PDBRA160E1
Fed: Endangered
State: Endangered
RANK: G3?T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Erysimum menziesii ssp. yadonii

Yadon's wallflower
PDBRA160E4
Fed: Endangered
State: Endangered
RANK: G3?T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Erysimum teretifolium

Santa Cruz wallflower
PDBRA160N0
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Erythronium citrinum var. citrinum

lemon-colored fawn lily
PMLIL0U041
Fed: None
State: None
RANK: G4T4/S3.3
CNPS List: 4
Records in CNDDb: No

Erythronium citrinum var. roderickii

Scott Mountains fawn lily
PMLIL0U042
Fed: None
State: None
RANK: G4T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Erythronium helenae

St. Helena fawn lily
PMLIL0U060
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Erythronium hendersonii

Henderson's fawn lily
PMLIL0U070
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDb: Yes

Erythronium howellii

Howell's fawn lily
PMLIL0U080
Fed: None
State: None
RANK: G3G4/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Erythronium klamathense

Klamath fawn lily
PMLIL0U090
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Erythronium pluriflorum

Shuteye Peak fawn lily
PMLIL0U0Q0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Erythronium pusaterii

Kaweah fawn lily
PMLIL0U0R0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Erythronium revolutum

coast fawn lily
PMLIL0U0F0
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Erythronium taylorii

Pilot Ridge fawn lily
PMLIL0U0S0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Erythronium tuolumnense

Tuolumne fawn lily
PMLIL0U0H0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Eschscholzia hypocoides

San Benito poppy
PDPAP0A060
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Eschscholzia lemmonii ssp. kernensis

Tejon poppy
PDPAP0A071
Fed: None
State: None
RANK: G5T1/S1.1?
CNPS List: 1B
Records in CNDDb: Yes

Eschscholzia minutiflora ssp. twisselmannii

Red Rock poppy
PDPAP0A093
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Eschscholzia procera

Kernville poppy
PDPAP0A0B0
Fed: None
State: None
RANK: G1G2Q/S1S2
CNPS List: 3
Records in CNDDb: No

Eschscholzia ramosa

island poppy
PDPAP0A0C0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Eschscholzia rhombipetala

diamond-petaled California poppy
PDPAP0A0D0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Eucnide rupestris

rock nettle
PDLOA02020
Fed: None
State: None
RANK: G3/S2.2?
CNPS List: 2
Records in CNDDb: Yes

Euphorbia exstipulata var. exstipulata

Clark Mountain spurge
PDEUP0Q0P1
Fed: None
State: None
RANK: G5T5?/S1.3
CNPS List: 2
Records in CNDDb: Yes

Euphorbia misera

cliff spurge
PDEUP0Q1B0
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 2
Records in CNDDb: Yes

Fendlerella utahensis

yerba desierto
PDHDR08010
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Ferocactus viridescens

San Diego barrel cactus
PDCAC08060
Fed: None
State: None
RANK: G4/S3.1
CNPS List: 2
Records in CNDDb: Yes

Festuca minutiflora

small-flowered fescue
PMPOA2V1M0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Fimbristylis thermalis

hot springs fimbristylis
PMCYP0B0N0
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Frankenia palmeri

Palmer's frankenia
PDFRA01040
Fed: None
State: None
RANK: G3G4/S1.1
CNPS List: 2
Records in CNDDb: Yes

Fremontodendron decumbens

Pine Hill flannelbush
PDSTE03030
Fed: Endangered
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Fremontodendron mexicanum

Mexican flannelbush
PDSTE03020
Fed: Endangered
State: Rare
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria agrestis

stinkbells
PMLILOV010
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Fritillaria biflora var. ineziana

Hillsborough chocolate lily
PMLILOV031
Fed: None
State: None
RANK: G1QT1Q/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria brandegeei

Greenhorn fritillary
PMLILOV040
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria eastwoodiae

Butte County fritillary
PMLILOV060
Fed: None
State: None
RANK: G3Q/S3.2
CNPS List: 3
Records in CNDDb: Yes

Fritillaria falcata

talus fritillary
PMLILOV070
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria gentneri

Gentner's fritillary
PMLILOV080
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria lanceolata var. tristulis

Marin checker lily
PMLILOV0P1
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria liliacea

fragrant fritillary
PMLILOV0C0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria ojaiensis

Ojai fritillary
PMLILOV0N0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria pinetorum

pine fritillary
PMLILOV0E0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Fritillaria pluriflora

adobe-lily
PMLILOV0F0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria purdyi

Purdy's fritillary
PMLILOV0H0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Fritillaria roderickii

Roderick's fritillary
PMLILOV0M0
Fed: None
State: Endangered
RANK: G1Q/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria striata

striped adobe-lily
PMLILOV0K0
Fed: None
State: Threatened
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Fritillaria viridea

San Benito fritillary
PMLILOV0L0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Galium andrewsii ssp. gatense

serpentine bedstraw
PDRUB0N032
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Galium angustifolium ssp. borregoense

Borrego bedstraw
PDRUB0N042
Fed: None
State: Rare
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Galium angustifolium ssp. gabrielense

San Antonio Canyon bedstraw
PDRUB0N044
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

***Galium angustifolium*
*ssp. gracillimum***

slender bedstraw
PDRUB0N04B
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

***Galium angustifolium*
*ssp. jacinticum***

San Jacinto Mountains
bedstraw
PDRUB0N04C
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

***Galium angustifolium*
*ssp. onycense***

Onyx Peak bedstraw
PDRUB0N048
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Galium buxifolium

box bedstraw
PDRUB0N0D0
Fed: Endangered
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Galium californicum*
*ssp. luciense***

Cone Peak bedstraw
PDRUB0N0E3
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Galium californicum*
*ssp. miguelense***

San Miguel Island
bedstraw
PDRUB0N0E5
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

***Galium californicum*
*ssp. primum***

California bedstraw
PDRUB0N0E6
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Galium californicum*
*ssp. sierrae***

El Dorado bedstraw
PDRUB0N0E7
Fed: Endangered
State: Rare
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Galium catalinense* *ssp.*
*acrispum***

San Clemente Island
bedstraw
PDRUB0N0F1
Fed: None
State: Endangered
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Galium catalinense* *ssp.*
*catalinense***

Santa Catalina Island
bedstraw
PDRUB0N0F2
Fed: None
State: None
RANK: G4T2T3/S2S3.
CNPS List: 1B
Records in CNDDb: Yes

Galium clementis

Santa Lucia bedstraw
PDRUB0N0H0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Galium cliftonsmithii

Santa Barbara bedstraw
PDRUB0N0J0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Galium glabrescens*
*ssp. modocense***

Modoc bedstraw
PDRUB0N0T2
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Galium grande

San Gabriel bedstraw
PDRUB0N0V0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Galium hardhamiae

Hardham's bedstraw
PDRUB0N0Y0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Galium hilendiae* *ssp.*
*carneum***

Panamint Mountains
bedstraw
PDRUB0N0Z1
Fed: None
State: None
RANK: G4T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Galium hilendiae* *ssp.*
*kingstonense***

Kingston Mountains
bedstraw
PDRUB0N0Z3
Fed: None
State: None
RANK: G4T2/S1.3
CNPS List: 1B
Records in CNDDb: Yes

***Galium hypotrachium*
*ssp. tomentellum***

Telescope Peak
bedstraw
PDRUB0N126
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Galium jepsonii

Jepson's bedstraw
PDRUB0N130
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Galium johnstonii

Johnston's bedstraw
PDRUB0N140
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Galium munzii

Munz's bedstraw
PDRUB0N1G0
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDb: No

***Galium nuttallii* *ssp.*
*insulare***

Nuttall's island bedstraw
PDRUB0N1K1
Fed: None
State: None
RANK: G5?T3/S3.3
CNPS List: 4
Records in CNDDb: No

Galium oreganum

Oregon bedstraw
PDRUB0N1N0
Fed: None
State: None
RANK: G4/S2S3
CNPS List: 3
Records in CNDDb: No

***Galium serpenticum*
*ssp. scotticum***

Scott Mountain bedstraw
PDRUB0N1Y6
Fed: None
State: None
RANK: G4G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Galium serpticum*
*ssp. warnerense***

Warner Mountains
bedstraw
PDRUB0N1Y8
Fed: None
State: None
RANK: G4G5T2/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Galium wrightii

Wright's bedstraw
PDRUB0N2F0
Fed: None
State: None
RANK: G3G4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Galvezia speciosa

island snapdragon
PDSCR2H010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Gentiana affinis* var.
*parvidentata***

small-toothed prairie
gentian
PDGEN06013
Fed: None
State: None
RANK: G5T3?Q/S?
CNPS List: 3
Records in CNDDb: No

Gentiana fremontii

moss gentian
PDGEN060Y0
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Gentiana plurisetosa

Klamath gentian
PDGEN060V0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Gentiana prostrata

pygmy gentian
PDGEN060M0
Fed: None
State: None
RANK: G4G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Gentiana setigera

Mendocino gentian
PDGEN060S0
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Geraea viscida

sticky geraea
PDAST42020
Fed: None
State: None
RANK: G3/S2.3?
CNPS List: 2
Records in CNDDb: Yes

Geum aleppicum

Aleppo avens
PDROS0S010
Fed: None
State: None
RANK: G5/S2.2?
CNPS List: 2
Records in CNDDb: Yes

***Gilia capitata* ssp.
*chamissonis***

dune gilia
PDPLM040B3
Fed: None
State: None
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Gilia capitata* ssp.
*pacifica***

Pacific gilia
PDPLM040B6
Fed: None
State: None
RANK: G5T3T4/S2.2?
CNPS List: 1B
Records in CNDDb: Yes

***Gilia capitata* ssp.
*tomentosa***

woolly-headed gilia
PDPLM040B9
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Gilia interior

inland gilia
PDPLM040Q0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Gilia latiflora* ssp.
*cuyamensis***

Cuyama gilia
PDPLM040T2
Fed: None
State: None
RANK: G5?T3/S3.3
CNPS List: 4
Records in CNDDb: No

***Gilia leptantha* ssp.
*leptantha***

San Bernardino gilia
PDPLM040W1
Fed: None
State: None
RANK: G4T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Gilia leptantha* ssp.
*pinetorum***

pine gilia
PDPLM040W2
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Gilia millefoliata

dark-eyed gilia
PDPLM04130
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Gilia nevinii

Nevin's gilia
PDPLM04160
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Gilia tenuiflora* ssp.
*amplifaucalis***

trumpet-throated gilia
PDPLM041P4
Fed: None
State: None
RANK: G3G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

***Gilia tenuiflora* ssp.
*arenaria***

sand gilia
PDPLM041P2
Fed: Endangered
State: Threatened
RANK: G3G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Gilia tenuiflora* ssp.
*hoffmannii***

Hoffmann's slender-
flowered gilia
PDPLM041P3
Fed: Endangered
State: None
RANK: G3G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Gilia yorkii

Monarch gilia
PDPLM04230
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Gilmania luteola

golden carpet
PDPGN0A010
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

***Githopsis diffusa* ssp.
*filicaulis***

Mission Canyon bluecup
PDCAM07023
Fed: None
State: None
RANK: G5T2T3/S1.1
CNPS List: 3
Records in CNDDb: Yes

***Githopsis pulchella* ssp.
*serpentinicola***

serpentine bluecup
PDCAM07053
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Githopsis tenella

delicate bluecup
PDCAM07070
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Glehnia littoralis* ssp.
*leiocarpa***

American glehnia
PDAP113011
Fed: None
State: None
RANK: G5T5/S3.2
CNPS List: 4
Records in CNDDb: No

Glossopetalon pungens

pungent glossopetalon
PDCRO04020
Fed: None
State: None
RANK: G2G3/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Glyceria grandis

American manna grass
PMPOA2Y080
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Goodmania luteola

golden goodmania
PDPGN0B010
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Gratiola heterosepala

Boggs Lake hedge-
hyssop
PDSCR0R060
Fed: None
State: Endangered
RANK: G3/S3.1
CNPS List: 1B
Records in CNDDb: Yes

***Grindelia fraxino-
pratensis***

Ash Meadows gumplant
PDAST47080
Fed: Threatened
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Grindelia hirsutula* var.
*hallii***

San Diego gumplant
PDAST470D4
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Grindelia hirsutula* var.
*maritima***

San Francisco gumplant
PDAST470D3
Fed: None
State: None
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Hackelia amethystina

amethyst stickseed
PDBOR0G010
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Hackelia brevicula

Poison Canyon stickseed
PDBOR0G040
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 3
Records in CNDDb: Yes

Hackelia cusickii

Cusick's stickseed
PDBOR0G090
Fed: None
State: None
RANK: G5?/S3.3
CNPS List: 4
Records in CNDDb: No

Hackelia sharsmithii

Sharsmith's stickseed
PDBOR0G0Q0
Fed: None
State: None
RANK: G3/S2S3.3
CNPS List: 2
Records in CNDDb: Yes

Halimolobos virgata

virgate halimolobos
PDBRA1A040
Fed: None
State: None
RANK: G4/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Harmonia doris-nilesiae

Niles's harmonia
PDAST650L0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Harmonia guggolziorum

PDAST650M0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Harmonia hallii

Hall's harmonia
PDAST650A0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Harmonia nutans

nodding harmonia
PDAST650D0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Harmonia stebbinsii

Stebbins's harmonia
PDAST650K0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Harpagonella palmeri

Palmer's grapplinghook
PDBOR0H010
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

Hazardia cana

San Clemente Island
hazardia
PDAST4H020
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Hazardia detonsa

island hazardia
PDAST4H030
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Hazardia orcuttii

Orcutt's hazardia
PDAST4H070
Fed: None
State: Threatened
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Hedeoma nanum* var.
*californicum***

California mock-pennyroyal
PDLAM0M0S1
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDDB: No

Helianthella castanea

Diablo helianthella
PDAST4M020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Helianthemum greenei

island rush-rose
PDCIS02090
Fed: Threatened
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Helianthemum
suffrutescens***

Bisbee Peak rush-rose
PDCIS020F0
Fed: None
State: None
RANK: G2Q/S2.2
CNPS List: 3
Records in CNDDDB: Yes

Helianthus exilis

serpentine sunflower
PDAST4N1J0
Fed: None
State: None
RANK: G3Q/S3.2
CNPS List: 4
Records in CNDDDB: No

***Helianthus niveus* ssp.
*tephrodes***

Algodones Dunes sunflower
PDAST4N0Z2
Fed: None
State: Endangered
RANK: G4T2/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Helianthus nuttallii* ssp.
*parishii***

Los Angeles sunflower
PDAST4N102
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1A
Records in CNDDDB: Yes

***Hemizonia congesta*
ssp. *calyculata***

Mendocino tarplant
PDAST4R063
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Hemizonia congesta*
ssp. *leucocephala***

Hayfield tarplant
PDAST4R065
Fed: None
State: None
RANK: G5T2T3/S2S3
CNPS List: 3
Records in CNDDDB: No

***Hemizonia congesta*
ssp. *tracyi***

Tracy's tarplant
PDAST4R067
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Herissantia crispa

curly herissantia
PDMAL0F010
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 2
Records in CNDDDB: Yes

Hesperevax caulescens

hogwallow starfish
PDASTE5020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Hesperevax sparsiflora*
var. *brevifolia***

short-leaved evax
PDASTE5011
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 2
Records in CNDDDB: Yes

***Hesperolinon
adenophyllum***

glandular western flax
PDLIN01010
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

***Hesperolinon
bicarpellatum***

two-carpellate western flax
PDLIN01020
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Hesperolinon breweri

Brewer's western flax
PDLIN01030
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Hesperolinon congestum

Marin western flax
PDLIN01060
Fed: Threatened
State: Threatened
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Hesperolinon
didymocarpum***

Lake County western flax
PDLIN01070
Fed: None
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Hesperolinon
drymarioides***

drymaria-like western flax
PDLIN01090
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Hesperolinon* sp. nov.
"serpentinum"**

Napa western flax
PDLIN010D0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Hesperolinon tehamense

Tehama County western flax
PDLIN010C0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Heterotheca
monarchensis***

Monarch golden-aster
PDAST4V0U0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Heterotheca shevockii

Shevock's golden-aster
PDAST4V0T0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Heuchera abramsii

Abrams's alumroot
PDSAX0E010
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Heuchera brevistaminea

Laguna Mountains
alumroot
PDSAX0E050
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Heuchera elegans

urn-flowered alumroot
PDSAX0E0C0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Heuchera hirsutissima

shaggy-haired alumroot
PDSAX0E0J0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Heuchera maxima

island alumroot
PDSAX0E0M0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Heuchera parishii

Parish's alumroot
PDSAX0E0S0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Heuchera rubescens*
*var. versicolor***

San Diego County
alumroot
PDSAX0E106
Fed: None
State: None
RANK: G5T4/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Hibiscus lasiocarpus

rose-mallow
PDMAL0H0Q0
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Hierochloa odorata

vanilla-grass
PMPOA35040
Fed: None
State: None
RANK: G4G5/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Hoita strobilina

Loma Prieta hoita
PDFAB5Z030
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Holocarpha macradenia

Santa Cruz tarplant
PDAST4X020
Fed: Threatened
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Holocarpha virgata ssp.*
*elongata***

graceful tarplant
PDAST4X041
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Hordeum intercedens

vernal barley
PMPOA380E0
Fed: None
State: None
RANK: G3G4/S3S4
CNPS List: 3
Records in CNDDb: No

Horkelia bolanderi

Bolander's horkelia
PDROS0W010
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Horkelia congesta ssp.*
*memorosa***

Josephine horkelia
PDROS0W032
Fed: None
State: None
RANK: G4T4?/S1.1
CNPS List: 2
Records in CNDDb: Yes

***Horkelia cuneata ssp.*
*puberula***

mesa horkelia
PDROS0W045
Fed: None
State: None
RANK: G4T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Horkelia cuneata ssp.*
*sericea***

Kellogg's horkelia
PDROS0W043
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Horkelia hendersonii

Henderson's horkelia
PDROS0W090
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Horkelia hispidula

White Mountains horkelia
PDROS0W0A0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Horkelia marinensis

Point Reyes horkelia
PDROS0W0B0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Horkelia parryi

Parry's horkelia
PDROS0W0C0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Horkelia sericata

Howell's horkelia
PDROS0W0D0
Fed: None
State: None
RANK: G3G4/S3.3
CNPS List: 4
Records in CNDDb: No

Horkelia tenuiloba

thin-lobed horkelia
PDROS0W0E0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Horkelia truncata

Ramona horkelia
PDROS0W0G0
Fed: None
State: None
RANK: G3/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Horkelia tularensis

Kern Plateau horkelia
PDROS0W0H0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Horkelia wilderae

Barton Flats horkelia
PDROS0W0J0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Horkelia yadonii

Santa Lucia horkelia
PDROS0W0K0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Horsfordia alata

pink velvet-mallow
PDMAL0J010
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Horsfordia newberryi

Newberry's velvet-mallow
PDMAL0J020
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Howellia aquatilis

water howellia
PDCAM0A010
Fed: Threatened
State: None
RANK: G2/S1.2
CNPS List: 2
Records in CNDDb: Yes

Hulsea brevifolia

short-leaved hulsea
PDAST4Z020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Hulsea californica

San Diego sunflower
PDAST4Z030
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Hulsea mexicana

Mexican hulsea
PDAST4Z050
Fed: None
State: None
RANK: G3G4/S1.3
CNPS List: 2
Records in CNDDb: Yes

Hulsea nana

little hulsea
PDAST4Z060
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Hulsea vestita ssp. callicarpa

beautiful hulsea
PDAST4Z074
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Hulsea vestita ssp. gabrielensis

San Gabriel Mountains sunflower
PDAST4Z075
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Hulsea vestita ssp. inyoensis

Inyo hulsea
PDAST4Z073
Fed: None
State: None
RANK: G5T2T3/S1.2
CNPS List: 2
Records in CNDDb: Yes

Hulsea vestita ssp. parryi

Parry's sunflower
PDAST4Z076
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Hulsea vestita ssp. pygmaea

pygmy hulsea
PDAST4Z077
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Hymenopappus filifolius var. nanus

little cutleaf
PDAST5103H
Fed: None
State: None
RANK: G5T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Hymenothrix wrightii

Wright's hymenothrix
PDAST52030
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Hymenoxys lemmonii

alkali hymenoxys
PDAST530C0
Fed: None
State: None
RANK: G3?/S2.2
CNPS List: 2
Records in CNDDb: Yes

Iliamna bakeri

Baker's globe mallow
PDMAL0K010
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Iliamna latibracteata

California globe mallow
PDMAL0K040
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Ipomopsis effusa

Baja California ipomopsis
PDPLM060U0
Fed: None
State: None
RANK: G3?/S1.2?
CNPS List: 2
Records in CNDDb: Yes

Ipomopsis tenuifolia

slender-leaved ipomopsis
PDPLM060J0
Fed: None
State: None
RANK: G3G4/S2.3?
CNPS List: 2
Records in CNDDb: Yes

Iris bracteata

Siskiyou iris
PMIRI09020
Fed: None
State: None
RANK: G4G5/S3.3?
CNPS List: 3
Records in CNDDb: No

Iris hartwegii ssp. columbiana

Tuolumne iris
PMIRI090D2
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Iris innominata

Del Norte County iris
PMIRI090F0
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDb: No

Iris munzii

Munz's iris
PMIRI090M0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Iris tenax ssp. klamathensis

Orleans iris
PMIRI090Z2
Fed: None
State: None
RANK: G4G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Isocoma arguta

Carquinez goldenbush
PDAST57050
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Isocoma menziesii* var.
*decumbens***

decumbent goldenbush
PDAST57091
Fed: None
State: None
RANK: G3G5T2T3/S2.
CNPS List: 1B
Records in CNDDb: Yes

***Isocoma menziesii* var.
*diabolica***

Satan's goldenbush
PDAST57092
Fed: None
State: None
RANK: G3G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Iva acerosa

copperwort
PDAST58010
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDb: No

Iva hayesiana

San Diego marsh-elder
PDAST580A0
Fed: None
State: None
RANK: G3?/S2.2?
CNPS List: 2
Records in CNDDb: Yes

Iva nevadensis

Nevada wormwood
PDAST580D0
Fed: None
State: None
RANK: G3?/S3.3
CNPS List: 4
Records in CNDDb: No

Ivesia aperta* var. *aperta

Sierra Valley ivesia
PDROS0X011
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Ivesia aperta* var. *canina

Dog Valley ivesia
PDROS0X012
Fed: None
State: None
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Ivesia argyrocoma

silver-haired ivesia
PDROS0X020
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Ivesia arizonica* var.
*arizonica***

yellow ivesia
PDROS0X0R1
Fed: None
State: None
RANK: G3G4T3T4/S1.
CNPS List: 3
Records in CNDDb: Yes

Ivesia baileyi* var. *baileyi

Bailey's ivesia
PDROS0X031
Fed: None
State: None
RANK: G5T4/S1.3
CNPS List: 2
Records in CNDDb: Yes

***Ivesia baileyi* var.
*beneolens***

Owyhee ivesia
PDROS0X032
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Ivesia callida

Tahquitz ivesia
PDROS0X040
Fed: None
State: Rare
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Ivesia campestris

field ivesia
PDROS0X050
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Ivesia jaegeri

Jaeger's ivesia
PDROS0X080
Fed: None
State: None
RANK: G2G3/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Ivesia kingii* var. *kingii

alkali ivesia
PDROS0X092
Fed: None
State: None
RANK: G3T2Q/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Ivesia longibracteata

Castle Crags ivesia
PDROS0X0U0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Ivesia paniculata

Ash Creek ivesia
PDROS0X0S0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Ivesia patellifera

Kingston Mountains ivesia
PDROS0X0Z0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Ivesia pickeringii

Pickering's ivesia
PDROS0X0D0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Ivesia sericoleuca

Plumas ivesia
PDROS0X0K0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Ivesia unguiculata

Yosemite ivesia
PDROS0X0N0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Ivesia webberi

Webber's ivesia
PDROS0X0Q0
Fed: Candidate
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Jamesia americana* var.
*rosea***

rosy-petalled cliffbush
PDHDR02019
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Jensia yosemitana

Yosemite tarplant
PDAST650J0
Fed: None
State: None
RANK: G2G3/S2S3
CNPS List: 3
Records in CNDDb: No

Jepsonia heterandra

foothill jepsonia
PDSAX0J010
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Jepsonia malvifolia

island jepsonia
PDSAX0J020
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Juglans californica

southern California
black walnut
PDJUG02020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Juglans hindsii

Northern California
black walnut
PDJUG02040
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Juncus acutus ssp. leopoldii

southwestern spiny rush
PMJUN01051
Fed: None
State: None
RANK: G5T5/S3.2
CNPS List: 4
Records in CNDDb: No

Juncus cooperi

Cooper's rush
PMJUN010T0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Juncus dudleyi

Dudley's rush
PMJUN01390
Fed: None
State: None
RANK: G5/S2.3?
CNPS List: 2
Records in CNDDb: Yes

Juncus duranii

Duran's rush
PMJUN013T0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Juncus hemiendytus var. abjectus

Center Basin rush
PMJUN011F1
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDb: No

Juncus leiospermus var. ahartii

Ahart's dwarf rush
PMJUN011L1
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Juncus leiospermus var. leiospermus

Red Bluff dwarf rush
PMJUN011L2
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Juncus marginatus var. marginatus

red-anthered rush
PMJUN011S1
Fed: None
State: None
RANK: G5T5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Juncus nodosus

knotted rush
PMJUN01210
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Juncus regelii

Regel's rush
PMJUN012D0
Fed: None
State: None
RANK: G4?/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Juncus supiniformis

hair-leaved rush
PMJUN012R0
Fed: None
State: None
RANK: G5/S2.2?
CNPS List: 2
Records in CNDDb: Yes

Kobresia bellardii

seep kobresia
PMCYP0F050
Fed: None
State: None
RANK: G5?/S1.3
CNPS List: 2
Records in CNDDb: Yes

Koelerlinia spinosa ssp. tenuispina

crown-of-thorns
PDCPP05012
Fed: None
State: None
RANK: G4T4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Lasthenia burkei

Burke's goldfields
PDAST5L010
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Lasthenia conjugens

Contra Costa goldfields
PDAST5L040
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Lasthenia ferrisiae

Ferris's goldfields
PDAST5L070
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Lasthenia glabrata ssp. coulteri

Coulter's goldfields
PDAST5L0A1
Fed: None
State: None
RANK: G4T3/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Lasthenia leptalea

Salinas Valley goldfields
PDAST5L0B0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Lasthenia macrantha ssp. bakeri

Baker's goldfields
PDAST5L0C4
Fed: None
State: None
RANK: G3T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Lasthenia macrantha ssp. macrantha

perennial goldfields
PDAST5L0C5
Fed: None
State: None
RANK: G3T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Lathyrus biflorus

two-flowered pea
PDFAB25180
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Lathyrus delnorticus

Del Norte pea
PDFAB25070
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Lathyrus glandulosus

sticky pea
PDFAB251A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Lathyrus japonicus

sand pea
PDFAB250C0
Fed: None
State: None
RANK: G5/S1.1
CNPS List: 2
Records in CNDDb: Yes

Lathyrus jepsonii* var. *jepsonii

Delta tule pea
PDFAB250D2
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Lathyrus palustris

marsh pea
PDFAB250P0
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Lathyrus rigidus

rigid pea
PDFAB250W0
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Lathyrus splendens

pride-of-California
PDFAB250Z0
Fed: None
State: None
RANK: G3G4/S3.3
CNPS List: 4
Records in CNDDb: No

Lathyrus sulphureus* var. *argillaceus

dubious pea
PDFAB25101
Fed: None
State: None
RANK: G5T1T2/S1S2
CNPS List: 3
Records in CNDDb: No

Lavatera assurgentiflora* ssp. *assurgentiflora

island mallow
PDMAL0N021
Fed: None
State: None
RANK: G2T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Lavatera assurgentiflora* ssp. *glabra

southern island mallow
PDMAL0N022
Fed: None
State: None
RANK: G2T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Layia carnosa

beach layia
PDAST5N010
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Layia discoidea

rayless layia
PDAST5N030
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Layia heterotricha

pale-yellow layia
PDAST5N070
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Layia jonesii

Jones's layia
PDAST5N090
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Layia leucopappa

Comanche Point layia
PDAST5N0A0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Layia munzii

Munz's tidy-tips
PDAST5N0B0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Layia septentrionalis

Colusa layia
PDAST5N0F0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Legenere limosa

legenere
PDCAM0C010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Lepechinia cardiophylla

heart-leaved pitcher sage
PDLAM0V020
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Lepechinia fragrans

fragrant pitcher sage
PDLAM0V030
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Lepechinia ganderi

Gander's pitcher sage
PDLAM0V040
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Lepidium flavum* var. *felipense

Borrego Valley pepper-grass
PDBRA1M0B1
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Lepidium jaredii* ssp. *albom

Panoche pepper-grass
PDBRA1M0G2
Fed: None
State: None
RANK: G1T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Lepidium jaredii* ssp. *jaredii

Jared's pepper-grass
PDBRA1M0G1
Fed: None
State: None
RANK: G1T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Lepidium latipes* var. *heckardii

Heckard's pepper-grass
PDBRA1M0K1
Fed: None
State: None
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Lepidium virginicum* var. *robinsonii

Robinson's pepper-grass
PDBRA1M114
Fed: None
State: None
RANK: G5T2?/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Leptodactylon californicum ssp. tomentosum

fuzzy prickly phlox
PDPLM08021
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Leptosiphon acicularis

bristly leptosiphon
PDPLM09010
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Leptosiphon ambiguus

serpentine leptosiphon
PDPLM09020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Leptosiphon croceus

coast yellow leptosiphon
PDPLM09170
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Leptosiphon floribundus ssp. hallii

Santa Rosa Mountains leptosiphon
PDPLM090J3
Fed: None
State: None
RANK: G4T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Leptosiphon grandiflorus

large-flowered leptosiphon
PDPLM090K0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Leptosiphon jepsonii

Jepson's leptosiphon
PDPLM09140
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Leptosiphon latisectus

broad-lobed leptosiphon
PDPLM09150
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Leptosiphon nuttallii ssp. howellii

Mt. Tedoc leptosiphon
PDPLM090V4
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Leptosiphon obanceolatus

Sierra Nevada leptosiphon
PDPLM090W0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Leptosiphon pygmaeus ssp. pygmaeus

pygmy leptosiphon
PDPLM09102
Fed: None
State: None
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Leptosiphon rattanii

Rattan's leptosiphon
PDPLM09110
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Leptosiphon rosaceus

rose leptosiphon
PDPLM09180
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Leptosiphon serrulatus

Madera leptosiphon
PDPLM09130
Fed: None
State: None
RANK: G1?/S1?
CNPS List: 1B
Records in CNDDb: Yes

Lesquerella kingii ssp. bernardina

San Bernardino Mountains bladderpod
PDBRA1N0W1
Fed: Endangered
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Lessingia arachnoidea

Crystal Springs lessingia
PDAST5S0C0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Lessingia germanorum

San Francisco lessingia
PDAST5S010
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Lessingia glandulifera var. tomentosa

Warner Springs lessingia
PDAST5S022
Fed: None
State: None
RANK: G4?T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Lessingia hololeuca

woolly-headed lessingia
PDAST5S030
Fed: None
State: None
RANK: G3?/S3
CNPS List: 3
Records in CNDDb: No

Lessingia micradenia var. glabrata

smooth lessingia
PDAST5S062
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Lessingia micradenia var. micradenia

Tamalpais lessingia
PDAST5S063
Fed: None
State: None
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Lessingia occidentalis

western lessingia
PDAST15010
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Lessingia tenuis

spring lessingia
PDAST5S0B0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Lewisia brachycalyx

short-sepaled lewisia
PDPOR04010
Fed: None
State: None
RANK: G4G5/S3.2
CNPS List: 2
Records in CNDDb: Yes

Lewisia cantelovii

Cantelow's lewisia
PDPOR04020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Lewisia congdonii

Congdon's lewisia
PDPOR04040
Fed: None
State: Rare
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Lewisia cotyledon var. heckneri

Heckner's lewisia
PDPOR04052
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lewisia cotyledon var. howellii

Howell's lewisia
PDPOR04053
Fed: None
State: None
RANK: G4T4Q/S3?
CNPS List: 3
Records in CNDDDB: No

Lewisia disepala

Yosemite lewisia
PDPOR04060
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lewisia kelloggii ssp. hutchisonii

Hutchison's lewisia
PDPOR04071
Fed: None
State: None
RANK: G4T2T3/S2S3.
CNPS List: 3
Records in CNDDDB: No

Lewisia longipetala

long-petaled lewisia
PDPOR040K0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lewisia oppositifolia

opposite-leaved lewisia
PDPOR040B0
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Lewisia serrata

saw-toothed lewisia
PDPOR040E0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lewisia stebbinsii

Stebbins's lewisia
PDPOR040G0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Leymus salinus ssp. mojavnensis

hillside wheat grass
PMPOA6P013
Fed: None
State: None
RANK: G5T3?/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Lilaeopsis masonii

Mason's lilaeopsis
PDAPI19030
Fed: None
State: Rare
RANK: G3/S3.1
CNPS List: 1B
Records in CNDDDB: Yes

Lilium bolanderi

Bolander's lily
PMLIL1A010
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDDB: No

Lilium humboldtii ssp. humboldtii

Humboldt lily
PMLIL1A071
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Lilium humboldtii ssp. ocellatum

ocellated humboldt lily
PMLIL1A072
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Lilium kelloggii

Kellogg's lily
PMLIL1A0A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Lilium maritimum

coast lily
PMLIL1A0C0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Lilium occidentale

western lily
PMLIL1A0G0
Fed: Endangered
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Lilium pardalinum ssp. pitkinense

Pitkin Marsh lily
PMLIL1A0H3
Fed: Endangered
State: Endangered
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lilium pardalinum ssp. vollmeri

Vollmer's lily
PMLIL1A0H2
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDDB: No

Lilium pardalinum ssp. wigginsii

Wiggins' lily
PMLIL1A0S0
Fed: None
State: None
RANK: G4T4/S3.3
CNPS List: 4
Records in CNDDDB: No

Lilium parryi

lemon lily
PMLIL1A0J0
Fed: None
State: None
RANK: G3/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Lilium rubescens

redwood lily
PMLIL1A0N0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Lilium washingtonianum ssp. purpurascens

purple-flowered Washington lily
PMLIL1A0R2
Fed: None
State: None
RANK: G4T4/S3.3
CNPS List: 4
Records in CNDDDB: No

Limnanthes bakeri

Baker's meadowfoam
PDLIM02020
Fed: None
State: Rare
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Limnanthes douglasii*
*ssp. sulphurea***

Point Reyes
meadowfoam
PDLIM02038
Fed: None
State: Endangered
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Limnanthes floccosa*
*ssp. bellingeriana***

Bellinger's meadowfoam
PDLIM02041
Fed: None
State: None
RANK: G4T2/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Limnanthes floccosa*
*ssp. californica***

Butte County
meadowfoam
PDLIM02042
Fed: Endangered
State: Endangered
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Limnanthes floccosa*
*ssp. floccosa***

woolly meadowfoam
PDLIM02043
Fed: None
State: None
RANK: G4T4/S3.2
CNPS List: 4
Records in CNDDDB: No

***Limnanthes gracilis* *ssp.*
*parishii***

Parish's meadowfoam
PDLIM02052
Fed: None
State: Endangered
RANK: G3T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Limnanthes vinculans

Sebastopol
meadowfoam
PDLIM02090
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Limosella subulata

Delta mudwort
PDSCR10050
Fed: None
State: None
RANK: G4?Q/S2.1
CNPS List: 2
Records in CNDDDB: Yes

Linanthus bellus

desert beauty
PDPLM09070
Fed: None
State: None
RANK: G2G3/S2.3?
CNPS List: 2
Records in CNDDDB: Yes

Linanthus concinnus

San Gabriel linanthus
PDPLM090D0
Fed: None
State: None
RANK: G2?/S2?
CNPS List: 1B
Records in CNDDDB: Yes

Linanthus jaegeri

San Jacinto prickly phlox
PDPLM08030
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Linanthus killipii

Baldwin Lake linanthus
PDPLM090N0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Linanthus maculatus

Little San Bernardino
Mtns. linanthus
PDPLM041Y0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Linanthus orcuttii

Orcutt's linanthus
PDPLM090X0
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Listera cordata

heart-leaved twayblade
PMORC1N060
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDDB: No

Lithophragma maximum

San Clemente Island
woodland star
PDSAX0M070
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lithospermum incisum

plains stoneseed
PDBOR0L070
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

***Loeflingia squarrosa*
*var. artemisiarum***

sagebrush loeflingia
PDCAR0E011
Fed: None
State: None
RANK: G5T2T3/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Lomatium congdonii

Congdon's lomatium
PDAP1B0B0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lomatium engelmannii

Engelmann's lomatium
PDAP1B0K0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Lomatium*
foeniculaceum *ssp.*
*inyoense***

Inyo lomatium
PDAP1B0M4
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Lomatium*
foeniculaceum *var.*
*macdougalii***

Macdougal's lomatium
PDAP1B0M5
Fed: None
State: None
RANK: G5T4T5/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Lomatium grayi

Gray's lomatium
PDAP1B0Q0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Lomatium hendersonii

Henderson's lomatium
PDAP1B0T0
Fed: None
State: None
RANK: G5?/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Lomatium hooveri

Hoover's lomatium
PDAP1B2K0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Lomatium howellii

Howell's lomatium
PDAP1B0U0
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Lomatium insulare

San Nicolas Island
lomatium
PDAPI1B0W0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Lomatium martindalei

Coast Range lomatium
PDAPI1B140
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Lomatium observatorium

Mt. Hamilton lomatium
PDAPI1B2J0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Lomatium parvifolium

small-leaved lomatium
PDAPI1B1F0
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 4
Records in CNDDDB: No

Lomatium peckianum

Peck's lomatium
PDAPI1B1G0
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Lomatium ravenii

Raven's lomatium
PDAPI1B1L0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 2
Records in CNDDDB: Yes

Lomatium repostum

Napa lomatium
PDAPI1B1M0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Lomatium rigidum

stiff lomatium
PDAPI1B1N0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Lomatium shevockii

Owens Peak lomatium
PDAPI1B2C0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Lomatium stebbinsii

Stebbins's lomatium
PDAPI1B1V0
Fed: None
State: None
RANK: G3/S3.1
CNPS List: 1B
Records in CNDDDB: Yes

Lomatium tracyi

Tracy's lomatium
PDAPI1B1Y0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Lonicera subspicata var. subspicata

Santa Barbara
honeysuckle
PDCPR030R3
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lotus argophyllus var. adsurgens

San Clemente Island
bird's-foot trefoil
PDFAB2A041
Fed: None
State: Endangered
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lotus argophyllus var. niveus

Santa Cruz Island bird's-
foot trefoil
PDFAB2A048
Fed: None
State: Endangered
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDDB: Yes

Lotus argyraeus var. multicaulis

scrub lotus
PDFAB2A052
Fed: None
State: None
RANK: G4?T1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Lotus argyraeus var. notitius

Providence Mountains
lotus
PDFAB2A053
Fed: None
State: None
RANK: G4?T1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Lotus crassifolius var. otayensis

Otay Mountain lotus
PDFAB2A092
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lotus dendroideus var. dendroideus

island broom
PDFAB2A1G1
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Lotus dendroideus var. traskiae

San Clemente Island
lotus
PDFAB2A1G2
Fed: Endangered
State: Endangered
RANK: G4T2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Lotus dendroideus var. veatchii

San Miguel Island
deerweed
PDFAB2A1G3
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Lotus haydonii

pygmy lotus
PDFAB2A0H0
Fed: None
State: None
RANK: G3/S2.3?
CNPS List: 1B
Records in CNDDDB: Yes

Lotus nuttallianus

Nuttall's lotus
PDFAB2A0V0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lotus oblongifolius var. cupreus

copper-flowered bird's-
foot trefoil
PDFAB2A0W1
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Lotus rubriflorus

red-flowered lotus
PDFAB2A150
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lotus yollabolliensis

Yolla Bolly Mtns. bird's-
foot trefoil
PDFAB2A1F0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Lupinus albifrons* var.
*abramsii***

Abram's lupine
PDFAB2B010
Fed: None
State: None
RANK: G1Q/S1.2
CNPS List: 3
Records in CNDDb: No

Lupinus antoninus

Anthony Peak lupine
PDFAB2B0C0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Lupinus cervinus

Santa Lucia lupine
PDFAB2B0X0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Lupinus citrinus* var.
*citrinus***

orange lupine
PDFAB2B103
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Lupinus citrinus* var.
*deflexus***

Mariposa lupine
PDFAB2B102
Fed: None
State: Threatened
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Lupinus constancei

The Lassics lupine
PDFAB2B490
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Lupinus croceus* var.
*pilosellus***

saffron-flowered lupine
PDFAB2B162
Fed: None
State: None
RANK: G3?T3/S3.3
CNPS List: 4
Records in CNDDb: No

Lupinus dalesiae

Quincy lupine
PDFAB2B1A0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Lupinus duranii

Mono Lake lupine
PDFAB2B1E0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Lupinus elatus

silky lupine
PDFAB2B1F0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Lupinus elmeri

South Fork Mtn. lupine
PDFAB2B1G0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Lupinus excubitus* var.
*johnstonii***

interior bush lupine
PDFAB2B1J4
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

***Lupinus excubitus* var.
*medius***

Mountain Springs bush
lupine
PDFAB2B1J5
Fed: None
State: None
RANK: G4T2T3/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Lupinus eximius

San Mateo tree lupine
PDFAB2B0E2
Fed: None
State: None
RANK: G2Q/S2.2
CNPS List: 3
Records in CNDDb: No

Lupinus gracilentus

slender lupine
PDFAB2B1R0
Fed: None
State: None
RANK: G2/S2.3?
CNPS List: 1B
Records in CNDDb: Yes

Lupinus guadalupensis

Guadalupe Island lupine
PDFAB2B1T0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Lupinus holmgrenianus

Holmgren's lupine
PDFAB2B1Y0
Fed: None
State: None
RANK: G2G3/S2.3
CNPS List: 2
Records in CNDDb: Yes

Lupinus lapidicola

Mt. Eddy lupine
PDFAB2B280
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Lupinus latifolius* var.
*barbatus***

bearded lupine
PDFAB2B29H
Fed: None
State: None
RANK: G5T1T2/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Lupinus lepidus* var.
*culbertsonii***

Hockett Meadows lupine
PDFAB2B171
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

***Lupinus lepidus* var.
*utahensis***

stemless lupine
PDFAB2B0V2
Fed: None
State: None
RANK: G5T5?/S3.3
CNPS List: 4
Records in CNDDb: No

Lupinus ludovicianus

San Luis Obispo County
lupine
PDFAB2B2G0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Lupinus magnificus* var.
*glarecola***

Coso Mountains lupine
PDFAB2B2K1
Fed: None
State: None
RANK: G3T3/S3.3
CNPS List: 4
Records in CNDDb: No

***Lupinus magnificus* var.
*hesperius***

Mcgee Meadows lupine
PDFAB2B2K2
Fed: None
State: None
RANK: G3T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Lupinus magnificus* var. *magnificus

Panamint Mountains lupine
PDFAB2B2K3
Fed: None
State: None
RANK: G3TH/SH
CNPS List: 1B
Records in CNDDDB: Yes

Lupinus milo-bakeri

Milo Baker's lupine
PDFAB2B4E0
Fed: None
State: Threatened
RANK: G1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lupinus nevadensis

Nevada lupine
PDFAB2B500
Fed: None
State: None
RANK: G3G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Lupinus nipomensis

Nipomo Mesa lupine
PDFAB2B111
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lupinus padre-crowleyi

Father Crowley's lupine
PDFAB2B2Z0
Fed: None
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Lupinus peirsonii

Peirson's lupine
PDFAB2B330
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Lupinus pusillus* var. *intermontanus

intermontane lupine
PDFAB2B3B1
Fed: None
State: None
RANK: G5T5?/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Lupinus sericatus

Cobb Mountain lupine
PDFAB2B3J0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lupinus spectabilis

shaggyhair lupine
PDFAB2B3P0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lupinus tidestromii

Tidestrom's lupine
PDFAB2B3Y0
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Lupinus tracyi

Tracy's lupine
PDFAB2B3Z0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Lupinus uncialis

lilliput lupine
PDFAB2B410
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Lycium brevipes* var. *hassei

Santa Catalina Island desert-thorn
PDSOL0G0N0
Fed: None
State: None
RANK: G1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Lycium californicum

California box-thorn
PDSOL0G050
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDDB: No

Lycium parishii

Parish's desert-thorn
PDSOL0G0D0
Fed: None
State: None
RANK: G3?/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Lycium verrucosum

San Nicolas Island desert-thorn
PDSOL0G0M0
Fed: None
State: None
RANK: GXQ/SX
CNPS List: 1A
Records in CNDDDB: Yes

Lycopodiella inundata

bog club-moss
PPLYC03060
Fed: None
State: None
RANK: G5/S1?
CNPS List: 2
Records in CNDDDB: Yes

Lycopodium clavatum

running-pine
PPLYC01080
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Lycopus uniflorus

northern bugleweed
PDLAM0X080
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Lycurus phleoides* var. *phleoides

wolftail
PMPOA3W011
Fed: None
State: None
RANK: G5T4?Q/S1?
CNPS List: 2
Records in CNDDDB: Yes

Lyonothamnus floribundus* ssp. *aspleniifolius

Santa Cruz Island ironwood
PDROS12011
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Lyonothamnus floribundus* ssp. *floribundus

Santa Catalina Island ironwood
PDROS12012
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Lyrocarpa coulteri* var. *palmeri

Coulter's lyrepod
PDBRA1R012
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDDB: No

Machaeranthera asteroides* var. *lagunensis

Mount Laguna aster
PDAST64131
Fed: None
State: Rare
RANK: G5T2T3/S1.1
CNPS List: 2
Records in CNDDDB: Yes

***Machaeranthera
canescens var. ziegleri***

Ziegler's aster
PDAST640B2
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Machaeranthera gracilis

annual bristleweed
PDAST640E0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Machaeranthera juncea

rush-like bristleweed
PDAST641A0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Madia radiata

showy madia
PDAST650E0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Mahonia sonnei

Truckee barberry
PDBER060F0
Fed: Delisted
State: Endangered
RANK: G1Q/S?
CNPS List:
Records in CNDDDB: No

Malacothamnus abbottii

Abbott's bush mallow
PDMAL0Q010
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Malacothamnus
aboriginum***

Indian Valley bush
mallow
PDMAL0Q020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Malacothamnus arcuatus

arcuate bush mallow
PDMAL0Q0E0
Fed: None
State: None
RANK: G2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Malacothamnus
clementinus***

San Clemente Island
bush mallow
PDMAL0Q030
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Malacothamnus
davidsonii***

Davidson's bush mallow
PDMAL0Q040
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Malacothamnus
fasciculatus var.
nesioticus***

Santa Cruz Island bush
mallow
PDMAL0Q061
Fed: Endangered
State: Endangered
RANK: G4T1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Malacothamnus gracilis

slender bush mallow
PDMAL0Q0J0
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Malacothamnus hallii

Hall's bush mallow
PDMAL0Q0F0
Fed: None
State: None
RANK: G1Q/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Malacothamnus helleri

Heller's bush mallow
PDMAL0Q0G0
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Malacothamnus jonesii

Jones's bush mallow
PDMAL0Q090
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Malacothamnus
mendocinensis***

Mendocino bush mallow
PDMAL0Q0D0
Fed: None
State: None
RANK: GXQ/SX
CNPS List: 1A
Records in CNDDDB: Yes

Malacothamnus niveus

San Luis Obispo County
bush mallow
PDMAL0Q0H0
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDDB: No

***Malacothamnus palmeri
var. involucratus***

Carmel Valley bush
mallow
PDMAL0Q0B1
Fed: None
State: None
RANK: G3T2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Malacothamnus palmeri
var. lucianus***

Arroyo Seco bush
mallow
PDMAL0Q0B2
Fed: None
State: None
RANK: G3T1Q/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Malacothamnus palmeri
var. palmeri***

Santa Lucia bush mallow
PDMAL0Q0B5
Fed: None
State: None
RANK: G3T2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Malacothamnus parishii

Parish's bush mallow
PDMAL0Q0C0
Fed: None
State: None
RANK: GHQ/SH
CNPS List: 1A
Records in CNDDDB: Yes

***Malacothrix foliosa ssp.
crispifolia***

wavy-leaved malacothrix
PDAST66066
Fed: None
State: None
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Malacothrix foliosa ssp.
foliosa***

leafy malacothrix
PDAST66064
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Malacothrix foliosa ssp.
philbrickii***

Philbrick's malacothrix
PDAST66065
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Malacothrix foliosa* ssp. *polycephala

many-headed
malacothrix
PDAST66067
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Malacothrix incana

dunedelion
PDAST66070
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Malacothrix indecora

Santa Cruz Island
malacothrix
PDAST660J0
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Malacothrix junakii

Junak's malcorthrix
PDAST660Q0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Malacothrix phaeocarpa

dusky-fruited malacothrix
PDAST66090
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Malacothrix saxatilis*
var. *arachnoidea***

Carmel Valley
malacothrix
PDAST660C2
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Malacothrix saxatilis*
var. *saxatilis***

cliff malacothrix
PDAST660C5
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Malacothrix squalida

island malacothrix
PDAST660K0
Fed: Endangered
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Malaxis monophyllos*
ssp. *brachypoda***

adder's-mouth
PMORC1R010
Fed: None
State: None
RANK: G4?T4/S1.1
CNPS List: 2
Records in CNDDDB: Yes

Malperia tenuis

brown turbans
PDAST67010
Fed: None
State: None
RANK: G4?T4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Marina orcuttii* var. *orcuttii

California marina
PDFAB2F031
Fed: None
State: None
RANK: G2G3T1T2/S1.
CNPS List: 1B
Records in CNDDDB: Yes

Matelea parvifolia

spearleaf
PDASC0A0J0
Fed: None
State: None
RANK: G5?/S2.2
CNPS List: 2
Records in CNDDDB: Yes

***Maurandya*
antirrhiniflora ssp. *antirrhiniflora***

violet twining snapdragon
PDSCR2M011
Fed: None
State: None
RANK: G4?T3?/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Maurandya petrophila

rock lady
PDSCR2J010
Fed: None
State: Rare
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Meconella oregana

Oregon meconella
PDPAP0G030
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Melica spectabilis

purple onion grass
PMPOA3X0G0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Mentzelia eremophila

solitary blazing star
PDLOA030G0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Mentzelia hirsutissima

hairy stickleaf
PDLOA030K0
Fed: None
State: None
RANK: G3?/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Mentzelia torreyi

Torrey's blazing star
PDLOA031S0
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Mentzelia tridentata

creamy blazing star
PDLOA031U0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Mertensia bella

Oregon lungwort
PDBOR0N040
Fed: None
State: None
RANK: G4/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Mertensia cusickii

Toiyabe bluebells
PDBOR0N0M0
Fed: None
State: None
RANK: G4?/S2.2?
CNPS List: 2
Records in CNDDDB: Yes

Mertensia longiflora

long bluebells
PDBOR0N0D0
Fed: None
State: None
RANK: G4G5/S1.2
CNPS List: 2
Records in CNDDDB: Yes

***Mertensia oblongifolia*
var. *amoena***

beautiful bluebells
PDBOR0N0G1
Fed: None
State: None
RANK: G5T5/S2.2
CNPS List: 2
Records in CNDDDB: Yes

***Mertensia oblongifolia*
*var. oblongifolia***

sagebrush bluebells
PDBOR0N0G2
Fed: None
State: None
RANK: G5T2/S2.2?
CNPS List: 2
Records in CNDDb: Yes

Micropus amphibolus

Mt. Diablo cottonweed
PDAST6D030
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 3
Records in CNDDb: No

Microseris borealis

northern microseris
PDAST6E030
Fed: None
State: None
RANK: G4?/S1.1
CNPS List: 2
Records in CNDDb: Yes

***Microseris douglasii* var.
*platycarpa***

small-flowered
microseris
PDAST6E062
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDb: No

Microseris paludosa

marsh microseris
PDAST6E0D0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Microseris sylvatica

sylvan microseris
PDAST6E0E0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Mimulus acutidens

Kings River
monkeyflower
PDSCR1B010
Fed: None
State: None
RANK: G2?Q/S2?
CNPS List: 3
Records in CNDDb: No

Mimulus aridus

low bush monkeyflower
PDSCR22040
Fed: None
State: None
RANK: G3G4/S3.3
CNPS List: 4
Records in CNDDb: No

Mimulus brandegeei

Santa Cruz Island
monkeyflower
PDSCR1B0K0
Fed: None
State: None
RANK: GXQ/SX
CNPS List: 1A
Records in CNDDb: Yes

Mimulus clevelandii

Cleveland's bush
monkeyflower
PDSCR22010
Fed: None
State: None
RANK: G3G4/S3.2
CNPS List: 4
Records in CNDDb: No

Mimulus cusickii

Cusick's monkeyflower
PDSCR1B0V0
Fed: None
State: None
RANK: G4G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Mimulus diffusus

Palomar monkeyflower
PDSCR1B0Z0
Fed: None
State: None
RANK: G4Q/S3.3
CNPS List: 4
Records in CNDDb: No

Mimulus evanescens

ephemeral monkeyflower
PDSCR1B370
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Mimulus exiguus

San Bernardino
Mountains monkeyflower
PDSCR1B140
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Mimulus filicaulis

slender-stemmed
monkeyflower
PDSCR1B150
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Mimulus flemingii

island bush
monkeyflower
PDSCR1B320
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDb: No

***Mimulus glabratus* ssp.
*utahensis***

Utah monkeyflower
PDSCR1B1A6
Fed: None
State: None
RANK: G5T5?/S1.1
CNPS List: 2
Records in CNDDb: Yes

Mimulus glaucescens

shield-bracted
monkeyflower
PDSCR1B1B0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Mimulus gracilipes

slender-stalked
monkeyflower
PDSCR1B1C0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Mimulus grayi

Gray's monkeyflower
PDSCR1B1D0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Mimulus inconspicuus

small-flowered
monkeyflower
PDSCR1B1F0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Mimulus johnstonii

Johnston's monkeyflower
PDSCR1B1H0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Mimulus laciniatus

cut-leaved monkeyflower
PDSCR1B1L0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Mimulus microphyllus

small-leaved
monkeyflower
PDSCR1B300
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDb: No

Mimulus mohavensis

Mojave monkeyflower
PDSCR1B1V0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Mimulus norrisii

Kaweah monkeyflower
PDSCR1B2Y0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Mimulus nudatus

bare monkeyflower
PDSCR1B200
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Mimulus parryi

Parry's monkeyflower
PDSCR1B230
Fed: None
State: None
RANK: G3G4/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Mimulus pictus

calico monkeyflower
PDSCR1B240
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Mimulus pulchellus

pansy monkeyflower
PDSCR1B280
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 1B
Records in CNDDDB: Yes

Mimulus purpureus

purple monkeyflower
PDSCR1B2B0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Mimulus pygmaeus

Egg Lake monkeyflower
PDSCR1B2C0
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDDB: No

Mimulus rattanii ssp. decurtatus

Santa Cruz County monkeyflower
PDSCR1B2D2
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Mimulus rupicola

Death Valley monkeyflower
PDSCR1B2H0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Mimulus shevockii

Kelso Creek monkeyflower
PDSCR1B2Z0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Mimulus subsecundus

one-sided monkeyflower
PDSCR1B2K0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Mimulus traskiae

Santa Catalina Island monkeyflower
PDSCR1B2P0
Fed: None
State: None
RANK: GX/SX
CNPS List: 1A
Records in CNDDDB: Yes

Mimulus whipplei

Whipple's monkeyflower
PDSCR1B2U0
Fed: None
State: None
RANK: GXQ/SX
CNPS List: 1A
Records in CNDDDB: Yes

Minuartia decumbens

The lassics sandwort
PDCAR0G0Y0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Minuartia howellii

Howell's sandwort
PDCAR0G0F0
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Minuartia obtusiloba

alpine sandwort
PDCAR0G0N0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Minuartia rosei

peanut sandwort
PDCAR0G0R0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Minuartia stolonifera

Scott Mountain sandwort
PDCAR0G110
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Mirabilis coccinea

red four o'clock
PDNYC0A090
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Mirabilis greenei

Greene's four o'clock
PDNYC0A0N0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Mirabilis tenuiloba

slender-lobed four o'clock
PDNYC0A150
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Mitella caulescens

leafy-stemmed mitrewort
PDSAX0N020
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Monarda pectinata

plains bee balm
PDLAM170A0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Monardella antonina ssp. antonina

San Antonio Hills monardella
PDLAM18011
Fed: None
State: None
RANK: G4T3Q/S3?
CNPS List: 3
Records in CNDDDB: No

Monardella antonina ssp. benitensis

San Benito monardella
PDLAM18012
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Monardella beneolens

sweet-smelling
monardella

PDLAM180U0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Monardella candicans

Sierra monardella

PDLAM18050
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Monardella cinerea

gray monardella

PDLAM18060
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Monardella crispa

crisp monardella

PDLAM18070
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Monardella douglasii*
*ssp. venosa***

veiny monardella

PDLAM18082
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Monardella follettii

Follett's monardella

PDLAM180W0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Monardella frutescens

San Luis Obispo
monardella

PDLAM180X0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Monardella hypoleuca*
*ssp. lanata***

felt-leaved monardella

PDLAM180A2
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Monardella leucocephala

Merced monardella

PDLAM180C0
Fed: None
State: None
RANK: GH/SH
CNPS List: 1A
Records in CNDDb: Yes

***Monardella linoides* *ssp.*
*oblonga***

flax-like monardella

PDLAM180D2
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Monardella macrantha*
*ssp. hallii***

Hall's monardella

PDLAM180E1
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 1B
Records in CNDDb: Yes

***Monardella nana* *ssp.*
*leptosiphon***

San Felipe monardella

PDLAM180F2
Fed: None
State: None
RANK: G4G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Monardella palmeri

Palmer's monardella

PDLAM180H0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Monardella pringlei

Pringle's monardella

PDLAM180J0
Fed: None
State: None
RANK: GX/SX
CNPS List: 1A
Records in CNDDb: Yes

Monardella robisonii

Robison's monardella

PDLAM180K0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Monardella stebbinsii

Stebbins's monardella

PDLAM180L0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Monardella stoneana

Jennifer's monardella

PDLAM180Y0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Monardella undulata

curly-leaved monardella

PDLAM180N0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Monardella villosa* *ssp.*
*globosa***

robust monardella

PDLAM180P7
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Monardella viminea

willowy monardella

PDLAM180D4
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Monardella viridis* *ssp.*
*saxicola***

rock monardella

PDLAM180Q1
Fed: None
State: None
RANK: G3?T3/S3.2
CNPS List: 4
Records in CNDDb: No

***Monardella viridis* *ssp.*
*viridis***

green monardella

PDLAM180Q2
Fed: None
State: None
RANK: G3?T3/S3.3
CNPS List: 4
Records in CNDDb: No

Moneses uniflora

woodnymph

PDPYR02010
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Monolopia congdonii

San Joaquin
woollythreads

PDASTA8010
Fed: Endangered
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Monotropa uniflora

Indian-pipe

PDMON03030
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Montia howellii

Howell's montia
PDPOR05070
Fed: None
State: None
RANK: G3G4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Mortonia utahensis

Utah mortonia
PDCEL09030
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDb: No

Mucronea californica

California spineflower
PDPGN0F010
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 4
Records in CNDDb: No

Muhlenbergia appressa

appressed muhly
PMPOA48020
Fed: None
State: None
RANK: G4/S3?
CNPS List: 2
Records in CNDDb: Yes

Muhlenbergia arsenei

tough muhly
PMPOA48060
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDb: Yes

Muhlenbergia californica

California muhly
PMPOA480A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Muhlenbergia fragilis

delicate muhly
PMPOA480Q0
Fed: None
State: None
RANK: G5?/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Muhlenbergia jonesii

Jones's muhly
PMPOA480X0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Muhlenbergia pauciflora

few-flowered muhly
PMPOA48170
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Muilla clevelandii

San Diego goldenstar
PMLIL1H010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Muilla coronata

crowned muilla
PMLIL1H020
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 4
Records in CNDDb: No

Munroa squarrosa

false buffalo-grass
PMPOA49010
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDb: Yes

Myosurus minimus ssp. apus

little mousetail
PDRAN0H031
Fed: None
State: None
RANK: G5T2Q/S2.2
CNPS List: 3
Records in CNDDb: Yes

Nama dichotomum var. dichotomum

forked purple mat
PDHYD0A061
Fed: None
State: None
RANK: G4T4?/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Nama stenocarpum

mud nama
PDHYD0A0H0
Fed: None
State: None
RANK: G4G5/S1S2
CNPS List: 2
Records in CNDDb: Yes

Navarretia cotulifolia

cotula navarretia
PDPLM0C040
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Navarretia eriocephala

hoary navarretia
PDPLM0C060
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Navarretia fossalis

spreading navarretia
PDPLM0C080
Fed: Threatened
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Navarretia heterandra

Tehama navarretia
PDPLM0C0A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Navarretia jaredii

Paso Robles navarretia
PDPLM0C0Y0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Navarretia jepsonii

Jepson's navarretia
PDPLM0C0D0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Navarretia leucocephala ssp. bakeri

Baker's navarretia
PDPLM0C0E1
Fed: None
State: None
RANK: G4T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Navarretia leucocephala ssp. pauciflora

few-flowered navarretia
PDPLM0C0E4
Fed: Endangered
State: Threatened
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Navarretia leucocephala ssp. plieantha

many-flowered navarretia
PDPLM0C0E5
Fed: Endangered
State: Endangered
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Navarretia myersii ssp. deminuta

small pincushion
navarretia
PDPLM0C0X2
Fed: None
State: None
RANK: G1T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Navarretia myersii ssp. myersii

pincushion navarretia
PDPLM0C0X1
Fed: None
State: None
RANK: G1T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Navarretia nigelliformis*
*ssp. radians***

shining navarretia
PDPLM0C0J2
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Navarretia peninsularis

Baja navarretia
PDPLM0C0L0
Fed: None
State: None
RANK: G3?/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Navarretia prolifera* ssp.
*lutea***

yellow bur navarretia
PDPLM0C0N1
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Navarretia prostrata

prostrate navarretia
PDPLM0C0Q0
Fed: None
State: None
RANK: G2?/S2.1?
CNPS List: 1B
Records in CNDDb: Yes

Navarretia rosulata

Marin County navarretia
PDPLM0C0Z0
Fed: None
State: None
RANK: G2?/S2?
CNPS List: 1B
Records in CNDDb: Yes

Navarretia setiloba

Piute Mountains
navarretia
PDPLM0C0S0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Navarretia sinistra* ssp.
*pinnatisecta***

pinnate-leaved navarretia
PDPLM04211
Fed: None
State: None
RANK: G4G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Navarretia subuligera

awl-leaved navarretia
PDPLM0C0U0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

***Nemacaulis denudata*
var. *denudata***

coast woolly-heads
PDPGN0G011
Fed: None
State: None
RANK: G3G4T3?/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Nemacaulis denudata*
var. *gracilis***

slender woolly-heads
PDPGN0G012
Fed: None
State: None
RANK: G3G4T3?/S2S3
CNPS List: 2
Records in CNDDb: Yes

Nemacladus gracilis

slender nemacladus
PDCAM0F030
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Nemacladus*
*twisselmannii***

Twisselmann's
nemacladus
PDCAM0F0D0
Fed: None
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Nemophila breviflora

Great Basin nemophila
PDHYD0B020
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

***Nemophila parviflora*
var. *quercifolia***

oak-leaved nemophila
PDHYD0B073
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDb: No

Neostapfia colusana

Colusa grass
PMPOA4C010
Fed: Threatened
State: Endangered
RANK: G3/S3.1
CNPS List: 1B
Records in CNDDb: Yes

Neviusia cliftonii

Shasta snow-wreath
PDROS14020
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Nitrophila mohavensis

Amargosa nitrophila
PDCHE0G010
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Nolina cismontana

chaparral nolina
PMAGA080E0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Nolina interrata

Dehesa nolina
PMAGA08070
Fed: None
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Oenothera caespitosa*
ssp. *crinita***

caespitose evening-
primrose
PDONA0C063
Fed: None
State: None
RANK: G5T4T5/S3.3
CNPS List: 4
Records in CNDDb: No

***Oenothera californica*
ssp. *eurekensis***

Eureka Dunes evening-
primrose
PDONA0C071
Fed: Endangered
State: Rare
RANK: G4?T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Oenothera deltoidea*
ssp. *howellii***

Antioch Dunes evening-
primrose
PDONA0C0B4
Fed: Endangered
State: Endangered
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Oenothera wolfii

Wolf's evening-primrose
PDONA0C1K0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Ophioglossum*
*californicum***

California adder's-tongue
PPOPH020G0
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

Ophioglossum pusillum

northern adder's-tongue
PPOPH020F0
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

***Opuntia basilaris* var.
*brachyclada***

short-joint beavertail
PDCAC0D053
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Opuntia basilaris* var.
*treleasei***

Bakersfield cactus
PDCAC0D055
Fed: Endangered
State: Endangered
RANK: G5T2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Opuntia californica* var.
*californica***

snake cholla
PDCAC0D2Y1
Fed: None
State: None
RANK: G3T2/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Opuntia curvospina

curved-spine beavertail
PDCAC0D270
Fed: None
State: None
RANK: G3G4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Opuntia fragilis

brittle prickly-pear
PDCAC0D0H0
Fed: None
State: None
RANK: G4G5/SH
CNPS List: 2
Records in CNDDDB: Yes

Opuntia munzii

Munz's cholla
PDCAC0D0V0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Opuntia pulchella

beautiful cholla
PDCAC0D120
Fed: None
State: None
RANK: G4/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Opuntia wigginsii

Wiggins's cholla
PDCAC0D1P0
Fed: None
State: None
RANK: G3?Q/S1.2?
CNPS List: 3
Records in CNDDDB: Yes

Opuntia wolfii

Wolf's cholla
PDCAC0D2R0
Fed: None
State: None
RANK: G4?/S3.3
CNPS List: 4
Records in CNDDDB: No

Orcuttia californica

California Orcutt grass
PMPOA4G010
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Orcuttia inaequalis

San Joaquin Valley
orcutt grass
PMPOA4G060
Fed: Threatened
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Orcuttia pilosa

hairy orcutt grass
PMPOA4G040
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Orcuttia tenuis

slender orcutt grass
PMPOA4G050
Fed: Threatened
State: Endangered
RANK: G3/S3.1
CNPS List: 1B
Records in CNDDDB: Yes

Orcuttia viscida

Sacramento orcutt grass
PMPOA4G070
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Oreonana purpurascens

purple mountain-parsley
PDAP1G020
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Oreonana vestita

woolly mountain-parsley
PDAP1G030
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 1B
Records in CNDDDB: Yes

Oreostemma elatum

tall alpine-aster
PDAST0T510
Fed: None
State: None
RANK: G2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Ornithostaphylos*
*oppositifolia***

Baja California birdbush
PDERI0W010
Fed: None
State: Endangered
RANK: G4/S1.1
CNPS List: 2
Records in CNDDDB: Yes

***Orobanche ludoviciana*
var. *arenosa***

Suksdorf's broom-rape
PDORO04071
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

***Orobanche parishii* ssp.
*brachyloba***

short-lobed broomrape
PDORO040A2
Fed: None
State: None
RANK: G4?T3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Orobanche valida* ssp.
*howellii***

Howell's broomrape
PDORO040G1
Fed: None
State: None
RANK: G3T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Orobanche valida* ssp.
*valida***

Rock Creek broomrape
PDORO040G2
Fed: None
State: None
RANK: G3T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Orthocarpus cuspidatus*
ssp. *cuspidatus***

Siskiyou Mountains
orthocarpus
PDSCR1H081
Fed: None
State: None
RANK: G5T3T4/S3.3
CNPS List: 4
Records in CNDDDB: No

***Orthocarpus*
*pachystachyus***

Shasta orthocarpus
PDSCR1H0L0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Oryctes nevadensis

Nevada oryctes
PDSOL0Q010
Fed: None
State: None
RANK: G2G3/S1.1
CNPS List: 2
Records in CNDDDB: Yes

Oryzopsis exigu

little ricegrass
PMPOA4J040
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Osmorhiza depauperata

blunt-fruited sweet-cicely
PDAP11K050
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Oxalis suksdorfii

Suksdorf's wood-sorrel
PDOXA010U0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Oxytheca caryophylloides

chickweed oxytheca
PDPGN0J010
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Oxytheca emarginata

white-margined oxytheca
PDPGN0J030
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Oxytheca parishii var. abramsii

Abrams's oxytheca
PDPGN0J041
Fed: None
State: None
RANK: G4?T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Oxytheca parishii var. cienegensis

Cienega Seca oxytheca
PDPGN0J042
Fed: None
State: None
RANK: G4?T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Oxytheca parishii var. goodmaniana

Cushenbury oxytheca
PDPGN0J043
Fed: Endangered
State: None
RANK: G4?T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Oxytheca watsonii

Watson's oxytheca
PDPGN0J070
Fed: None
State: None
RANK: G3?/S1.2
CNPS List: 2
Records in CNDDb: Yes

Oxytropis deflexa var. sericea

blue pendent-pod oxytrope
PDFAB2X053
Fed: None
State: None
RANK: G5T5/S1.1
CNPS List: 2
Records in CNDDb: Yes

Oxytropis oreophila var. oreophila

mountain oxytrope
PDFAB2X0H3
Fed: None
State: None
RANK: G5T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Oxytropis parryi

Parry's oxytrope
PDFAB2X0J0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Palafoxia arida var. gigantea

giant spanish-needle
PDAST6T012
Fed: None
State: None
RANK: G5T3/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Parnassia cirrata

fringed grass-of-parnassus
PDSAX0P030
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Paronychia ahartii

Ahart's paronychia
PDCAR0L0V0
Fed: None
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Pedicularis bracteosa var. flavida

yellowish lousewort
PDSCR1K044
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDb: No

Pedicularis centranthera

dwarf lousewort
PDSCR1K070
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Pedicularis contorta

curved-beak lousewort
PDSCR1K090
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Pedicularis crenulata

scalloped-leaved lousewort
PDSCR1K0A0
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Pedicularis dudleyi

Dudley's lousewort
PDSCR1K0D0
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Pedicularis howellii

Howell's lousewort
PDSCR1K0J0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Pedimelum castoreum

Beaver Dam breadroot
PDFAB5L050
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Pellaea truncata

cliff brake
PPADI0H0C0
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDb: Yes

Penstemon albomarginatus

white-margined beardtongue
PDSCR1L070
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Penstemon barnebyi

Barneby's beardtongue
PDSCR1L0Q0
Fed: None
State: None
RANK: G3G4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Penstemon bicolor ssp. roseus

rosy two-toned
beardtongue
PDSCR1L0S2
Fed: None
State: None
RANK: G3T3Q/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Penstemon calcareus

limestone beardtongue
PDSCR1L100
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Penstemon californicus

California beardtongue
PDSCR1L110
Fed: None
State: None
RANK: G3?/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Penstemon cinereus

gray beardtongue
PDSCR1L354
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Penstemon cinicola

ash beardtongue
PDSCR1L1B0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

***Penstemon clevelandii*
var. *connatus***

San Jacinto beardtongue
PDSCR1L1D2
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDDB: No

Penstemon filiformis

thread-leaved
beardtongue
PDSCR1L2A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 1B
Records in CNDDDB: Yes

***Penstemon fruticiformis*
var. *amargosae***

Death Valley
beardtongue
PDSCR1L2F2
Fed: None
State: None
RANK: G4T3/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

***Penstemon heterodoxus*
var. *shastensis***

Shasta beardtongue
PDSCR1L5Q0
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Penstemon janishiae

Janish's beardtongue
PDSCR1L3A0
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

***Penstemon newberryi*
var. *sonomensis***

Sonoma beardtongue
PDSCR1L483
Fed: None
State: None
RANK: G4T1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Penstemon papillatus

inyo beardtongue
PDSCR1L4L0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Penstemon personatus

closed-throated
beardtongue
PDSCR1L4Y0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Penstemon rattanii var. kleei

Santa Cruz Mountains
beardtongue
PDSCR1L5B1
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Penstemon scapoides

pinyon beardtongue
PDSCR1L5J0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Penstemon stephensii

Stephens's beardtongue
PDSCR1L5W0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Penstemon sudans

Susanville beardtongue
PDSCR1L620
Fed: None
State: None
RANK: G2G3/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Penstemon thompsoniae

Thompson's
beardtongue
PDSCR1L670
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Penstemon thurberi

Thurber's beardtongue
PDSCR1L680
Fed: None
State: None
RANK: G5/S3.2?
CNPS List: 4
Records in CNDDDB: No

Penstemon tracyi

Tracy's beardtongue
PDSCR1L6A0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Penstemon utahensis

Utah beardtongue
PDSCR1L6G0
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Pentachaeta aurea

golden-rayed
pentachaeta
PDAST6X020
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDDB: No

Pentachaeta bellidiflora

white-rayed pentachaeta
PDAST6X030
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Pentachaeta exilis ssp. aeolica

slender pentachaeta
PDAST6X041
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Pentachaeta fragilis

fragile pentachaeta
PDAST6X050
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Pentachaeta lyonii

Lyon's pentachaeta
PDAST6X060
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Perideridia bacigalupii

Bacigalupi's yampah
PDAP11N020
Fed: None
State: None
RANK: G3/S3.2?
CNPS List: 4
Records in CNDDb: No

Perideridia gairdneri ssp. gairdneri

Gairdner's yampah
PDAP11N062
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Perideridia leptocarpa

narrow-seeded yampah
PDAP11N0A0
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDb: No

Perideridia parishii ssp. parishii

Parish's yampah
PDAP11N0C2
Fed: None
State: None
RANK: G4T3T4/S2.2?
CNPS List: 2
Records in CNDDb: Yes

Perideridia pringlei

adobe yampah
PDAP11N0D0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Perityle inyoensis

Inyo rock daisy
PDAST700F0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Perityle villosa

Hanaupah rock daisy
PDAST700V0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Petalonyx thurberi ssp. gilmanii

Death Valley sandpaper-plant
PDLOA04041
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Peteria thompsoniae

spine-noded milk vetch
PDFAB32020
Fed: None
State: None
RANK: G4/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Petradoria pumila ssp. pumila

rock goldenrod
PDAST72022
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDb: No

Petrophyton caespitosum ssp. acuminatum

marble rockmat
PDROS18010
Fed: None
State: None
RANK: G4T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Phacelia amabilis

Saline Valley phacelia
PDHYD0C040
Fed: None
State: None
RANK: GHQ/SH
CNPS List: 3
Records in CNDDb: Yes

Phacelia anelsonii

Aven Nelson's phacelia
PDHYD0C060
Fed: None
State: None
RANK: G2G3/S2.3?
CNPS List: 2
Records in CNDDb: Yes

Phacelia argentea

sand dune phacelia
PDHYD0C070
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Phacelia ciliata var. opaca

Merced phacelia
PDHYD0C0S2
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Phacelia cinerea

ashy phacelia
PDHYD0C0T0
Fed: None
State: None
RANK: GXQ/SX
CNPS List: 1A
Records in CNDDb: Yes

Phacelia coerulea

sky-blue phacelia
PDHYD0C0U0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Phacelia cookei

Cooke's phacelia
PDHYD0C0Y0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Phacelia dalesiana

Scott Mountain phacelia
PDHYD0C140
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Phacelia exilis

Transverse Range phacelia
PDHYD0C4Y0
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDb: No

Phacelia floribunda

many-flowered phacelia
PDHYD0C1G0
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Phacelia greenei

Scott Valley phacelia
PDHYD0C1V0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Phacelia gymnoclada

naked-stemmed phacelia
PDHYD0C1X0
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Phacelia insularis* var. *continentis

North Coast phacelia
PDHYD0C2B1
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia insularis* var. *insularis

northern Channel
Islands phacelia
PDHYD0C2B2
Fed: Endangered
State: None
RANK: G2TH/SH
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia inundata

playa phacelia
PDHYD0C2E0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia inyoensis

Inyo phacelia
PDHYD0C2F0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia leonis

Siskiyou phacelia
PDHYD0C2N0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia mohavensis

Mojave phacelia
PDHYD0C310
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Phacelia monoensis

Mono County phacelia
PDHYD0C4V0
Fed: None
State: None
RANK: G3/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia mustelina

Death Valley round-
leaved phacelia
PDHYD0C330
Fed: None
State: None
RANK: G2/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia nashiana

Charlotte's phacelia
PDHYD0C350
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia novemmillensis

Nine Mile Canyon
phacelia
PDHYD0C3A0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia orogenes

mountain phacelia
PDHYD0C3C0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Phacelia parishii

Parish's phacelia
PDHYD0C3G0
Fed: None
State: None
RANK: G2G3/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia peirsoniana

Peirson's phacelia
PDHYD0C3N0
Fed: None
State: None
RANK: G3G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Phacelia perityloides* var. *jaegeri

Jaeger's phacelia
PDHYD0C1M0
Fed: None
State: None
RANK: G4T2/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia phacelioides

Mt. Diablo phacelia
PDHYD0C3Q0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia pulchella* var. *gooddingii

Goodding's phacelia
PDHYD0C3V1
Fed: None
State: None
RANK: G5T2T3/S1.3?
CNPS List: 2
Records in CNDDDB: Yes

Phacelia sericea* var. *ciliosa

blue alpine phacelia
PDHYD0C4A1
Fed: None
State: None
RANK: G5T5/S1.3?
CNPS List: 2
Records in CNDDDB: Yes

Phacelia stebbinsii

Stebbins's phacelia
PDHYD0C4D0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia stellaris

Brand's phacelia
PDHYD0C510
Fed: None
State: None
RANK: G1G2/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Phacelia suaveolens* ssp. *keckii

Santiago Peak phacelia
PDHYD0C4G1
Fed: None
State: None
RANK: G4T1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Phaseolus filiformis

slender-stem bean
PDFAB330P0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Phlox dispersa

High Sierra phlox
PDPLM0D0M0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Phlox dolichantha

Big Bear Valley phlox
PDPLM0D0P0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Phlox hirsuta

Yreka phlox
PDPLM0D100
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Phlox muscoides

moss phlox
PDPLM0D115
Fed: None
State: None
RANK: G4/S2S3
CNPS List: 2
Records in CNDDb: Yes

Pholisma sonorae

sand food
PDLNN02020
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Pholistoma auritum* var.
*arizonicum***

Arizona pholistoma
PDHYD0D011
Fed: None
State: None
RANK: G5T2T3/S1.3
CNPS List: 2
Records in CNDDb: Yes

Physalis lobata

lobed ground-cherry
PDSOL0T010
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Physaria chambersii

Chambers's physaria
PDBRA22050
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Physocarpus alternans

Nevada ninebark
PDROS19010
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Picea engelmannii

Engelmann spruce
PGPIN03030
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDb: Yes

Pilostyles thurberi

Thurber's pilostyles
PDRAF01010
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

***Pinguicula vulgaris* ssp.
*macroceras***

horned butterwort
PDLNT01041
Fed: None
State: None
RANK: G5T4Q/S3.2
CNPS List: 2
Records in CNDDb: Yes

***Pinus contorta* ssp.
*bolanderi***

Bolander's beach pine
PGPIN04081
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Pinus edulis

two-needle pinyon pine
PGPIN040C0
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 3
Records in CNDDb: No

Pinus longaeva

bristlecone pine
PGPIN04180
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Pinus radiata

Monterey pine
PGPIN040V0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Pinus torreyana* ssp.
*insularis***

Santa Rosa Island
torrey pine
PGPIN04151
Fed: None
State: None
RANK: G1T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Pinus torreyana* ssp.
*torreyana***

torrey pine
PGPIN04152
Fed: None
State: None
RANK: G1T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Piperia candida

white-flowered rein
orchid
PMORC1X050
Fed: None
State: None
RANK: G3G4/S3.3
CNPS List: 4
Records in CNDDb: No

Piperia colemanii

Coleman's rein orchid
PMORC1X080
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Piperia cooperi

chaparral rein orchid
PMORC1X090
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

***Piperia elegans* ssp.
*decurtata***

Point Reyes rein orchid
PMORC1X011
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Piperia leptopetala

narrow-petaled rein
orchid
PMORC1X100
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Piperia michaelii

Michael's rein orchid
PMORC1X041
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Piperia yadonii

Yadon's rein orchid
PMORC1X070
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Piptatherum micranthum

small-flowered rice grass
PMPOA4J070
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Pityopus californicus

California pinefoot
PDMON05010
Fed: None
State: None
RANK: G4G5/S3.2
CNPS List: 4
Records in CNDDb: No

***Plagiobothrys*
chorisianus var.
*chorisianus***

Choris's popcorn-flower
PDBOR0V061
Fed: None
State: None
RANK: G3T2Q/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Plagiobothrys chorisianus* var. *hickmanii

Hickman's popcorn-flower
PDBOR0V062
Fed: None
State: None
RANK: G3T3Q/S3.2
CNPS List: 4
Records in CNDDDB: No

Plagiobothrys diffusus

San Francisco popcorn-flower
PDBOR0V080
Fed: None
State: Endangered
RANK: G1Q/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Plagiobothrys glaber

hairless popcorn-flower
PDBOR0V0B0
Fed: None
State: None
RANK: GH/SH
CNPS List: 1A
Records in CNDDDB: Yes

Plagiobothrys glyptocarpus* var. *modestus

Cedar Crest popcorn-flower
PDBOR0V0C2
Fed: None
State: None
RANK: G3THQ/SH
CNPS List: 3
Records in CNDDDB: No

Plagiobothrys hystriulus

bearded popcorn-flower
PDBOR0V0H0
Fed: None
State: None
RANK: GH/SH
CNPS List: 1A
Records in CNDDDB: Yes

Plagiobothrys lithocaryus

Mayacamas popcorn-flower
PDBOR0V0P0
Fed: None
State: None
RANK: GH/SH
CNPS List: 1A
Records in CNDDDB: Yes

Plagiobothrys mollis* var. *vestitus

Petaluma popcorn-flower
PDBOR0V0Q2
Fed: None
State: None
RANK: G4?TX/SX
CNPS List: 1A
Records in CNDDDB: Yes

Plagiobothrys myosotoides

forget-me-not popcorn-flower
PDBOR0V0R0
Fed: None
State: None
RANK: G4Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Plagiobothrys parishii

Parish's popcorn-flower
PDBOR0V0U0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Plagiobothrys salsus

desert popcorn-flower
PDBOR0V0X0
Fed: None
State: None
RANK: G2G3/S1.2?
CNPS List: 2
Records in CNDDDB: Yes

Plagiobothrys strictus

Calistoga popcorn-flower
PDBOR0V120
Fed: Endangered
State: Threatened
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Plagiobothrys torreyi* var. *torreyi

Yosemite popcorn-flower
PDBOR0V152
Fed: None
State: None
RANK: G4T2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Plagiobothrys uncinatus

hooked popcorn-flower
PDBOR0V170
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Platanthera stricta

slender bog-orchid
PMORC1Y0P0
Fed: None
State: None
RANK: G5/S3.2?
CNPS List: 4
Records in CNDDDB: No

Platystemon californicus* var. *ciliatus

Santa Barbara Island cream cups
PDPAP0J022
Fed: None
State: None
RANK: G5T1Q/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Pleuropogon californicus* var. *davyi

Davy's semaphore grass
PMPOA7Y012
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Pleuropogon hooverianus

North Coast semaphore grass
PMPOA7Y031
Fed: None
State: Threatened
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Pleuropogon refractus

nodding semaphore grass
PMPOA7Y032
Fed: None
State: None
RANK: G4/S3.2?
CNPS List: 4
Records in CNDDDB: No

Poa abbreviata* ssp. *marshii

Marsh's blue grass
PMPOA4Z013
Fed: None
State: None
RANK: G5T2/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Poa abbreviata* ssp. *pattersonii

Patterson's blue grass
PMPOA4Z015
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Poa atropurpurea

San Bernardino blue grass
PMPOA4Z0A0
Fed: Endangered
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Poa lettermanii

Letterman's blue grass
PMPOA4Z1H0
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Poa napensis

Napa blue grass
PMPOA4Z1R0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Poa piperi

Piper's blue grass
PMPOA4Z200
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Poa rhizomata

timber blue grass
PMPOA4Z250
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Podistera nevadensis

Sierra podistera
PDAP11T030
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Pogogyne abramsii

San Diego mesa mint
PDLAM1K010
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Pogogyne clareana

Santa Lucia mint
PDLAM1K020
Fed: None
State: Endangered
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Pogogyne floribunda

profuse-flowered
pogogyne
PDLAM1K070
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Pogogyne nudiuscula

Otay Mesa mint
PDLAM1K040
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Polemonium chartaceum

Mason's sky pilot
PDPLM0E060
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Poliomintha incana

frosted mint
PDLAM1L020
Fed: None
State: None
RANK: G5/SH
CNPS List: 1A
Records in CNDDb: Yes

***Polycatenium fremontii*
var. *fremontii***

Fremont's combleaf
PDBRA23012
Fed: None
State: None
RANK: G4T4/S3.3
CNPS List: 4
Records in CNDDb: No

Polycatenium williamsiae

Williams's combleaf
PDBRA23020
Fed: None
State: None
RANK: G2Q/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Polygala acanthoclada

thorny milkwort
PDPGL02020
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

***Polygala cornuta* var.
*fishiae***

Fish's milkwort
PDPGL020B2
Fed: None
State: None
RANK: G5T4/S3.3
CNPS List: 4
Records in CNDDb: No

Polygala heterorhyncha

notch-beaked milkwort
PDPGL02270
Fed: None
State: None
RANK: G3/S1.3
CNPS List: 2
Records in CNDDb: Yes

Polygala intermontana

intermountain milkwort
PDPGL021U0
Fed: None
State: None
RANK: G3?/S2.3
CNPS List: 2
Records in CNDDb: Yes

Polygala subspinosa

spiny milkwort
PDPGL021Q0
Fed: None
State: None
RANK: G4?/S3.2
CNPS List: 2
Records in CNDDb: Yes

Polygonum bidwelliae

Bidwell's knotweed
PDPGN0L0C0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Polygonum hickmanii

Scott's Valley polygonum
PDPGN0L310
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Polygonum marinense

Marin knotweed
PDPGN0L1C0
Fed: None
State: None
RANK: G1Q/S1.1
CNPS List: 3
Records in CNDDb: Yes

***Polygonum*
polygaloides ssp.
*esotericum***

Modoc County knotweed
PDPGN0L1Y2
Fed: None
State: None
RANK: G4G5T2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Polystichum*
*kruckebergii***

Kruckeberg's sword fern
PPDRY0R0C0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Polystichum lonchitis

holly fern
PPDRY0R0F0
Fed: None
State: None
RANK: G5/S2?
CNPS List: 3
Records in CNDDb: No

Populus angustifolia

narrow-leaved
cottonwood
PDSAL01020
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Portulaca halimoides

desert portulaca
PDPOR06040
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDb: No

***Potamogeton epihydrus*
ssp. *nuttallii***

Nuttall's pondweed
PMPOT03081
Fed: None
State: None
RANK: G5T5Q/S2.2?
CNPS List: 2
Records in CNDDb: Yes

Potamogeton filiformis

slender-leaved
pondweed
PMPOT03090
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDb: Yes

***Potamogeton foliosus*
*var. fibrillosus***

fibrous pondweed
PMPOT030B1
Fed: None
State: None
RANK: G5T2T4/S1S2
CNPS List: 2
Records in CNDDDB: Yes

Potamogeton praelongus

white-stemmed
pondweed
PMPOT030V0
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDDB: Yes

Potamogeton robbinsii

Robbins's pondweed
PMPOT030Z0
Fed: None
State: None
RANK: G5/S2.3?
CNPS List: 2
Records in CNDDDB: Yes

***Potamogeton
zosteriformis***

eel-grass pondweed
PMPOT03160
Fed: None
State: None
RANK: G5/S2.2?
CNPS List: 2
Records in CNDDDB: Yes

Potentilla basaltica

Black Rock potentilla
PDROS1B270
Fed: Candidate
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Potentilla concinna

alpine cinquefoil
PDROS1B0F0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Potentilla cristae

crested potentilla
PDROS1B2F0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

***Potentilla glandulosa*
*ssp. ewanii***

Ewan's cinquefoil
PDROS1B0S3
Fed: None
State: None
RANK: G5T1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

***Potentilla gracilis var.
pulcherrima***

white-leaved cinquefoil
PDROS1B2P0
Fed: None
State: None
RANK: G5T5/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Potentilla hickmanii

Hickman's cinquefoil
PDROS1B0U0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Potentilla morefieldii

Morefield's cinquefoil
PDROS1B2R0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Potentilla multijuga

Ballona cinquefoil
PDROS1B120
Fed: None
State: None
RANK: GX/SX
CNPS List: 1A
Records in CNDDDB: Yes

Potentilla newberryi

Newberry's cinquefoil
PDROS1B130
Fed: None
State: None
RANK: G3G4/S2.3?
CNPS List: 2
Records in CNDDDB: Yes

Potentilla rimicola

cliff cinquefoil
PDROS1B2G0
Fed: None
State: None
RANK: G2G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Proboscidea althaeifolia

desert unicorn-plant
PDPED06010
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Prunus eremophila

desert plum
PDROS1C1Q0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Prunus fasciculata var.
punctata***

sand almond
PDROS1C0E2
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Pseudobahia bahiifolia

Hartweg's golden
sunburst
PDAST7P010
Fed: Endangered
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Pseudobahia peirsonii

San Joaquin adobe
sunburst
PDAST7P030
Fed: Threatened
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Pseudostellaria sierrae

Sierra starwort
PDCAR13020
Fed: None
State: None
RANK: G2G3/S2S3.2
CNPS List: 1B
Records in CNDDDB: No

***Psilocarphus
brevissimus var.
multiflorus***

Delta woolly-marbles
PDAST7R012
Fed: None
State: None
RANK: G4T3/S3.2?
CNPS List: 4
Records in CNDDDB: No

Psilocarphus elatior

tall woolly-marbles
PDAST7R020
Fed: None
State: None
RANK: G4Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Psoralidium lanceolatum

lance-leaved scurf-pea
PDFAB5M030
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

***Psorothamnus
arborescens var.
arborescens***

Mojave indigo-bush
PDFAB3C011
Fed: None
State: None
RANK: G5T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Psorothamnus fremontii*
*var. attenuatus***

narrow-leaved
psorothamnus
PDFAB3C031
Fed: None
State: None
RANK: G5T3?/S2.3
CNPS List: 2
Records in CNDDb: Yes

Puccinellia howellii

Howell's alkali grass
PMPOA531A0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Puccinellia parishii

Parish's alkali grass
PMPOA530T0
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Puccinellia pumila

dwarf alkali grass
PMPOA531B0
Fed: None
State: None
RANK: G4?/S1.1?
CNPS List: 2
Records in CNDDb: Yes

Pyrola chlorantha

green-flowered
wintergreen
PDPYR04030
Fed: None
State: None
RANK: G5/SH
CNPS List: 1A
Records in CNDDb: Yes

Pyrrcoma lucida

sticky pyrrocoma
PDASTDT0E0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

***Pyrrcoma racemosa*
*var. congesta***

Del Norte pyrrocoma
PDASTDT0F4
Fed: None
State: None
RANK: G5T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

***Pyrrcoma racemosa*
*var. pinetorum***

pine pyrrocoma
PDASTDT0F2
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

***Pyrrcoma uniflora* var.
*gossypina***

Bear Valley pyrrocoma
PDASTDT0K1
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Quercus cedrosensis

Cedros Island oak
PDFAG05650
Fed: None
State: None
RANK: G2?/S1.2
CNPS List: 2
Records in CNDDb: Yes

Quercus dumosa

Nuttall's scrub oak
PDFAG050D0
Fed: None
State: None
RANK: G2/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Quercus durata* var.
*gabrielensis***

San Gabriel oak
PDFAG050G2
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDb: No

Quercus engelmannii

Engelmann oak
PDFAG050K0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Quercus pacifica

island scrub oak
PDFAG05620
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Quercus parvula* var.
*parvula***

Santa Cruz Island oak
PDFAG051Q1
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDb: No

***Quercus parvula* var.
*tamalpaisensis***

Tamalpais oak
PDFAG051Q3
Fed: None
State: None
RANK: G4T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Quercus tomentella

island oak
PDFAG05250
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Quercus turbinella

shrub live oak
PDFAG05270
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Raillardella pringlei

showy raillardella
PDAST7X030
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Ranunculus*
*hydrocharoides***

frog's-bit buttercup
PDRAN0L190
Fed: None
State: None
RANK: G4G5/S1.1
CNPS List: 2
Records in CNDDb: Yes

Ranunculus lobbii

Lobb's aquatic buttercup
PDRAN0L1J0
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

Ranunculus macounii

Macoun's buttercup
PDRAN0L1M0
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDb: Yes

Rhamnus pirifolia

island redberry
PDRHA0C0A0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Rhus trilobata* var.
*simplicifolia***

single-leaved
skunkbrush
PDANA080B5
Fed: None
State: None
RANK: G5T3T5/S1.3?
CNPS List: 2
Records in CNDDb: Yes

Rhynchospora alba

white beaked-rush
PMCP0N010
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 2
Records in CNDDDB: Yes

Rhynchospora californica

California beaked-rush
PMCP0N060
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Rhynchospora capitellata

brownish beaked-rush
PMCP0N080
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Rhynchospora globularis* var. *globularis

round-headed beaked-rush
PMCP0N0W1
Fed: None
State: None
RANK: G5?T5?/S1.1
CNPS List: 2
Records in CNDDDB: Yes

Ribes amarum* var. *hoffmannii

bitter gooseberry
PDGRO02012
Fed: None
State: None
RANK: G4?T2T3/S2S3
CNPS List: 3
Records in CNDDDB: No

Ribes canthariforme

Moreno currant
PDGRO02070
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Ribes divaricatum* var. *parishii

Parish's gooseberry
PDGRO020F3
Fed: None
State: None
RANK: G4T1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Ribes hudsonianum* var. *petiolare

western black currant
PDGRO020N2
Fed: None
State: None
RANK: G5T3T5/S2.3?
CNPS List: 2
Records in CNDDDB: Yes

Ribes laxiflorum

trailing black currant
PDGRO020V0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Ribes marshallii

Marshall's gooseberry
PDGRO020Z0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Ribes menziesii* var. *ixoderme

aromatic canyon gooseberry
PDGRO02104
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Ribes roezlii* var. *amictum

hoary gooseberry
PDGRO021B1
Fed: None
State: None
RANK: G3G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Ribes sericeum

Santa Lucia gooseberry
PDGRO021F0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Ribes thacherianum

Santa Cruz Island gooseberry
PDGRO02109
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Ribes tulareense

Sequoia gooseberry
PDGRO021L0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Ribes viburnifolium

Santa Catalina Island currant
PDGRO021P0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 1B
Records in CNDDDB: Yes

Ribes victoris

Victor's gooseberry
PDGRO021Q0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Robinia neomexicana

New Mexico locust
PDFAB3G070
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Romanzoffia tracyi

Tracy's romanzoffia
PDHYD0E030
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Romneya coulteri

Coulter's matilija poppy
PDPAP0L010
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Rorippa columbiae

Columbia yellow cress
PDBRA27060
Fed: None
State: None
RANK: G3/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Rorippa gambelii

Gambel's water cress
PDBRA270V0
Fed: Endangered
State: Threatened
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Rorippa subumbellata

Tahoe yellow cress
PDBRA270M0
Fed: Candidate
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Rosa minutifolia

small-leaved rose
PDROS1J1B0
Fed: None
State: Endangered
RANK: G3/S1.1
CNPS List: 2
Records in CNDDDB: Yes

Rosa pinetorum

pine rose
PDROS1J0W0
Fed: None
State: None
RANK: G2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Rubus glaucifolius* var.
*ganderi***

Cuyamaca raspberry
PDROS1K2N1
Fed: None
State: None
RANK: G5TH/SH
CNPS List: 1B
Records in CNDDDB: Yes

Rubus nivalis

snow dwarf bramble
PDROS1K4S0
Fed: None
State: None
RANK: G4?/S1.3?
CNPS List: 2
Records in CNDDDB: Yes

Rumex venosus

winged dock
PDPGN0P1K0
Fed: None
State: None
RANK: G5?/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Rupertia hallii

Hall's rupertia
PDFAB62010
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Rupertia rigida

Parish's rupertia
PDFAB62030
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Sagittaria sanfordii

Sanford's arrowhead
PMALI040Q0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDDB: Yes

Salix bebbiana

gray willow
PDSAL020E0
Fed: None
State: None
RANK: G5/S2.3?
CNPS List: 2
Records in CNDDDB: Yes

***Salix brachycarpa* ssp.
*brachycarpa***

short-fruited willow
PDSAL020H5
Fed: None
State: None
RANK: G5T5/S1.3?
CNPS List: 2
Records in CNDDDB: Yes

Salix delnortensis

Del Norte willow
PDSAL023F0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Salix nivalis

snow willow
PDSAL024K0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Saltugilia caruifolia

caraway-leaved saltugilia
PDPLM040C0
Fed: None
State: None
RANK: G4?/S3.3
CNPS List: 4
Records in CNDDDB: No

Saltugilia latimeri

Latimer's woodland gilia
PDPLM0H010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Salvia brandegeei

Brandegee's sage
PDLAM1S080
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Salvia dorrii* var. *incana

fleshy sage
PDLAM1S0G8
Fed: None
State: None
RANK: G5T5/S1S2
CNPS List: 3
Records in CNDDDB: No

Salvia eremostachya

desert sage
PDLAM1S0K0
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Salvia funerea

Death Valley sage
PDLAM1S0M0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Salvia greatae

Orocopia sage
PDLAM1S0P0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Salvia munzii

Munz's sage
PDLAM1S140
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Sanguisorba officinalis

great burnet
PDROS1L060
Fed: None
State: None
RANK: G5?/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Sanicula hoffmannii

Hoffmann's sanicle
PDAP11Z090
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Sanicula maritima

adobe sanicle
PDAP11Z0D0
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Sanicula peckiana

Peck's sanicle
PDAP11Z0E0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Sanicula saxatilis

rock sanicle
PDAP11Z0H0
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Sanicula tracyi

Tracy's sanicle
PDAP11Z0K0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Sanvitalia abertii

Abert's sanvitalia
PDAST89010
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDDB: Yes

Sarcocornia utahensis

Utah glasswort
PDCHE0M040
Fed: None
State: None
RANK: G4?/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Satureja chandleri

San Miguel savory
PDLAM08030
Fed: None
State: None
RANK: G4/S3.2?
CNPS List: 1B
Records in CNDDDB: Yes

Saussurea americana

American saw-wort
PDAST8B020
Fed: None
State: None
RANK: G5/S1.2?
CNPS List: 2
Records in CNDDDB: Yes

Saxifraga cespitosa

tufted saxifrage
PDSAX0U0C0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Saxifraga howellii

Howell's saxifrage
PDSAX0U0T0
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Saxifraga nuttallii

Nuttall's saxifrage
PDSAX0U160
Fed: None
State: None
RANK: G4/S1.1
CNPS List: 2
Records in CNDDb: Yes

Saxifraga rufidula

rusty saxifrage
PDSAX0U1H0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

***Scheuchzeria palustris*
*var. americana***

American scheuchzeria
PMSCH02011
Fed: None
State: None
RANK: G5T5/S1.1
CNPS List: 2
Records in CNDDb: Yes

Schkuhria multiflora* *var. multiflora

many-flowered schkuhria
PDAST8C021
Fed: None
State: None
RANK: G5T5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Schoenus nigricans

black sedge
PMCYP0P010
Fed: None
State: None
RANK: G4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Scirpus heterochaetus

slender bulrush
PMCYP0Q0T0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Scirpus pendulus

pendulous bulrush
PMCYP0Q160
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Scirpus pumilus

dwarf bulrush
PMCYP0Q250
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: No

Scirpus subterminalis

water bulrush
PMCYP0Q1G0
Fed: None
State: None
RANK: G4G5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Sclerocactus johnsonii

bee-hive cactus
PDCAC0J0H0
Fed: None
State: None
RANK: G3G4/S2.2
CNPS List: 2
Records in CNDDb: Yes

***Sclerocactus*
*polyancistrus***

Mojave fish-hook cactus
PDCAC0J050
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

Scleropogon brevifolius

burro grass
PMPOA5G010
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Scrophularia atrata

black-flowered figwort
PDSCR1S010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Scrophularia villosa

Santa Catalina figwort
PDSCR1S0D0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Scutellaria bolanderi*
*ssp. austromontana***

southern skullcap
PDLAM1U0A1
Fed: None
State: None
RANK: G4T2/S2.2?
CNPS List: 1B
Records in CNDDb: Yes

Scutellaria galericulata

marsh skullcap
PDLAM1U0J0
Fed: None
State: None
RANK: G5/S2.2?
CNPS List: 2
Records in CNDDb: Yes

***Scutellaria*
*holmgreniorum***

Holmgren's skullcap
PDLAM1U1C0
Fed: None
State: None
RANK: G3Q/S3.3
CNPS List: 4
Records in CNDDb: No

Scutellaria lateriflora

blue skullcap
PDLAM1U0Q0
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Sedella leiocarpa

Lake County stonecrop
PDCRA0F020
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Sedum albomarginatum

Feather River stonecrop
PDCRA0A030
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Sedum divergens

Cascade stonecrop
PDCRA0A0B0
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Sedum eastwoodiae

Red Mountain stonecrop
PDCRA0A1S0
Fed: Candidate
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Sedum laxum* *ssp. flavidum

pale yellow stonecrop
PDCRA0A0L2
Fed: None
State: None
RANK: G5T3Q/S3.3
CNPS List: 4
Records in CNDDb: No

Sedum laxum ssp. heckneri

Heckner's stonecrop
PDCRA0A0L3
Fed: None
State: None
RANK: G5T3Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Sedum niveum

Davidson's stonecrop
PDCRA0A0R0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Sedum oblaceolatum

Applegate stonecrop
PDCRA0A0T0
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Sedum paradisum

Canyon Creek stonecrop
PDCRA0A0U3
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Sedum pinetorum

Pine City sedum
PDCRA0A0Z0
Fed: None
State: None
RANK: GUGH/SH
CNPS List: 3
Records in CNDDDB: No

Selaginella asprella

bluish spike-moss
PPSEL01060
Fed: None
State: None
RANK: G4G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Selaginella densa var. scopulorum

Rocky Mountain spike-moss
PPSEL010C2
Fed: None
State: None
RANK: G5T4T5/S2S3
CNPS List: 3
Records in CNDDDB: No

Selaginella eremophila

desert spike-moss
PPSEL010G0
Fed: None
State: None
RANK: G4/S2.2?
CNPS List: 2
Records in CNDDDB: Yes

Selaginella leucobryoides

Mojave spike-moss
PPSEL010P0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Selinocarpus nevadensis

desert wing-fruit
PDNYC0F040
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Senecio aphanactis

rayless ragwort
PDAST8H060
Fed: None
State: None
RANK: G3?/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Senecio bernardinus

San Bernardino ragwort
PDAST8H0E0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Senecio blochmaniae

Blochman's ragwort
PDAST8H0G0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

Senecio bolanderi var. bolanderi

seacoast ragwort
PDAST8H0H1
Fed: None
State: None
RANK: G4T4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Senecio clevelandii var. clevelandii

Cleveland's ragwort
PDAST8H0R1
Fed: None
State: None
RANK: G4?T3Q/S3.3
CNPS List: 4
Records in CNDDDB: No

Senecio clevelandii var. heterophyllus

Red Hills ragwort
PDAST8H0R2
Fed: None
State: None
RANK: G4?T2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Senecio eurycephalus var. lewisrosei

cut-leaved ragwort
PDAST8H182
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Senecio ganderi

Gander's ragwort
PDAST8H1F0
Fed: None
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Senecio hydrophiloides

sweet marsh ragwort
PDAST8H400
Fed: None
State: None
RANK: G4G5/S2S3
CNPS List: 4
Records in CNDDDB: No

Senecio indecorus

rayless mountain ragwort
PDAST8H1R0
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Senecio ionophyllus

Tehachapi ragwort
PDAST8H1T0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Senecio layneae

Layne's ragwort
PDAST8H1V0
Fed: Threatened
State: Rare
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Senecio macounii

Siskiyou Mountains ragwort
PDAST8H1Z0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Senecio pattersonensis

Mono ragwort
PDAST8H2C0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Senna covesii

Coves's cassia
PDFAB491X0
Fed: None
State: None
RANK: G5?/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Sibara deserti

desert winged rock-cress
PDBRA2A010
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Sibara filifolia

Santa Cruz Island rock
cress
PDBRA2A020
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Sibaropsis hammittii

Hammitt's clay-cress
PDBRA32010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea calycosa ssp.
rhizomata***

Point Reyes
checkerbloom
PDMAL11012
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Sidalcea covillei

Owens Valley
checkerbloom
PDMAL11040
Fed: None
State: Endangered
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea hickmanii ssp.
anomala***

Cuesta Pass
checkerbloom
PDMAL110A1
Fed: None
State: Rare
RANK: G3T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea hickmanii ssp.
hickmanii***

Hickman's checkerbloom
PDMAL110A2
Fed: None
State: None
RANK: G3T2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea hickmanii ssp.
parishii***

Parish's checkerbloom
PDMAL110A3
Fed: Candidate
State: Rare
RANK: G3T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea hickmanii ssp.
viridis***

Marin checkerbloom
PDMAL110A4
Fed: None
State: None
RANK: G3T2/S2.2?
CNPS List: 1B
Records in CNDDb: Yes

Sidalcea keckii

Keck's checkerbloom
PDMAL110D0
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Sidalcea malachroides

maple-leaved
checkerbloom
PDMAL110E0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea malviflora ssp.
patula***

Siskiyou checkerbloom
PDMAL110F9
Fed: None
State: None
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea malviflora ssp.
purpurea***

purple-stemmed
checkerbloom
PDMAL110FL
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Sidalcea neomexicana

Salt Spring
checkerbloom
PDMAL110J0
Fed: None
State: None
RANK: G4?/S2S3
CNPS List: 2
Records in CNDDb: Yes

***Sidalcea oregana ssp.
eximia***

coast checkerbloom
PDMAL110K9
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea oregana ssp.
hydrophila***

marsh checkerbloom
PDMAL110K2
Fed: None
State: None
RANK: G5T2?/S2?
CNPS List: 1B
Records in CNDDb: Yes

***Sidalcea oregana ssp.
valida***

Kenwood Marsh
checkerbloom
PDMAL110K5
Fed: Endangered
State: Endangered
RANK: G5T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Sidalcea pedata

bird-foot checkerbloom
PDMAL110L0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Sidalcea robusta

Butte County
checkerbloom
PDMAL110P0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Sidalcea stipularis

Scadden Flat
checkerbloom
PDMAL110R0
Fed: None
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Silene aperta

Tulare campion
PDCAR0U050
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Silene campanulata ssp.
campanulata***

Red Mountain catchfly
PDCAR0U0A2
Fed: None
State: Endangered
RANK: G5T3Q/S3.2
CNPS List: 4
Records in CNDDb: No

Silene marmorensis

Marble Mountain
campion
PDCAR0U0Z0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Silene occidentalis ssp.
longistipitata***

long-stiped campion
PDCAR0U161
Fed: None
State: None
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Silene oregana

Oregon campion
PDCAR0U170
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Silene suksdorfii

Cascade alpine campion
PDCAR0U1W0
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Silene verecunda* ssp. *verecunda

San Francisco campion
PDCAR0U213
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Sisyrinchium funereum

Death Valley blue-eyed grass
PMIRI0D0L0
Fed: None
State: None
RANK: G2G3/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Sisyrinchium hitchcockii

Hitchcock's blue-eyed grass
PMIRI0D0S0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Smelowskia ovalis* var. *congesta

Lassen Peak smelowskia
PDBRA2D041
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Smilax jamesii

English Peak greenbriar
PMSMI010D0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

Solanum clokeyi

island nightshade
PDSOL0Z281
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Solanum wallacei

Wallace's nightshade
PDSOL0Z280
Fed: None
State: None
RANK: G2Q/S2.1
CNPS List: 1B
Records in CNDDb: Yes

Solidago gigantea

smooth goldenrod
PDAST8P0Q0
Fed: None
State: None
RANK: G5/S1.2?
CNPS List: 2
Records in CNDDb: Yes

Solidago guiradonis

Guirado's goldenrod
PDAST8P0T0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

Sparganium natans

small bur-reed
PMSPA01090
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Spartina gracilis

alkali cord grass
PMPOA5S060
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDb: No

Spergularia canadensis* var. *occidentalis

western sand-spurrey
PDCAR0W032
Fed: None
State: None
RANK: G5T4?/S1.1
CNPS List: 2
Records in CNDDb: Yes

Spermolepis echinata

bristly scaleseed
PDAP123020
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDb: Yes

Sphaeralcea* *grossulariifolia* ssp. *grossulariifolia

currant-leaved desert mallow
PDMAL14091
Fed: None
State: None
RANK: G5T4T5/S2S3
CNPS List: 2
Records in CNDDb: Yes

Sphaeralcea munroana

Munroe's desert mallow
PDMAL140F0
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDb: Yes

Sphaeralcea rusbyi* var. *eremicola

Rusby's desert-mallow
PDMAL140L1
Fed: None
State: None
RANK: G4T1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Sphaeromeria* *potentilloides* var. *nitrophila

alkali tansy-sage
PDAST8S061
Fed: None
State: None
RANK: G5T4/S2.2
CNPS List: 2
Records in CNDDb: Yes

Sphenopholis obtusata

prairie wedge grass
PMPOA5T030
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDb: Yes

Stachys palustris* ssp. *pilosa

marsh hedge nettle
PDLAM1X1A0
Fed: None
State: None
RANK: G5T5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Stanleya viridiflora

green-flowered prince's plume
PDBRA2E060
Fed: None
State: None
RANK: G4/S1S2
CNPS List: 2
Records in CNDDb: Yes

Stebbinsoseris* *decipiens

Santa Cruz microseris
PDAST6E050
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Stellaria littoralis

beach starwort
PDCAR0X0L0
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDb: No

Stellaria longifolia

long-leaved starwort
PDCAR0X0M0
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Stellaria obtusa

obtuse starwort
PDCAR0X0U0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Stemodia durantifolia

purple stemodia
PDSCR1U010
Fed: None
State: None
RANK: G5/S2.1?
CNPS List: 2
Records in CNDDb: Yes

Stenotus lanuginosus

woolly stenotus
PDASTCX010
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Stephanomeria blairii

Blair's stephanomeria
PDAST8U0K0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus albidus*
*ssp. albidus***

Metcalf Canyon jewel-
flower
PDBRA2G011
Fed: Endangered
State: None
RANK: G2T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus albidus*
*ssp. peramoenus***

most beautiful jewel-
flower
PDBRA2G012
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Streptanthus barbiger

bearded jewel-flower
PDBRA2G040
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Streptanthus*
*batrachopus***

Tamalpais jewel-flower
PDBRA2G050
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus*
*bernardinus***

Laguna Mountains jewel-
flower
PDBRA2G060
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Streptanthus brachiatus*
*ssp. brachiatus***

Socrates Mine jewel-
flower
PDBRA2G072
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus brachiatus*
*ssp. hoffmanii***

Freed's jewel-flower
PDBRA2G071
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus breweri*
*var. hesperidis***

green jewel-flower
PDBRA2G092
Fed: None
State: None
RANK: G5T2/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Streptanthus callistus

Mt. Hamilton jewel-flower
PDBRA2G0A0
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Streptanthus campestris

southern jewel-flower
PDBRA2G0B0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus cordatus*
*var. piutensis***

Piute Mountains jewel-
flower
PDBRA2G0D2
Fed: None
State: None
RANK: G5T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus*
*drepanoides***

sickle-fruit jewel-flower
PDBRA2G200
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

***Streptanthus*
*farnsworthianus***

Farnsworth's jewel-flower
PDBRA2G0G0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Streptanthus fenestratus

Tehipite Valley jewel-
flower
PDBRA2G0H0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus*
glandulosus ssp.
*pulchellus***

Mt. Tamalpais jewel-
flower
PDBRA2G0J2
Fed: None
State: None
RANK: G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus*
glandulosus var.
*hoffmanii***

second jewel-flower
PDBRA2G0J4
Fed: None
State: None
RANK: G4TH/SH
CNPS List: 1B
Records in CNDDb: Yes

Streptanthus gracilis

alpine jewel-flower
PDBRA2G0K0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 1B
Records in CNDDb: Yes

Streptanthus hispidus

Mt. Diablo jewel-flower
PDBRA2G0M0
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Streptanthus howellii

Howell's jewel-flower
PDBRA2G0N0
Fed: None
State: None
RANK: G2/S1.2
CNPS List: 1B
Records in CNDDb: Yes

***Streptanthus insignis*
*ssp. lyonii***

Arburua Ranch jewel-
flower
PDBRA2G0Q1
Fed: None
State: None
RANK: G3G4T1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Streptanthus morrisonii

see individual
subspecies!
PDBRA2G0S0
Fed: None
State: None
RANK: G2/S2
CNPS List:
Records in CNDDb: Yes

**Streptanthus morrisonii
ssp. elatus**

Three Peaks jewel-flower
PDBRA2G0S1
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: No

**Streptanthus morrisonii
ssp. hirtiflorus**

Dorr's Cabin jewel-flower
PDBRA2G0S2
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: No

**Streptanthus morrisonii
ssp. kruckebergii**

Kruckeberg's jewel-
flower
PDBRA2G0S4
Fed: None
State: None
RANK: G2T1/S1.2
CNPS List: 1B
Records in CNDDb: No

**Streptanthus morrisonii
ssp. morrisonii**

Morrison's jewel-flower
PDBRA2G0S3
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDb: No

Streptanthus niger

Tiburon jewel-flower
PDBRA2G0T0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Streptanthus oliganthus

Masonic Mountain jewel-
flower
PDBRA2G0V0
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 1B
Records in CNDDb: Yes

Stylocline citroleum

oil neststraw
PDAST8Y070
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Stylocline masonii

Mason's neststraw
PDAST8Y080
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Stylocline sonorensis

mesquite neststraw
PDAST8Y060
Fed: None
State: None
RANK: G3G5/SX
CNPS List: 1A
Records in CNDDb: Yes

Suaeda californica

California seablite
PDCHE0P020
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Suaeda esteroa

estuary seablite
PDCHE0P0D0
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Suaeda occidentalis

western seablite
PDCHE0P080
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

Suaeda taxifolia

woolly seablite
PDCHE0P0L0
Fed: None
State: None
RANK: G3?/S2S3
CNPS List: 4
Records in CNDDb: No

Swallenia alexandrae

Eureka Valley dune
grass
PMPOA5Y010
Fed: Endangered
State: Rare
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Swertia albomarginata

desert green-gentian
PDGEN05020
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

Swertia neglecta

pine green-gentian
PDGEN05080
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Swertia umpquaensis

Umpqua green-gentian
PDGEN05050
Fed: None
State: None
RANK: G4?/S2.2
CNPS List: 2
Records in CNDDb: Yes

**Synthyris missurica
ssp. missurica**

kitten-tails
PDSCR1W042
Fed: None
State: None
RANK: G4T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

**Syntrichopappus
lemmonii**

Lemmon's
syntrichopappus
PDAST90020
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Systemotheca vortriedei

Vortriede's spineflower
PDPGN0W010
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Taraxacum californicum

California dandelion
PDAST93050
Fed: Endangered
State: None
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDb: Yes

**Taraxacum
ceratophorum**

horned dandelion
PDAST930Y1
Fed: None
State: None
RANK: G5/S1.1
CNPS List: 2
Records in CNDDb: Yes

Tauschia glauca

glaucous tauschia
PDAP127020
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Tauschia howellii

Howell's tauschia
PDAP127050
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDb: Yes

Tetracoccus dioicus

Parry's tetracoccus
PDEUP1C010
Fed: None
State: None
RANK: G3/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Tetracoccus hallii

Hall's tetracoccus
PDEUP1C021
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Tetracoccus ilicifolius

holly-leaved tetracoccus
PDEUP1C030
Fed: None
State: None
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Tetradymia argyraea

striped horsebrush
PDAST95010
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Tetradymia tetrameres

dune horsebrush
PDAST950A0
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Teucrium glandulosum

sticky germander
PDLAM20040
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Thalictrum alpinum

arctic meadow-rue
PDRAN0M010
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Thelypodium brachycarpum

short-podded
thelypodium
PDBRA2N010
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Thelypodium howellii*
*ssp. howellii***

Howell's thelypodium
PDBRA2N051
Fed: None
State: None
RANK: G2T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Thelypodium integrifolium* *ssp.*
*complanatum***

foxtail thelypodium
PDBRA2N062
Fed: None
State: None
RANK: G5T5/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Thelypodium milleflorum

many-flowered
thelypodium
PDBRA2N0A0
Fed: None
State: None
RANK: G5/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Thelypodium stenopetalum

slender-petaled
thelypodium
PDBRA2N0F0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

***Thelypteris puberula*
*var. sonorensis***

Sonoran maiden fern
PPTHE05192
Fed: None
State: None
RANK: G5T3/S2.2?
CNPS List: 2
Records in CNDDDB: Yes

***Thermopsis californica*
*var. argentata***

silvery false lupine
PDFAB3Z05A
Fed: None
State: None
RANK: G3?T3/S3.3
CNPS List: 4
Records in CNDDDB: No

***Thermopsis californica*
*var. semota***

velvety false lupine
PDFAB3Z053
Fed: None
State: None
RANK: G3?T2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

***Thermopsis gracilis* *var.*
*gracilis***

slender false lupine
PDFAB3Z0C1
Fed: None
State: None
RANK: G4T3T4/S3.3
CNPS List: 4
Records in CNDDDB: No

Thermopsis macrophylla

Santa Ynez false lupine
PDFAB3Z0E0
Fed: None
State: Rare
RANK: G1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

Thermopsis robusta

robust false lupine
PDFAB3Z0D0
Fed: None
State: None
RANK: G2Q/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Thlaspi californicum

Kneeland Prairie
pennycress
PDBRA2P041
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Thysanocarpus conchuliferus

Santa Cruz Island
fringepod
PDBRA2Q060
Fed: Endangered
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

***Tiarella trifoliata* *var.*
*trifoliata***

trifoliolate laceflower
PDSAX10031
Fed: None
State: None
RANK: G5T5/S2S3
CNPS List: 3
Records in CNDDDB: No

Tonestus eximius

Tahoe tonestus
PDASTE0030
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Tonestus lyallii

Lyall's tonestus
PDASTE0050
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 2
Records in CNDDDB: Yes

Tonestus peirsonii

Peirson's tonestus
PDASTE0070
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Townsendia condensata

cushion townsendia
PDAST9C040
Fed: None
State: None
RANK: G4/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Townsendia leptotes

slender townsendia
PDAST9C0F0
Fed: None
State: None
RANK: G4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Tracyina rostrata

beaked tracyina
PDAST9D010
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Tragia ramosa

desert tragia
PDEUP1D090
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDb: No

***Trichocoronis wrightii*
*var. wrightii***

Wright's trichocoronis
PDAST9F031
Fed: None
State: None
RANK: G4T3/S1.1
CNPS List: 2
Records in CNDDb: Yes

***Trichostema*
austromontanum ssp.
*compactum***

Hidden Lake bluecurls
PDLAM22022
Fed: Threatened
State: None
RANK: G3G4T1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Trichostema micranthum

small-flowered bluecurls
PDLAM22080
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Trichostema ovatum

San Joaquin bluecurls
PDLAM220A0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDb: No

***Trichostema*
*rubisepalum***

Hernandez bluecurls
PDLAM220C0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDb: No

Trientalis arctica

arctic starflower
PDPRI0A030
Fed: None
State: None
RANK: G5/S1.2
CNPS List: 2
Records in CNDDb: Yes

Trifolium amoenum

showy indian clover
PDFAB40040
Fed: Endangered
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

***Trifolium andersonii var.*
*andersonii***

Anderson's clover
PDFAB40055
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDb: No

Trifolium bolanderi

Bolander's clover
PDFAB400G0
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 1B
Records in CNDDb: Yes

Trifolium buckwestiorum

Santa Cruz clover
PDFAB402W0
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Trifolium dedeckerae

Dedecker's clover
PDFAB400Q0
Fed: None
State: None
RANK: G2/S2.3
CNPS List: 1B
Records in CNDDb: Yes

***Trifolium depauperatum*
*var. hydrophilum***

saline clover
PDFAB400R5
Fed: None
State: None
RANK: G5T2?/S2.2?
CNPS List: 1B
Records in CNDDb: Yes

***Trifolium gracilentum*
*var. palmeri***

southern island clover
PDFAB40102
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

***Trifolium gymnocarpon*
*var. plummerae***

Plummer's clover
PDFAB40112
Fed: None
State: None
RANK: G5T4/S2.3
CNPS List: 2
Records in CNDDb: Yes

Trifolium howellii

Howell's clover
PDFAB40140
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDb: No

Trifolium jokerstii

Butte County golden clover
PDFAB40310
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDb: Yes

Trifolium lemmonii

Lemmon's clover
PDFAB401C0
Fed: None
State: None
RANK: G4?/S3.2
CNPS List: 4
Records in CNDDb: No

Trifolium polyodon

Pacific Grove clover
PDFAB402H0
Fed: None
State: Rare
RANK: G1Q/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Trifolium trichocalyx

Monterey clover
PDFAB402J0
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDb: Yes

Triglochin palustris

marsh arrow-grass
PMJCG02040
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDb: Yes

***Trillium ovatum ssp.*
*oettingeri***

Salmon Mountains wakerobin
PMLIL200M1
Fed: None
State: None
RANK: G5T3/S3.2
CNPS List: 4
Records in CNDDb: No

Trimorpha acris* var. *debilis

northern daisy
PDASTE1012
Fed: None
State: None
RANK: G5T4/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Triphysaria floribunda

San Francisco owl's-clover
PDSCR2T010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Tripterocalyx crux-maltae

Kellogg's sand-verbena
PDNYC0G020
Fed: None
State: None
RANK: G4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Tripterocalyx micranthus

small-flowered sand-verbena
PDNYC0G030
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Triteleia clementina

San Clemente Island triteleia
PMLIL21020
Fed: None
State: None
RANK: G1/S1.2
CNPS List: 1B
Records in CNDDDB: Yes

Triteleia crocea* var. *crocea

yellow triteleia
PMLIL21031
Fed: None
State: None
RANK: G4T4/S3.3
CNPS List: 4
Records in CNDDDB: No

Triteleia crocea* var. *modesta

Trinity Mountains triteleia
PMLIL21032
Fed: None
State: None
RANK: G4T3/S3.3
CNPS List: 4
Records in CNDDDB: No

Triteleia grandiflora* var. *howellii

Howell's triteleia
PMLIL21061
Fed: None
State: None
RANK: G4G5T3T4/S1.
CNPS List: 2
Records in CNDDDB: Yes

Triteleia hendersonii* var. *hendersonii

Henderson's triteleia
PMLIL21073
Fed: None
State: None
RANK: G4G5T4/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Triteleia ixioides* ssp. *cookii

Cook's triteleia
PMLIL210A2
Fed: None
State: None
RANK: G5T2/S2.3
CNPS List: 1B
Records in CNDDDB: Yes

Triteleia lugens

dark-mouthed triteleia
PMLIL210D0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Tropidocarpum capparideum

caper-fruited tropidocarpum
PDBRA2R010
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1A
Records in CNDDDB: Yes

Tuctoria greenei

Greene's tuctoria
PMPOA6N010
Fed: Endangered
State: Rare
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Tuctoria mucronata

Crampton's tuctoria or Solano grass
PMPOA6N020
Fed: Endangered
State: Endangered
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Twisselmannia californica

Kings gold
PDBRA33010
Fed: None
State: None
RANK: G1/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Utricularia intermedia

flat-leaved bladderwort
PDLNT020A0
Fed: None
State: None
RANK: G5/S2.2
CNPS List: 2
Records in CNDDDB: Yes

Utricularia minor

lesser bladderwort
PDLNT020D0
Fed: None
State: None
RANK: G5/S3.2
CNPS List: 4
Records in CNDDDB: No

Utricularia ochroleuca

cream-flowered bladderwort
PDLNT020E0
Fed: None
State: None
RANK: G4?/S1.2
CNPS List: 2
Records in CNDDDB: Yes

Vaccinium coccineum

Siskiyou Mountains huckleberry
PDERI181N0
Fed: None
State: None
RANK: G5Q/S2.2?
CNPS List: 3
Records in CNDDDB: No

Vaccinium scoparium

little-leaved huckleberry
PDERI180Y0
Fed: None
State: None
RANK: G5/S2.2?
CNPS List: 2
Records in CNDDDB: Yes

Valeriana occidentalis

western valerian
PDVAL03080
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Vancouveria chrysantha

Siskiyou inside-out-flower
PDBER09010
Fed: None
State: None
RANK: G4/S3.3
CNPS List: 4
Records in CNDDDB: No

Veratrum fimbriatum

fringed false-hellebore
PMLIL25030
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Veratrum insolitum

Siskiyou false-hellebore
PMLIL25040
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Verbena californica

California vervain
PDVER0N050
Fed: Threatened
State: Threatened
RANK: G2/S2.1
CNPS List: 1B
Records in CNDDDB: Yes

Verbesina dissita

crownbeard
PDAST9R050
Fed: Threatened
State: Threatened
RANK: G2G3/S1.1
CNPS List: 1B
Records in CNDDDB: Yes

Veronica copelandii

Copeland's speedwell
PDSCR200B0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Veronica cusickii

Cusick's speedwell
PDSCR200C0
Fed: None
State: None
RANK: G5/S3.3
CNPS List: 4
Records in CNDDDB: No

Viburnum ellipticum

oval-leaved viburnum
PDCPR07080
Fed: None
State: None
RANK: G5/S2.3
CNPS List: 2
Records in CNDDDB: Yes

Viguiera laciniata

San Diego County
viguiera
PDAST9T060
Fed: None
State: None
RANK: G4/S3.2
CNPS List: 4
Records in CNDDDB: No

Viola aurea

golden violet
PDVIO04420
Fed: None
State: None
RANK: G3G4/S2S3
CNPS List: 2
Records in CNDDDB: Yes

Viola langsdorfii

Langsdorf's violet
PDVIO04100
Fed: None
State: None
RANK: G4/S1.1
CNPS List: 2
Records in CNDDDB: Yes

Viola palustris

marsh violet
PDVIO041G0
Fed: None
State: None
RANK: G5/S1S2
CNPS List: 2
Records in CNDDDB: Yes

***Viola pinetorum ssp.
grisea***

grey-leaved violet
PDVIO04431
Fed: None
State: None
RANK: G4G5T1/S1.3
CNPS List: 1B
Records in CNDDDB: Yes

***Viola primulifolia ssp.
occidentalis***

western bog violet
PDVIO040Y2
Fed: None
State: None
RANK: G4T2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Viola tomentosa

woolly violet
PDVIO04280
Fed: None
State: None
RANK: G3/S3.2
CNPS List: 4
Records in CNDDDB: No

***Wislizenia refracta ssp.
refracta***

jackass-clover
PDCPP09013
Fed: None
State: None
RANK: G5T5?/S1.2?
CNPS List: 2
Records in CNDDDB: Yes

Woffia brasiliensis

Columbian watermeal
PMLEM03020
Fed: None
State: None
RANK: G5/S1.3
CNPS List: 2
Records in CNDDDB: Yes

Woodsia plummerae

Plummer's woodsia
PPDRY0U0A0
Fed: None
State: None
RANK: G5/S1.3?
CNPS List: 2
Records in CNDDDB: Yes

Wyethia elata

Hall's wyethia
PDAST9X050
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Wyethia longicaulis

Humboldt County
wyethia
PDAST9X0A0
Fed: None
State: None
RANK: G3/S3.3
CNPS List: 4
Records in CNDDDB: No

Wyethia reticulata

El Dorado County mule
ears
PDAST9X0D0
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Xylorhiza cognata

Mecca-aster
PDASTA1010
Fed: None
State: None
RANK: G2/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

Xylorhiza orcuttii

Orcutt's woody-aster
PDASTA1040
Fed: None
State: None
RANK: G2G3/S2.2
CNPS List: 1B
Records in CNDDDB: Yes

***Zigadenus micranthus
var. fontanus***

marsh zigadenus
PMLIL28050
Fed: None
State: None
RANK: G4T3/S3.2
CNPS List: 4
Records in CNDDDB: No

Appendix D



Baseline Biodiversity Survey For The Santa Ysabel Ranch Open Space Preserve

U.S. Geological Survey



Prepared for:

**The Nature Conservancy
San Diego County Department of Parks and Recreation**

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
WESTERN ECOLOGICAL RESEARCH CENTER

Baseline Biodiversity Survey For The Santa Ysabel Ranch Open Space Preserve

By Stacie Hathaway, Robert Fisher, Carlton Rochester, Chris Haas, Mark Mendelsohn, Greta Turschak, Drew Stokes, Melanie Madden-Smith, Ed Ervin, Krista Pease, and Chris Brown

U.S. GEOLOGICAL SURVEY
WESTERN ECOLOGICAL RESEARCH CENTER

Prepared for:

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Sacramento, California
2004

U.S. DEPARTMENT OF THE INTERIOR
GALE A. NORTON, SECRETARY

U.S. GEOLOGICAL SURVEY
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Abstract

Santa Ysabel Ranch Open Space Preserve, a 5,400-acre property previously operated as a cattle ranch, became part of the San Diego County Parks and Recreation Department in the fall of 2001. Following this acquisition, the U.S. Geological Survey conducted surveys to establish baseline species data. Aquatic surveys detected four native amphibian species and two non-native fish species. Herpetofauna pitfall arrays detected four native and one non-native amphibian species, eight lizard species, and eleven snake species. Forty-three ant species were recorded using ant pitfall traps co-located at the herpetofauna pitfall arrays. Diurnal and nocturnal bird point counts including targeted California spotted owl surveys and incidental bird sightings recorded 108 bird species present on or near the study site. Fifteen bat species were detected using foraging and roost site surveys. Twelve small mammal species were captured in pitfall buckets at the herpetofauna pitfall arrays. Remotely triggered cameras and scent stations documented the presence of nine native and four non-native medium and large bodied mammal species. Additional incidental observations and detection of non-target species through sampling efforts brought the total number of species detected on the Santa Ysabel Ranch Open Space Preserve to 225. This list includes one federally endangered species, 20 federal species of concern, 28 California Department of Fish and Game Species of Special Concern (eight of which are also federal species of concern), and 10 non-native species.

1. Introduction

For several generations, the Edwards Ranch was a cattle ranch owned and operated continuously by the Edwards family. In 1998 and 1999, The Nature Conservancy acquired approximately 5,400-acres and incorporated it as the Santa Ysabel Ranch Open Space Preserve (SYROSP). In the fall of 2001, the two properties that comprise the preserve were transferred to the San Diego County Parks and Recreation Department. Funds for the purchase of the SYROSP were provided, in part, by grants from the Federal Transportation Enhancement Act and the State Wildlife Conservation Board. Per grant agreements with those programs, an inventory of biological resources on the preserve was initiated. In 2002, the U.S. Geological Survey (USGS) began baseline biodiversity surveys. This project was multifaceted and included surveys designed to detect ants, fishes, reptiles, amphibians, birds, bats, and small, medium, and large mammals. A variety of techniques were utilized to detect presence and, when possible, relative abundance, for these taxonomic groups. The survey techniques used for this study followed standard protocols used by the USGS San Diego Field Station in other baseline biodiversity studies (Fisher & Crooks 2000, Hathaway et al. 2002). These data will serve as a basis for the development of public use and biological management guidelines for the preserve, as well as establish baseline conditions for a long-term monitoring program. This report summarizes our findings and will include the raw data in a Microsoft Access database.

The research approach taken here forms the basis for broader applications as an ecosystem function based design where the relationships between various taxonomic groups can be compared to a variety of reserve level covariates. One example is to determine patterns of diversity of native species in specific habitats to examine the effects of invasives

such as grasses. This type of design is more robust for conducting adaptive management experiments over time where the response is measured in biodiversity increases/recovery over time. By conducting a series of these biodiversity surveys under different environmental conditions we are able to begin to determine repeated patterns of co-occurrence across taxonomic groups and develop robust conceptual models of the relationships of these animal communities to habitat features. As we develop long-term monitoring strategies, the multi-taxa baseline data will be used to identify potential indicator taxa or groups to monitor that will be representative of ecosystem function and biodiversity. This will help to optimize the use of resources for monitoring.

2. Study Area

The Santa Ysabel Ranch Open Space Preserve (SYROSP) is located north, west, and east of the village of Santa Ysabel, California, approximately 40 miles (63 km) northeast of downtown San Diego (Figure 1). The preserve is comprised of two separate parcels: an east parcel, which is approximately 3,800 acres and is located east of CA 79 and north of CA 78 and a west parcel, which is approximately 1,512 acres and is located west of CA 79 and north of CA 78.

Two major drainage systems have their headwaters within or immediately adjacent to SYROSP. Santa Ysabel Creek, a tributary to the San Dieguito River, flows westward along the northern boundary of the east property and bisects the west property. Its headwaters also extend to the immediate east and north of the preserve on the western slopes of Volcan Mountain and it serves as the primary drainage to SYROSP. The east property also contains the headwaters of the San Diego River, which flows south into the Pacific Ocean.

The habitats within SYROSP are part of the California Floristic Province, which includes the cismontane areas from southern Oregon to coastal northwest Baja California. This floristic region is characterized by a Mediterranean climate, which has shaped the evolution and biogeography of its species and habitats (Munz 1974; Raven & Axelrod 1978; Wiggins 1980; Beauchamp 1986; Holland 1986; Oberbauer 1992; Hickman 1993).

SYROSP supports numerous native vegetation communities, including coastal sage scrub, chaparral, Engelmann oak woodlands, mixed oak woodlands, riparian scrub/forest, Coulter pine/black oak woodlands, grasslands, and chaparral (CBI 2000). Soils consist of sandy loams over decomposed gabbro or weathered granodiorite parent material and the hillsides feature outcrops of granite and granodiorite (CBI 2000).

3. Methods

Surveys were begun in early 2002 and continued through summer 2003, depending on the taxonomic group, survey technique, and the necessary temporal sampling regime. Specialists in the different survey techniques and project tasks were used and the leads for each project are listed below:

<u>Project</u>	<u>Study Lead</u>
Project management	Hathaway
Aquatic surveys	Ervin, Fisher
Herpetofauna	Rochester, Fisher
Ants	Pease
Avifauna	Mendelsohn, Madden-Smith, Turschak
Bats	Stokes
Small mammals	Rochester
Large mammals	Turschak
Geospatial data and maps	Hathaway
Data development	Rochester, Hathaway, Brown
Report compilation and editing	Haas, Hathaway

The various sections of the report are primarily authored by the leads on the various projects.

3.1 Aquatics

Potential aquatic habitats were identified by looking at the topographic maps for the properties combined with reconnaissance surveys to better refine potential survey locations. Three reconnaissance visits were conducted and we identified a total of 15 wetland sites within the preserve to be included in the surveys. These 15 sites represented multiple aquatic features. All of the surveyed wetlands were classified by hydroperiod, which is defined as the length of time pooled or flowing water occurs above the substrate. The range of terms used to categorize wetland hydroperiod forms a continuum from permanent to short duration. The terms considered were: perennial, semi-permanent, seasonal, and temporary. Site names were formed and assigned to any presumably unnamed wetlands we surveyed by combining the habitat type with a sequential number (i.e., Spring 1, Spring 2). We used established names when possible and applied a sequential numbering method when a named habitat was subdivided into artificial segments (i.e., Santa Ysabel Creek 1, Santa Ysabel Creek 2).

On the west property, we surveyed the entire length of the seasonal Santa Ysabel Creek (Santa Ysabel Creek 1), a temporary unnamed tributary to Santa Ysabel Creek (named in this document as unnamed tributary to Santa Ysabel Creek), a temporary cattle pond (Cattle Pond 2), and a perennial cattle pond (Cattle Pond 3) (Figure 2; Appendix 1). Cattle Pond 3 is located mainly outside the preserve with the high water line encompassing an area within the preserve. Consequently, only after sufficient input from rainfall or runoff does the pond surface water advance onto the preserve property. Therefore, we also identified this perennially marshy input drainage to Pond 3 as potential refugia for aquatic-associated species. On the east property, we sampled the entire length of the mostly seasonal Santa Ysabel Creek, which was divided into six reaches using existing road crossings or changes in land ownership as transition points (Santa Ysabel Creek 2-7). We also surveyed the temporary headwaters of the San Diego River and several upland wetland habitats, consisting of an additional temporary cattle pond (Cattle Pond 1) and two perennial springs (Spring 1 and Spring 2) (Figure 2; Appendix 1).

We targeted a variety of species with very divergent life histories. Therefore, we employed a variety of different survey methods and techniques throughout the preserve and surveyed temporally across seasons. These methods included: visual encounter surveys, hand capture, dip netting, aural detections (for male frog vocalizations), and focused surveys for the arroyo toad and California red-legged frog habitat. Trapping was not used as a survey technique with the exception of those detections of aquatic species that were made using the passive capture method of pitfall trapping (see Section 3.2). We used a combination of survey methods and techniques to detect the greatest number of species within the shortest amount of time. The methods are discussed below and some examples of species they targeted are provided.

3.1.1 *Visual Encounter Survey*

We used a modified version of the visual encounter surveys described by Crump and Scott (1994). Our techniques varied in that they were neither time nor area constrained. The visual encounter surveys consisted of walking through an area or habitat in search of all aquatic (larval stage amphibians, fishes) and aquatic-associated organisms (garter snakes, turtles, newts, frogs and toads). We concentrated our efforts on the wetted portions as well as the perimeter and vicinity of the aquatic habitat. An additional component of the visual encounter survey was the identification and notation of sub-areas, or habitat patches, which fit the criteria for suitable arroyo toad habitat (see Section 3.1.5). All 15 aquatic sites identified were initially visually surveyed during daylight hours; any follow-up visual encounter surveys were conducted during daylight hours and/or after sunset.

3.1.2 *Hand Capture*

We located and attempted to capture by hand at least one individual per species at each sample site to confirm species identification and on occasion take a digital photograph to serve as a record of species presence and activity.

3.1.3 *Dip Netting*

Dip nets were used to capture individual animals visually detected or to sample areas between and among debris. This method is most effective in smaller bodies of water and shallow streams which characterize the wetlands that occur on site. This method has been shown to be effective in capturing small fish, all amphibian life stages, large macroinvertebrates, and reptiles (Heyer et al., 1994; Warburton et al. 2002). Dip nets were used to sample deeper pools in each of the Santa Ysabel Creek survey reaches where more complex microhabitats (thick algae growth, cobble substrates) were found. Dip nets were not required in the shallow waters of the upland spring habitats.

3.1.4 *Aural Detection*

This method is limited to species that produce detectable and identifiable species-specific vocalizations. Male anurans (frogs and toads) in breeding condition were the only group of aquatic species to fit this criterion. The advantage of aural detection over visual

surveys is that the animals advertise their presence, whereas the observer must locate them during visual surveys. In addition, the male anuran advertisement calls permit detection from a distance. Aural detections were used to supplement the basic visual encounter surveys by enabling us to detect species presence by their vocalization.

3.1.5 *Focused Surveys for Arroyo Toads*

The arroyo toad is a species of concern to resource agencies and this preserve is within the arroyo toad's distribution range. During our preliminary visual encounter surveys we identified suitable arroyo toad habitat on-site. Therefore, we conducted focused surveys for the federally endangered arroyo toad (*Bufo californicus*) along several segments of Santa Ysabel Creek. This species is considered to have the most specialized habitat requirements of any amphibian found in California (Jennings & Hayes 1994). Although the arroyo toad is a terrestrial species most months of the year, it requires aquatic habitat for breeding; it is not known to breed in lentic habitats. Based on Jaeger (1994), we developed a patch sampling approach to plan and conduct focused surveys for the endangered arroyo toad (Ervin et al. 2003). This method emphasizes searching a habitat patch within a broader environment for a specific species and is most useful for species that are strongly associated with specific habitat types (Jaeger 1994).

Initial surveys for the arroyo toad consisted of hiking up riparian corridors (all Santa Ysabel Creek segments, the unnamed tributary to Santa Ysabel Creek, and the San Diego River; Figure 2; Appendix 1) during daylight hours and searching for habitat features known to be associated with suitable arroyo toad habitat (i.e., low gradient drainages, predominantly sandy substrate and adjacent banks, and terraces composed of friable soil types). All other aquatic species were noted during the focused surveys. The physical habitat features used to characterize riparian habitats in terms of quality for arroyo toads included: 1) any given drainage, or portion thereof, with a gradient (degree of slope) of $\leq 2\%$, 2-3%, or $> 3\%$, 2) the channel substrate type being predominately composed of depositional sand with the presence of sandy banks, 3) the presence of flat sandy terraces immediately adjacent to channel, and 4) the degree of channel braiding. In combination, the occurrence of a low gradient ($\leq 2\%$) with sandy depositional substrate results in conditions conducive to the formation of seasonal quiet backwater breeding pools (Sweet 1992; Campbell et al. 1996). Assessments were based on physical features and channel morphology, and not necessarily on the presence of surface water (seasonal breeding pools). The following four habitat quality types are based on various conditions and combinations of upland (terrestrial) and stream channel (potential aquatic breeding pools) characteristics:

High Quality: Portion of drainage of low gradient ($\leq 2\%$), with predominantly sandy substrate and banks, adjacent terraces with friable soils, and often having a watercourse of braided channels.

Good Quality: Portion of drainage of relatively low gradient (2-3%) and having only one of the following characteristics: predominantly sandy substrate and banks, adjacent sandy terraces, and a watercourse of braided channels.

Marginal Quality: Portion of drainage of relatively low gradient (2-3%) and lacking all three of the following characteristics: predominantly sandy substrate and banks, adjacent sandy terraces, and a watercourse of braided channels.

Poor Quality: Portion of drainage with a gradient of $> 3\%$, and lacking all three of the following characteristics: predominantly sandy substrate and banks, adjacent sandy terraces.

Those sites which were characterized as 'High Quality' or 'Good Quality' were subsequently revisited during the evening hours to survey for arroyo toads. These nocturnal presence surveys entailed walking along drainages in search of any of the various life history stages (i.e., calling males, egg strings, larvae, metamorphic individuals, and foraging juveniles and adults in upland habitats) using multiple cues (direct observation and calling males). Headlamps with 45,000-candle power were used to provide the required amount of illumination to maximize detection. We followed a modified version (USGS San Diego Field Station, unpublished protocol) of the USFWS arroyo toad survey guidelines (USFWS 1999b), which recommends commencing nighttime surveys 60 minutes after sunset on nights with an ambient temperature of 15°C (at sundown) in the absence of wind, hard rains, and a full moon (USFWS 1999b). Modifications made to the USFWS guidelines for our nocturnal presence surveys included commencing surveys at approximately 30 minutes after sunset (to take advantage of the darkness but prior to lower air temperatures).

All surveys for aquatic species were conducted between the months of March and September 2002 and May through August 2003. Not all sites were surveyed on each survey day, however each site was visited at least once.

3.2 Herpetofauna

Pitfall trap arrays have been widely used to obtain data on a variety of arthropods, amphibians, reptiles, and small mammals throughout southern California (Fisher & Case 2000). In this study, each array consisted of seven 5-gallon buckets connected by shade cloth drift-fences. From a center bucket, three arms of drift fence extended out 15 m, thus forming a Y (Figure 3). In addition to the center bucket, each arm of the Y had a bucket placed in the middle and at the end. A meter long hardware cloth funnel trap was placed along each of the three arms for capturing large snakes and lizards. Each snake trap had a funnel on each end, allowing animals to enter but not exit, contained a piece of PVC pipe to provide shelter for captured animals, and was covered with boards to provide shade. Sampling was conducted at each array for four consecutive days every 4-6 weeks (Appendix 2). The traps were kept closed between the sampling periods.

Captured animals were individually marked either by toe-clipping (lizards and amphibians) or scale-clipping (snakes) and then released. In addition, individuals were weighed, measured (snout to vent), sexed, and age classed. Twenty-four pitfall arrays were established across the preserve (Figure 4; Appendix 3). A sample period was represented by all arrays being open for four consecutive days. A total of 10 four-day sample periods and two three-day sample periods were performed, resulting in 46 survey nights. For more in depth methods see Fisher et al., in review.

3.2.1 *Vegetation and Site Characterization*

Vegetation was recorded in the vicinity of each array following established protocols of the California Native Plant Society (Sawyer & Keeler-Wolf 1995). Local landscape features were also recorded and entered into a GIS database. The flora and vegetation at each array were measured with two 25 m orthogonal line transects. These transects were north and south of the center bucket of each array. Data were collected at points every 0.5 m for plant species, canopy height, leaf litter depth, and substrate type. We determined the proportion of habitat type at each pitfall trap array based on the typical plant indicators of those habitat types (Holland 1986). We also characterized the substrate type into seven categories at each array: sandy soil, bare rock, organic soil, moss, leaf litter, cobble stone, and cryptogamic crust.

3.3 **Ants**

Ants were sampled in association with the herpetofauna and small mammal sampling locations (24 locations; Figure 4; Appendix 3). Five ant pitfall traps (50 mL centrifuge tubes) filled with approximately 25 mL of Sierra™ brand antifreeze were installed at each herpetofauna array. This brand of antifreeze preserves the specimens without threatening the health of the environment. Holes were made in the soil using a metal stake. A PVC sleeve constructed from a 1" pipe was inserted into each hole and an ant pitfall trap was inserted into the sleeve so that the opening of the centrifuge tube was flush with the ground. The five traps overlaid the existing herpetofauna array in the shape of a "+", with a trap at the center bucket and one located (in each direction) 15 m away from the center bucket (Figure 3). The four corners of the "+" were separated by approximately 20 m.

Each ant pitfall trap was left open for 10 consecutive days. In order to reduce and prevent incidental captures between sampling efforts, the sleeves were closed using empty 50 mL centrifuge tubes with the lids remaining on. The ants were identified and counted after the samples were sorted to remove ants from non-ants and debris. When necessary, representative specimens of unknown species were sent to Dr. Andrew Suarez at University of California, Berkeley and Dr. Phil Ward of University of California, Davis to be identified. The five tubes from each array were pooled for analysis to determine the number and relative abundance of ant species at each array. Winged queens and males were noted but not used in analysis since they may have originated from outside the site.

3.4 **Avifauna**

Avian species were observed and recorded through morning (diurnal) point counts, night driving surveys, and incidental observations from other USGS research efforts on the preserve. Additional focused species surveys were used to target California spotted owls.

3.4.1 *Diurnal Point Count Surveys and Nocturnal Driving Surveys*

Field methods and data forms used for avifauna surveys were similar to Ralph et al. (1993). Point counts were conducted between roughly 0530 and 1100, recording all birds observed visually and/or audibly. All methods were chosen to maximize species detectability, which ultimately depends on the observer's skill, a bird's distance from the observer, and species' behavior (Nichols et al. 2000). Only mornings with favorable weather conditions (i.e., lacking heavy rain, heavy wind, fog, or abnormally cold temperatures that could hamper bird activity and/or detections) were used for surveys. Notes regarding habitat associations of birds and signs of any breeding activity were also recorded. The counts were broken down into 0-5 minute and 5-10 minute time frames so that the results could be compared to censuses done with only 5-minute intervals. Additionally, the radius of detection was divided into 0-50 m and 51-100 m, and observations for each were recorded in distinct columns. Fly-over observations were also recorded in separate columns. Temperature, percent cloud cover, and wind speed were noted at the beginning and end of each day.

Computer-generated point count locations were determined by overlaying a 0.125 km² grid on a GIS map of the study area and then placing a point in the middle of each grid cell, so that 0.25 km separated the two closest points. These points were then examined with an existing vegetation map (San Diego Association of Governments) in an attempt to stratify across the general vegetation types present. The goal was to create a proportional allocation of points across habitat areas based on the area covered by each habitat. Which points would be surveyed were then randomly selected within each vegetation type. The actual point counts were conducted as close as possible to these computer-generated locations, however accessibility determined the exact location. Terrain, vegetation and hydrological features, and land ownership usually determined accessibility. In fewer than five cases, points were just slightly relocated.

The total number of census points was 50 (Figure 5; Appendix 4). Flagging and GPS waypoints (Garmin 12XL) were used to mark all point count stations and to navigate to the points with relative ease. Three cycles (May, June, and July) were conducted at 50 points during each of the two survey years, 2002 and 2003. Incidental observations of avifauna species through other sampling methods (e.g., camera surveys; see Section 3.7.2), as well as raptor nesting sites, were also recorded.

For each bird identified, the general habitat type (pine woodland, oak woodland, riparian, chaparral, coastal sage scrub, grassland, and human-modified) in which it was found was recorded. Birds using urban habitat or any non-natural structures on the study area (e.g., roads, telephone/electricity poles, towers and wires, and fences) were lumped into the category "human-modified" (H). Additionally, vegetation data (measured within a 100 m radius of each point count station), substrate, hydrology, aspect, slope, and road presence data were recorded for each point. One of the variables, the percentage of this area covered by each habitat type present, was visually estimated from each point count station (Appendix 17).

We created files with 1) notes on the best access, via driving and/or walking to each point, 2) a complete list of species observed, 3) notes on the date and habitat(s) in which each species was first observed, and 4) two digital photographs of each point count station. In conducting the point counts, especially during the first cycle, time was spent following unknown birds and consulting field guides (National Geographic Society 1999; Sibley 2000) and CD's (Cornell Laboratory of Ornithology 1992) with bird vocalizations for positive identification.

In order to target nocturnal species, such as owls and Caprimulgids, four nocturnal-driving surveys (one during new and one during full moon phases, on each property, west and east) were performed in 2002 from one hour before dusk to two to three hours after nightfall. During each of the four surveys, the vehicle was stopped at at least three locations on roads throughout the study area for 30 minutes each. At each location, vocalizations of all potential owl and Caprimulgid species were played from CD's to elicit behavioral responses from such birds for detection, both by visual (aided by the use of a spotlight) and audible (callbacks) means. Data from the night surveys were recorded onto "area search forms" available on Point Reyes Bird Observatory's website - <http://www.prbo.org/tools/index.html> (Point Reyes Bird Observatory 2002). Nocturnal driving surveys were not conducted in 2003; rather focused surveys for California spotted owls were conducted and all incidental nocturnal avifauna species were recorded.

3.4.2 Focused Surveys for California Spotted Owls

A survey for the California spotted owl (*Strix occidentalis*) was conducted to determine its presence within the preserve. Calling stations were established following the USFWS Protocol for Surveying for California spotted owls in Proposed Management Activity Areas and Habitat Conservation Areas (USFWS 1993). When feasible, stations were established on prominent points such as ridge tops or hills to enhance calling distance. The stations were spaced at approximately 0.5 mile intervals. Projected calls can be heard approximately 0.25 miles from a calling station, so a distance of 0.5 miles between calling stations provided adequate coverage. Thirty-six calling stations were established throughout the preserve prior to surveying. However, due to time and personnel constraints, only a fraction of these calling stations could be surveyed. We surveyed all 15 high priority sites and one medium priority site between May and August 2003. The one year survey consisted of six visits to the property and followed the USFWS protocol (USFWS 1993) (16 stations; Figure 6; Appendix 5).

California spotted owls tend to select older forests for nesting, roosting, and foraging. In southern California, California spotted owls inhabit patches of higher elevation forest surrounded by chaparral or desert scrub (Noon & McKelvey 1992), riparian hardwood forests (Verner et al. 1992), and multi-storied coniferous forest (Gutierrez et al. 1992). With these characteristics in mind, we assigned a priority level (high, medium, or low) to each of the 36 calling stations based on the habitat quality requirements for California spotted owls. This prioritization resulted in 15 high priority sites, 10 medium priority sites, and 11 low priority sites (Appendix 5).

California spotted owls are most likely to be active and detectable directly following sunset and preceding sunrise. Each visit involved visiting a series of calling stations, beginning at sunset and extending for approximately 8 hours. To ensure that each station received at least one or two visits during the optimal detection time, the calling stations were visited in a different order on each visit. At each calling station, taped California spotted owl calls (Stokes et al. 1999) were played over a megaphone (Johnny Stewart 512 Wildlife Caller, 5100 Fort Ave., Waco, TX 76710). The calls were played for approximately 30 seconds followed by a one to two minute listening interval; this pattern was repeated until a minimum of 10 minutes had passed. Calling was discontinued if great horned owls or other predators were detected. Species and estimated location (compass bearing) were recorded each time an owl was detected. Sex and age (adult or juvenile) were also recorded following a response.

When California spotted owls responded, day follow-up surveys were conducted to determine pair status and reproductive status. Day follow-up surveys involved searching the general area in which the California spotted owl was heard, and included both a visual search of the area and playing California spotted owl calls to obtain audible responses. If an owl was located during the day, visual observations were used to determine pair status and/or reproductive success. If pair status could be determined, an activity center was established. An activity center consisted of a $\frac{1}{2}$ to $\frac{3}{4}$ mile radius around the point where a pair was detected. After an activity center was determined, the calling stations within that center were eliminated. (USFWS 1993)

3.5 Bats

Acoustic, visual, and mist-net capture techniques were used to observe and detect bats. These techniques were used in concert during two types of surveys: foraging bat surveys and roosting bat surveys. Occasionally, foraging bats were detected during roost surveys and bats exiting roosts were detected during foraging bat surveys.

3.5.1 *Foraging Bat Surveys*

Foraging bat surveys were conducted at 8 of the 9 survey sites (sites 1, 2, 4-9) using a combination of an Anabat, the unaided ear, visual, and mist-net techniques (Figure 7; Appendix 6). We focused on a variety of habitat features within the preserve, including six creek/riparian reaches, an upland woodland area, and a pond. These are habitats where a number of different bat species would be expected to be found foraging based on previous experiences surveying for bats in southern California (D. Stokes, pers. obs.). We targeted these areas in order to detect as many bat species as possible in a limited survey effort.

When surveying for foraging bats, an Anabat II bat detector (Titley Electronics, New South Wales, Australia) was utilized to detect and record bat echolocation signals (O'Farrell et al. 1999). The Anabat was used at foraging sites for a minimum period of three hours beginning approximately at sunset. The calls were then analyzed and identified to the species level when possible. The unaided ear was also used to detect audible bat echolocation and social calls, which were also identifiable to the species level in most cases.

Visual techniques (i.e., a spotlight, unaided eyes) were often used simultaneously with acoustic techniques to observe foraging bats, which typically aided in species identification.

Mist-netting was conducted simultaneously with acoustic techniques during all foraging bat surveys. Mist-nets are made of fine nylon mesh and are used to capture bats in flight and are usually placed in areas likely to intercept flying bats, such as over small bodies of water or in vegetation flyways (Kunz et al. 1996a). We employed one to five mist-nets at appropriate foraging sites to capture bats. Mist-nets were used for a minimum period of three hours beginning approximately at sunset. Captured bats were processed and then released immediately. The information recorded during processing included the species, age, tooth wear (estimate of age), sex, reproductive status, parasite load, general measurements, and anything else noteworthy. In most cases, a digital camera was used to document the captured bat.

3.5.2 Roost Surveys

Roost surveys require first locating potential roost sites and then employing passive techniques to detect bats, including using the unaided ear, visual techniques, and Anabat bat detectors. To manage for and conserve bats, it is extremely important to locate, characterize, and monitor roosts (Pierson 1998). Some bat species are more easily detected at roost sites (e.g., Townsend's big-eared bat (*Corynorhinus townsendii*)) than foraging sites and thus this technique is used to compliment foraging bat surveys for conducting a thorough bat inventory. Roost surveys must be conducted cautiously as many bat species are very sensitive to disturbance at roost sites (Kunz et al. 1996b), therefore only passive techniques were used. An Anabat bat detector, the unaided ear, and visual techniques were used to observe and detect bats at a single roost site (corner store in town of Santa Ysabel; Figure 7; Appendix 6) on two different dates.

3.6 Small Mammals

Small mammals were passively captured in the buckets comprising each of the 24 herpetofauna pitfall arrays (Figure 4; Appendix 3; see Section 3.2 for a more detailed explanation of trap configuration and sampling methods). Small mammal species captured in pitfall traps were identified, when possible, and recorded. However, they were not weighed, measured, nor marked. Data were analyzed as the number of confirmed captures per array site. Capture rates were not calculated, since not all small mammal species captured by the herpetofauna field crews were identified to the species level and individually marked.

In addition to the small mammals documented in the pitfall traps, surveys were also conducted to determine the presence of wood rat (*Neotoma* spp.) nests near each array. A visual search for wood rat nests was performed around each array, to an approximate radius of 25 m from the center pitfall trap. When detected, wood rat nest locations were recorded with a GPS receiver.

3.7 Medium and Large Mammals

Two sampling techniques were used to document the distribution and relative abundance of native medium and large bodied mammals across the preserve: baited scent station surveys and remotely triggered camera stations.

3.7.1 Scent Station Surveys

Scent stations have been widely used as a means to monitor trends in carnivore populations. Following methods developed by Linhart and Knowlton (1975), track surveys have been shown to be effective measures of distribution and relative abundance of mammalian species (Conner et al. 1983; Sargeant et al. 1998).

Ten track transects were established throughout the property. Nine track transects were located along dirt roads within the property. Each 1000 m transect consisted of five scent stations at approximately 250 m intervals (e.g., transect 1: stations 1-1 to 1-5, etc...) (Figure 8; Appendix 7). To further assess the movement of medium and large bodied mammals along and across roadways bordering and transecting the preserve, additional scent stations were placed at potential movement routes across and along CA 78 and CA 79 (Figure 8; Appendix 7). Three scent stations were established at varying intervals along these two roads. Although not a true transect (it did not contain five scent stations 250 m apart in a linear configuration like transects 1-9), these three stations were collectively referred to as transect 10. Each scent station consisted of a 1 m² plot of finely sifted gypsum powder with a rock, placed in the middle of the station, baited with two artificial scent lures (Russ Carman's Pro Choice and Canine Call) every other day. Stations were checked for visitation on five consecutive mornings. If an animal visited a station, tracks were identified to species and the station was cleared and resifted. Scent stations were surveyed quarterly from June 2002 to June 2003 for a total of five sample periods.

To obtain an index of relative abundance, the number of visits by each species was divided by the total sampling effort. This index was calculated using the following equation:

$$I = \{v_j / (s_j n_j)\}$$

where, I = index of carnivore activity at transect j
 v_j = number of stations visited by species at transect j
 s_j = number of stations in transect j
 n_j = number of nights that stations were active in transect j

Any scent station in which tracks were too difficult to read was omitted from the sampling night. Thus, the true sampling effort was:

$$\{s_j n_j\} - o_j$$

where, o_j = number of omits in transect j

Sampling efforts for each transect are presented in Appendix 8. This index does not provide data on the absolute number of individuals. Instead, the index is used to compare relative abundance of species across space and time (Conner et al. 1983; Sargeant et al. 1998). Track indices were pooled across seasons to derive a single track index per transect for each individual species.

3.7.2 Camera Surveys

Remotely triggered camera stations have increasingly become a useful tool in recording activity of various wildlife species (Griffiths & Van Schaik 1993; Jacobson et al. 1997; Karanth & Nichols 1998). Cameras provide a relatively low-maintenance means of surveying wildlife populations because visitations to the units are only made to change film and batteries.

Nine Camtrak cameras (CamTrakker, 1050 Industrial Drive, Watkinsville, GA 30677) were placed along wildlife trails and dirt roads throughout the property (Figure 8; Appendix 7). Each camera was paired with a track transect in order to compare the detection of various species along different travel routes (i.e., scent stations were placed along major dirt roads throughout the preserve; camera stations were placed off of these routes along wildlife trails, cattle paths, and abandoned roadways). Each pass of an animal by the infra-red sensor triggered the camera. Date and time of pass were recorded on each print. Cameras were operated continuously, barring drained batteries or all of the photos used between periodic visits, between April 2002 and June 2003.

To obtain an index of relative abundance, the number of visits by each species was divided by the total sampling effort. This index was calculated using the following equation:

$$I = \{v_j/n_j\}$$

where, I = index of activity at camera j
 v_j = number of passes by species at camera j
 n_j = number of nights that camera j was active

Sampling efforts for each camera station are presented in Appendix 8. Camera indices were compared among camera locations to detect relative activity levels of species across the property.

4. Results and Discussion

4.1 Aquatics

4.1.1 Visual Encounter Surveys

Visual encounter surveys detected four amphibian species, two non-native fishes, and a freshwater clam (Table 1). Five of these species were observed on the west property, including the Pacific treefrog (*Hyla regilla*), western toad (*Bufo boreas*), arroyo toad (*Bufo*

californicus), the non-native mosquitofish (*Gambusia affinis*), and the yet to be identified fingernail clam (*Cyclocalyx* spp.). All five species were observed in the Santa Ysabel Creek 1 reach; only the Pacific treefrog and western toad were observed at Cattle Pond 3 and its input drainage. No aquatic species were observed in Cattle Pond 2 or the unnamed tributary to Santa Ysabel Creek although this is not unexpected because no pooled water was present when our aquatic surveys were conducted.

Three species were detected on the east property: the Pacific treefrog, California treefrog (*Hyla cadaverina*), and a single individual of the stocked rainbow trout (*Oncorhynchus mykiss*), which was detected along the Santa Ysabel Creek 4 reach (Table 1) (see section 4.1.6 for discussion of trout status). The Pacific treefrog was the only aquatic species detected at a spring (Spring 1). No aquatic species were observed in Santa Ysabel Creek 7, Spring 2, or the San Diego River. We did not conduct thorough focused surveys at Cattle Pond 1, since there was no pooled surface water observed. No emergent wetland plants (i.e., *Typha*, *Scirpus*) were noted in this pond.

4.1.2 Hand Capture

Of the four anuran species detected during the aquatic surveys, only the Pacific treefrog was hand captured. The arroyo toads were not handled because they were observed on a fairly cool evening (temperature was 13.5°C) and were easily photographed.

4.1.3 Dip Netting

Pacific treefrog and California treefrog eggs and tadpoles and mosquitofish were easily captured by dip nets. The fingernail clams were an incidental capture during routine capture and examination of amphibian larva.

4.1.4 Aural Detection

The mating behavior most commonly associated with frogs and toads is the advertisement call produced by the male. Male frogs and toads in breeding condition call most vigorously after sundown, often for several hours. The Pacific treefrogs and California treefrogs were detected on site by the males 'advertisement' call. Male arroyo toads also produce a distinctive advertisement call, but none were heard during our surveys. The male western toad also has the ability to produce an advertisement call but it is seldom used. No western toads were detected aurally. The western spadefoot (*Spea hammondi*) also has distinctive call but breeds almost exclusively in the temporary lentic wetlands such as pools and ponds. They were not observed nor heard vocalizing during our surveys, probably because these wetlands did not provide suitable breeding habitats due to the lack of adequate precipitation needed to fill and maintain pooled surface water.

4.1.5 Focused Surveys for Arroyo Toads

We identified four sections along Santa Ysabel Creek that contained High Quality arroyo toad habitat: Santa Ysabel Creek reaches 1, 2, 5, and 6. An additional area outside the

main creek was also identified along the input drainage to Cattle Pond 3. Within each of these survey sites, we further delineated potentially occupied arroyo toad habitat patches based on the presence of habitat features highly associated with toad populations (i.e., low stream gradient, a primarily sandy channel substrate, and adjacent sandy terraces). These subsets of survey segments included: North Sandy Arroyo (within the input drainage to Cattle Pond 3 site), Mortero Terrace (within the Santa Ysabel Creek 2 site), Turkey Terrace and Sandy Wash (within the Santa Ysabel Creek 5 site), and East Side Reach (within the Santa Ysabel Creek 6 site); the entire length of the Santa Ysabel Creek 1 survey site was determined to be High Quality arroyo toad habitat (Figure 2; Appendix 1). Representative photos of occupied and potential arroyo toad habitat are provided in Appendix 9.

No arroyo toads were detected during our nighttime aquatic surveys. However, there were three incidental observations of arroyo toads during one evening that a bat survey was conducted (Appendix 9). These three observations constituted at least two unique individuals and confirm the presence of the arroyo toad on SYROSP. These observations occurred within the Santa Ysabel Creek 1 site. Furthermore, several other species were detected during these nighttime surveys, including the Pacific treefrog, California treefrog, and western toad.

4.1.6 *Survey Discussion*

Our study took place during a period of below average rainfall for the mountains of San Diego County. Although weather data for Santa Ysabel were not available, data were available for nearby Julian (approximately 4 km (2.5 mi) from the SYROSP east property) and Henshaw Dam (approximately 11.5 km (7.1 mi) from the SYROSP east property). The annual precipitation (Jan – Dec) in Julian was 416.8 mm (16.4 in) in 2001, 307.1 mm (12.1 in) in 2002 and during the period sampled in 2003 (January – July), the total rainfall was 382.5 mm (15.1 in) (DWR 2004). Based on available daily data during 1971-2000, the average annual precipitation for the Julian area is 697.2 mm (27.45 in) (WRCC 2004). The annual precipitation (Jan – Dec) at Henshaw Dam was 495.3 mm (19.5 in) in 2001, 299.5 mm (11.8 in) in 2002 and during the period sampled in 2003 (January – July), the total rainfall was 447.8 mm (17.6 in) (DWR 2004). Based on available daily data during 1948-2004, the average annual precipitation for the Henshaw Dam area is 697.2 mm (27.45 in) (WRCC 2004). As a result a result of the below average rainfall in this area, surface water and the durations of surface flow of lotic habitats were at a minimum within the SYROSP. The majority of wetland habitats (springs, marsh, riparian, ponds) within the SYROSP are non-permanent. Perennial wetland habitats included Spring 1, Spring 2, and Cattle Pond 3 (including the marshy habitat of the input drainage). Seasonal habitats included Santa Ysabel Creek segments 1-7. Temporary habitats included Cattle Pond 1, Cattle Pond 2, the unnamed tributary to Santa Ysabel Creek, and the headwaters of the San Diego River. Aquatic species may be more diverse, common, and widespread during wetter years.

It is difficult to make meaningful comparisons between habitat types (creek, pond, spring) and the aquatic species we detected because some habitats did not contain surface waters during aquatic surveys (i.e., Cattle Pond 1), while others only contained little surface waters for a few months (i.e., Santa Ysabel Creek). Thus, we identified those sites where we

expect certain native species to occur, based on the known ecology of the individual species (Table 1).

The collection of fingernail clams (*Cyclocalyx* spp.) in Santa Ysabel Creek is, to our knowledge, the first record of fingernail clams from San Diego County (Burch 1975; Thorp & Covich 1991). The specimens have been sent to Dr. Taehwan Lee, a Sphaeriinae expert at the University of Michigan Museum of Zoology, Mollusk Division, for species identification.

Two fish species, both stocked, were detected within the preserve. The mosquitofish, a common and widely distributed non-native fish in southern California, was the only species detected on the west property. All age classes were observed, confirming that an established population exists. Because the entire portion of the Santa Ysabel Creek within the west property is seasonal (non-permanent), effectively extirpating the mosquitofish in late summer, they are likely persisting (perhaps via stocking for mosquito abatement) upstream in perennial pools on the private property immediately to the east and are washed downstream onto the preserve during flooding events. No mosquitofish were observed within the preserve on the east property. Being a top-water fish, they are highly visible; consequently, we have a high confidence that they do not occur on the east property. On the east property, the only fish species detected was an adult rainbow trout. It is likely that this individual migrated up the Santa Ysabel Creek from Sutherland Reservoir, where the California Department of Fish and Game (CDFG) regularly plants hatchery-stock rainbow trout to enhance recreational angler opportunities, or from stockings they have done in the creek proper.

Additional data relating to the status of the rainbow trout detected come from our examination of CDFG fish stocking files currently being held at the Chino Hills, CDFG headquarters. We were able to obtain CDFG fish stocking records for San Diego County. In most cases, these records spanned from the 1940's to the 1990's and included the number and type of fish stocked at locations throughout the region. These data did not include specific geographic coordinates for stocking locations but give locality descriptions. Years during which a given site was stocked were recorded. The number of years each location was stocked was then determined. From this database we found that Santa Ysabel Creek was stocked with rainbow trout beginning in 1950 and was last stocked in 1974. During this time period it was stocked for 23 of these 24 years. We could not get any more recent stocking records for the creek.

Trout are known to prey on native amphibian larvae and have the ability to completely eliminate them from small pools (Cooper et al. 1986). The placement of trout into streams and rivers that were previously fishless has been shown to negatively affect native amphibians at the population level (Bradford et al. 1993; Fisher & Shaffer 1996; Backlin et al. 2002). Tadpoles are particularly vulnerable to predatory fish when they do not possess effective anti-predatory mechanisms (Sexton & Phillips 1986; Bradford 1989; Hecnar & Closkey 1997) and this has been demonstrated to be the case with arroyo toad larvae (Sweet 1992). Consequently, successful recruitment could be significantly reduced in the presence of trout, thus resulting in artificially lowering the abundance of local populations of arroyo toads and other aquatic breeding amphibian species (i.e., western toad, Pacific treefrog, California treefrog). Thus the almost annual stocking of trout in the creek

from 1950-1974 and possibly longer may have had a large impact on aquatic species in this system.

The presence of egg masses, tadpoles, and/or metamorphic individuals indicate that breeding populations of anurans (frogs and toads) occur onsite. On the west property, larvae of the Pacific treefrog and the western toad were observed, confirming the presence of breeding populations. On the east property, larvae of the Pacific treefrog and California treefrog were observed, confirming the presence of breeding populations. Especially significant was the observation of the federally endangered arroyo toad. The potential for occurrence of this toad was high because of the presence of the physical habitat characteristics known to constitute suitable habitat for this species (Sweet 1992; Campbell et al. 1996; USFWS 1999a). In regards to the potential occurrence of the arroyo toad on the east property, several areas along Santa Ysabel Creek were identified as potential arroyo toad breeding habitat in that they contained a low gradient with primarily sand channel substrate and adjacent sandy terraces. These potential arroyo toad habitat patches occur within the Santa Ysabel Creek sites 2, 5, and 6. Based on the physical attributes at these habitat patches, and the confirmation of arroyo toads a few kilometers downstream on the west portion, it is possible that the toad also occurs within the preserve on the east property.

Four rare or sensitive aquatic dependent species that were expected to be detected during these surveys were not. The coast range newt (*Taricha torosa*) occurs in central San Diego County in some tributaries of the San Diego River system, and could occur on the preserve, but it was not detected. It may have never occurred at this site due to natural reasons. The threatened California red-legged frog (*Rana aurora draytonii*) was not observed onsite, nor was suitable habitat currently present, it is possible that a population could exist outside the preserve boundaries within the permanent waters such as Cattle Pond 3. Consequently, there is a possibility that this frog may frequent the preserve during wetter periods (i.e., greater rainfall) when these frogs disperse (Jennings & Hayes 1994). We did find two historic records for California red-legged frogs at SYROSP or nearby. Both of these records are very old. The first is for Santa Ysabel, at Witch Creek, which was a specimen at the U.S. National Museum collected in 1893 and the second is in the field notes of Laurence Klauber (from the San Diego Natural History Museum) from Santa Ysabel on May 6, 1928. We could find no additional records after these.

In addition, the western pond turtle (*Emys marmorata*), which also requires longer duration pooled water than was found within the preserve, may occur in Cattle Pond 3. If either the western pond turtle or the California red-legged frog does occur in this pond, proper management would be problematic because the water level fluctuates greatly and the pond advances onto the preserve property from private property only during high water levels. We found few records for *Emys marmorata* from above Sutherland Lake within the Santa Ysabel Creek watershed, although there are very few museum records for this species in general. They do currently occur below the lake in Santa Ysabel Creek (Tod Reeder, pers. comm.), and if habitat was identified or created for them it is possible that a population translocation into the preserve could take place.

The red-sided gartersnake (*Thamnophis sirtalis*) was not found onsite but may occur in the marshy habitat where willows dominate, such as the input drainage to Cattle Pond 3 or along the Santa Ysabel Creek. There are historic records for this species from this system early last century, but they became rarer over time. There are no recent records for red-sided gartersnakes from the San Dieguito River system with the most current records dating over 50 years. Appendix 10 lists the expected aquatic-associated species that may be present on SYROSP but were not detected through our aquatic survey efforts.

It is also notable that a non-native amphibian species, the bullfrog (*Rana catesbaeiana*), was heard calling in this vicinity near pitfall array number seven. This species has a voracious appetite and will consume anything it can capture that will fit in its mouth from invertebrates to vertebrates including other frogs, turtles, lizards, snakes, birds, and rodents. This species can be difficult to manage due to its ability to travel across the landscape over at least several kilometers.

Springs are an important component of this system because they provide a source of surface water beyond the period of initial storm runoff. They are uncommon and widely distributed across the preserve, occurring within the main course of the Santa Ysabel Creek up through the headwaters of smaller feeder tributaries. Wetland vegetation for the spring habitat varies in relation to their location to the Santa Ysabel Creek drainage system. For example, indicator species for spring habitat along the Santa Ysabel Creek proper are willow (*Salix* sp.) and/or alder (*Alnus rhombifolia*) trees, while rushes (*Juncus* spp.) serve as indicator species of 'upland' springs in the grassland and/or oak woodland habitats. The portion of Santa Ysabel Creek on the east property has several segments lined with alder trees, indicating the seeps are probably perennial. However, the limited duration of this study did not afford us the opportunity to delimit the number, precise location, and length of these segments. The 'hidden' emergent waters (seeps/springs) along Santa Ysabel Creek were also difficult to delimit. Consequently, they were not individually named nor treated separately from the creek.

Since the 1930's, translocated wild turkeys (*Meleagris gallopavo*) have been periodically released into oak woodlands and associated habitats on private ranches and on National Forest lands of San Diego County extending from the foothills to the mountains (CDFG 1995). However, we do not have information on the exact release locations, when release took place, how often, or how many individuals were liberated at any particular release. As a result of these introductions, turkeys have migrated onto SYROSP and have become a common sight. In terms of diet, turkeys have been shown to consume a great variety of food types such as hard mast (acorns, seeds from grasses and forbs), soft mast (grasses, sedges, and various forbs), and a variety of invertebrate and vertebrates, including insects, snails, crayfish, salamanders, frogs, tadpoles, and lizards (Hurst 1992; CDFG 1995).

In this study, both the turkey (through observations of footprints and droppings) and the arroyo toad co-occur on open sandy stream benches and terraces along Santa Ysabel Creek. Turkeys were detected at several scent and camera stations situated along Santa Ysabel Creek (track transects 8 and 9; camera stations 2 and 9). The presence of turkeys in these areas adjacent to arroyo toad breeding habitat may increase vulnerability to predation. These toads are naturally subject to predation specific to various stages of their development,

including egg masses, tadpoles, juveniles, and adults. It is during the juvenile phase in which the arroyo toad would become most vulnerable to predation by turkeys. One of the most distinctive characteristics of the arroyo toad is the tendency for metamorphic individuals to remain on the open sand benches at the margins of the natal pool (rather than immediately dispersing). The metamorphs may occupy the sandy benches and bars, if conditions permit, for up to four months (from late June well into October) and grow to 30-35 mm (Sweet 1992). Although they make themselves more vulnerable to predation, that may be offset by the opportunity for rapid growth afforded by abundant insect prey and elevated body temperatures (Sweet 1992). It is also possible that predation by turkeys and introduced trout may be having an additive effect on the reduction of arroyo toad populations.

4.2 Herpetofauna

The pitfall trap arrays at SYROSP were surveyed for a total of 46 days across 12 sample periods from April 2002 through July 2003 (Appendix 2). A total of 580 herpetofauna captures were recorded representing 24 species (Table 2), 23 of which are native and one which is introduced (Stebbins 1985; Fisher & Case 1997). These species include 5 amphibians, 8 lizards, and 11 snakes; the one non-native species was a bullfrog (*Rana catesbeiana*) which was heard calling near array 7. Only one herpetofauna species known to occur on site was not detected in the pitfall trap arrays, the arroyo toad. However, this species was detected as an incidental observation during bat surveys (Table 1). Included in these 24 species are six of the CDFG Species of Special Concern: the large-blotched ensatina (*Ensatina klauberi*), western spadefoot (*Spea hammondi*), western skink (*Eumeces skiltonianus*), coast horned lizard (*Phrynosoma coronatum*), western patch-nosed snake (*Salvadora hexalepis*), and two-striped garter snake (*Thamnophis hammondi*).

Pitfall array captures were dominated by the lizard species, which accounted for over 90% of all herpetofaunal captures. The western fence lizard (*Sceloporus occidentalis*) was the most commonly captured species during this study (231 captures). The western whiptail (*Aspidoscelis tigris*) was the second most commonly captured species (79 captures) followed by the southern alligator lizard (*Elgaria multicarinatus*) and the western skink (each with 54 captures), and the side-blotched lizard (*Uta stansburiana*) (49 captures) (Table 2).

These same five lizard species were also the top five most widely distributed species. The western fence lizard was the only species detected at all 24 arrays. The western skink was detected at 18 of the 24 pitfall arrays, the southern alligator lizard occurred at 16 arrays, the side-blotched lizard at 15 arrays, and the western whiptail at 14 arrays. No other species occurred at more than 10 of the pitfall arrays (Table 2).

Snake species accounted for 6% of the herpetofauna records from SYROSP. The gopher snake (*Pituophis catenifer*), striped racer (*Masticophis lateralis*), and racer (*Coluber constrictor*) were the most frequently detected snake species with nine, seven, and seven captures, respectively. Gopher snakes and striped racers, which were each detected at six arrays, had the highest array occurrence. Ring-necked snakes (*Diadophis punctatus*) were the third most widely occurring snake species, detected at four arrays (Table 2).

Amphibians made up less than 2% of the captures reported during pitfall array sampling. The only amphibian species captured more than once was the large-blotched salamander, which was reported six times at two pitfall arrays (two captures at array 5 and four captures at array 23). All other amphibian species were only detected once in the pitfall sampling effort (Table 2).

Arrays 20 and 2 yielded the most captures (59 and 42, respectively), whereas arrays 9 and 18 yielded the fewest captures (8 and 9, respectively) (Table 2). The number of species captured was highest at arrays 11 and 13 (8 species at each array) and lowest at arrays 6, 16, 17, 18, 23, and 24 (four species at each array) (Table 2). The highest number of species captured was observed during the month of June (16 species); the lowest number of species captured was observed during the months of January and November (2 species each) (Table 3). Pitfall trap arrays were not sampled during the month of February. Capture rate trends followed number of species captured trends, peaking in June (23.0 individuals/day) and bottoming out in January (1.0 individual/day) (Table 3).

Herpetofauna species captures were compared with the vegetation transect data. Table 4 presents the number of captures per habitat type, along with the number of species detected within each habitat type. Habitat types included oak woodland (OAK), riparian (RIP), pine woodland (PIN), non-native grassland (NNG), chaparral (CHAP), and coastal sage scrub (CSS). Oak woodland (OAK) had the highest total number of captures (180); however this habitat type contained the greatest number of arrays (8). The lowest total number of captures was in the riparian habitat (RIP), which resulted in 15 captures across two arrays. The habitats with the greatest number of species (12) occurred in oak woodland (OAK) and non-native grassland (NNG). The two riparian arrays produced the least number of species of the six habitats sampled; seven species were detected between the two arrays. Because the six different habitats were sampled by varying numbers of arrays during this study, capture rates were averaged across the number of arrays within each habitat type. Pine woodland (PIN) revealed the highest average capture rate per array (45.0 captures/array), whereas arrays in riparian habitats (RIP) produced the lowest average capture rate per array (7.5 captures/array). Riparian arrays also resulted in the lowest average number of species per array within a habitat type (4.5 species per array). Coastal sage scrub (CSS) lead with an average of 7.5 species per array (Table 4).

Five species were detected in all six habitat types, including the southern alligator lizard, western skink, western whiptail, western fence lizard, and side-blotched lizard. The western fence lizard was the most commonly captured species in all but one habitat type, non-native grassland; in this habitat type the western whiptail was the most common capture. Several species showed an affinity for a particular habitat type. Eight of the nine Gilbert's skinks (*Eumeces gilberti*) detected were at coastal sage scrub (CSS) arrays, 30 of the 31 coast horned lizards captures occurred in the chaparral (CHAP) arrays, and six of the seven racer captures were in the riparian (RIP) arrays (Table 4).

SYROSP is within the range maps of several other herpetofauna species (Stebbins 1985) which were not detected during the course of this study. Species that may be present but were not detected include the California red-legged frog (*Rana aurora draytonii*),

California newt (*Taricha torosa*), garden slender salamander (*Batrachoseps major*), western pond turtle (*Emys marmorata*), San Diego banded gecko (*Coleonyx variegatus*), southern sagebrush lizard (*Sceloporus graciosus*), granite night lizard (*Xantusia henshawi*), California legless lizard (*Anniella pulchra*), coachwhip (*Masticophis flagellum*), rosy boa (*Charina trivirgata*), glossy snake (*Arizona elegans*), California mountain kingsnake (*Lampropeltis zonata*), long-nosed snake (*Rhinocheilus lecontei*), California black-headed snake (*Tantilla planiceps*), California lyresnake (*Trimorphodon biscutatus*), red-sided gartersnake (*Thamnophis sirtalis*), and red diamond rattlesnake (*Crotalus ruber*) (Appendix 10). Several rosy boas were found on CA 78 as researchers traveled to and from the study site, but all were closer to Ramona than to Santa Ysabel. The majority of these expected species are secretive, cryptic, habitat specialists, and have been hard to detect at other study sites as well. Further trapping and survey efforts, designed to target a specific species, would be needed to confirm the presence or absence of these species. For example, the banded gecko has been shown to be an indicator species whose presence reflects a rich herpetofauna community (Case & Fisher 2001). The absence of detection of this species in this study should not be taken as an absence of presence; rather that additional monitoring would be needed to determine the presence of this species on SYROSP. The data presented here only covers one and a half years of pitfall surveys consisting of 46 survey nights, much of which was during a drought. Other herpetofauna pitfall study sites around San Diego County have continued to document new species into the fifth survey year (USGS San Diego Field Station, unpublished data).

In addition to the species which were not detected, several other species which were documented may be under-represented due to site access restrictions during inclement weather conditions. For example, four out of the five amphibian species detected by the pitfall traps were represented by only a single capture each. A possible explanation as to why there were so few amphibian captures could be that site access was restricted during and immediately after any rain events. Sampling during and immediately after these events would have likely increased the detection and capture rates for many of the amphibian species present on the preserve.

Photographic documentation of selected species can be found in Appendix 11.

4.2.1 *Vegetation and Site Characterization*

Seven plant communities were identified, including oak woodland (OAK), riparian wetland (RIP), pine woodland (PIN), native grassland (NG), non-native grassland (NNG), chaparral (CHAP), and coastal sage scrub (CSS) (Appendix 12). Pine woodlands occurred at arrays 20 and 22, with pines representing greater than 20% of the vegetation along the transect (Appendices 12 and 13). For both of these arrays, non-native grasses filled the understory and comprised a greater proportion of habitat type at the points along the transects (Appendix 12). However, we classified these arrays as pine woodland since that habitat type constituted greater than 20% of the habitat surrounding the arrays. Oak woodlands were represented by 8 of the 24 pitfall arrays, with 20% or more of the vegetation being one of several oak species (Appendices 12 and 13). Like the arrays in the pine woodlands, while most of these pitfall arrays actually had a higher percentage of non-native grasses than oaks,

they were still classified as oak woodland, since this habitat type was greater than 20% of the habitat surrounding the arrays. Two arrays (19 and 24) were classified as riparian wetlands due to their proximity to natural and human-modified seeps (Appendices 12 and 13). Six of the 24 arrays were categorized as chaparral (Appendices 12 and 13). Five of these arrays consisted of greater than 50% chaparral plant species (arrays 2, 8, 12, 13, and 14). Although chaparral only accounted for 35% of the vegetation at array 18, it was the most common vegetation type at the array. The vegetation at two arrays (11 and 15) was made up of greater than 20% coastal sage scrub species, with a larger percentage of non-native grasses comprising the remaining vegetation (Appendices 12 and 13). While non-native grasses occurred at nearly every array, only four were categorized as such. Each of these arrays (7, 9, 17, and 21) contained greater than 50% non-native grasses along the transect; no other habitat type representing a significant portion of the vegetation was encountered (Appendices 12 and 13). A complete list of plant species, common names, scientific names, and four-letter codes can be found in Appendix 14.

Seven substrate categories were identified, including sandy soil (SS), leaf litter (LL), cryptogamic crust (CR), organic soil (OR), moss (MOSS), cobble stone (CS), and bare rock (BR) (Appendix 12). Leaf litter was the most frequent form of substrate and was present at each of the 24 arrays. Only at array 14 did leaf litter represent less than 50% of the substrate; here cobble and bare rock were at their highest levels of any of the arrays.

The arrays ranged in elevation from ~897 to ~1291 meters (using TOPO! Version 2.5). Array 7 was the lowest array and array 22 was the highest. Across the 24 arrays, the average elevation was 1086 meters.

Photographic documentation of each array can be found in Appendix 15.

4.3 Ants

We captured 3,017 individual ants, representing four subfamilies and 43 species across three sampling periods: summer 2002 (July), winter 2002 (November), and winter 2003 (February) (Table 5). After identification, a subset of the ants from the site were sent out for confirmation. All ants detected were native to the area. The most abundant species, determined by total number of individuals captured, were *Formica francoueri* (559), *Pheidole hyatti* (454), and *Dorymyrmex bicolor* (434), (Table 5). However, the number of individuals for both *Dorymyrmex bicolor* and *Pheidole hyatti* were biased by one unusually large sample of each species at array 2. The most widespread species, determined by the highest percent array occurrence, were *Pheidole hyatti* (75%), *Liometopum occidentale* (54%), *Formica moki* (54%), and *Tapimona sessile* (50%) (Table 5).

Arrays 2 and 24 yielded the most captures (789 and 563), whereas arrays 10 and 19 yielded the fewest captures (22 and 26). The number of species captured was highest at array 8 (21 species), 2 (16 species), and 5 (15 species). The number of species captured was lowest at array 19 (2 species), 13 (4 species), and 24 (3 species) (Table 5).

With a few exceptions, most ant species do not function well below 20° C, and cease to function below 10° C (Hölldobler & Wilson 1990). Consequently, 20 and 14 species were detected in each winter sample effort, and 31 species were found in the summer sample. The total number of species from both winter sampling efforts was 23. The total number of individuals sampled in summer 2002 was 1275, in winter 2002 was 525, in winter 2003 was 96, and in summer 2003 was 1280. The data support a clear relationship between outside temperature (and probably other related environmental factors) and the number of foraging workers.

Because the pitfall trap design is geared toward the collection of epigeic (aboveground foraging) ants, this technique may potentially under-sample hypogeic (belowground foraging) and arboreal ants. However, evaluation of pitfall traps as a sampling method for ground-dwelling ants found that most epigeic ants are well represented, especially in open habitats (Bestelmeyer et al. 2000). Also, Suarez et al. (1998) found reasonable epigeic diversity estimates using the proposed sampling technique in coastal sage scrub habitat.

Photographic documentation of selected species can be found in Appendix 16.

4.4 Avifauna

4.4.1 Diurnal Point Count Surveys and Nocturnal Driving Surveys

During our point count surveys, we detected 92 species, representing 5,592 individual bird records (Tables 6). The points with the greatest number of detected species were station 49 (42 species), station 13 (39 species), and station 10 (37 species); the points with the fewest number of species detected were station 42 (12 species), station 41 (16 species), and station 15 (18 species) (Table 6). Included in the table is an “unidentified hummingbird” species, which was detected at several point count stations. In most instances, these were likely female and/or juvenile Black-chinned, Anna’s, or Costa’s Hummingbirds, based on size, and bill and plumage characteristics therefore it was not used in counting the number of species per station. Incidental observations recorded while traveling about the preserve (i.e., while installing and monitoring herpetofauna pitfall arrays, performing vegetation transects, traveling between point count locations, and reported sightings from coworkers) resulted in an additional 11 species not observed during point count surveys. These species included the cattle egret (*Bubulcus ibis*), ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), greater roadrunner (*Geococcyx californianus*), white-throated swift (*Aeronautes saxatalis*), Lewis's woodpecker (*Melanerpes lewis*), Cassin's vireo (*Vireo cassinii*), pygmy nuthatch (*Sitta pygmaea*), hermit warbler (*Dendroica occidentalis*), palm warbler (*Dendroica palmarum*), and MacGillivray's warbler (*Oporornis tolmiei*). The nocturnal driving surveys produced an additional four species not observed during daylight, including the western screech owl (*Otus kennicottii*), great horned owl (*Bubo virginianus*), short-eared owl (*Asio flammeus*), and lesser nighthawk (*Chordeiles acutipennis*). Including the California spotted owl, which was detected during focused surveys for that species (see Section 4.4.2), as well as an unconfirmed but “probable” detection of a varied thrush (*Ixoreus naevius*) recorded during point counts, a total of 108 species were observed across the preserve. Finally, we

were given unconfirmed reports of an observation of a pair of zone-tailed hawks (*Buteo albonotatus*) by the rare plant surveying team in June 2002 just east of bird point 28 and herpetofauna array 16. Although there were no confirmed raptor nesting locations found, raptors are undoubtedly breeding on the preserve.

The approximate percentage of each habitat type covered by the point count stations was oak woodland (39.6%), grassland (26.2%), chaparral (11.8%), coastal sage scrub (11.1%), riparian (7.6%), pine woodland (3.5%), and human-modified (0.2%). The habitats and dominant plant species for each point are presented in Appendix 17. We examined the distribution of the 92 species detected at point count locations and found that while many species overlap multiple habitat types, greatest number of species (82% of the species observed during point counts; 3,025 individuals; 75 species) was recorded in oak woodland (Table 7). That was not unexpected due to both its high areal coverage on the preserve and previous literature (Appendix 17). For example, CalPIF (2002) suggests that California oak woodlands rank among the top three habitat types in North America for bird richness. Also consistent with the literature (Knopf et al. 1988), riparian habitats were especially rich in species, contributing 63% of the species (436 individuals; 58 species) observed during point counts, despite comprising only 7.6% of the area sampled during the point count surveys (Table 7; Appendix 17). Although they combined to cover just 15.3% of the habitat sampled, chaparral and pine woodland habitats both revealed relatively large proportions of the complete suite of species observed on the study area (Appendix 17). Chaparral contributed 42% (425 individuals; 39 species) and pine woodland contributed 30% (127 individuals; 28 species) of all species detected (Table 7). Grasslands have been described as habitats of “simple” structure (Cody 1985), and this could likely explain the relatively low proportions, mainly in individual abundance, contributed by this extensively sampled habitat type (Table 7; Appendix 17).

Although fly-overs were recorded as non-habitat-specific, biologically speaking many species do have preferences of vegetation associations over which they tend to fly (M. Mendelsohn, pers. obs.). While habitat generalists such as the European starling may be seen aurally over any number of habitats, habitat specialists are usually seen aurally over a specific habitat (e.g., acorn woodpeckers over woodlands; yellow warbler over riparian areas). Thus, many fly-over observations could likely be, at least for the habitat specialists, considered supplementary to each of the habitat-specific columns. Flyover detections resulted in 934 individuals and 42 species (Table 7).

Twenty-three species or subspecies listed as rare, threatened, endangered, of special concern, or fully protected by state and/or federal wildlife agencies were recorded on the study area. SYROSP is within the range maps of several other bird species (Unitt 1984; Sibley 2000). Sensitive species that may be present but were not detected include the osprey (*Pandion haliaetus*), sharp-shinned hawk (*Accipiter striatus*), Swainson's hawk (*Buteo swainsoni*), merlin (*Falco columbarius*), peregrine falcon (*Falco peregrinus*), prairie falcon (*Falco mexicanus*), loggerhead shrike (*Lanius ludovicianus*), and gray vireo (*Vireo vicinior*) (Appendix 10). The limitations of point count surveys (see Ralph et al. 1993 and others) are evident with rare and difficult-to-survey species, and so, must be considered when using these data to make management decisions. We suggest more intensive and species-specific

survey protocols for these and other species, especially when trying to accurately assess the presence or absence and true populations of rare, threatened, or endangered birds.

In July 2003, a female golden eagle was found freshly dead on the east property, about 1km west of Volcan/Farmer Rd. and slightly north of Santa Ysabel Creek. Illegal hunting was ruled out as a cause of death, but the necropsy was performed too late to determine whether it could have died due to West Nile Virus or some other natural cause. Singular golden eagle observations occurred during two point counts (one in June of each year) in that same vicinity, and at least once more incidentally by USGS researchers [e.g., one foraging on the ground in a non-native grassland/oak savanna near station 7, while being repeatedly harassed by a flock of American crows (*Corvus brachyrhynchos*) in July 2002]. The assumption that this was a single eagle pair ranging across the entire preserve (and likely beyond) was supported by the Volcan Mountain/Santa Ysabel Ranger observations of a male eagle hovering above the female's carcass for some time after her death (A. Inwood, J. Rundell, and V. Moran, pers. comm.). As this species is a top predator (CDFG 2002), the male eagle should be monitored closely in the future to follow his attempts to find a new mate or disperse from the area.

Non-native avifauna species observed on the preserve include the European starling (*Sturnus vulgaris*), wild turkey (*Meleagris gallopavo*), and rock dove (*Columba livia*). The rock dove (or domestic pigeon) was only observed once and is not expected to have any significant impacts on the native fauna of the preserve. The turkeys and starlings, on the other hand, were common observations on the preserve, both during point counts and incidentally. Starlings have colonized many areas of the preserve, likely moving in from the agricultural areas adjacent to the preserve. Starlings are problematic since they aggressively outcompete native cavity-nesting avifauna from accessing nesting sites (CalPIF 2002). The turkey, which has been introduced into southern California as an important game bird since the 1930s, is also a weighty consumer of acorns (CalPIF 2002), thus potentially depriving native fauna of an essential food source. Additionally, the California Native Plant Society is concerned that the excessive "scratching" characteristic of turkeys while foraging is detrimental to native flora and fauna (E. Ervin, pers. comm.). These latter two non-native species should be monitored in the future for their effects on such sensitive species as the ground-dwelling burrowing owl (*Athene cuicularia*), and the cavity-nesting purple martin (*Progne subis*) and western bluebird (*Sialia mexicana*), as well as other native flora and fauna.

The brown-headed cowbird (*Molothrus ater*), an invasive native species, was found to be widespread at SYROSP. Cowbirds are well-documented brood parasites and their presence can have an impact on the reproductive success of songbirds (RHJV 2003). Wholesale clearing of forested land has allowed this species to extend its historic range from just the Great Plains region to across most of North America. Livestock grazing, like that which historically occurred at SYROSP, is known to provide foraging habitat for the brown-headed cowbird (Goguen & Matthews 2000; RHJV 2003). Future research should revolve around managing the habitat in ways that will minimize the cowbird's adverse effects (CalPIF 2002).

4.4.2 Focused Survey for California Spotted Owls

During nocturnal surveys for the California spotted owl, four owl species were detected, including the barn owl (*Tyto alba*), the great horned owl (*Bubo virginianus*), the California spotted owl (*Strix occidentalis*), and the western screech owl (*Otus kennicottii*) (Table 8). Calling station 16 detected all four owl species, while stations 17 and 20 detected three species. Calling stations 9, 24, and 36 did not detect any owls. The barn owl was the most commonly detected species; followed by California spotted owl, western screech owl, and great horned owl. California spotted owls were detected at calling stations 14-18 and 20. A male and female California spotted owl were detected in close proximity ($< 1/4$ mile apart) to each other during day follow-up surveys on two separate occasions (6/18/03 and 6/25/03), confirming pair status (USFWS 1993) (Appendix 18). As such, an activity center was determined based on the pair's location and calling stations 14,15,16,18, and 19 were subsequently eliminated after four visits. Nesting and reproductive status of the California spotted owl pair could not be determined. Stations 1, 9, 10, 17, and 20-25 were visited six times. Finally, calling station 36 was visited only once; it was the only calling station located on the west property.

Data collected suggests that Santa Ysabel Creek is an important drainage for California spotted owls and other owl species on the preserve. The majority of owl detections occurred along Santa Ysabel Creek in the riparian hardwood forest habitat. The California spotted owl activity center was determined to lie at the junction of Santa Ysabel Creek and a small, side drainage on the eastern property of the preserve (Figure 9). Although the nesting and reproductive status of the pair could not be determined during our 2003 surveys, an incidental observation of an adult California spotted owl and three fledglings occurred on June 13, 2002 (V. Moran, pers. comm.). The location of this sighting was within the activity center identified during the 2003 surveys, and indicates that breeding is taking place within the preserve. Finally, the Santa Ysabel Valley riparian corridor is considered a critical connectivity zone by a state-wide working group (Penrod 2000).

SYROSP is within the range of several other owl species that went undetected by this survey: the northern pygmy owl (*Glaucidium gnoma*), northern saw-whet owl (*Aegolius acadicus*), and burrowing owl (*Athene cuicularia*) (Appendix 10). Although the long-eared owl (*Asio otus*) was not detected by the California spotted owl survey, that species was detected at two different locations during the diurnal point count surveys in 2003 (stations 17 and 37).

4.5 Bats

4.5.1 Foraging Bat Surveys

Foraging bat surveys were conducted on 18 nights at eight of the nine survey sites (sites 1, 2, 4-9) using a combination of an Anabat, the unaided ear, visual, and mist-net techniques (Table 9). A total of 15 of the 23 bat species known to occur in San Diego County (Miner & Stokes, in prep.) were detected on SYROSP during foraging bat surveys (Table 10). This includes 10 state and/or federally sensitive species. Big brown bats

(*Eptesicus fuscus*) and Mexican free-tailed bats (*Tadarida brasiliensis*) were detected at all eight foraging survey sites on the preserve, whereas the western yellow bat (*Lasiurus xanthinus*) and long-eared Myotis (*Myotis evotis*) were each detected only at a single foraging site. Bat species that were detected foraging on the preserve that are noteworthy because of their apparent rarity and sensitivity status include the Townsend's big-eared bat (*Corynorhinus townsendii*) and the coastal form of the pallid bat (*Antrozous pallidus*).

All 15 bat species detected at SYROSP during foraging bat surveys were detected acoustically (Anabat and/or unaided ear) while only seven of these species were captured in mist-nets (Table 10). While the number of bat species detected at the eight different foraging bat survey sites varied, the number of bat species detected on the west property was similar to the number of bat species detected on the east property. The variability of bat species detections from site to site is likely a function of night to night variability in bat activity, species detectability, and survey effort. It is suspected that the foraging bat community is fairly constant across the entire preserve with some exceptions. For instance, western pipistrelles (*Pipistrellus hesperus*) are largely dependent on rock crevices for roosting and they are thought to forage only within a few kilometers of their roosting sites (Barbour & Davis 1969). At the SYROSP, exposed rock habitat is found mainly on the west property and at the western end of the east property. Western pipistrelles were detected foraging only in these areas.

Of the 31 bats captured in mist-nets at foraging sites, 21 were females and 10 were males. Several of the bat species captured in mist-nets at foraging sites were found to be in breeding condition. This included pregnant female Yuma Myotis (*Myotis yumanensis*), California Myotis (*Myotis californicus*) and big brown bats (*Eptesicus fuscus*). Lactating and/or post-lactating female California Myotis and big brown bats were also captured. One captured male big brown bat was found to be in breeding condition (descended testes). Other captures included juvenile California Myotis and big brown bats. Appendix 19 provides photos of two captured bats: the hoary bat and the red bat.

4.5.2 Roost Surveys

No bat roosts were documented on SYROSP during this study. However, there was one roost that was surveyed on two occasions where bats were known to previously occur referred to here as survey site number three. This site is the corner store in the village of Santa Ysabel. This store has supported bats for a number of years now (storeowner, pers. comm.). There have been observations of at least two species known to occupy this building: the Mexican free-tailed bat and the pallid bat (D. Stokes, unpub. data). A survey visit to this site in summer 2001 revealed that the pallid bats were breeding females and, thus, was at that time and is still likely a maternity site. This is one of only two maternity sites of the coastal form of the pallid bat currently known in San Diego County (D. Stokes, unpub. data). Pallid bats and Mexican free-tailed bats were confirmed at this location during a roost survey visit on August 7, 2002. The current storeowner has expressed displeasure with the bats in that there is a foul odor associated with the bat droppings during the heat of mid-summer. In the winter of 2002, the store was modified such that there are now obstructions located in the areas where the bats previously entered and exited the building. A roost survey visit on June

30, 2003 (well after the modifications had been made) revealed that both bat species were still roosting in the building, although the number of bats detected appeared to be reduced compared to the 2002 survey visit. This roost is extremely significant and is in great need of protection. Either the storeowner should be convinced to allow the bats to stay or the bats must be safely excluded from this roost site and provided with an alternate roost site, such as a man-made bat box of the proper design.

During certain foraging bat surveys, observations were made of multiple numbers of bats foraging early in the evening, suggesting that roosts of these bats occurred nearby adjacent to the preserve. On the west property, a number of individuals of a *Myotis* spp. were observed early in the evening during several survey visits to site 1 on Santa Ysabel Creek near the west boundary of the west property. It is likely a *Myotis* colony exists somewhere close to the western boundary of the west property but not within the preserve itself. On the east property, a number of individuals of big brown bats were observed early in the evening during a survey on July 17, 2002 at site 5 coming from the direction of the rocky outcrop covered hillside located north of Santa Ysabel Creek, just east of CA 79. This hillside is not within the SYROSP, but is adjacent to it. It is suspected that a big brown bat colony roost site exists on this rocky hillside or near it.

There were also regular audible observations of western mastiff bats (*Eumops perotis*) and acoustic detections of pocketed free-tailed bats (*Nyctinomops femorosaccus*) relatively early during survey evenings coming from an area northeast of SYROSP. It is suspected that colonies of these species are roosting somewhere northeast of the preserve.

4.5.3 Survey Discussion

The preserve is supporting at least part of the needs of a rich bat population likely as a result of the diversity of habitats used by bats found on the preserve and the intermediate elevation of the preserve. Their habitats include the numerous riparian and upland trees that support bat foraging and roosting needs, the large amounts of grassland and scrub habitats that support foraging needs, the open water that supports drinking and feeding needs, and the exposed rock areas that also support roosting needs. The intermediate elevation of the preserve and associated habitats and climate allow bats typically found at low to middle elevations along with bats usually found in middle to higher elevations to co-occur on the preserve. Also, the position of the preserve in relation to the desert has provided foraging opportunities for species typically found in the desert, such as the western yellow bat (*Lasiurus xanthinus*).

There were numerous hoary bat (*Lasiurus cinereus*) and red bat (*Lasiurus blossevillii*) detections on the preserve (Table 10). In San Diego County, both of these bat species roost in the foliage of trees including broad-leaf riparian species such as sycamores, cottonwoods, and willows (Krutzsch 1948). Sycamores and other riparian trees are abundant along Santa Ysabel Creek and are probably used as roost trees for these bats. It is likely that SYROSP supports a number of hoary bats and red bats based on the amount of roosting habitat available to them and the number of observations of these bats on the property. Both these species are thought to make seasonal movements along elevational gradients, with most

individuals occurring in the lowlands during the winter and then certain individuals (males and non-reproductive females) shifting to higher elevations during the summer. Breeding red bat females, however, stay in the lowlands during the summer while breeding hoary bat females probably migrate north (Krutzsch 1948; Pierson et al. 2000; Cryan 2003). The San Dieguito River and associated tributaries, including Santa Ysabel Creek, likely act as a movement corridor for males and non-reproductive females of these species, providing continuous habitat from coastal lowlands to inland highlands. SYROSP is probably preserving a fairly significant portion of this suspected hoary bat and red bat movement corridor.

There are four bat species that could potentially occur on SYROSP that were not detected during our surveys. These include the spotted bat (*Euderma maculatum*), the fringed Myotis (*Myotis thysanodes*), the long-legged Myotis (*Myotis volans*), and the silver-haired bat (*Lasionycteris noctivagans*). The first three species are generally rare throughout their ranges, including San Diego County, and the fourth species is considered a rare migrant in San Diego County (Miner & Stokes, in prep.). Though these species could occur on the preserve, their rarity makes them difficult to detect.

There were a large number of sensitive, rare and/or declining bat species detected on the preserve, including the Townsend's big-eared bat and pallid bat. Of the bats captured on the preserve, a large percentage were female. In addition, several species captured were found to be in breeding condition. Breeding female bats are suspected to be largely found in the highest quality of habitats (D. Stokes, pers. obs.) The presence of so many sensitive species, the fairly large ratio of females compared to males captured, and the presence of breeding bats are all indicators that SYROSP is potentially very important for bats on a local and regional level. While habitats are lost or altered around San Diego County and throughout the south coast ecoregion, it is likely that the preserve in its current condition will continue to support at least some of the needs of a rich bat community. However, because bats depend on and utilize a variety of habitats on a landscape level, the future of the bat community on SYROSP will depend largely on management actions and other activities on the preserve itself, as well as on the lands surrounding the property.

4.6 Small Mammals

Extensive pitfall sampling resulted in 346 captures representing 12 small mammal species (Table 11). Results documented the widespread presence of the Botta's pocket gopher (*Thomomys bottae*) (captured at 23 arrays) and the California vole (*Microtus californicus*) (captured at 22 arrays). Other species captured included the desert shrew (*Notiosorex crawfordi*) (captured at four arrays), ornate shrew (*Sorex ornatus*) (captured at 10 arrays), and California mouse (*Peromyscus californicus*) (captured at two arrays). Arrays with the least number of species captured were arrays 7, 10, and 14 (each with two species). Arrays with the greatest number of species captured were arrays 20 and 22 (seven species each) and 4 (six species). Arrays 5 and 6 yielded the most captures (40 and 33, respectively), whereas arrays 7 and 10 yielded the fewest captures (five and three respectively) (Table 11).

Although pitfall sampling only detected desert wood rats (*Neotoma lepida*) at array 22, visual surveys detected wood rat nests over a wider range of arrays. This is not surprising, as wood rats are typically under-sampled in pitfall traps. They are large enough to escape the buckets used for this type of survey. Wood rat nests were detected in the vicinity of 9 of the 24 arrays. The search around array 17 detected the highest number of wood rat nests (six nests).

Camera surveys detected an additional small mammal not captured at the pitfall arrays: the kangaroo rat (*Dipodomys* spp.). Two camera sites documented the presence of this genus: cameras 3 and 4 (Figure 8). The photo of a kangaroo rat taken at camera 3 was verified as the Dulzura kangaroo rat (*Dipodomys simulans*) and it is likely that the individuals recorded at camera 4 were the same species (W. Spencer, pers. comm.).

It is advantageous to perform both pitfall and Sherman trap sampling for a complete small mammal survey. Species such as the desert shrew (*Notiosorex crawfordi*), ornate shrew (*Sorex ornatus*), , and the western harvest mouse (*Reithrodontomys megalotis*) are preferentially captured in pitfall traps because of their small size which often is not enough to trip shut a Sherman trap and/or, as in the case of Botta's pocket gopher (*Thomomys bottae*), their preference for alternate foods. Larger mammals, such as the California mouse, and *Neotoma* and *Dipodomys* species are preferentially captured in Sherman traps because of their decreased likelihood of falling into pitfall traps and ease of escape. Most medium sized species of the genus *Peromyscus* (except *boylii*) and *Chaetodipus* can be effectively captured using either method.

SYROSP is within the range maps of several other rodent species (Jameson & Peeters 1988). Species that may be present but were not detected are the broad-footed mole (*Scapanus latimanus*), Dulzura pocket mouse (*Chaetodipus californicus*), brush mouse (*Peromyscus boylii*), southern grasshopper mouse (*Onychomys torridus*), and Stephens' kangaroo rat (*Dipodomys stephensi*) (Appendix 10). Portions of the west property (along CA 78) and east property (along CA 79 and throughout Kanaka Flat) have been identified as containing a very high habitat value for the federally endangered Stephens' kangaroo rat (Spencer 2003). Further trapping and survey efforts would be needed to confirm the presence or absence of this species.

4.7 Medium and Large Mammals

Eight target species and a number of human associated and non-target species were detected across the preserve. The target species include all native large to mid-sized carnivores and mule deer. The human associated species include humans, cattle, horses, domestic dogs, and opossums. Non-target species include all other species detected and are noted separately. Scent station surveys detected nine species, including both target and human associated species (Table 12). Camera stations detected eleven species including both target and human associated species (Table 13). Both scent survey stations and camera stations also detected a suite of non-target species, including small mammals, birds, and herpetofauna. When possible, these non-target animals were identified to genus or species, and the number of detections was listed in Tables 13 and 14.

4.7.1 Scent Station Surveys

Nine target species were detected throughout the preserve, including six native species (mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), bobcat (*Felis rufus*), gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), and spotted skunk (*Spilogale gracilis*)), and three human associated species (domestic dog (*Canis familiaris*), opossum (*Didelphis virginiana*), and humans (*Homo sapiens*)) (Table 12). Transect 7 was visited by all nine species; transect 2 was visited by eight species, and transect 4 was visited by seven species. Transects 6, 8, and 9 were visited by six species, and transects 1, 3, 5, and 10 were visited by only five species. Coyotes and striped skunks were detected on all 10 transects within the preserve. Bobcats were detected on nine transects; gray foxes and domestic dogs were detected on eight transects. Coyote activity was highest along transect 1 and lowest along transect 8. Bobcat activity was highest along transects 2, 4, and 7; no bobcats were detected on transect 10. Gray fox activity was highest along transect 4. Striped and spotted skunk activity was highest at transect 5. Mule deer were detected only at transects 7 and 8. Scent stations also documented the presence of several non-target species including smaller mammal, bird, and herpetofauna species, including squirrels, rabbits, rodents, turkeys (*Meleagris gallopavo*), lizards, and snakes (Table 12).

4.7.2 Camera Surveys

Examining target and human associated species, eleven species were detected at camera stations, including seven native species (mountain lion (*Puma concolor*), mule deer, coyote, bobcat, gray fox, raccoon (*Procyon lotor*), and striped skunk) and four human associated species (opossum, domestic cow (*Bos taurus*), domestic horse (*Equus caballus*), and humans) (Table 13). Eight species were detected at camera 5, seven species were detected at cameras 3 and 9, and six species were detected at cameras 1 and 4. Bobcats and mule deer were detected at all nine camera stations. Gray foxes were detected at five cameras; coyotes and mountain lions were recorded at four cameras. Mountain lions were photographed at cameras 1, 5, 8, and 9; the highest activity was at camera 5. Bobcat activity was highest at camera 3, mule deer activity was highest at camera 2, and gray fox activity was highest at camera 1. Several non-target species were also detected at the camera stations, including the Dulzura kangaroo rat (*Dipodomys simulans*) (cameras 3 and 4), the desert cottontail or brush rabbit (*Sylvilagus* spp.) (camera 8), a squirrel species [California ground squirrel (*Spermophilus beecheyi*) or western grey squirrel (*Sciurus carolinensis*)] (camera 8), the greater roadrunner (*Geococcyx californianus*) (camera 3), and the wild turkey (*Meleagris gallopavo*) (cameras 1, 2, 3, 4, 5, and 9) (Table 13). Photos were also taken of rodents and birds (including quail). However these individuals could not be identified to species. Appendix 20 contains representative photos of species detected at camera stations.

4.7.3 Survey Discussion

Large mammals represent an excellent group of species for conservation, in that they are wide-ranging, exhibit low population densities, and are large patch or interior dwelling species (Meffe et al. 1997). Further, the disappearance of top predators from fragmented systems may have community-wide implications (Robinson 1953, 1961; Linhart & Robinson

1972; Voight & Earle 1983; Schmidt 1986; Johnson et al. 1989; Sovada et al. 1995; Ralls & White 1995). As a group, carnivores (Order Carnivora) are collectively listed as state mammal species of special concern. Furthermore, the preserve lies at the nexus of two critical connectivity zones, the Cuyamaca-Palomar corridor and the Santa Ysabel Valley riparian corridor (Penrod 2000).

At least two distinguishable mountain lions were recorded at four camera stations (1, 5, 8, and 9) on the preserve with the majority of activity at camera 5. Data collected from camera stations suggests that the SYSOSR likely serves as a component of two or more mountain lion home ranges. Mountain lions possess large body sizes, home ranges, and habitat requirements and hence are the most sensitive predator species to fragmentation effects (Beier 1993; Crooks 2002). Specifically, the preserve alone is too small to permanently support resident lion populations with long-term viability, and thus this preserve likely serves as a critical component of several mountain lion home ranges that extend much further than the boundaries of the preserve. At least two individuals, one male and one female, were identified in the photos. The male was a GPS-collared individual whose 475.4 km² home range incorporated portions of SYROSP (Sweaner et al. 2003). Preliminary data taken on four collared mountain lions for a minimum of six months indicates that home ranges average 410 km² in this region (Sweaner et al. 2003). Elsewhere in southern California, mountain lion home ranges range from 218 km² (average female home range) to 767 km² (average male home range) (Beier & Barrett 1993). Monitoring for mountain lions throughout the preserve can be best achieved by maintaining long-term camera stations. Although track transects are a cheaper means to document activity, they are only operated quarterly. Thus for large-ranging animals, such as mountain lions, the frequency of track transects reduces the potential for these species to be detected, particularly where there are a wide variety of travel routes (i.e., no choke points). However, camera stations can be operated over much larger time frames, thus increasing the likelihood of detecting the presence of a mountain lion on the preserve. In this study, a mountain lion was not detected until the 47th day that camera 9 was active; mountain lions were never detected at scent stations.

Bobcats were the most commonly detected mammal species on the preserve with a combined 281 detections at the track transects and camera stations. Bobcats were recorded at every camera station and every track transect with the exception of transect 10. Camera stations detected bobcats nearly four times as often as the track stations on the preserve. The highest bobcat activity occurred at camera 3. This camera was located along a dirt road on the northwest property of the preserve. Bobcats are intermediate in their sensitivity to habitat fragmentation (Haas 2000; Crooks 2002); they can still exist in fragmented and disturbed habitats, but only those with adequate movement corridors. Bobcats are therefore less sensitive to disturbance than are mountain lions, which seldom use fragmented areas, yet are more sensitive than coyotes, which can persist in all but the most disturbed habitat isolates.

Coyotes followed bobcats as the second most detected mammal species on the preserve. Coyotes were detected on 270 occasions by the camera and scent stations. Coyotes were much more likely to be detected by scent stations than camera stations on the preserve; only 8 of the 270 detections occurred at the camera stations. Coyote activity was

highest along transects 1, 2, and 7. These areas of the preserve contain large portions of open, grassland, and are the closest to residential/ranch lands. Coyotes are widespread and relatively abundant throughout the region, however coyote populations can experience local extinction in habitat fragments, especially those that are too small, disturbed, or isolated (Crooks & Soulé 2000).

Spotted skunk activity was highest along transects 5 and 6; these transects were located in the central region of the east property. However, no spotted skunks were detected at camera stations. Unlike the larger and more conspicuous striped skunks, spotted skunks are a relatively secretive species with restricted habitat requirements and low population densities (Crooks 2002). As such, spotted skunks are difficult to monitor which limits their utility as target species for management and conservation plans. Nevertheless, the status of the spotted skunk in southern California is currently unclear.

Mule deer not only represent a critical component to a functioning ecosystem (in that they are top herbivores), they also comprise the majority of mountain lion diet (Beier 1995). Although mule deer were detected at every camera station, indicating a wide distribution across the entire preserve, the key to maintaining their populations (as is the case for all species) is to provide adequate crossing structures in order for them to successfully pass under roadways (Reed et al. 1975; Foster & Humphrey 1995; Haas 2000). Although traffic densities remain relatively low – moderate along CA 78 and CA 79, future increases in road width and traffic volume could necessitate the need for adequate crossing structures for mule deer. Furthermore, in the event that traffic volumes increase, considerations should be given to providing adequate wildlife fencing (to reduce vehicle-related mortality), enhancing existing crossing structures, and providing additional crossing structures. Such considerations are important in maintaining connectivity (Haas 2000; Lyren 2001).

These survey techniques also detected several non-target species that were not detected with other sampling methods, including rabbits, squirrels, and several bird species. For example, kangaroo rats were not detected at herpetofauna pitfall trap arrays and the Greater Roadrunner was never detected during diurnal point count surveys. Although tracks and photos of rabbits, squirrels, and other rodents were not identified to species, they do provide information on the distribution and relative abundance of prey species across the preserve. Occasionally snake tracks were observed in the scent stations; several snake species can be identified based on their track patterns, which may complement pitfall survey efforts.

SYROSP is within the range of several other sensitive mammal species that went undetected by these survey methods: the kit fox (*Vulpes macrotis*), American badger (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), black-tailed jackrabbit (*Lepus californicus*), and ringtail (*Bassariscus astutus*) (Ingles 1965) (Appendix 10). However, there was an incidental sighting of a long-tailed weasel on the eastern edge of the east property. Some burrows were noted on both the east and west properties, notably in the vicinity of herpetofauna pitfall arrays 1 and 2 (west property) and in the grasslands along the east side of CA 79 (east property). However, it is unclear whether or not the burrows were utilized by badgers. More intensive, species specific survey efforts may be necessary to

determine whether or not these species may be present on the preserve. Such techniques may include hair snares, hair tubes, scat surveys, spotlight surveys, and video monitoring. These additional techniques, when conducted in concert with the methods used in this study, may provide for a more complete preserve-wide inventory and monitoring of these focal species.

5. Conclusions and Management Recommendations

Our survey efforts resulted in the detection of 225 species throughout the SYROSP (Appendix 21). These survey efforts have generated a valuable data set which will aid in the further development of the management plan of the preserve to preserve the biological diversity of the native wildlands of San Diego County. Included in our species detected list are a fingernail clam species, two fishes, 43 ants, seven amphibians, 19 reptiles, 108 birds, 45 mammals (15 bats, 13 small mammals, and 17 medium and large bodied mammals). This list includes a federally endangered species, 20 federal species of concern, 28 California Department of Fish and Game Species of Special Concern (eight of which are also federal species of concern), and 10 non-native species (two fish, one amphibian, three birds, and four mammals). Species status was obtained from the California Natural Diversity Database (CDFG 2003). In addition to those species with listing status, we identified an additional 14 sensitive species based on our knowledge of their current status and distribution (Appendix 22). The locations of where these 55 species were detected are presented in Figure 9.

Although our surveys for the different taxonomic groups were not conducted uniformly throughout the preserve and because few specific areas were surveyed for each taxonomic group (i.e., herpetofauna pitfall arrays locations were not the same locations from which aquatic, avifauna, and mammal surveys were conducted), it is difficult to identify specific locations within the preserve that contain the greatest concentrations of sensitive species. However, several areas within the preserve contained high concentrations of sensitive species. On the west property, sensitive species were concentrated along Santa Ysabel Creek and in the northeast corner of the preserve. On the east property, sensitive species were concentrated along the entire stretch of Santa Ysabel Creek (Figure 9). Our surveys also detected 10 non-native species within the preserve (Appendix 22). The locations where these species were detected are presented in Figure 10. The majority of these detections occurred along the SYROSP boundaries; few non-native species were detected in the northeast corner of the west property and in the center of the east property (Figure 10).

5.1 Aquatics

We identified and surveyed a total of 15 wetland sites within the preserve. All of the surveyed wetlands were classified by hydroperiod. A diverse assemblage of aquatic animals was detected within SYROSP during the course of the aquatic surveys from a currently unidentified species of fingernail clam (*Cyclocalyx* spp.), to four amphibian species (Pacific treefrog, California treefrog, western toad, and the endangered arroyo toad), and two non-native fishes (mosquitofish and rainbow trout). The observation of the arroyo toad on the west property of the preserve is a new location for this species and is the highest elevation for the entire San Dieguito River watershed.

However, we confirmed the presence of introduced rainbow trout, mosquitofish, bullfrog, and the Rio Grande turkey. Management actions should be taken to address these species such as removal or reduction of artificial permanent water, with regards to the fish and frog. Where possible, the water impoundments on SYROSP should be allowed to develop into a natural pattern of drying and refilling. The maintenance of water levels in artificial ponds bordering the preserve (i.e., Cattle Pond 3) may allow for non-native species to become established. For example, the bullfrog detection occurred in the vicinity of Cattle Pond 3. A natural drying pattern in this artificial pond would result in removing many of the non-native species that may occur, particularly fish species (Hathaway et al. 2002). Management recommendations for the enhancement of artificial ponds for native species include draining in fall (to kill bullfrog tadpoles and) and trapping for non-natives when pools are holding water (to remove crayfish). We did record an adult western spadefoot toad (*Spea hammondi*) in pit-fall traps on site. They were expected to be found at several of the ponds, however, the ponds were very dry and it did not appear this species bred on site during our surveys. We recommend further surveys of the ponds where we expect this species might breed (see Table 1) during a normal or high rain year to verify reproduction on site.

We recommend restricting access to areas of high biological value, such as riparian zones, creek crossings where arroyo toads occur, and upland pools that serve as breeding habitat for these amphibians. We also recommend the development of a specific management plan for the prevention of the introduction of invasive and ecologically destructive aquatic species. Included in this plan would be the steps to remove any non-native species immediately upon detection to prevent their establishment. Currently, the seasonal nature of surface flow of Santa Ysabel Creek provides an obstacle for the permanent establishment of non-native predatory game fish (i.e., trout and green sunfish) and the bullfrog, within the preserve, should they be introduced. However, the perennially moist sections of the creek would provide refugia for highly invasive semi-aquatic pest species such as the crayfish. Consequently, if they were introduced they would likely become established and may likely prove difficult to eradicate. Therefore, it is important to maintain the natural hydrologic regime of the riparian systems.

To protect and conserve populations of the aquatic fauna within the SYROSP we make the following recommendations. Preserve and protect all existing wetlands (i.e., upland pools, springs, creeks) identified during our surveys from incompatible usage and degradation. Restrict potentially negative impacts which may include, but are not limited to, crushing of flora and fauna by recreationalists (i.e., mountain bikes, horseback riders, hikers), diversion of runoff that maintains wetlands, draining wetlands for alternative water usage, isolating wetlands (creating barriers for animals), and subjecting wetlands to unnatural levels of artificial light after dark

To better understand the diversity and distribution of the aquatic fauna within the SYROSP we make the following recommendations. Conduct additional aquatic surveys during periods of greater than normal rainfall to better understand the aquatic species that occur onsite, their distribution, and when they are surface active and more effort can be dedicated to identifying unmapped surface water. Further clarification of these issues is

critical to the development of conservation plans for the aquatic communities. For example, temporary upland ponds (Cattle Ponds 1 and 2) should be surveyed for western spadefoots, as stated above, when they fill after sufficient spring rainfall has been received. Priority should be given to areas along the Santa Ysabel Creek where the arroyo toad is expected to occur but has not yet been detected (Table 1; Figure 2).

To better understand the ecology and phenology of the arroyo toad population within the SYROSP we make the following recommendations. Conduct additional species-specific arroyo toad surveys on both the west and east properties to aid in the development of a management plan for the arroyo toad. The objectives of follow-up focused arroyo toad surveys include 1) conducting additional nocturnal presence surveys for the arroyo toads in areas identified as potential habitat under more favorable environmental conditions to confirm their presence or increase the confidence in their absence, 2) determine the distribution of arroyo toads within occupied areas, and 3) use environmental data collected to develop a phenologic profile for this high elevation population. Further clarification of these issues would enable the County to develop specific policies to manage and conserve the federally endangered arroyo toad within the SYROSP and make informed management decisions regarding compatible recreational programs and activities. The distribution and locations of breeding sites have not been determined because amphibian eggs and larvae were not common during our aquatic surveys conducted under drought conditions and these life stages were not documented for the arroyo toad during these surveys. In addition, we are currently unable to make recommendations regarding upland use of the preserve.

However, if we can increase the quality and use of the aquatic habitats on site to the benefit of native amphibians, this in turn should result in the benefit of increases in the populations of two-striped gartersnakes and racers which will feed on these species.

5.2 Herpetofauna

Herpetofauna pitfall arrays detected five amphibian species, eight lizard species, and eleven snake species. While this may not represent the full extent of all species present at SYROSP, it most likely includes the majority. The remainder of undetected species would require a more long-term sampling effort or the establishment of alternate survey techniques. Such survey efforts should be considered as supplemental to the pitfall sampling technique employed by this survey and might include visual encounter surveys, transect sampling, and breeding site surveys (Heyer et al. 1994). One of the most important aspects of this data is that it serves as a baseline for future comparisons of species' presence/absence and capture rates at established sampling locations. For comparability, future surveys should be carried out as close as possible to the protocols established under this effort. As San Diego continues to become developed, areas like SYROSP will become increasingly isolated and impacted. Future surveys can be designed to compare with the data collected here, in an attempt to detect trends or the extirpation of species from the preserve.

Specific management recommendations for sensitive species include leaving downed wood on site. This is often viewed as a fire hazard and removed, but it is important as cover habitat for species such as the large-blotched salamander (*Ensatina klauberi*), western skinks

(*Eumeces skiltonianus*), and many snake species. The coast horned lizard (*Phrynosoma coronatum*) often sits on dirt roads and hatchlings use the fine sand for burying. Placing signage so that anyone driving or riding a bike is aware of this and therefore should be cautious while on site might help reduce mortality in this species and other species that frequently cross roads (i.e., western patch-nosed snakes, rattlesnakes).

5.3 Ants

Thus far, no non-native ant species have been detected from the ant pitfall traps. The most important non-native species to monitor for is the Argentine ant (*Linepithema humile*). The negative effects of Argentine ants on native ants, other arthropods, reptiles, and small mammals have occurred in other portions of San Diego County (Suarez et al. 1998; Laakkonen et al. 2001; Fisher et al. 2002). Likely sources for Argentine ant invasions would be on vehicles or infested plants or building materials that may be brought into the area. In the future it will be important to monitor near paved roads and any buildings within SYROSP, where humans may accidentally introduce Argentine or red imported fire ants (*Solenopsis invicta*). Specifically, new and existing water sources and habitat disturbance, particularly by new trails, roads, or other infrastructure, should be targeted for monitoring.

5.4 Avifauna

Interpretation of the lists of bird species and numbers: the intent of the study was to develop an avian species inventory, following structured, popular protocols. This resulted in a list of species and habitat associations and relative levels of abundance. In addition, although limited notes on breeding were taken and are available, this study was not intended to assess the breeding status of species on the preserve. Nor should any large or small numbers found herein be extrapolated into breeding success or failure, since abundance levels cannot be reliably converted into fitness measurements of populations (Savard & Hooper 1995).

Many of the species on site will benefit from the habitat recovery that is expected to occur as a result of managing grazing on the preserve as well as active restoration. As disturbed habitats recover, bird species that are habitat specialists will have new ranges in which to disperse (i.e., woodland species moving into existing pastures). Thus, fencing out of vagrant cattle should continue to be strictly enforced. Considering the very high numbers of individuals and species we detected, SYROSP should be managed carefully as it is a refuge for a rich assemblage of birds. In particular, the oak woodland and riparian communities should be protected from significant impacts (i.e., heavy foot, horse, and/or bicycle traffic, as well as trash dumping) that could occur with the opening up the preserve to human recreational use. Future avian surveys (point count or otherwise) conducted during the fall, winter, and early spring would likely add species detections (i.e., migrants and winter visitors) to the list presented herein and more completely characterize the bird assemblage using the preserve in all seasons. We mentioned earlier the limitations of point count surveys for detecting rare and difficult-to-survey species. This must be considered when using these data to make management decisions and we suggest more intensive and

species-specific survey protocols for these and other species, especially for rare, threatened, or endangered birds.

The preserve landscape will continue to be sensitive to any changes in the management of adjacent lands. Monitoring of raptors and other long-ranging species occurring on the preserve may also be beneficial in understanding the post-burn effects of the 2002 Pines fire on the adjacent Volcan Mountain range. Lastly, good relations should be continued with adjacent property owners, since their actions have potential to have immediate, marked effects on the preserve's landscape.

Focused California spotted owl surveys detected four owl species within the preserve. Of the four species detected, all were native. A pair of California spotted owls was detected along Santa Ysabel Creek and an activity center was delineated. The California spotted owl is listed as a state species of special concern; for this reason, management decisions should consider restricting human activity around the California spotted owl activity center (Figure 9). The California spotted owl's distribution is patchy, largely due to breaks in the natural vegetation, topography, and the rapid pace of human development (Noon & McKelvey 1992). California spotted owls possess specific habitat requirements, a discontinuous distribution, and large home ranges. These factors may make California spotted owls susceptible to local extinction and severe habitat fragmentation. Additionally, barred owls (*Strix vagaria*) have recently expanded their range into California, and have been known to displace California spotted owls from their territories (Verner et al. 1992; Gutierrez et al. 1995) thus, surveying for their presence is advised. Future surveys will be helpful in determining the status of California spotted owl populations, particularly as human recreation and adjacent land development increase.

5.5 Bats

The preserve is currently supporting the habitat needs of a diverse population of bat species, although several critical elements are lacking. There is an abundance of riparian trees, upland woodland species (such as oaks and conifers), grasslands, scrub vegetation, leaf-litter, and perennial water that all provide foraging opportunities for bats. The riparian trees can also provide roosting habitat for certain species such as hoary bats and red bats and some dead or dying trees may provide roosting opportunities for crevice and cave dwelling bat species. However, there is a general lack of other types of roosting habitats that local bat species are typically associated with. These roosting habitats include natural rock caves, rocky outcrops, artificial caves (such as abandoned mines), and man-made structures (such as buildings and bridges). Many of these habitats occur adjacent to the preserve and so do several bat colonies.

Therefore, in order to encourage bats to relocate colonies onto this protected preserve we recommend that bat boxes of various designs and colors be put up in various areas of the preserve to provide or enhance roosting opportunities for bats. The standard bat box design will accommodate several crevice-roosting bat species that have been detected on the preserve including big brown bats, Mexican free-tailed bats, Yuma Myotis, and California Myotis. However, pallid bats do not readily use the standard bat boxes so it is recommended

that pallid bat-specific bat boxes also be put up in suitable areas, as pallid bats do occur on the preserve and roost in a building adjacent to the preserve on private land. After pallid bat boxes have been put up the next potential step would be to have the pallid bat colony excluded from the corner store using appropriate exclusion methods during the appropriate season. It is recommended that bat boxes be placed in areas where they are not likely to be encountered and disturbed by humans. This would mean placing boxes away from major trails or other recreational areas of the preserve. Some areas where placement of bat boxes would be appropriate include: 1) on the west property: two boxes, one dark colored and one light colored mounted side-by-side on posts and/or one pallid bat-specific bat box post-mounted on the south facing slope on the north side of the Santa Ysabel Creek as close to the creek as possible but out of the flood zone (near bat survey site 1), 2) on the east property: two boxes, one dark colored and one light colored mounted side-by-side on posts near the cattle pond (bat survey site 4; Cattle Pond 1), 3) on the east property: one pallid bat-specific bat box post mounted on the southwest-facing slope between the cattle pond (bat survey site 4) and the corner store (bat survey site 3), 4) on the east property: two boxes, one dark colored and one light colored mounted side-by-side on posts and/or one pallid bat-specific bat box post-mounted in close proximity to the Santa Ysabel Creek at the east end of the preserve (near bat survey sites 7 and 9). Further bat box advice and both standard bat box and pallid bat-specific bat box designs can be provided by USGS.

Obligate cave-roosting species such as the Townsend's big-eared bat, which was detected on the preserve, are not known to use bat boxes of any kind but will use natural caves and artificial, cave-like structures (such as mines), certain bridge designs, and cavities within buildings as roost sites. There does not appear to be any suitable roosting habitats for obligate cave-roosting bat species on SYROSP, except for cavities and hollows within dead or dying trees. We recommend that at least one artificial cave-like structure be constructed and placed in a suitable location within SYROSP to accommodate obligate cave-roosting species such as the Townsend's big-eared bat. This structure, ideally constructed of a combination of concrete and wood, could be designed so that it accommodates not only cave-roosting species but crevice roosting species as well. It could also be designed to accommodate both day and night roosting bats. The designing and construction of such a structure would require collaboration between bat biologists, contractors, and volunteers. It is recommended that any artificial caves that might be constructed on the preserve be placed where they are not likely to be encountered and disturbed by humans. This would mean placing the cave(s) away from trails or other recreational areas of the preserve. Suggested locations would include the same areas where bat boxes are recommended.

There is perennial water in some reaches of Santa Ysabel Creek and there are a few cattle ponds within and adjacent to the preserve that hold water for part of the year. These open water sites are likely very important to bats for both drinking and feeding, due to the increased insect abundance associated with water. Maintenance of open water within the preserve would be important for bats. Any activities that would reduce the amount of open water available to bats would likely negatively impact bats. Examples include water diversions, pumping of local ground water, recreational activities that might degrade water quality, and conversion of open cattle ponds to covered guzzlers. If management actions at SYROSP will include at least temporary drying of artificially perennial water as

recommended to control non-native aquatic requiring species, we recommend at least some water sources remain at all times for bat foraging requirements. Also, any activities that might alter or reduce the arthropod bat prey items associated with open water would likely negatively affect bats. This would include releasing or stocking of mosquito fish, trout and other game fish, crayfish, and any other pest control practices associated with open water.

There are many trees on SYROSP that are providing foraging opportunities for bats, as well as roosting opportunities for foliage roosting species such as hoary bats and red bats. In addition, many dead trees and snags could also be providing roosting opportunities for crevice and cave roosting species. Several years of drought in San Diego County has resulted in the death of a large number of trees county-wide including on the preserve. Fire prevention practices often involve removal of dead or dying trees. This kind of activity must be done with care, as it is important not to remove important wildlife trees including potential bat roosts. Preservation of trees, including dead trees and snags, will be necessary to maintain a rich bat population on the preserve.

There is growing evidence that certain bat species, including red bats, spend much or part of cold periods buried in leaf litter where the temperature is warmer and more stable than the ambient temperature (Saugey et al. 1998). Pallid bats forage on terrestrial arthropods that are taken from the ground's surface including on the surface of leaf litter (Orr 1954). Preservation of leaf-litter would benefit these bat species. Any winter prescribed burning efforts that focus on leaf litter could potentially cause direct mortality to species such as the red bat and would remove foraging habitat for the pallid bat.

There is an abundance of grassland on SYROSP, although most of it is non-native. The pallid bat is known to feed in grassland habitats on terrestrial arthropods (Orr 1954). It is suspected that the grasslands that pallid bats feed in must be somewhat sparsely vegetated to allow the bats to land on the ground to tackle their preferred prey items (i.e., Jerusalem crickets, burrowing scorpions, centipedes, etc). Native grasslands are typically sparsely vegetated but non-native grasslands, which predominate the preserve, are typically not sparse and instead are thick and probably hinder the pallid bat's ability to find and tackle prey items on the ground. It is recommended that non-native grass control efforts be implemented to reduce non-native grasses and allow native grasses to grow. However, prescribed burns as a non-native grass control method would need to be done with care and in a way that would minimize loss of leaf litter, particularly during the winter.

It is unclear what the full effects of artificial lights have on both the flying insect and bat community. However, it is suspected that artificial lights benefit aerial hawking bat species such as free-tailed bats (Family: Molossidae) while possibly negatively affecting gleaner bat species and/or bat species that capture flying insects in close proximity to vegetative structure such as Townsend's big-eared bats. It is recommended that no artificial lights be placed anywhere on the preserve. If they are needed, they should be required to be properly shielded to direct the light and reduce light and only be turned on when necessary.

5.6 Small Mammals

Twelve small mammal species were detected through herpetofauna pitfall sampling. Future survey efforts for small mammals should include multiple techniques. The use of trapping stations containing pitfall traps and small and large size box traps is recommended. Various small mammal species present within the preserve, from robust wood rats to minute shrews, are differentially detected when using only a single survey method. Species associated with chaparral and riparian habitats were either captured in low numbers (California mouse) or not at all (brush mouse, California pocket mouse). Focused efforts in these areas of the preserve should confirm the presence of these species. We recommend monitoring to continue to track for invasive species and the recovery of diversity in restored habitats over time.

5.7 Medium and Large Mammals

For the purposes of conservation of fauna and large mammals in particular within the SYROSP, maintaining connections across CA 78 and CA 79 will be essential, particularly if traffic volumes along these roadways increase in the future. Future considerations to reduce wildlife mortality along Highways CA 78 and CA 79 include the construction of underpasses (to meet minimum mule deer requirements), wildlife fencing, and native vegetative cover leading to existing underpasses (Haas 2000; Lyren 2001).

Track and camera stations detected thirteen mid-sized to large mammal species within SYROSP. Of the thirteen species detected, four were non-native: domestic dog, domestic cow, domestic horse, and Virginia opossum. Dogs were detected at eight track transects and domestic cattle were detected at six camera stations within the preserve. Both species have the potential to negatively impact the native plant and animal species of the region. Domestic dogs could chase native species, potentially carry diseases harmful to native species, and cause native species to avoid certain areas of the preserve. Domestic cattle and horses could damage native vegetation through grazing and potentially aid the spread of non-native plants through the deposition of manure. The non-native red fox (*Vulpes vulpes*) was not detected at either scent stations or camera stations on the preserve. However, there was a possible incidental sighting of a red fox just north of herpetofauna pitfall array 8. Red foxes could adversely affect native gray fox populations and the confirmation of this species occurring within or around the preserve is critical. Management decisions should consider restricting domestic dog access, removing any feral dog populations, cattle grazing should be managed (management might include removal), and monitoring red fox populations across the preserve (if present).

Future surveys should utilize existing sampling locations (which now serve as baseline monitoring locations) and consider alternative sampling methodologies to detect both common and rare species. A variety of sampling techniques, including baited scent stations, camera stations, hair snares, spotlight surveys, etc., may be necessary to detect the entire suite of medium and large mammals in a region. Monitoring for mountain lions throughout the preserve can be best achieved by maintaining long-term camera stations. Also, more intensive, species specific survey efforts including techniques such as hair snares,

hair tubes, scat surveys, spotlight surveys, and video monitoring may be necessary to determine whether or not other species such as badgers may be present on the preserve. Furthermore, given the potential for increased levels of habitat fragmentation surrounding the preserve in the future, obtaining information on the specific movements and activity patterns of fragmentation-sensitive species through radio or GPS telemetry will provide valuable information on these populations that can otherwise not be obtained through track and camera surveys alone.

5.8 Additional Management Recommendations

SYROSP supports numerous native habitats, many of which are unique to the southern California and Baja California region. These habitats support populations of multiple vertebrate species of concern that are dependent on the stability and health of the general habitat. Although portions of SYROSP appear stable and healthy in habitat quality, other areas of the preserve have issues that need some type of management attention. Without active management of these populations and habitats, many may decline in the future. The baseline data collected in this report is a starting point for building a program that will not only monitor but also manage these populations and habitats. This program of monitoring and management will ensure that these vertebrate species and habitats continue to thrive into the future.

Most of SYROSP is faced with the same management issues which are common throughout all of the open space areas in San Diego County. These problems include invasion by non-native species (both plants and animals), illegal off-road activity, unauthorized grazing, unauthorized trail development, and a lack of patrols by staff and/or law enforcement. In order to ensure that the habitats are protected and managed correctly, a restoration and management plan will be written for SYROSP. This plan should address the problems discussed below.

5.8.1 *Restoration*

Some areas of the property could be targeted for restoration. Above we discussed some of the potential for aquatic habitat such as managing for non-native species by temporarily removing water, another key area to target would be the non-native grasslands. These habitats are often restored using a variety of techniques, and we would suggest carefully selecting methods that do not adversely impact native animal species. Post-fire recovery is an important topic and ensuring that natural habitat that is burned on site does not transition to invasive species will be important. In addition, it is highly recommended that dead tree branches be piled rather than removed or chipped. These resources provide needed habitat and chipping can prohibit regrowth.

5.8.2 *Illegal Off-Road Activity*

Although this is not a serious problem throughout SYROSP, in other areas this continues to be a very serious threat. Off-road activity can cause physical impacts to the landscape and vegetation, increase the rate of weed invasion in and around the impacts, and

can cause mortality in ground-nesting birds, reptiles, amphibians, and mammals of all sizes. Options for controlling this problem include improved fencing and signs, increased patrols by staff, and public education of the impacts of such actions. Some areas on the preserve are currently fenced, but fence destruction or removal allows access to the open space. In many cases, destruction or removal of fencing occurs and is not or cannot be fixed immediately; this often results in long-term access for illegal off-road activities. Many open space areas would benefit from improved signs and other methods of public education.

5.8.3 *Unauthorized Grazing*

We documented numerous locations within SYROSP in which cattle from some of the properties adjacent to the preserve were grazing. The greatest levels of activity, as recorded by the remotely-triggered cameras, occurred on the west property, along Santa Ysabel Creek (camera 2) and within the drainage upstream of Cattle Pond 3 (camera 4) and, on the east property, along Santa Ysabel Creek and the northern boundary of the preserve (cameras 8 and 9) (Figure 8). Multiple private property owners surrounding SYROSP maintain cattle grazing on their lands, but in some places the cattle have open access to the preserve, either through open gates or discontinuous fencing. If it is determined that management of grazing include removal, the best solution to this problem is improved fencing by either the County or the surrounding property owners. Such fencing may need to be more than barbed wire fencing. As noted above, fence destruction and removal is not uncommon and may be deliberate acts to increase grazing access for cattle to the preserve. Efforts should be made to develop a plan which determines whether cattle grazing should be included or excluded on the property and determine how that decision will be upheld.

5.8.4 *Unauthorized Trail Access and Development*

Public access and use is an important issue for management of SYROSP. The public should be allowed to enjoy the open space areas of the preserve, but not at the expense of the natural resources. However, increasing the level of public use within SYROSP may result in unauthorized access trails which may have serious impacts on the rare habitats and plant populations.

As the county of San Diego continues to grow in population size, public use of the preserve will continue to grow. This increase in public usage is very likely to be accompanied by an increase in unauthorized trail access and development for horses, mountain bikes, and hikers. As with the off-road activity, the solutions to this problem include better fencing, improved signs and public education, and increased patrols.

5.8.5 *Collection*

As with unauthorized trail access and development and illegal off-road activity, the collection of the natural resources of SYROSP will likely increase as nearby populations rise. Both plants and animals can be affected by the seemingly innocent collection of a sample of these wildlife species. As is posted at many of the parks and preserves throughout the

county, the public should be notified of the nature of the preserve and encouraged to enjoy the wildlife experience, but to leave what they encounter in place.

At greatest risk to collection would be flowering plants, reptiles, and amphibians. Of the vertebrate species on SYROSP, reptiles and amphibians would be the most likely to be collected as visitors move across the landscape. Visitors will likely encounter such reptile species as the Common kingsnake (*Lampropeltis getulus*), gopher snake (*Pituophis catenifer*), and coast horned lizard (*Phrynosoma coronatum*) throughout many of the habitats at SYROSP. These animals are small enough to be carried off the preserve and are popular as pets, although they can be relatively difficult to keep (particularly the coast horned lizard). Amphibians on the preserve are most susceptible to collection during their immature life stages, as egg masses or tadpoles. These may be collected out of curiosity, to watch the development of amphibians from egg to tadpole to an adult frog or toad. At the egg mass and tadpole stages, a larger numbers of individuals can be removed from the system than if a visitor finds and collects a single adult animal. The matter gains seriousness with the potential of endangered species breeding on the site.

5.8.6 *Patrol by County Staff*

Although SYROSP is patrolled by County staff, the level of patrol activity may be inadequate. Even with the patrols, some areas may have problems relating to illegal encroachment, off-road and off-trail use, trash dumping, and other destructive activities. Without an increase in patrols and other forms of oversight, management plans will not be effective. However, when developing patrol routes sensitive habitats within the preserve, particularly within the breeding habitat of sensitive species (i.e., arroyo toad, California spotted owl) should be considered. Additionally the patrol can be trained to identify and record a variety of non-native species on the site such as the turkeys and cattle. Through their help in identifying locations that are problems they can help direct removal efforts.

5.8.7 *Education*

We recommend that information kiosks be placed at trailheads. These kiosks should provide educational material to the public that informs them of 1) the prevalence of wildlife species on the preserve, 2) interpretive signs including the benefits of certain species to the natural ecosystem, 3) the importance of not disturbing or molesting or removing any plant or wildlife they may encounter, 4) the potential danger(s) of handling and collecting wild animals, and 5) maps of official trails. In addition, educational pamphlets could be provided that contain information similar to what is provided at the kiosks. These pamphlets could be made available at stores and other suitable locations in the vicinity of SYROSP to educate people about wildlife species that they may encounter on or near the preserve. The USGS could provide advice on information details that could be provided in these pamphlets or at the kiosks. Interpretative signs could be established along official trails throughout the preserve and signage with plant species names could be strategically located near representative specimens along official trails.

Another form of education could be through the Rangers and/or interpretive personnel. It is recommended that rangers and interpretive personnel that are working on SYROSP become educated about the preserves various resources so they in turn can help educate the public.

Finally, an educational program for the general public that promotes the value of native ecosystems as well as the negative effects of non-native species may aid in the future management of SYROSP. In general, the public is largely unaware of the high biological diversity in San Diego County. If the public is informed of this, they may have a better appreciation and willingness to protect and conserve the natural resources within the preserve and beyond.

5.8.8 *Additional Surveys*

We must remember that this is only a baseline survey with two years of data. There are a number of sensitive or rare species that we expect may be present but were not detected during these surveys (Appendix 10). We suggest continuing surveys as carried out here for a longer duration for detecting most of these species. In addition, there are some species that could be best detected using targeted survey techniques such as looking under rocks for the granite night lizard (*Xantusia henshawi*) or nest surveys for raptors.

5.8.9 *Site Access*

In order to adequately sample amphibians in the future, researchers will need access to the study site during and immediately after rain events. Amphibian reproduction and dispersal is necessarily linked to heavy moisture conditions. Access will greatly increase species detection and capture rates.

5.8.10 *Baseline Survey Materials Removal*

Currently, there is still some study equipment present on SYROSP: the herpetofauna pitfall arrays and the telspar posts used for camera surveys. If no further research is going to occur in the foreseeable future, at minimum, the pitfall array materials should be removed from the ground. As the site is opened to the public and visitation increases, so does the likelihood that visitors will encounter the pitfall array material. This could lead to an increased probability that the equipment will be vandalized or tampered with. The pitfall array materials in the ground at the site represent a significant investment in time and effort for site development (over 150 hours of field time). If it is decided to keep the pitfall arrays in the ground and there is no plan to sample them in the near future, a transfer of responsibility will need to be arranged.

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Table 1. Occurrence of aquatic and aquatic-associated species as determined by surveys and incidental observations on the Santa Ysabel Ranch Open Space Preserve. Survey locations are shown in Figure 2.

		<i>West Property</i>									
		<i>SYC 1</i>		<i>Cattle Pond 2</i>		<i>Cattle Pond 3 (East Side)</i>		<i>Input Drainage to Cattle Pond 3</i>		<i>Unnamed Tributary to SYC</i>	
Dates Surveyed		9/10/02, 6/10/03, 8/11/03		8/11/03		8/14/03		8/14/03		8/14/03	
		Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected
Mollusks											
Fingernail clam	<i>Cyclocalyx sp.</i>		D								
Fishes											
Rainbow trout	<i>Oncorhynchus mykiss</i>										
Mosquitofish ^a	<i>Gambusia affinis</i>		V, D								
Amphibians											
Western spadefoot ^c	<i>Spea hammondi</i>	•		•	P	•		•		•	
Western toad	<i>Bufo boreas</i>	•	V	•		•	V	•	V	•	
Arroyo toad ^b	<i>Bufo californicus</i>	•	V					•			
Pacific treefrog	<i>Hyla regilla</i>	•	V, H, D, A	•		•	V, H	•	V, H	•	
California treefrog	<i>Hyla cadaverina</i>										
Bullfrog ^a	<i>Rana catesbeiana</i>					I					
Reptiles											
Racer	<i>Coluber constrictor</i>	•		•		•		•	P		
Two-striped garter snake ^c	<i>Thamnophis hammondi</i>	•		•		•		•			

		<i>East Property</i>																			
		<i>SYC 2</i>		<i>SYC 3</i>		<i>SYC 4</i>		<i>SYC 5</i>		<i>SYC 6</i>		<i>SYC 7</i>		<i>San Diego River</i>		<i>Cattle Pond 1</i>		<i>Spring 1</i>		<i>Spring 2</i>	
Dates Surveyed		9/11/02, 5/28/03, 6/10/03, 8/14/03		9/10/02, 9/11/02		9/10/02, 8/14/03		3/18/02, 8/22/02, 7/10/03, 8/14/03		3/18/02, 8/22/02, 8/14/03		7/10/03		8/11/03		3/18/02, 9/10/02, 6/25/03, 8/14/03		6/25/03, 8/14/03		6/25/03, 8/14/03	
		Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected	Expected	Detected
Mollusks																					
Fingernail clam	<i>Cyclocalyx sp.</i>																				
Fishes																					
Rainbow trout	<i>Oncorhynchus mykiss</i>							V													
Mosquitofish ^a	<i>Gambusia affinis</i>																				
Amphibians																					
Western spadefoot ^c	<i>Spea hammondi</i>	•				•		•		•				•		•		•			
Western toad	<i>Bufo boreas</i>	•		•		•		•		•		•		•		•		•			
Arroyo toad ^b	<i>Bufo californicus</i>	•						•		•											
Pacific treefrog	<i>Hyla regilla</i>	•	V, H, D, A	•	V, H, D, P	•	A	•	A	•	A	•		•		•		•	V, H	•	
California treefrog	<i>Hyla cadaverina</i>	•	V, H, D, A	•	V, H, D	•	A														
Bullfrog ^a	<i>Rana catesbeiana</i>																				
Reptiles																					
Racer	<i>Coluber constrictor</i>	•		•		•		•		•		•						•	P	•	
Two-striped garter snake ^c	<i>Thamnophis hammondi</i>	•		•		•		•		•		•				•	V				

^a = non-native species

^b = federally endangered species

^c = CDFG species of special concern

V = Visual Encounter Survey

H = Hand Capture

D = Dip Netting

A = Aural Detection

P = Pitfall Trap Arrays

Table 2. Number of herpetofauna individuals and species captured at pitfall arrays by array within the Santa Ysabel Ranch Open Space Preserve.

Species	Common Name	Array Number																								Total Captures	Total # Arrays	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			O ^a
Am																												
<i>Ensatina klauberi</i>	LH				2																		4			6	2	
<i>Hyla regilla</i>	PH														1											1	1	
<i>Bufo boreas</i>	MV								1																	1	1	
<i>Rana catesbeiana</i>	BH							1																		1	1	
<i>Spea hammondi</i> ^b	MV	1																								1	1	
LH																												
<i>Elgaria multicarinatus</i>	SH	2		3	1	6	2		1	1	2	2							3	2	6	1	10	9	3	54	16	
<i>Eumeces gilberti</i>	GH					1						4				4										9	3	
<i>Eumeces skiltonianus</i> ^b	MV	1		4	2	5	1	2			2	1		1		3	4	8	3	2	7	3	4	1		54	18	
<i>Aspidoscelis tigris</i>	MV		8		9	2		6			1	3	6	7	4	4	2	24		2				1		79	14	
<i>Sceloporus occidentalis</i>	MV	5	2	11	21	7	7	2	5	1	18	7	17	10	6	11	17	2	2	3	36	9	14	5	13	231	24	
<i>Sceloporus orcutti</i>	GH		1					1					3	2	14					2	1	1				25	8	
<i>Uta stansburiana</i>	SH	6	13	2	1			3		4	3	3	1	2	2	1		2		2	4					49	15	
<i>Phrynosoma coronatum</i> ^b	CH		18					2					6	3	1								1		1	32	6	
SH																												
<i>Leptotyphlops humilis</i>	MV			1																						1	1	
<i>Coluber constrictor</i>	Re							1												6						7	2	
<i>Diadophis punctatus</i>	RH	1			1																	1	1			4	4	
<i>Hypsiglena torquata</i>	NH																						1			1	1	
<i>Lampropeltis getulus</i>	CH												1								2					3	2	
<i>Masticophis lateralis</i>	SH				2						1	1		1	1				1							7	6	
<i>Pituophis melanoleucas</i>	GH	1					1	1						1			2				2				1	9	6	
<i>Salvadora hexalepis</i> ^b	MV															1										1	1	
<i>Thamnophis hammondi</i> ^b	TH											2														2	1	
<i>Crotalus mitchellii</i>	SH																								1	1		
<i>Crotalus viridis</i>	MV								1																	1	1	
Total Captures		17	42	21	37	23	11	10	15	8	27	23	34	27	28	25	25	36	9	15	59	17	31	19	18	3	580	24
Total Species		7	5	5	7	6	4	6	5	5	6	8	6	8	6	7	4	4	4	5	7	6	6	4	4	3	24	

^a = species observed on the study site but not in association with an array^b = CDFG species of special concern

Table 3. Number of herpetofauna individuals and species captured at pitfall arrays by month within the Santa Ysabel Ranch Open Space Preserve.

Species	Common Name	Month											
		Jan	Feb ^a	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Amphibians													
<i>Ensatina klauberi</i>	Large-blotched ensatina	3			2		1						
<i>Hyla regilla</i>	Pacific treefrog												1
<i>Bufo boreas</i>	Western toad	1											
<i>Rana catesbeiana</i>	Bullfrog							1					
<i>Spea hammondi</i> ^b	Western spadefoot				1								
Lizards													
<i>Elgaria multicarinatus</i>	Southern alligator lizard			9	3	13	11	12		5	1		
<i>Eumeces gilberti</i>	Gilbert's skink					4	4	1					
<i>Eumeces skiltonianus</i> ^b	Western skink			13	4	1	11	13	4	6	1		1
<i>Aspidoscelis tigris</i>	Western whiptail					12	49	11	5	2			
<i>Sceloporus occidentalis</i>	Western fence lizard			22	16	24	68	35	6	31	21	3	5
<i>Sceloporus orcutti</i>	Granite spiny lizard			1		12	7	2	1		2		
<i>Uta stansburiana</i>	Side-blotched lizard			2	5	5	5	6	3	12	6	2	3
<i>Phrynosoma coronatum</i> ^b	Coast horned lizard			3	5	4	10	8		2			
Snakes													
<i>Leptotyphlops humilis</i>	Western blind snake									1			
<i>Coluber constrictor</i>	Racer						6	1					
<i>Diadophis punctatus</i>	Ring-necked snake			1		1	1						1
<i>Hypsiglena torquata</i>	Night snake									1			
<i>Lampropeltis getulus</i>	Common kingsnake					1	2						
<i>Masticophis lateralis</i>	Striped racer			1	1	3	2						
<i>Pituophis melanoleucas</i>	Gopher snake			1			5	3					
<i>Salvadora hexalepis</i> ^b	Western patch-nosed snake					1							
<i>Thamnophis hammondi</i> ^b	Two-striped gartersnake			2									
<i>Crotalus mitchellii</i>	Speckled rattlesnake						1						
<i>Crotalus viridis</i>	Western rattlesnake						1						
Total Captures		4	-	55	37	81	184	93	19	60	31	5	11
Total Species		2	-	10	8	12	16	11	5	8	5	2	5
Number of Sampling Days/Month		4	-	4	5	6	8	6	1	4	3	1	4
Capture Rate (captures/days)		1.0	-	13.8	7.4	13.5	23.0	15.5	19.0	15.0	10.3	5.0	2.8

^a = no sample periods fell within this month^b = CDFG species of special concern

Table 4. Herpetofauna species captures per habitat type within the Santa Ysabel Ranch Open Space Preserve. The total number of captures of species per habitat type and the average number of captures of species per array within each habitat type are shown. The number of arrays represented by each habitat type is included in

		Habitat Type ^a												Total (24)	
		OAK (8)		RIP (2)		PIN (2)		NNG (4)		CHAP (6)		CSS (2)			
Species	Common Name	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average
Amphibians															
<i>Ensatina klauberi</i>	Large-blotched ensatina	6	0.8											6	0.25
<i>Hyla regilla</i>	Pacific treefrog											1	0.5	1	0.04
<i>Bufo boreas</i>	Western toad							1	0.3					1	0.04
<i>Rana catesbeiana</i>	Bullfrog							1	0.3					1	0.04
<i>Spea hammondi</i> ^b	Western spadefoot	1	0.1											1	0.04
Lizards															
<i>Elgaria multicarinatus</i>	Southern alligator lizard	25	3.1	5	2.5	16	8.0	2	0.5	4	0.7	2	1.0	54	2.25
<i>Eumeces gilberti</i>	Gilbert's skink	1	0.1									8	4.0	9	0.38
<i>Eumeces skiltonianus</i> ^b	Western skink	20	2.5	2	1.0	11	5.5	13	3.3	4	0.7	4	2.0	54	2.25
<i>Aspidoscelis tigris</i>	Western whiptail	14	1.8	1	0.5	2	1.0	24	6.0	31	5.2	7	3.5	79	3.29
<i>Sceloporus occidentalis</i>	Western fence lizard	91	11.4	16	8.0	50	25.0	14	3.5	42	7.0	18	9.0	231	9.63
<i>Sceloporus orcutti</i>	Granite spiny lizard					3	1.5	1	0.3	21	3.5			25	1.04
<i>Uta stansburiana</i>	Side-blotched lizard	12	1.5	2	1.0	4	2.0	9	2.3	18	3.0	4	2.0	49	2.04
<i>Phrynosoma coronatum</i> ^b	Coast horned lizard			1	0.5					30	5.0			31	1.29
Snakes															
<i>Leptotyphlops humilis</i>	Western blind snake	1	0.1											1	0.04
<i>Coluber constrictor</i>	Racer			6	3.0			1	0.3					7	0.29
<i>Diadophis punctatus</i>	Ring-necked snake	2	0.3			1	0.5	1	0.3					4	0.17
<i>Hypsiglena torquata</i>	Night snake					1	0.5							1	0.04
<i>Lampropeltis getulus</i>	Common kingsnake					2	1.0			1	0.2			3	0.13
<i>Masticophis lateralis</i>	Striped racer	3	0.4							3	0.5	1	0.5	7	0.29
<i>Pituophis melanoleucas</i>	Gopher snake	4	0.5					3	0.8	1	0.2			8	0.33
<i>Salvadora hexalepis</i> ^b	Western patch-nosed snake											1	0.5	1	0.04
<i>Thamnophis hammondi</i> ^b	Two-striped gartersnake											2	1.0	2	0.08
<i>Crotalus viridis</i>	Western rattlesnake							1	0.3					1	0.04
Number of Captures		180	22.5	15	7.5	90	45.0	71	17.8	155	25.8	48	24.0	577*	24.04
Number of Species		12	5.4	7	4.5	9	6.5	12	5.3	10	5.7	10	7.5	23	5.63

^a = habitat types include: oak woodland (OAK), riparian (RIP), pine woodland (PIN), non-native grassland (NNG), chaparral (CHAP), and coastal sage scrub (CSS)

^b = CDFG species of special concern

Table 5 (continued).

Species	Array Numbers																								Total Indivi- duals	% Array Occur- rence
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Subfamily Myrmicinae (continued)																										
<i>Leptothorax nitens</i>																		1					3		4	8%
<i>Leptothorax rugatulus</i>																							4		4	4%
<i>Leptothorax</i> sp CA-03																							4		4	4%
<i>Messor andrei</i>			40	38	3	1		42	2								8	2			5	1			142	42%
<i>Messor stoddardii</i>				1				1	7											3	8	4		22	46	29%
<i>Monomorium ergatogyna</i>								13	11		2	1						6		5	9		2		49	33%
<i>Myrmica rugiventris</i>																				2					2	4%
<i>Pheidole californica</i>																				1					1	4%
<i>Pheidole cerebrobior</i>					1	1																			2	8%
<i>Pheidole hyatti</i>	44	162	35	12	8	7	11	5	2		13	1	15			2	14	55		23	38	7			454	75%
<i>Pheidole</i> spp.			3																						3	4%
<i>Pheidole vistana</i>			72					39			10				9										130	17%
<i>Pogonomyrmex californicus</i>			11	3		12										1									27	17%
<i>Pogonomyrmex rugosus</i>								2																	2	4%
<i>Pogonomyrmex subnitidus</i>			1	2		21		11	1	66					1	29									132	33%
<i>Solenopsis molesta</i>			1		2			7						1	4			1			1		2		19	33%
<i>Solenopsis xyloni</i>								17			1				26										44	13%
<i>Stenamma diecki</i>					1																				1	4%
<i>Number of Captures</i>	72	789	98	77	55	44	50	183	154	22	50	33	47	89	93	152	48	106	26	68	71	92	35	563	3017	
<i>Number of Species</i> ^a	11	15	9	11	16	12	8	22	8	6	12	11	5	9	8	11	10	14	3	12	10	11	11	4	43	

^a = number of confirmed species; *Camponotus* spp. and *Pheidole* spp. were not included in species totals since they may have been individuals of other species in that genus that were identified

Table 6. Avifauna species detected at point count stations within the Santa Ysabel Ranch Open Space Preserve, sorted from most common species to least common species.

	Point Count Number																																																		Total # of Points	Total # individuals		
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50				
Lazuli bunting	3	6	4	15	8	10	4	10	5	6	9		2	7	1	13	6	14	10	10	10	12	2	1	3	14	8	8	1	4	2	7	10	6	6	10	4	19	5		3	13	9	14	6	4	3	44	323					
Mourning dove	15	6	6	11	4	5	9	7	7	5	8	6	2	7	5	5	6	4	8	9	5	11	5	8	5	6	4	3	5	4	4	4	12	6	7	8	2	6	5	7	7	6	6	3	4	4	2	7	48	291				
Ash-throated flycatcher	11	13		4	9	3	7	8	5	6	8		1	3	3	8	9	1	10	6	6	7	8	7	6	5	9	3	6	7	7	12	10	6	5	7	1	5	6	4		1	2	3	3	2	8	4	3	46	268			
Spotted towhee	6	10		1	8	3	6	7	10	5	8		1		10	3	6	5	4	2	9	9	7	11	4	3	5	8	10	9	4	5	5	3	4	7	6	1	5	6		4	1	6	5	2	11	7	10	44	257			
Acorn woodpecker	1	8	2	5		8			4	7	3		1	4	8	1		4	4	2		2		7	3	12	3		7	11	7	7	10	1	8	6	14	2		6	15	2	4	2	7	3	14	39	220					
House wren	2	3		10	6	1	2	4	3	3	5		2	4		13	4	7	3	6	1	5	4	1	4	8	10	10	5	7	9	9	6	13	5	6	1		3			3	1	7	6	5	40	207						
Violet-green swallow	1	1			10			1	4		4		4	5	15	2	1	5	6	1	2	2	5	1	5	9	3		6	8	5	4		6	1	4	7	1			8	13	7	8	1	10	20	6	38	199				
Lesser goldfinch	10	4		1	4	12	1	6	8	3	7		4	7	1	7	4	7	5	7	4	7	7	3	3	11	5	4	1	4	8	2	1		2	1	1		1		2	2	3	4	1		2	6	42	183				
Oak titmouse	5	8		4	2	3	2		1	2	7				2	5		5	9		10	4		2	4	3	6	7	5	4	4	4	2	1	5	4	6		5	4		2	1	7	11		4	8	4	37	168			
Western bluebird		2	2									4	3	2	5	1	2	1	3	3	7	12									2		8	2	3		12	6	9	18	15		3	3	10	6	18		6	28	168			
Lark sparrow		3	6	13	13	3	2		2	2	3	12	6	11		1	3	3	1	8			1	1	2		1	2			8	2	6	4	7	4	7		4		9	1	1	2			1	35	155					
Western wood-pewee	2				6	1	5	4	2	6	5	4	1	4	4	1		6			1	4	3	1	3	3	9	6		3	5	1	12	2	9	2	10	5	9			3		2	4	7	36	155						
European starling			2				1		4		2	15	16	1	1				3	1								1			1	3		2	6	4			12	3	11	58	4		1	2		23	154					
Wrentit	18	9			2	2	1	7	5		6			1	2	2	5	1	4	1	3	5	6	13		5	2	9	8	7	2	4		1	4	1		2	2				1	3	2	5	35	151						
California towhee	5	11	3	2	4	5	6	10	8	6	13	2	4	3	3	10	5	6	7	3	1	2	1	1				1		6	9		1	1	1				1	5	1			1	1	1	36	150						
Bullock's oriole	1	1	2	7	1	2	1	1		8	6	2	6	6	8	1	2	3		2	3	5			1		1	1	1	1	2	9	3	6	3	5	2	2		11	5	7	6	3	2	2	2	40	135					
White-breasted nuthatch	3	6	2	4	7		3	1	5	4	4				1	1	1		6	5	1		2		2	4		4		1	2	5	4	6		6	5	5	1	7		2	1	4	1	1	3	3	37	123				
Western scrub-jay	5	2		4	5	3	1	1	1	1	3	1	3	5		2	2	3	3	2	4	1		6	4		1		9		6	3		3	4	1	2			4	4	2	3	2	3	2	4	38	115					
Western kingbird			1	1					2			15	11	11	14			1	2	1	6									1				1					5	3		13	8		1			21	109					
Tricolored blackbird																																																	1	100				
Nuttall's woodpecker	2		4	2			3	3	2	4		1	1		4		1		2	3	3	3	3	4	5	4	3	4	5	4	1	1	4	6	1	2		2	3					1		1	2	1	35	95				
Bushtit	3			8			3		2	3					3				5		4	7			4	7		4	10	7	12		2	1	6	2			1	5					1	5	21	94						
House finch		4						3		3		3	4	11			7		9	1	2	6	1	5		3			2	1	2	6			3		2	2							1	5	26	94						
American crow	2		5	6			2						2												3		5		1		7	5	4	2	4		4	2	4		3	1	10	3	3		1	9	5	3	3	2	25	92
Western meadowlark	10		1		3		3			5	2		5	2	2															3	3	1		4	2		6			9	13	16		1	1	7			19	92				
Cliff swallow			8	1				1							5	5			2	22			1		6				1		1		2				1	3	1		1	1	7	1	9	4	5	1	23	89				
Brewer's blackbird											15	19	35		3									1										6										2				7	81					
Anna's hummingbird	4	3	2	2						1	1					1	2	1	1	2	1	1	5	3	2	1		1	2	11	3	2	3	6	3	2	1	1		1	1	2			3	1	1	34	77					
Bewick's wren	6	5	1		1	2	1	3	1	1	2				2	2						2	3	5	6	3			4	4	1	2		2											4	3	4	28	76					
Lawrence's goldfinch	2				1		3			2		3	4	1	2		1	7	2		1	5		3	4				1						2	1		4	2	2			2	2	4	1	8		27	71				
Brown-headed cowbird	2		3	2	2	1			6	2	2	4	5					1			1		1		3	3	3			3		2	1	1	1	8	3	4	3				1	1			1	28	70					
Dark-eyed junco			4	2		1			1										1				4				7		1	2		1				9		16	10			2	2	3		4		17	70					
Black-chinned sparrow	1				3		6	2	1	1					5	13	2	3	5	4	2	1	1	1		1	1	1	4	1				1	3	6							1	1		1		1	25	63				
Steller's jay			2						1		1							1											3				3										3	9	5	6	1	3	5	4	19	63		
Phainopepla	7	1			2	1	1	5	2	1	1	1				2					3	2		1	2	4		4		1	2	4	1			7						1	4					24	60					
Black-headed grosbeak	4		1	2					1	2			2		4		1	1	1	1			1	5	4		1		5	1	3	2		3	2		1											2	4	26	54			
Costa's hummingbird	3	3			4		4	1	4	1	1				2						1	3	1																															

Table 6 (continued)

Species	Point Count Number																																																		Total # of Points	Total # individuals	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50			
Song sparrow				4									2	1						2							1																1	1			6	11	21				
Chipping sparrow		2												1																																	7	20					
Warbling vireo				1			2	1	1	7			2	1		1			1												1																		11	19			
California thrasher	2	4			1		1		1		1		1			1	1	1					2		1																							13	18				
Horned lark																																																	4	17			
Orange-crowned warbler																											4	1																					7	14			
Hutton's vireo	1				2						1																	3	2	1																			9	13			
Turkey vulture			1			1			2									2		1	1									1	1		1																10	13			
Wilson's warbler											1		3	2									2				2	1				1																	7	12			
California quail	3						1			1								2					1											1	2														7	11			
Red-shouldered hawk	2								1																																							1	2	8	11		
American robin			3																																														0	4	10		
Grasshopper sparrow			1										1		1																																		8	10			
White-tailed kite			1	1			2																																											7	10		
Yellow-rumped warbler			2	1				1		1			2						1																															8	10		
Swainson's thrush	2			1					1				2																																				6	8			
American kestrel							1											1														1																		7	7		
Rufous-crowned sparrow		1						2										1		1																														2	5	7	
Townsend's warbler																				1												2																		5	6		
Black-throated gray warbler										1																																									4	5	
Sage sparrow	1																	2				1																													4	5	
Black phoebe													1	2																																					1	3	4
Cooper's hawk																			1																																5	4	
Killdeer			2			1																																													3	4	
Ruby-crowned kinglet														2	2																																				2	4	
Allen's hummingbird																																																				2	3
Barn owl																																																				2	3
Blue grosbeak									1				2																																						2	3	
Olive-sided flycatcher																1																																			3	3	
Black-chinned hummingbird																									2																										1	2	
Black-throated sparrow																							2																												1	2	
Common yellowthroat																																																				1	2
Golden eagle																																																				2	2
Long-eared owl																		1																													</						

^a = this is only added into total species calculations when no other hummingbird species was recorded at a point^b = probable, but not confirmed, detection

Table 7. Habitat associations of avifauna species detected at point count stations within the Santa Ysabel Ranch Open Space Preserve listing number of individuals detected in each habitat type, sorted from most common species to least common species. For each bird observation vegetation was qualitatively assigned a habitat type.

<i>Species</i>	<i>Habitat Type^a</i>								<i>Total # of Points Detected</i>	<i>Grand Total</i>
	<i>CHAP</i>	<i>PIN</i>	<i>G</i>	<i>HUM</i>	<i>OAK</i>	<i>RIP</i>	<i>CSS</i>	<i>Flyover</i>		
Lazuli bunting	25		18		213	31	36		44	323
Mourning dove	26	4	21	1	152	14	3	70	48	291
Ash-throated flycatcher	28	3	7		207	9	11	3	46	268
Spotted towhee	44	2			186	10	14	1	44	257
Acorn woodpecker	9	28	1		163	12		7	39	220
House wren	10				166	22	9		40	207
Violet-green swallow		2	4	1	24	5	3	160	38	199
Lesser goldfinch	11		3		74	8	14	73	42	183
Oak titmouse	8	3			147	7	3		37	168
Western bluebird		3	77	1	78	5	1	3	28	168
Lark sparrow	6	1	40		70	20	14	4	35	155
Western wood-pewee	6	3			133	13			36	155
European starling		15	22	5	18	29		65	23	154
Wrentit	61	1			72	1	16		35	151
California towhee	35	5	3		79	5	23		36	150
Bullock's oriole	1	4	9		83	25	3	10	40	135
White-breasted nuthatch	2	2			112	5	1	1	37	123
Western scrub-jay	16	6		1	78	10	3	1	38	115
Western kingbird		13	26		35	10		25	21	109
Tricolored blackbird								100	1	100
Nuttall's woodpecker	9				79	5		2	35	95
Bushtit	6				87	1			21	94
House finch			1	2	38	15	2	36	26	94
American crow			4		27	13		48	25	92
Western meadowlark			71		20			1	19	92
Cliff swallow						1		88	23	89
Brewer's blackbird		2	2	15		12		50	7	81
Anna's hummingbird	11		2		45	1	4	14	34	77
Bewick's wren	24	1			42	3	6		28	76
Lawrence's goldfinch	1				34	11		25	27	71
Brown-headed cowbird	1		4	1	34	21		9	28	70
Dark-eyed junco	1	2	1		58	7		1	17	70
Black-chinned sparrow	8				25		30		25	63
Steller's jay	1	15			44	2		1	19	63
Phainopepla	11	1			37	4		7	24	60
Black-headed grosbeak	13				39	2			26	54
Costa's hummingbird	10				17		10		18	37
Purple martin		1		27	2			7	6	37
Northern flicker	2	4			28	2		1	23	37
Blue-gray gnatcatcher	7				27		2		18	36
Common raven			3		4	1		27	21	35
Red-tailed hawk			1	4	10			20	18	35
Western tanager	1		2		24	2		2	15	31
Wild turkey			1		25	4	1		11	31
Pacific-slope flycatcher					19	8			10	27
Band-tailed pigeon					15			11	10	26
Mountain chickadee		2			24				14	26
Unidentified hummingbird ^b	4				8	1		10	16	23
Yellow warbler					6	17			8	23
Red-winged blackbird					1	4		16	6	21

Table 7 (continued)

Species	Habitat Type ^a								Total # of Points Detected	Grand Total
	CHAP	PIN	G	HUM	OAK	RIP	CSS	Flyover		
Song sparrow		1			4	16			11	21
Chipping sparrow	2		3		10	3	2		7	20
Warbling vireo	2				14	3			11	19
California thrasher	13				2	1	2		13	18
Horned lark			13			1		3	4	17
Orange-crowned warbler					11	3			7	14
Hutton's vireo	1				8	4			9	13
Turkey vulture								13	10	13
Wilson's warbler					5	7			7	12
California quail	4		2		3		2		7	11
Red-shouldered hawk					5	1		5	8	11
American robin			3		3	4			4	10
Grasshopper sparrow			10						8	10
White-tailed kite					5			5	7	10
Yellow-rumped warbler	1				5	2		2	8	10
Swainson's thrush	2				4	2			6	8
American kestrel					5			2	7	7
Rufous-crowned sparrow	1						6		5	7
Townsend's warbler	1				5				5	6
Black-throated gray warbler					5				4	5
Sage sparrow			1		1		3		4	5
Black phoebe			1	1		2			3	4
Cooper's hawk		1			2	1			5	4
Killdeer					1			3	3	4
Ruby-crowned kinglet						4			2	4
Allen's hummingbird					3				2	3
Barn owl					3				2	3
Blue grosbeak				2	1				2	3
Olive-sided flycatcher					3				3	3
Black-chinned hummingbird					2				1	2
Black-throated sparrow							2		1	2
Common yellowthroat					2				1	2
Golden eagle		1						1	2	2
Long-eared owl					1		1		2	2
Mallard						2			1	2
Caspian tern								1	1	1
Hairy woodpecker					1				1	1
Mountain quail					1				1	1
Northern mockingbird					1				1	1
Northern rough-winged swallow						1			1	1
Rock dove			1						1	1
Varied thrush		1							1	1
Yellow-breasted chat						1			1	1
<i>Total Individuals</i>	425	127	357	61	3025	436	227	934		5592
<i>% Total Individuals/Habitat</i>	7.6	2.3	6.4	1.1	54.1	7.8	4.1	16.7		100
<i>Total Species</i>	39	28	31	12	75	58	29	42		92 ^d
<i>% Total Species/Habitat</i>	42.4	30.4	33.7	13.0	81.5	63.0	31.5	45.7		

^a = habitat that species was detected in during point count; habitat types include: chaparral (CHAP), pine woodland (PIN), grassland (G), human-modified (HUM), oak woodland (OAK), riparian (RIP), and coastal sage scrub (CSS) (note: point count locations may be associated with multiple habitat types).

^b = this is only added into total species calculations when no other hummingbird species was recorded at a point

^c = probable, but not confirmed, detection

^d = 92 is the total number of species detected

Table 8. Owl species detected during focused California spotted owl surveys on the Santa Ysabel Ranch Open Space Preserve.

		Calling Station Number ^a															
		1	9	10	14	15	16	17	18	19	20	21	22	23	24	25	36
Spotted owl	<i>Strix occidentalis</i>				✓	✓	✓	✓	✓		✓						
Barn owl	<i>Tyto alba</i>					✓	✓			✓	✓	✓		✓			✓
Great horned owl	<i>Bubo virginianus</i>				✓		✓	✓					✓				
Western screech owl	<i>Otus kennicottii</i>	✓		✓			✓	✓			✓						

^a = 36 spotted owl calling stations were chosen throughout SYROSR, but only 16 calling stations in the most suitable habitat (high and medium priority) were actually surveyed (see Appendix 4); the gaps in the station numbers reflect the omitted calling stations.

Table 9. Bat survey locations within the Santa Ysabel Ranch Open Space Preserve including survey site features, dates, and methodologies.

<i>Site Number</i>	<i>Location</i>	<i>Feature(s)</i>	<i>Survey Dates</i>	<i>Survey Methodology</i>
1	West Santa Ysabel Creek	Creek/Riparian Reach	5/28/2002	Acoustic, mist-net
			7/24/2002	Acoustic, mist-net
			9/10/2002	Acoustic, mist-net
			12/4/2002	Acoustic, mist-net
			1/23/2003	Acoustic, mist-net
			4/9/2003	Acoustic, mist-net
			5/28/2003	Acoustic, mist-net
			7/31/2003	Acoustic, mist-net
2	West Saddle	Upland woodland	7/1/2002	Acoustic, mist-net
3	Corner Store	Roost Structure	8/7/2002	Acoustica
			6/30/2003	Acoustica
4	Cattle Pond ^b	Pond	5/22/2003	Acoustic, mist-net
5	East Santa Ysabel Creek (CA 79)	Creek/Riparian Reach	7/17/2002	Acoustic, mist-net
6	East Santa Ysabel Creek (Tributary)	Creek/Riparian Reach	6/12/2002	Acoustic, mist-net
7	East SY Creek (West Crossing)	Creek/Riparian Reach	5/30/2002	Acoustic, mist-net
			8/29/2002	Acoustic, mist-net
			7/7/2003	Acoustic, mist-net
8	East Santa Ysabel Creek (NE portion)	Creek/Riparian Reach	6/20/2002	Acoustic, mist-net
9	East Santa Ysabel Creek (East Crossing)	Creek/Riparian Reach	6/6/2002	Acoustic, mist-net
			6/24/2003	Acoustic, mist-net

^a = indicates survey at roost location; all other surveys at foraging location(s)

^b = Cattle Pond 1 from aquatic survey

Table 10. Bat species detection methods and occurrence by site within the Santa Ysabel Ranch Open Space Preserve.

<i>Scientific Name</i>	<i>Common Name</i>	<i>Detection Method</i>	<i>Detection Sites</i>	<i>Number of Detection Nights</i>
<i>Antrozous pallidus</i> ^{acd}	Pallid bat	Acoustic	1,3	5
<i>Corynorhinus townsendii</i> ^{abcd}	Townsend's big-eared bat	Capture	7	1
		Acoustic	1,9	4
<i>Eptesicus fuscus</i>	Big brown bat	Capture	1,6,7	3
		Acoustic	1,2,3,4,5,6,7,8,9	14
<i>Eumops perotis</i> ^{abd}	Western mastiff bat	Acoustic	1,2,3,5,6,7,8,9	17
<i>Lasiurus blossevillei</i> ^a	Western red bat	Capture	1,7	2
		Acoustic	1,6,7,9	7
<i>Lasiurus cinereus</i>	Hoary bat	Capture	1,4,6,9	5
		Acoustic	1,4,6,7,9	7
<i>Lasiurus xanthinus</i> ^a	Western yellow bat	Acoustic	9	1
<i>Myotis californicus</i>	California myotis	Capture	2,4,7,9	6
		Acoustic	1,2,3,4,6,7,8,9	15
<i>Myotis ciliolabrum</i> ^{bd}	Western small-footed bat	Capture	7	1
		Acoustic	1,2,4,5,6,7	11
<i>Myotis evotis</i> ^{bd}	Long-eared myotis	Acoustic	7	1
<i>Myotis yumanensis</i> ^{bd}	Yuma myotis	Capture	1	1
		Acoustic	1,2,6,7,9	11
<i>Nyctinomops femorosaccus</i> ^a	Pocketed free-tailed bat	Acoustic	1,2,5,7,8,9	11
<i>Nyctinomops macrotis</i> ^a	Big free-tailed bat	Acoustic	7,9	2
<i>Pipistrellus hesperus</i>	Western pipistrelle	Acoustic	1,2,3,4,5,7	7
<i>Tadarida brasiliensis</i>	Mexican free-tailed bat	Acoustic	1,2,3,4,5,6,7,8,9	13

^a = CA species of special concern or proposed CA species of special concern^b = federal species of concern^c = U.S. Forest Service sensitive species^d = U.S. Bureau of Land Management sensitive species

Table 11. Total number of small mammals captured during pitfall trap surveys within the Santa Ysabel Ranch Open Space Preserve.

Species	Common Name	Array Number																								Total Captures	Total # Arrays
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Desert woodrat ^a	<i>Neotoma lepida</i>																						1			1	1
<i>Neotoma</i> Nest ^b		1			4		5								3	1		6	3		1			1		25	9
Deer mouse	<i>Peromyscus</i> spp.									2			1					4	1		1	1	3	2		15	8
Deer mouse	<i>Peromyscus maniculatus</i>				1	2			1	5							1	7	2	1	3	1	4	1		29	12
California mouse	<i>Peromyscus californicus</i>								2			1														3	2
Cactus mouse	<i>Peromyscus eremicus</i>				1												1				1		1			4	4
Desert shrew	<i>Notiosorex crawfordi</i>					1							1						1		1					4	4
Ornate shrew	<i>Sorex ornatus</i>	1				11	3					1	1			2			1		3			2	2	27	10
California vole	<i>Microtus californicus</i>	5	3			23	18	3	6	4	1	1	2	2	2	1	6	5	2	6	2	2	7	5	20	126	22
Botta's pocket gopher	<i>Thomomys bottae</i>	3	5	4	2	3	7	2		4	2	6	1	2	1	2	1	4	1	2	6	9	2	2	1	72	23
Western harvest mouse	<i>Reithrodontomys megalotis</i>			1	1											2	1	2		7	4	2	2		5	27	10
Merriam's chipmunk	<i>Tamias merriami</i>																						1			1	1
Desert cottontail	<i>Sylvilagus audubonii</i>													1												1	1
Unknown rabbit					1									1												2	2
Pocket mouse	<i>Chaetodipus</i> spp.															1										1	1
San Diego pocket mouse ^a	<i>Chaetodipus fallax</i>		4	1	1																					6	3
Unknown mouse																	1						1			2	2
Unknown rodent																				1						1	1
Total Captures		10	12	6	11	40	33	5	9	15	3	9	6	6	6	9	11	28	11	17	22	15	22	13	28	347	24
Total Species^c		4	3	3	7	5	4	2	3	3	2	4	5	3	3	6	5	5	6	4	8	4	7	5	4	12	

^a = CDFG species of special concern^b = visual surveys were conducted for *Neotoma* nests within a 50 meter radius of each pitfall array.^c = number of confirmed species; *Peromyscus* spp., *Chaetodipus* spp., unknown rabbit, unknown mouse, and unknown rodent were not included in species totals

Table 12. Large mammal species detected at baited scent stations within the Santa Ysabel Ranch Open Space Preserve. ^a

Species Detected	Transect Number									
	1	2	3	4	5	6	7	8	9	10
Target Species										
<i>Odocoileus hemionus</i> (Mule deer)	0	0	0	0	0	0	1 (0.009)	2 (0.017)	0	0
<i>Canis latrans</i> (Coyote)	55 (0.470)	42 (0.359)	22 (0.183)	22 (0.190)	9 (0.078)	19 (0.165)	48 (0.429)	7 (0.059)	15 (0.126)	23 (0.333)
<i>Felis rufus</i> (Bobcat)	9 (0.077)	10 (0.085)	9 (0.075)	10 (0.086)	9 (0.078)	8 (0.070)	10 (0.089)	1 (0.008)	1 (0.008)	0
<i>Urocyon cinereoargenteus</i> (Gray fox)	8 (0.068)	12 (0.103)	3 (0.025)	17 (0.147)	6 (0.052)	9 (0.078)	6 (0.054)	0	5 (0.042)	0
<i>Mephitis mephitis</i> (Striped skunk)	5 (0.043)	7 (0.060)	11 (0.092)	5 (0.043)	26 (0.224)	14 (0.122)	23 (0.205)	9 (0.076)	20 (0.168)	1 (0.014)
<i>Spilogale gracilis</i> (Spotted skunk)	0	2 (0.017)	0	1 (0.009)	15 (0.129)	11 (0.096)	4 (0.036)	3 (0.025)	2 (0.017)	0
Human Associated Species										
<i>Canis familiaris</i> (Domestic dog)	5 (0.043)	3 (0.026)	1 (0.008)	4 (0.034)	0	0	3 (0.027)	8 (0.067)	3 (0.025)	4 (0.058)
<i>Didelphis virginiana</i> (Opossum)	0	5 (0.043)	0	1 (0.009)	0	3 (0.026)	1 (0.009)	0	0	1 (0.014)
<i>Homo sapien</i> (Human)	0	1 (0.009)	0	0	0	0	1 (0.009)	0	0	1 (0.014)
Non-Target species										
Mammals										
<i>Sylvilagus</i> species (Rabbit)	0	0	0	4 (0.034)	1 (0.009)	6 (0.052)	0	0	0	0
Squirrel species	0	0	0	0	3 (0.026)	2 (0.017)	1 (0.009)	14 (0.118)	0	0
Rodent species	15 (0.128)	7 (0.060)	12 (0.100)	5 (0.043)	8 (0.069)	7 (0.061)	7 (0.063)	20 (0.168)	6 (0.050)	9 (0.130)
Birds										
Bird species ^b	34 (0.291)	39 (0.333)	27 (0.225)	26 (0.224)	31 (0.267)	54 (0.470)	64 (0.571)	56 (0.471)	31 (0.261)	8 (0.116)
<i>Meleagris gallopavo</i> (Wild turkey)	0	0	0	0	0	0	1 (0.009)	3 (0.025)	2 (0.017)	0
Herpetofauna										
Lizard species	17 (0.145)	10 (0.085)	8 (0.067)	3 (0.026)	20 (0.172)	9 (0.078)	0	12 (0.101)	10 (0.084)	2 (0.029)
Snake species	0	0	0	0	1 (0.009)	2 (0.017)	0	1 (0.008)	0	1 (0.014)

^a = values indicate number of visits by named species followed by associated track index within parentheses; track index calculated as $I = \{v_j / (s_j n_j)\}$, where I = index of species activity at transect j , v_j = number of stations visited by species at transect, s_j = number of stations at transect j , n_j = number of nights that stations were active in transect j ; see Section 3.7.1

^b = bird species encompasses all birds with the exception of wild turkeys, which are listed separately

Table 13. Large mammal species detected at camera stations^a within the Santa Ysabel Ranch Open Space Reserve.

<i>Species Detected</i>	<i>Camera Number</i>								
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>
Target Species									
<i>Puma concolor</i> (Mountain lion)	1 (0.004)	0	0	0	8 (0.035)	0	0	2 (0.011)	2 (0.006)
<i>Odocoileus hemionus</i> (Mule deer)	12 (0.048)	64 (0.296)	5 (0.027)	23 (0.113)	4 (0.017)	4 (0.029)	35 (0.257)	13 (0.068)	11 (0.034)
<i>Canis latrans</i> (Coyote)	2 (0.008)	0	4 (0.022)	0	0	1 (0.007)	0	0	1 (0.003)
<i>Felis rufus</i> (Bobcat)	38 (0.152)	1 (0.005)	64 (0.348)	8 (0.039)	21 (0.091)	10 (0.074)	1 (0.007)	55 (0.289)	16 (0.049)
<i>Urocyon cinereoargenteus</i> (Gray fox)	21 (0.084)	0	5 (0.027)	3 (0.015)	4 (0.017)	0	0	0	2 (0.006)
<i>Procyon lotor</i> (Raccoon)	0	0	0	0	0	0	0	6 (0.032)	0
<i>Mephitis mephitis</i> (Striped skunk)	6 (0.024)	0	6 (0.033)	3 (0.015)	21 (0.091)	3 (0.022)	1 (0.007)	0	0
Human Associated Species									
<i>Bos taurus</i> (Domestic cow)	0	39 (0.181)	2 (0.011)	21 (0.103)	1 (0.004)	0	0	14 (0.074)	15 (0.046)
<i>Didelphis virginiana</i> (Opossum)	0	1 (0.005)	0	1 (0.005)	0	0	0	0	0
<i>Equus caballus</i> (Domestic horse)	0	0	0	0	1 (0.004)	0	0	0	2 (0.006)
<i>Homo sapien</i> (Humans)	0	2 (0.009)	1 (0.005)	0	7 (0.030)	0	0	0	0
Non-Target Species									
Mammals									
<i>Sylvilagus</i> species (Rabbit)	0	0	0	0	0	0	0	1 (0.005)	0
Squirrel species	0	0	0	0	0	0	0	1 (0.005)	0
Rodent species ^b	0	0	0	0	0	0	0	0	1 (0.003)
<i>Dipodomys simulans</i>	0	0	0	2 (0.010)	0	0	0	0	0
<i>Dipodomys</i> species (Kangaroo rat)	0	0	6 (0.033)	0	0	0	0	0	0
Birds									
Bird species ^c	8 (0.032)	3 (0.014)	17 (0.092)	0	20 (0.087)	2 (0.015)	6 (0.044)	14 (0.074)	2 (0.006)
<i>Geococcyx californianus</i> (Greater Roadrunner)	0	0	1 (0.005)	0	0	0	0	0	0
<i>Meleagris gallopavo</i> (Wild turkey)	1 (0.004)	5 (0.023)	2 (0.011)	6 (0.029)	39 (0.170)	0	0	0	2 (0.006)
Quail species ^d	0	7 (0.032)	3 (0.016)	0	0	0	2 (0.015)	0	0

^a = values indicate number of visits by named species followed by associated camera index within parentheses; camera index is calculated as $I = \{v_j/n_j\}$, where I = index of activity at camera j ,

v_j = number of passes by species at camera j , n_j = number of nights that camera j was active; see Section 3.7.2

^b = rodent species encompasses all rodents with the exception of kangaroo rats, which are listed separately.

^c = bird species encompasses all birds with the exception of wild turkeys, roadrunners, and quail species, which are listed separately

^d = Quail species encompasses both California Quail (*Callipepla californica*) and Mountain Quail (*Oreortyx pictus*)

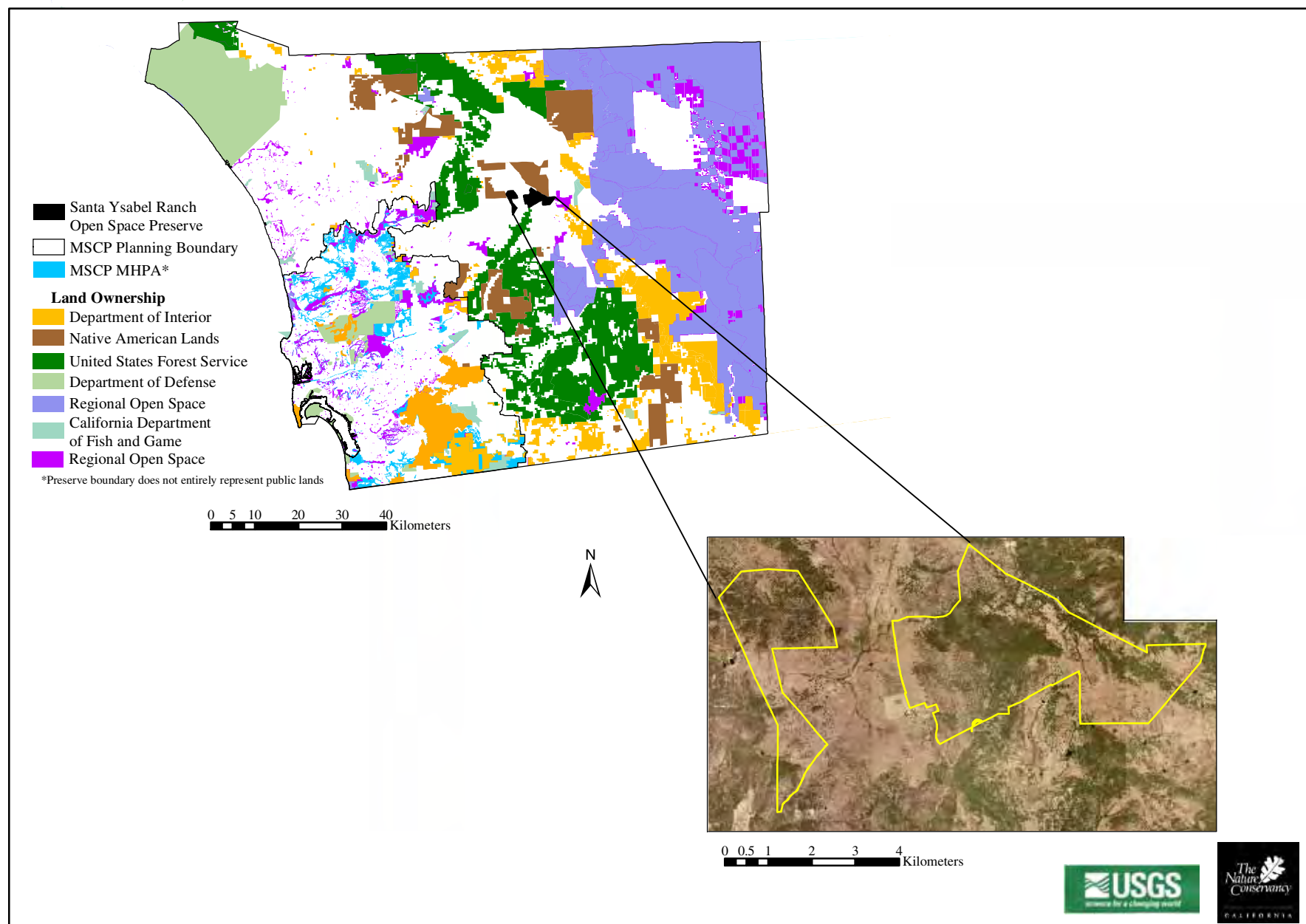


Figure 1. Location of Santa Ysabel Ranch Open Space Preserve.

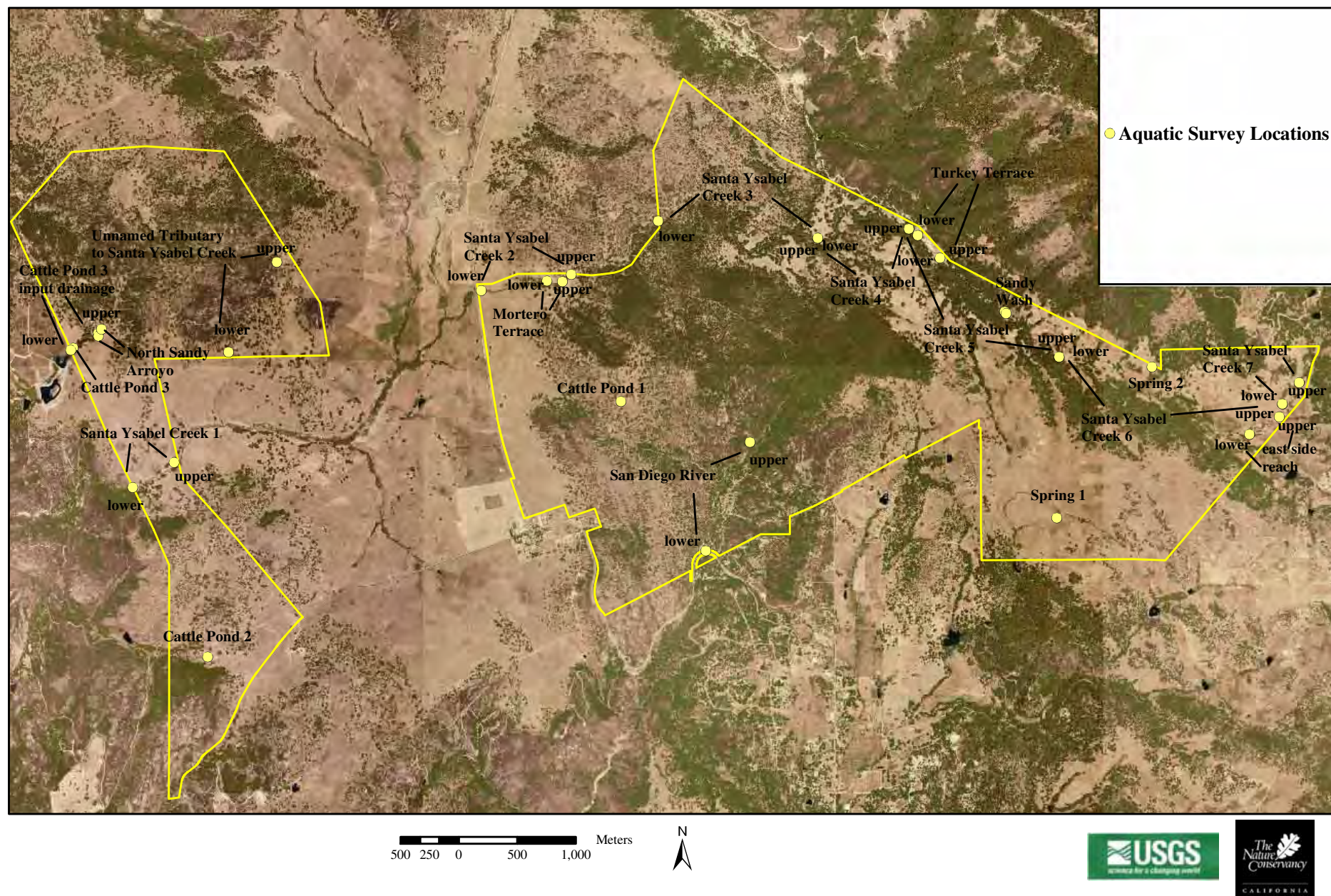


Figure 2. Aquatic survey locations at Santa Ysabel Ranch Open Space Preserve.

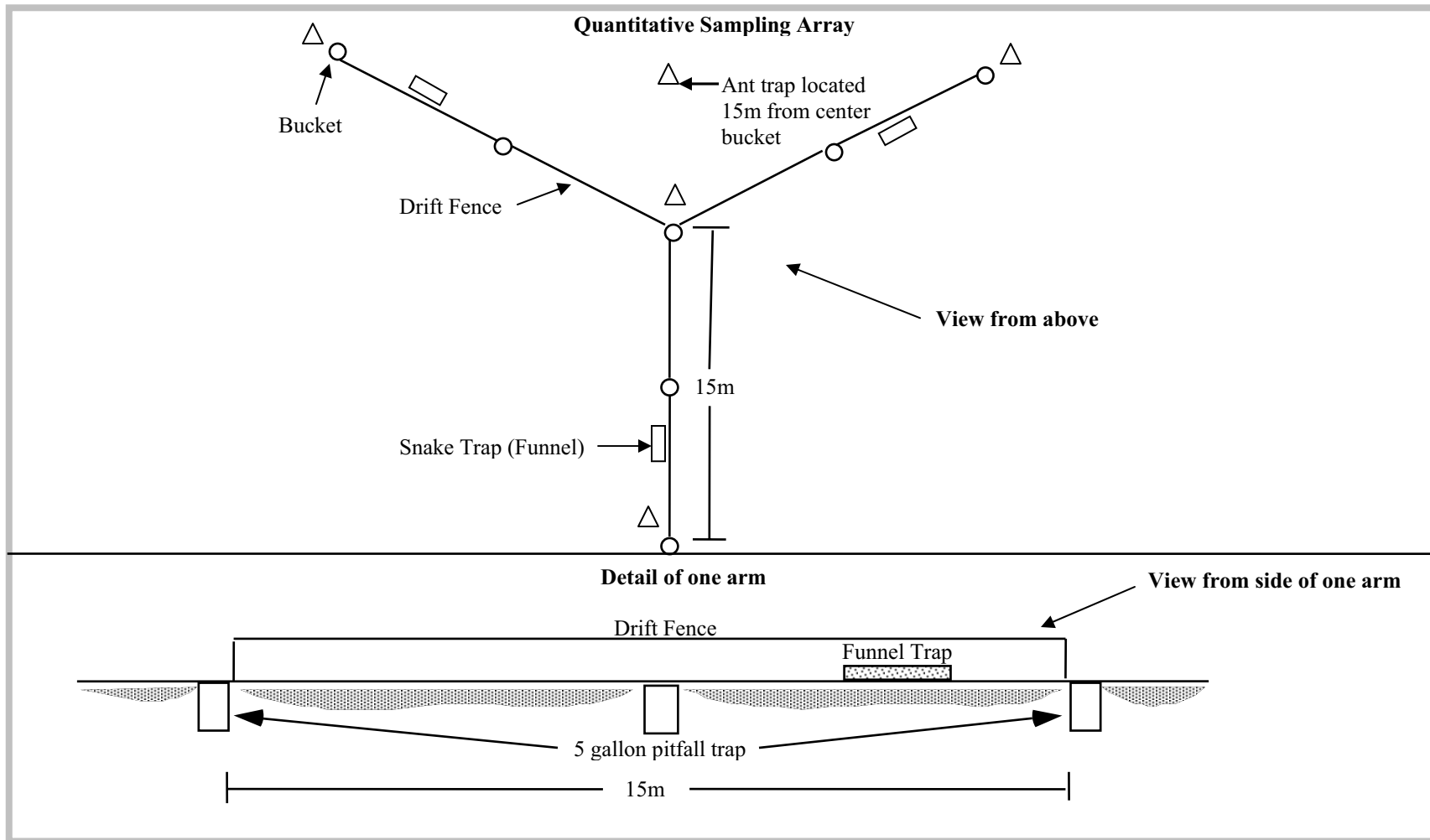


Figure 3. Terrestrial survey protocol and designs for arrangement of pitfall and funnel traps with drift fences for herpetofauna surveys and pitfall traps for ant surveys. Each pitfall bucket is represented by a circle and snake traps are represented by squares. Ant traps are represented by triangles. Figure not drawn to scale.

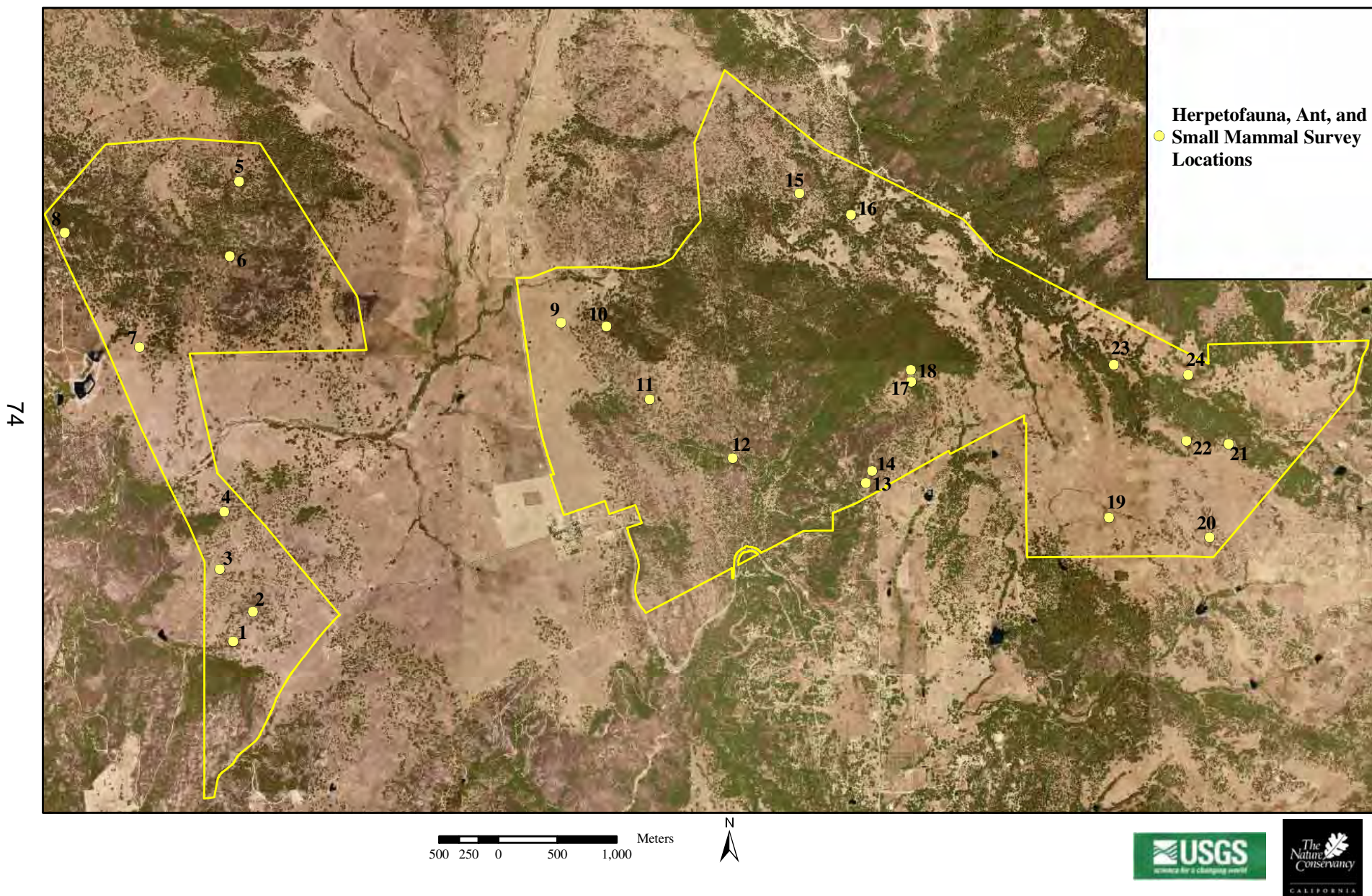


Figure 4. Herpetofauna, ant, and small mammal survey locations at Santa Ysabel Open Space Preserve.

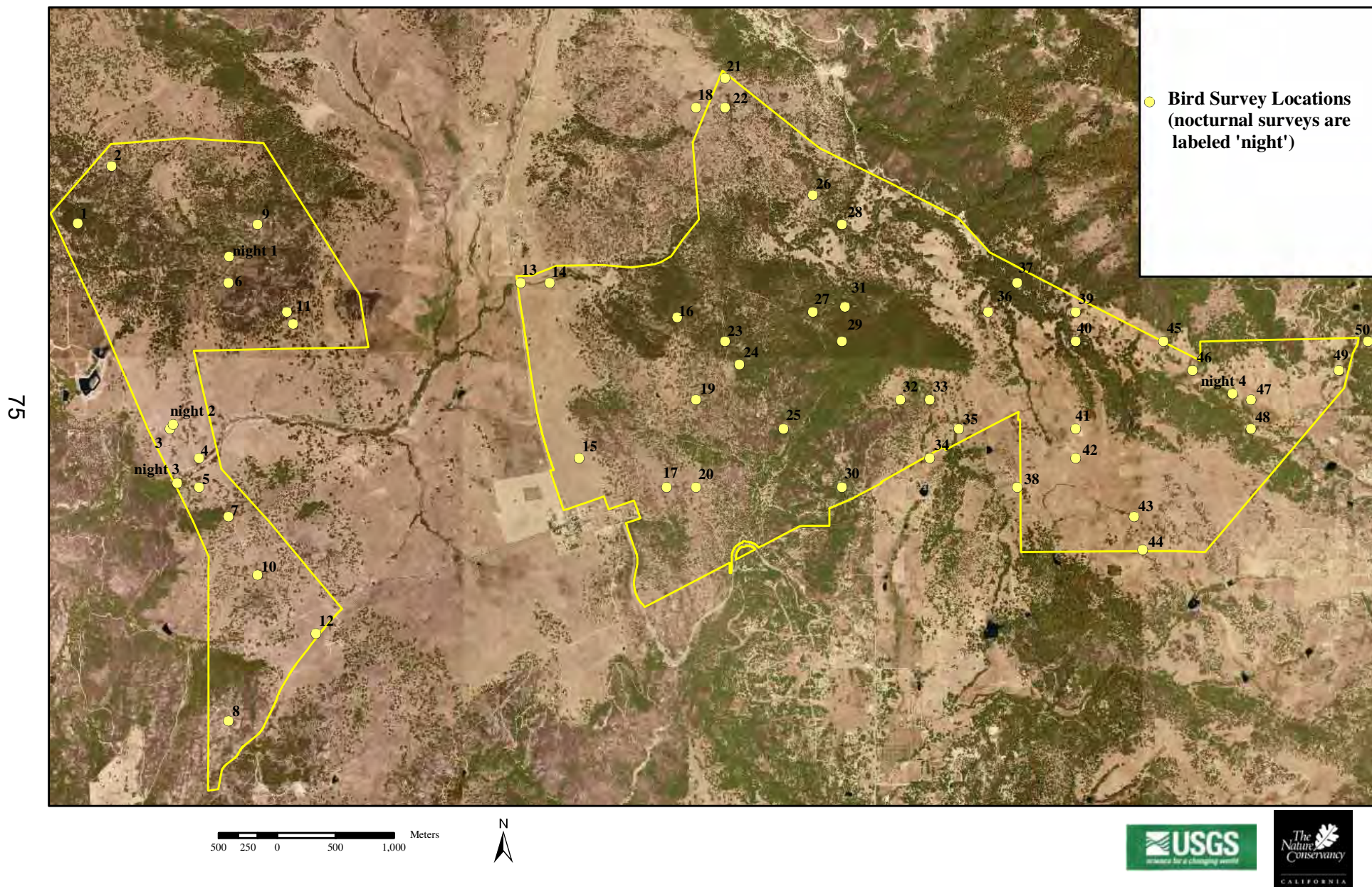


Figure 5. Bird survey locations (diurnal and nocturnal) at Santa Ysabel Ranch Open Space Preserve.

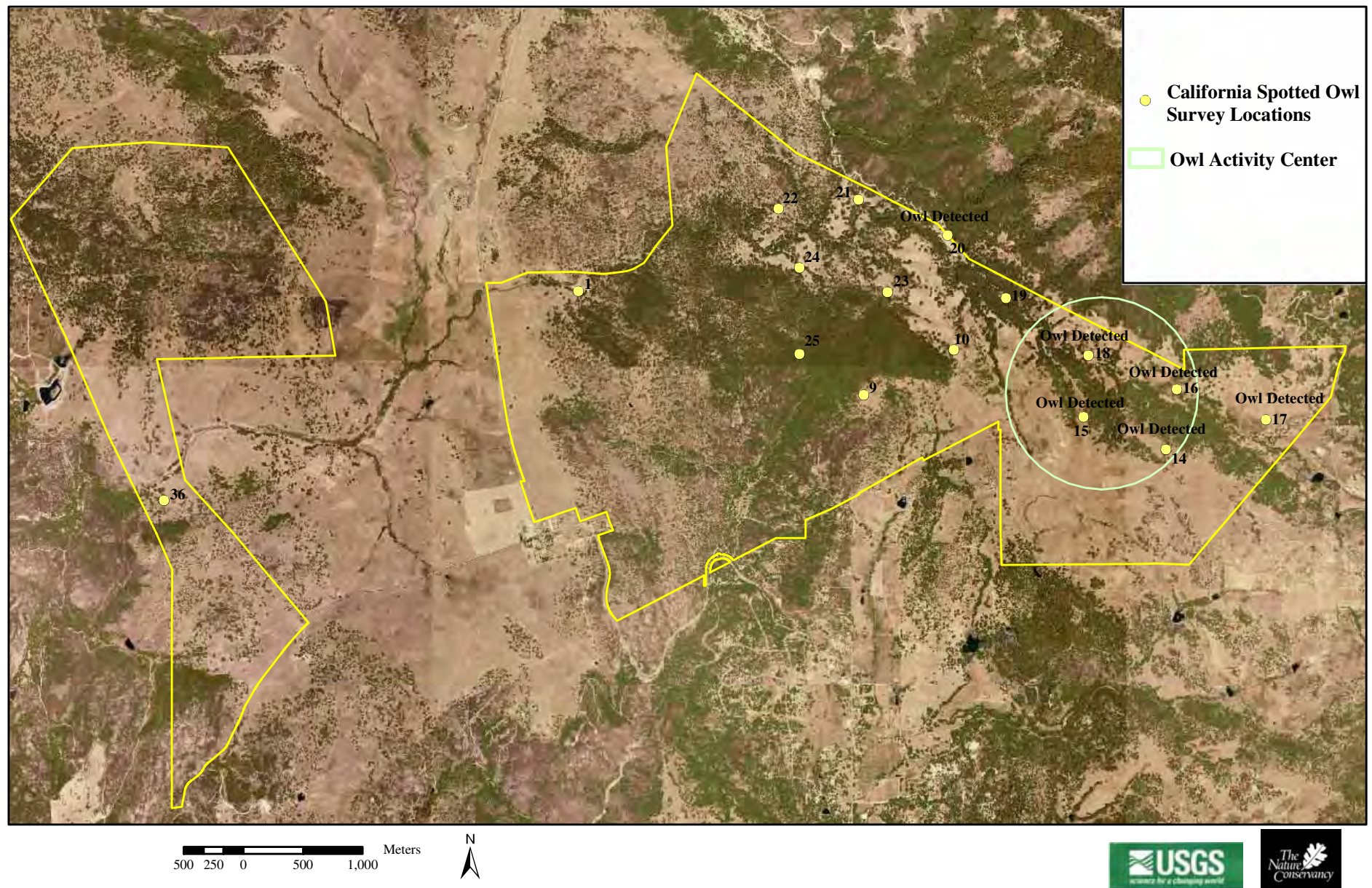


Figure 6. California spotted owl survey locations at Santa Ysabel Ranch Open Space Preserve.

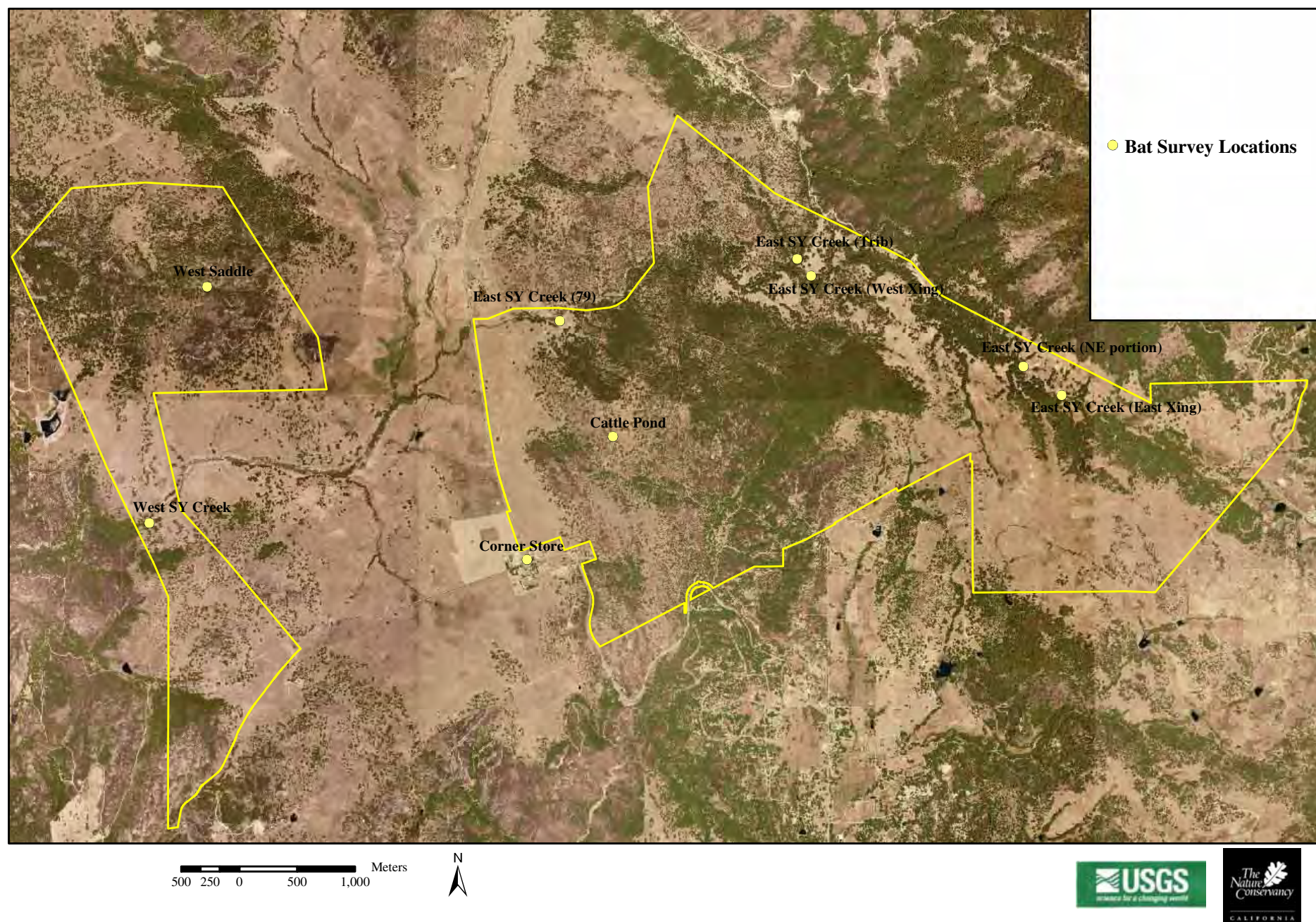


Figure 7. Bat survey locations at Santa Ysabel Ranch Open Space Preserve.

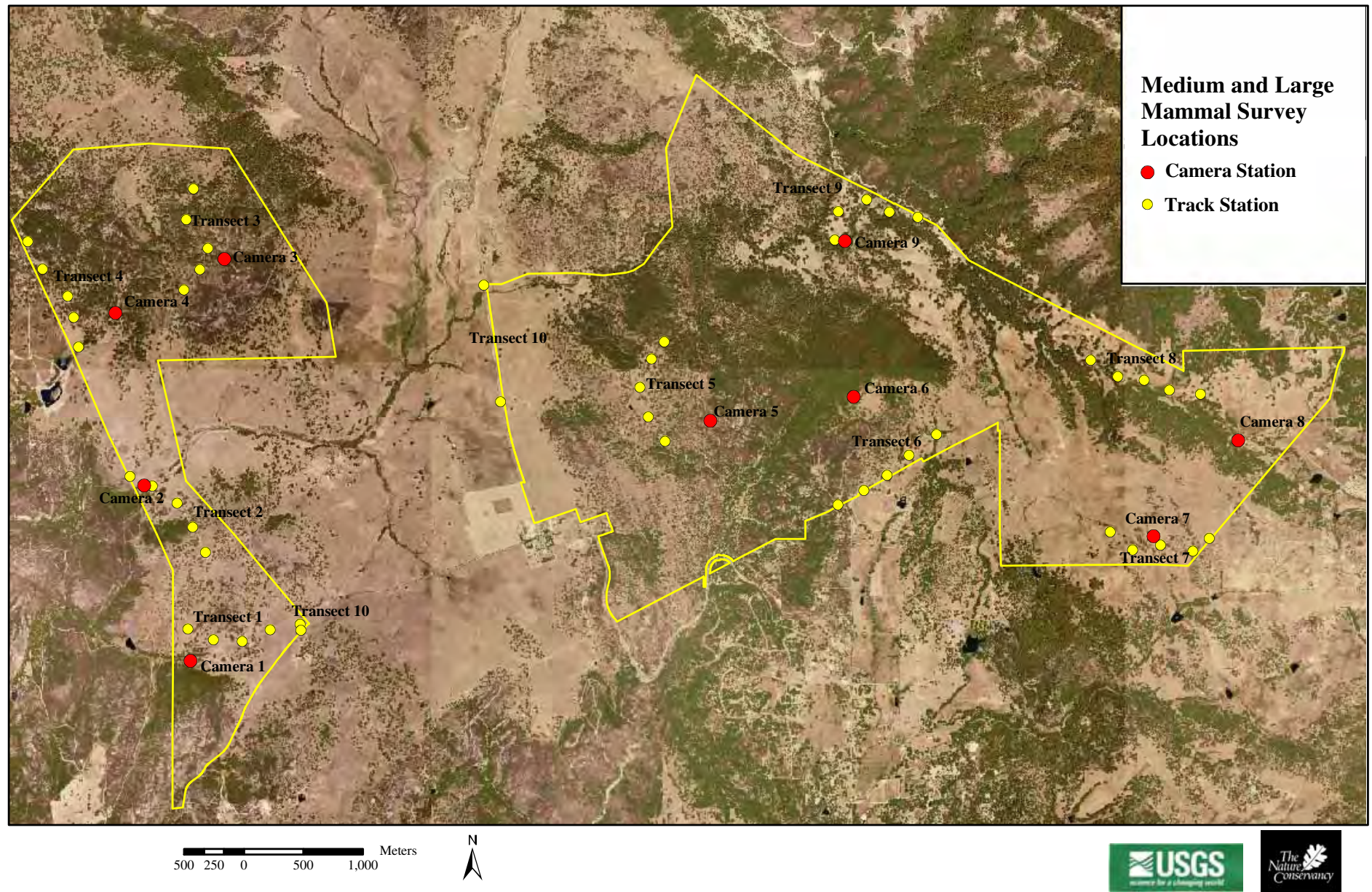


Figure 8. Medium and large mammal survey locations at Santa Ysabel Ranch Open Space Preserve.

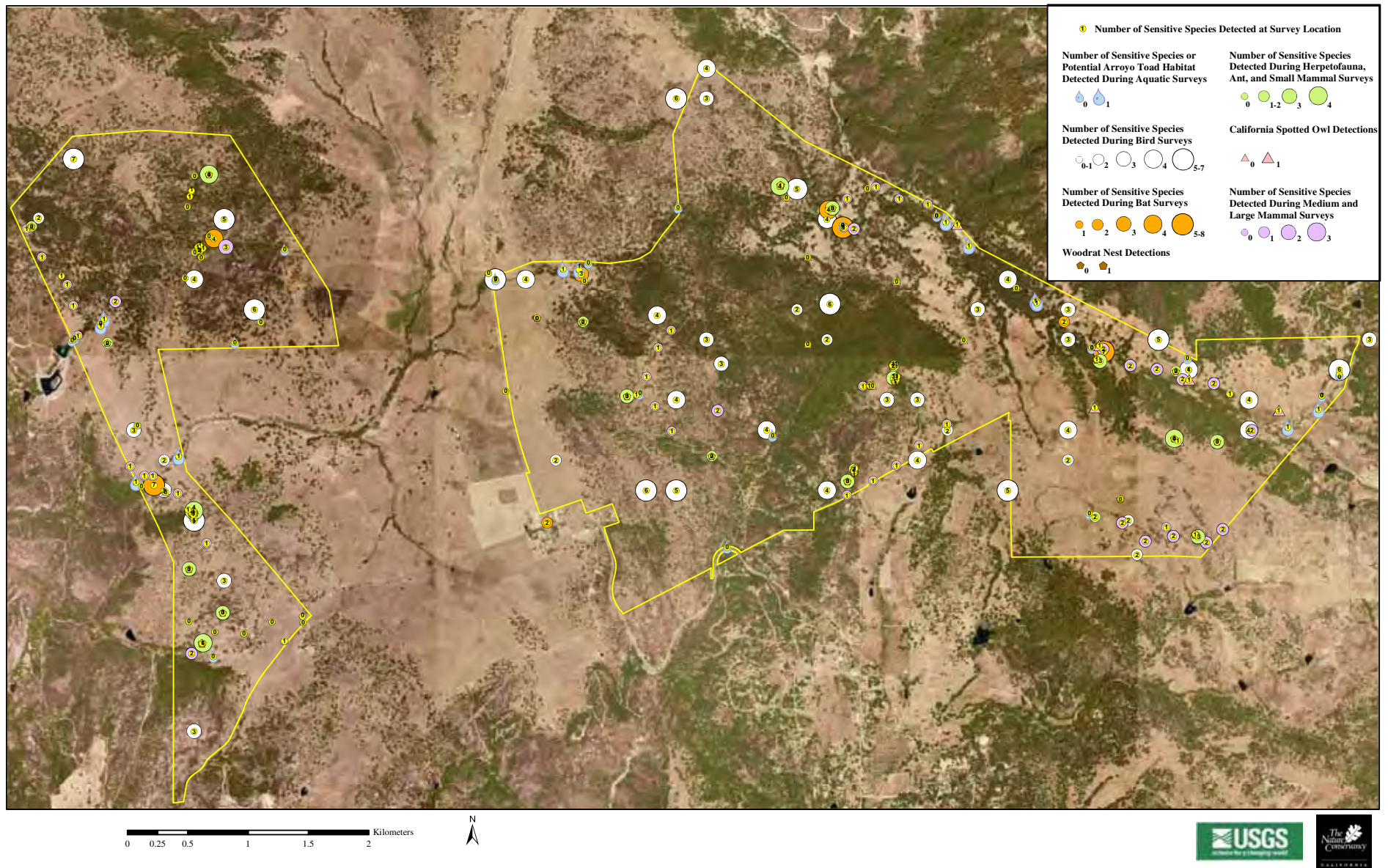


Figure 9. Locations of sensitive resources detected on Santa Ysabel Ranch Open Space Preserve.

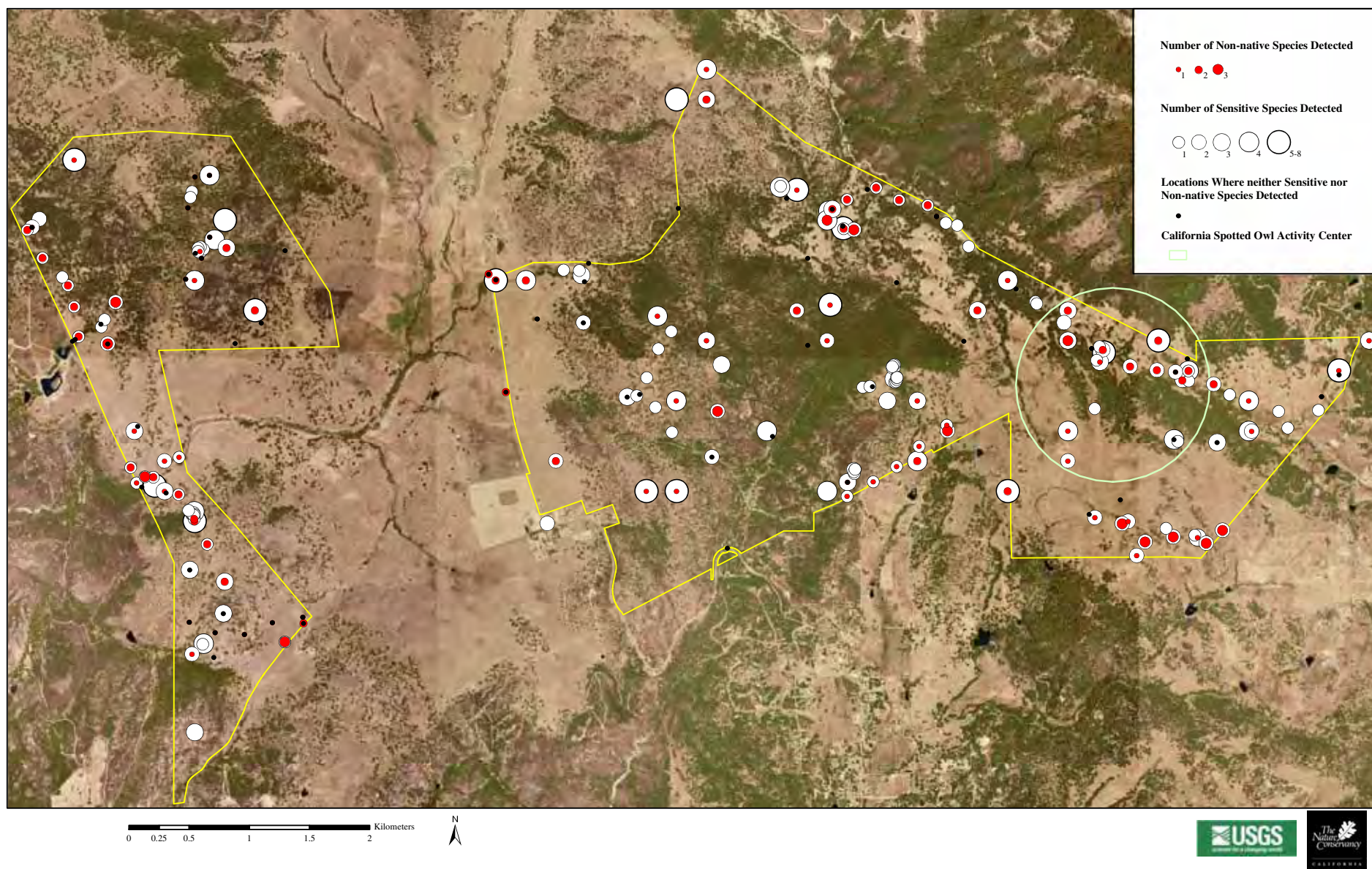


Figure 10. Locations of non-native species detected relative to survey locations on Santa Ysabel Ranch Open Space Preserve.

Appendix 1. Site names and coordinates of aquatic survey sites within the Santa Ysabel Ranch Open Space Preserve.

<i>Survey Site</i>	<i>Lower end</i>		<i>Upper end</i>	
	<i>Degrees N^a</i>	<i>Degrees W</i>	<i>Degrees N</i>	<i>Degrees W</i>
West Property				
Santa Ysabel Creek 1 ^b	33.11271	116.7104	33.11463	116.70661
Cattle Pond 2	33.09963	116.70358		
Cattle Pond 3 (east side)	33.12348	116.71583		
input drainage to Cattle Pond 3	33.12333	116.71607	33.1246	116.71353
North sandy arroyo ^c	33.12440	116.71350	33.12494	116.71321
unnamed tributary to Santa Ysabel Creek	33.12314	116.70159	33.13008	116.69713
East Property				
Santa Ysabel Creek 2	33.12783	116.67838	33.12905	116.67013
Mortero terrace ^c	33.12856	116.67235	33.12851	116.67095
Santa Ysabel Creek 3	33.13315	116.66213	33.13179	116.64749
Santa Ysabel Creek 4	33.13179	116.64749	33.13247	116.63913
Santa Ysabel Creek 5	33.13247	116.63913	33.12255	116.62538
Turkey terrace ^c	33.13198	116.63832	33.13022	116.63629
Sandy wash ^c	33.12607	116.63037	33.12592	116.63025
Santa Ysabel Creek 6	33.12255	116.62538	33.11888	116.60494
East side reach ^c	33.11654	116.60796	33.11786	116.60523
Santa Ysabel Creek 7	33.11888	116.60494	33.12051	116.60337
San Diego River	33.10769	116.65785	33.11605	116.65379
Cattle Pond 1	33.11923	116.66561		
Spring 1	33.11014	116.62565		
Spring 2	33.12176	116.61687		

^a = locations obtained in datum WGS84 (decimal.degrees)

^b = occupied arroyo toad habitat patch

^c = potential arroyo toad habitat patch (sub-reach of a survey site)

Appendix 2. Pitfall array sampling schedule for the Santa Ysabel Ranch Open Space Preserve.

<i>Sample Period #</i>	<i>Opening Day of Sample Period</i>	<i># of Days in Sample Period</i>
1	4/15/2002	4
2	6/3/2002	4
3	7/29/2002	3 ^a
4	9/9/2002	4
5	10/28/2002	4
6	1/28/2003	4
7	1/6/2003	4
8	3/26/2003	4
9	4/29/2003	3 ^b
10	5/19/2003	4
11	6/9/2003	4
12	7/7/2003	4
<i>Total # of Sample Days</i>		46

^a = closed early due to Pines fire

^b = closed early due to expected rains

Appendix 3. Coordinates of herpetofauna, ant, and small mammal survey stations within the Santa Ysabel Ranch Open Space Preserve.

<i>Array Number</i>	<i>Degrees Na</i>	<i>Degrees W</i>	<i>Elevation (m)*</i>
1	33.10065	116.70449	909
2	33.10291	116.70272	934
3	33.10618	116.70570	957
4	33.11055	116.70527	940
5	33.13572	116.70384	1061
6	33.13003	116.70470	1037
7	33.12312	116.71293	897
8	33.13186	116.71965	954
9	33.12490	116.67471	926
10	33.12461	116.67061	1000
11	33.11903	116.66672	1069
12	33.11452	116.65921	1117
13	33.11260	116.64715	1172
14	33.11352	116.64657	1180
15	33.13470	116.65308	1045
16	33.13305	116.64841	1018
17	33.12031	116.64302	1251
18	33.12120	116.64305	1246
19	33.10988	116.62514	1239
20	33.10836	116.61601	1277
21	33.11547	116.61425	1261
22	33.11571	116.61808	1291
23	33.12153	116.62465	1141
24	33.12076	116.61792	1150

^a = locations obtained in datum WGS84 (decimal.degrees)

*derived using Topo! Version 2.5

Appendix 4. Coordinates of avifauna point count stations within the Santa Ysabel Ranch Open Space Preserve.

<i>Point Count Number</i>	<i>Degrees N^a</i>	<i>Degrees W</i>	<i>Point Count Number</i>	<i>Degrees N</i>	<i>Degrees W</i>
1	33.13248	116.71900	26	33.13448	116.65156
2	33.13690	116.71588	27	33.12546	116.65160
3	33.11659	116.71059	28	33.13222	116.64889
4	33.11433	116.70792	29	33.12320	116.64893
5	33.11208	116.70792	30	33.11193	116.64897
6	33.12786	116.70519	31	33.12587	116.64865
7	33.10982	116.70525	32	33.11868	116.64359
8	33.09403	116.70530	33	33.11867	116.64091
9	33.13236	116.70250	34	33.11416	116.64093
10	33.10530	116.70259	35	33.11641	116.63824
11	33.12559	116.69984	36	33.12542	116.63552
12	33.10078	116.69724	37	33.12766	116.63283
13	33.12779	116.67839	38	33.11188	116.63290
14	33.12778	116.67571	39	33.12539	116.62748
15	33.11425	116.67308	40	33.12314	116.62749
16	33.12507	116.66402	41	33.11637	116.62752
17	33.11197	116.66505	42	33.11412	116.62753
18	33.14128	116.66226	43	33.10959	116.62219
19	33.11873	116.66235	44	33.10703	116.62143
20	33.11196	116.66237	45	33.12311	116.61945
21	33.14353	116.65957	46	33.12085	116.61678
22	33.14127	116.65958	47	33.11858	116.61143
23	33.12323	116.65965	48	33.11632	116.61144
24	33.12142	116.65833	49	33.12081	116.60338
25	33.11645	116.65432	50	33.12306	116.60069

^a = locations obtained in datum WGS84 (decimal.degrees)

Appendix 5. Coordinates of California spotted owl calling stations within the Santa Ysabel Ranch Open Space Preserve. Stations surveyed are indicated in bold.

<i>Calling Station Number</i>	<i>Degrees N^a</i>	<i>Degrees W</i>	<i>Priority^b</i>
1	33.12768	116.67049	High
2	33.12120	116.66695	Low
3	33.11546	116.66129	Medium
4	33.12009	116.65956	Medium
5	33.11092	116.65615	Medium
6	33.11426	116.65404	Medium
7	33.11151	116.64718	Medium
8	33.11587	116.63994	Medium
9	33.11976	116.64488	High
10	33.12314	116.63675	High
11	33.11701	116.63139	Low
12	33.11097	116.62661	Low
13	33.10844	116.61819	Medium
14	33.11556	116.61774	High
15	33.11805	116.62513	High
16	33.12009	116.61675	High
17	33.11778	116.60876	High
18	33.12268	116.62469	High
19	33.12704	116.63208	High
20	33.13180	116.63730	High
21	33.13452	116.64528	High
22	33.13387	116.65249	High
23	33.12753	116.64271	High
24	33.12939	116.65062	High
25	33.12287	116.65063	High
26	33.12722	116.65881	Medium
27	33.13850	116.70552	Low
28	33.13087	116.70391	Low
29	33.12454	116.70823	Low
30	33.11738	116.71135	Medium
31	33.12743	116.71644	Low
32	33.13331	116.72152	Low
33	33.13496	116.70846	Low
34	33.10175	116.69963	Low
35	33.10571	116.70676	Low
36	33.11196	116.70779	Medium

^a = locations obtained in datum WGS84 (decimal.degrees)

^b = priority (high, medium, or low) was assigned to each of the calling points based on habitat quality for spotted owls; all the high priority stations were surveyed and one medium priority station was surveyed (calling station 36)

Appendix 6. Coordinates of bat survey stations within the Santa Ysabel Ranch Open Space Preserve.

<i>Site Number</i>	<i>Location</i>	<i>Degrees N^a</i>	<i>Degrees W</i>
1	West Santa Ysabel Creek	33.11248	116.70882
2	West Saddle	33.13090	116.70342
3	Corner Store	33.10957	116.67387
4	Cattle Pond	33.11913	116.66587
5	East Santa Ysabel Creek (CA 79)	33.12815	116.67077
6	East Santa Ysabel Creek (Tributary)	33.13292	116.64877
7	East Santa Ysabel Creek (West Crossing)	33.13159	116.64748
8	East Santa Ysabel Creek (N Portion)	33.12448	116.62783
9	East Santa Ysabel Creek (East Crossing)	33.12223	116.62430

^a = locations obtained in datum WGS84 (decimal.degrees)

Appendix 7. Coordinates of baited scent and camera stations for mammal sampling within the Santa Ysabel Ranch Open Space Preserve.

<i>Survey Location</i>	<i>Degrees N^a</i>	<i>Degrees W</i>	<i>Survey Location</i>	<i>Degrees N</i>	<i>Degrees W</i>
Transect 1			Transect 7		
1-1	33.10263	116.69563	7-1	33.10942	116.62272
1-2	33.10222	116.69834	7-2	33.10804	116.62069
1-3	33.10134	116.70084	7-3	33.10841	116.61818
1-4	33.10148	116.70344	7-4	33.10793	116.61525
1-5	33.10228	116.70574	7-5	33.10890	116.61378
Transect 2			Transect 8		
2-1	33.10810	116.70414	8-1	33.12243	116.62439
2-2	33.11000	116.70528	8-2	33.12119	116.62195
2-3	33.11183	116.70667	8-3	33.12090	116.61959
2-4	33.11313	116.70891	8-4	33.12013	116.61733
2-5	33.11386	116.71092	8-5	33.11983	116.61454
Transect 3			Transect 9		
3-1	33.13561	116.70512	9-1	33.13331	116.63991
3-2	33.13330	116.70577	9-2	33.13371	116.64246
3-3	33.13110	116.70384	9-3	33.13463	116.64452
3-4	33.12951	116.70457	9-4	33.13375	116.64709
3-5	33.12796	116.70599	9-5	33.13158	116.64740
Transect 4			Transect 10 (potential crossing locations)		
4-1	33.12367	116.71553	10-1	33.12826	116.67901
4-2	33.12591	116.71592	10-2	33.11944	116.67752
4-3	33.12750	116.71646	10-3	33.10217	116.69558
4-4	33.12956	116.71871			
4-5	33.13166	116.72006			
Transect 5			Cameras		
5-1	33.12393	116.66278	CAM1	33.09987	116.70552
5-2	33.12263	116.66394	CAM2	33.11316	116.70965
5-3	33.12047	116.66498	CAM3	33.13027	116.70235
5-4	33.11825	116.66423	CAM4	33.12623	116.71221
5-5	33.11638	116.66275	CAM5	33.11793	116.65867
Transect 6			CAM6	33.11971	116.64575
6-1	33.11155	116.64718	CAM7	33.10907	116.61882
6-2	33.11263	116.64486	CAM8	33.11630	116.61117
6-3	33.11376	116.64278	CAM9	33.13150	116.64649
6-4	33.11526	116.64077			
6-5	33.11684	116.63828			

^a = locations obtained in datum WGS84 (decimal.degrees)

Appendix 8. Total sampling effort for baited scent and camera stations within the Santa Ysabel Ranch Open Space Preserve.

<i>Transect Number</i>	<i>Sampling Effort (SE) ^{a,b,c}</i>	<i>Camera Number</i>	<i>Sampling Effort (SE) ^d</i>
1	117	1	250
2	117	2	216
3	120	3	184
4	116	4	204
5	116	5	230
6	115	6	136
7	112	7	136
8	119	8	190
9	119	9	326
10	69		

^a = $SE = (s_j n_j) - o_j$, where, s_j = number of stations in transect j , n_j = number of nights that station was active in transect j , o_j = number of station nights omitted in transect j due to complications; see Section 3.7.1

^b = baited scent stations conducted June 4-8, 2002, Sept 17-21, 2002, Dec 4-7, 2002, Mar 11-15, 2003, and June 10-14, 2003

^c = s_j for transects 1-9 = 5 stations; s_j for transect 10 = 3 stations

^d = camera stations operated April 2002 to June 2003; SE = number of days camera was active

Appendix 9. Representative photos of aquatic survey sites and species detected at Santa Ysabel Ranch Open Space Preserve.



Santa Ysabel Creek 1



Arroyo toad detected at Santa Ysabel Creek 1 site



Fingernail clam detected at Santa Ysabel Creek 1 site

Appendix 9 (continued).

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Input drainage to Cattle Pond 3,north sandy arroyo habitat patch



Santa Yábel Creek 2,Mortero terrace habitat patch



Santa Yábel Creek 5,turkey terrace habitat patch

Appendix 9 (continued).



Santa Isabel Creek 5, sandy wash habitat patch



Santa Isabel Creek 6, east side reach habitat patch

Appendix 10. Rare and sensitive vertebrate species potentially occurring on the Santa Ysabel Ranch Open Space Preserve.

Common Name		Scientific Name
CLASS:AMPHIBA (Amphibians)		
ANURA SALIENTA (Frogs and Toads)		
RANIDAE (True Frogs)		
	California red-legged frog	<i>Rana aurora draytonii</i> ^{ab}
CAUDATA (Salamanders)		
SALAMANDRIDAE (Newts)		
	California newt	<i>Taricha torosa</i> ^b
PLETHODONTIDAE (Lungless Salamanders)		
	Garden slender salamander	<i>Batrachoseps major</i>
CLASS:REPTILIA (Reptiles)		
TESTUDINATA (Turtles)		
EMIDIDAE (Box and Water Turtles)		
	Western pond turtle	<i>Emys (Clemmys) marmorata</i> ^b
SQAMATA (Lizards and Snakes)		
GEKKONIDAE (Geckos)		
	San Diego banded gecko	<i>Coleonyx variegatus</i>
PHRYNOSOMATIDAE (Spiny lizards and relatives)		
	Southern sagebrush lizard	<i>Sceloporus graciosus</i>
XANTHODONTIDAE (Night Lizards)		
	Granite night lizard	<i>Xantusia henshawi</i>
ANNELOPHIDAE (California Legless Lizards)		
	California legless lizard	<i>Anniella pulchra</i> ^b
BOAIIDAE (Boas)		
	Rosy boa	<i>Charina (Lichamura) trivirgata</i> ^{cd}
COLUBRIDAE (Colubrids)		
	Coachwhip	<i>Masticophis flagellum</i>
	Glossy snake	<i>Arizona elegans</i> ^d
	California mountain kingsnake	<i>Lampropeltis zonata</i> ^b
	Long-nosed snake	<i>Rhinocheilus lecontei</i>
	California black-headed snake	<i>Tantilla planiceps</i>
	California lyresnake	<i>Trimorphodon biscutatus</i>
	Red-sided gartersnake	<i>Thamnophis sirtalis</i>
VIPERIDAE (Vipers)		
	Red diamond rattlesnake	<i>Crotalus ruber</i> ^b
CLASS:AVES (Birds)		
ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)		
	Osprey	<i>Pandion haliaetus</i> ^{bd}
	Sharp-shinned hawk	<i>Accipiter striatus</i> ^b
	Swinson's hawk	<i>Buteo swainsoni</i> ^{ce}
FALCONIDAE (Caracaras and Falcons)		
	Merlin	<i>Falco columbarius</i> ^b
	Peregrine falcon	<i>Falco peregrinus</i> ^f
	Prairie falcon	<i>Falco mexicanus</i> ^b

Appendix 10 (continued).

Common Name	Scientific Name
CLASS:AVES (Birds) (Continued)	
STRIGIFORMES (Owls)	
STRIGIDAE (Typical Owls)	
Burrowing owl	<i>Athene cunicularia</i> ^{bc}
PASSERIFORMES (Perching Birds)	
LANIDAE (Shrikes)	
Loggerhead shrike	<i>Lanius ludovicianus</i> ^{bc}
VRONTIDAE (Typical Vireos)	
Gray vireo	<i>Vireo vicinior</i> ^b
CLASS:MAMMALIA (Mammals)	
CHIROPTERA (Bats)	
MYOTIDAE (Evening Bats)	
Fringed myotis	<i>Myotis thysanodes</i> ^c
Long-legged myotis	<i>Myotis volans</i>
Spotted bat	<i>Euderma maculatum</i> ^{bc}
Silver-haired bat	<i>Lasionycteris noctivagans</i>
LAGOMORPHA (Rabbits, Hares, and Pikas)	
LEPIDIDAE (Rabbits and Hares)	
Black-tailed jackrabbit	<i>Lepus californicus</i> ^b
RODENTIA (Squirrels, Rats, Mice, and relatives)	
HEROMYIDAE (Pocket Mice and Kangaroo Rats)	
Dulzara pocket mouse	<i>Chaetodipus californicus</i> ^b
Stephens' kangaroo rat	<i>Dipodomys stephensi</i> ^{ade}
MURIDAE	
Southern grasshopper mouse	<i>Onychomys torridus</i> ^{bc}
CARNIVORA (Carnivores)	
CANIDAE (Foxes, Wolves, and coyotes)	
K fox	<i>Vulpes macrotis</i>
PROCYONIDAE (Raccoons and relatives)	
Ringtail cat	<i>Bassariscus astutus</i> ^d
MUSTELIDAE (Weasels and relatives)	
American badger	<i>Taxidea taxus</i> ^d

^a = federally threatened species

^b = CDFG species of special concern

^c = federal species of special concern

^d = species for which additional surveys are recommended

^e = CDFG threatened species

^f = CDFG endangered species

Appendix 11. Representative photos of species from herpetofauna pitfall trap arrays.



Coast Horned Lizard (*Phrynosoma coronatum*)



Western Skink (*Eumeces skiltonianus*)



Southern Alligator Lizard (*Elgaria multicarinatus*)



Large-blotched Esatina (*Ensatina klauberi*)



Ring-necked Snake (*Diadophis punctatus*)



Granite Spiny Lizard (*Sceloporus orcutti*)

Appendix 11 (continued).



Common Kingsnake (*Lampropeltis getulus*) (striped)



Gilbert's Skink (*Eumeces gilberti*)



Common Kingsnake (*Lampropeltis getulus*) (banded)



Racer (*Coluber constrictor*) (juvenile)



Racer (*Coluber constrictor*) (adult)



Two-Striped Gartersnake (*Thamnophis hammondi*)

Appendix 11 (continued).



Merriam's Chipmunk (*Tamias merriami*)

Appendix 12. Vegetation transect summary data for pitfall arrays within the Santa Ysabel Ranch Open Space Preserve.

		Array Number																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Canopy Height (cm)	Average	520.4	57.5	213.8	224.8	273.8	409.6	9.6	120.9	8.5	300.8	290.6	85.4	179.2	41.5	81.9	469.8	82.0	209.8	15.4	476.1	23.7	643.2	1221.5	30.6
	Median	650.0	62.0	139.5	125.0	30.5	600.0	7.5	102.5	5.5	52.5	59.5	94.0	92.0	25.5	36.5	31.0	12.0	192.0	13.0	44.0	20.5	500.0	1800.0	31.0
	Minimum	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0
	Maximum	800.0	240.0	680.0	700.0	1000.0	800.0	39.0	391.0	43.0	900.0	800.0	222.0	800.0	155.0	550.0	1600.0	400.0	500.0	52.0	2000.0	91.0	2300.0	1800.0	114.0
	StDev	229.0	49.2	225.0	239.8	392.0	382.7	10.3	115.2	11.1	353.7	327.0	60.1	237.6	46.5	141.8	612.3	126.8	173.4	10.5	680.1	17.8	639.7	705.8	15.4
Leaf Litter Depth (cm)	Average	6.7	0.9	2.6	2.7	2.2	4.6	1.5	2.1	1.0	1.7	3.2	0.8	1.7	0.8	2.6	2.7	1.5	3.1	2.6	1.6	2.8	3.6	5.6	6.3
	Median	7.0	0.5	2.0	2.0	2.0	4.0	1.0	1.0	0.5	2.0	3.0	0.5	0.5	0.0	2.0	2.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	6.0
	Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Maximum	18.0	6.0	6.0	14.0	9.0	17.0	11.0	14.0	5.0	6.0	15.0	5.0	14.0	8.0	25.0	12.0	11.0	30.0	8.0	11.0	9.0	18.0	24.0	14.0
	StDev	3.4	1.1	1.5	2.5	1.8	3.7	1.7	2.6	0.9	1.3	2.7	0.9	2.6	1.6	3.4	2.4	1.7	3.8	1.8	2.0	2.0	3.6	5.4	3.6
Substrate Type (# points along transect)	Sandy Soil		18					2	8				33	3	6	1		8	1		2				
	Leaf Litter	96	72	99	92	95	93	97	91	94	89	94	60	67	36	73	89	87	85	99	82	98	93	92	98
	Organic Soil	4	1	1		5	3	1	1	4	5	4	2	19	12	2	9	5	14	1	16	2	7	7	2
	Cryptogamic		3		2		2				3	1	3	7	8	12	1								
	Bare Rock		3		6					2	3	1	2	4	16	11	1							1	
	Moss		3				2									1									
	Cobblestone													22											
Number of Points Along Transect (n)		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Vegetation Layer Structure	% Trees	38.2%		21.5%	23.1%	28.2%	35.4%		13.4%		30.9%	22.1%		12.1%		7.3%	47.6%	8.5%	24.4%		22.5%		47.4%	62.7%	
	% Shrubs	10.8%	52.2%	12.9%	36.6%	9.4%	4.9%		63.4%		9.6%	13.3%	80.4%	60.0%	53.5%	30.9%	2.9%	15.5%	30.5%	0.7%	11.9%	5.8%	6.8%	8.2%	1.8%
	% Herbs	50.9%	47.8%	65.6%	40.3%	62.4%	59.7%	100.0%	23.2%	100.0%	59.6%	64.6%	19.6%	27.9%	46.5%	61.8%	49.5%	76.1%	45.1%	99.3%	65.6%	94.2%	45.9%	29.1%	98.2%
	Total Hits	212	113	163	134	117	144	66	112	76	136	181	102	140	71	123	105	142	164	153	151	137	133	134	166
Proportion of Habitat Type ^a	Chaparral	0.5%	51.3%		4.5%		0.7%		60.7%		12.5%		81.4%	63.3%	74.6%	4.9%									35.4%
	Coastal Sage Scrub		15.0%		10.4%		0.7%		15.2%	6.6%		26.0%	3.9%	7.2%		38.2%		2.1%	2.4%						
	Non-Native Grassland	51.4%	18.6%	49.7%	11.9%	57.3%	59.0%	97.0%	5.4%	73.7%	42.6%	46.4%	1.0%	5.0%	1.4%	39.8%	48.6%	52.8%	34.8%	42.5%	66.2%	92.6%	28.0%	17.2%	62.1%
	Native Grassland	2.4%	8.8%	18.4%	4.5%			1.5%	3.6%	3.9%	5.1%		2.0%	9.4%	16.9%			10.6%					1.5%		
	Riparian																			39.9%				2.2%	11.8%
	Oak Woodland	43.9%		31.9%	54.5%	33.3%	35.4%		8.9%		25.7%	23.8%		12.2%		7.3%	50.5%	23.9%	19.5%				1.5%	62.7%	
	Pine Woodland																				22.5%		47.0%		
	Un-Classified	1.9%	6.2%		14.2%	9.4%	4.2%	1.5%	6.3%	15.8%	14.0%	3.9%	11.8%	2.9%	7.0%	9.8%	1.0%	10.6%	7.9%	15.0%	11.3%	7.4%	22.0%	17.9%	26.1%
	Total %	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

^a = habitat types with the relative percentage for select dominant species at each pitfall array; see text for the dominant species used for each habitat type

Appendix 13. The habitat type at each pitfall array and the top three plant species recorded along vegetation transects within the Santa Ysabel Ranch Open Space Preserve. The number of arrays represented by each habitat class is found in parenthesis.

Array Number	Habitat Type ^a						Dominant Plant Species ^b		
	OAK (8)	RIP (2)	PIN (2)	NNG (4)	CHAP (6)	CSS (2)	1	2	3
1	X						QUAG	BRSP	AVSP
2					X		ADFA	BRSP	SAAP
3	X						BRSP	QUEN	NAPU
4	X						QUCH	QUEN	BRSP
5	X						BRSP	QUAG	DW
6	X						BRSP	QUAG	QUEN
7				X			BRSP	ERSP	NAPU
8					X		ADFA	ARGL	QUCH
9				X			BRSP	ERSP	ERFA
10	X						BRSP	QUEN	ARGL
11						X	BRSP	QUEN	ERFA
12					X		ADFA	ARGL	RHIL
13					X		ADFA	QUEN	LOIN
14					X		ADFA	NAPU	ARGL
15						X	SAAP	BRSP	AVSP
16	X						BRSP	QUAG	QUKE
17				X			BRSP	ERSP	NAPU
18					X		BRSP	ARGL	QUCH
19		X					BRSP	CSP	AMPS
20			X				BRSP	AVSP	PICO
21				X			BRSP	ERSP	AMPS
22			X				PICO	BRSP	DW
23	X						QUAG	BRSP	GASP
24		X					BRSP	AMPS	CSP

^a = habitat types include: oak woodland (OAK), riparian (RIP), pine woodland (PIN), non-native grassland (NNG), chaparral (CHAP), and coastal sage scrub (CSS)

^b = plant species codes can be found in Appendix 14

Appendix 14. Plant species codes used in the description of plant communities associated with pitfall arrays and bird point count stations within the Santa Ysabel Ranch Open Space Preserve.

Code	Species	Common Name	Family
ADFA	<i>Adenostoma fasciculatum</i>	Cin	Ro
AIAL	<i>Ailanthus altissima</i>	Til	San ^a
ALRH	<i>Alnus rhombifolia</i>	Al	Ba
AMPS	<i>Ambrosia psilostachya</i>	Rg	As
ANCA	<i>Anemopsis californica</i>	Yan	Sc
ARGL	<i>Arctostaphylos glauca</i>	Ma	Ec
AVSP	<i>Avena</i> p	Al	Pe
BASA	<i>Baccharis salicifolia</i>	Ma	As
BRSP	<i>Bromus</i> p	Ban	Pe
CELE	<i>Ceanothus leucodermis</i>	Ch	Ran
CSP	<i>Carex</i> p	Sc	Cp
DW	NA	Du	NA
ERFA	<i>Eriogonum fasciculatum</i>	Ch	Ph
ERSP	<i>Erodium</i> p	Uil	Ga
ERW	<i>Eriogonum wrightii</i>	Fil	Ph
GASP	<i>Galium</i> p	Uil	Ra
GUCA	<i>Gutierrezia californica</i>	Cin	As
JUSP	<i>Juncus</i> p	Rp	Ja
LEFI	<i>Lessingia filaginifolia</i>	Ch	As
LOIN	<i>Lonicera interrupta</i>	Ch	Cp
NAPU	<i>Nassella pulchra</i>	Ph	Pe
PICO	<i>Pinus coulteri</i>	Cp	Pa
PLRA	<i>Platanus racemosa</i>	San	Ph
POSP	<i>Poa</i> p	Bp	Pe
PRIL	<i>Prunus ilicifolia</i>	Hil	Ro
QUAG	<i>Quercus agrifolia</i>	Ch	Fg
QUCH	<i>Quercus chrysolepis</i>	Ch	Fg
QUEN	<i>Quercus engelmannii</i>	En	Fg
QUKE	<i>Quercus kelloggii</i>	Ch	Fg
RHIL	<i>Rhamnus ilicifolia</i>	Hil	Ran
SAAP	<i>Salvia apiana</i>	Al	Lan
SASP	<i>Salix</i> p	Uil	Sc
SYMO	<i>Symphoricarpos mollis</i>	Cp	Cp
TODI	<i>Toxicodendron diversilobum</i>	Ph	Ad

^a = non-native species

Appendix 15. Photos of herpetofauna pitfall trap arrays within Santa Ysabel Ranch Open Space Preserve.



A1



A2



A3



A4



A5

Appendix 15 (continued).



A6



A9



A7



A11



A8



A12

Appendix 15 (continued).



A13



A14



A15



A16



A17



A18

Appendix 15 (continued).



A19



A22



A20



A23



A21



A24

Appendix 16. Representative photos of ant species detected within Santa Ysabel Ranch Open Space Reserve.



S_{Min}
(*Dorymyrmex bicolor*)



S_{Min}
(*Formica francoueri*)



S_{Min}
(*Camponotus dumetorum*)



S_{Min}
(*Camponotus semitestaceus*)



S_{Min}
(*Crematogaster californica*)



S_{Min}
(*Crematogaster mutans*)

Appendix 16 (continued).



Min
(*Messor andrei*)



Min
(*Pheidole vistana*)



Min
(*Pheidole hyatti*)

Appendix 17. The qualitative percentage of each habitat type and the top three plant species present within a 100 meter radius of each bird point count station within the Santa Ysabel Ranch Open Space Preserve.

Number	CHAP	PIN	Habitat Type ^a					Dominant Plant Species ^b		
			G	HUM	OAK	RIP	CSS	1	2	3
1	100							ADFA	ARGL	QUCH
2	90				10			ADFA	QUAG	QUEN
3			95		5			AVSP	NAPU	QUEN
4					15	15	70	ERFA	QUAG	ANCA
5			50		50			BRSP	QUEN	QUAG
6	30				30		40	SAAP	ADFA	QUAG
7	10				75		15	QUEN	QUCH	SAAP
8	25				50		25	QUEN	PRIL	SAAP
9	50				50			ADFA	CELE	QUEN
10	10		30		60			QUEN	QUCH	BRSP
11	35				65			QUAG	QUEN	ADFA
12			99		1			AVSP	BRSP	QUAG
13			60			40		AVSP	SASP	BASA
14			50		25	25		AVSP	QUAG	SASP
15			98		2			BRSP	AVSP	QUEN
16	40				60			QUKE	QUAG	RHIL
17							100	SAAP	ERFA	QUEN
18							100	SAAP	TODI	QUAG
19					100			QUEN	AVSP	BRSP
20					25		75	SAAP	GUCA	QUAG
21			65		5		30	AVSP	QUKE	SAAP
22					60		40	QUAG	QUEN	SAAP
23					100			QUAG	QUKE	BRSP
24	100							ARGL	QUCH	RHIL
25	50				50			RHIL	QUEN	QUCH
26					100			QUEN	QUAG	SAAP
27					100			QUKE	QUCH	QUAG
28					75	25		QUKE	QUAG	PLRA
29					100			QUKE	QUAG	QUCH
30	50				50			ARGL	QUCH	QUAG
31					100			QUAG	QUCH	TODI
32			70		30			BRSP	LEFI	QUEN
33					100			QUEN	QUAG	QUKE
34			50		50			QUAG	QUEN	AVSP
35			25		75			QUAG	SYMO	BRSP
36			80		20			BRSP	AMPS	QUKE
37					50	50		QUAG	ALRH	TODI
38			70	10	20			AVSP	BRSP	QUKE
39			50		50			QUAG	BRSP	PLRA
40					75	25		QUAG	SYMO	PLRA
41			100					AVSP	BRSP	ERSP
42			100					AVSP	BRSP	ERSP
43		25	50			25		AVSP	QUAG	JUSP
44		100						PICO	QUKE	BRSP
45			45		55			QUAG	QUEN	AVSP
46			50		50			SASP	JUSP	QUAG

Appendix 17 (continued).

<i>Number</i>	<i>Habitat Type</i> ^a							<i>Dominant Plant Species</i> ^b		
	<i>CHAP</i>	<i>PIN</i>	<i>G</i>	<i>HUM</i>	<i>OAK</i>	<i>RIP</i>	<i>CSS</i>	<i>1</i>	<i>2</i>	<i>3</i>
47			75			25		POSP	BRSP	QUAG
48		50				50		QUAG	AIAL	QUKE
49						100		QUAG	PLRA	SASP
50					40		60	ERFA	SAAP	QUAG
<i>% Total</i> ^c	11.8	3.5	26.2	0.2	39.6	7.6	11.1			

^a = habitat types include: chaparral (CHAP), pine woodland (PIN), grassland (G), human-modified (HUM), oak woodland (OAK), riparian (RIP), and coastal sage scrub (CSS)

^b = plant species codes can be found in Appendix 14

^c = percentage calculated by taking sum of each column and dividing by 5000% (50 points x 100% area sampled per point)

Appendix 18. California spotted owl detected within the Santa Ysabel Ranch Open Space Preserve during day follow-up survey.



Appendix 19. Representative photos of bat species captured within the Santa Ysabel Ranch Open Space Preserve.



Hoary bat (*Lasiurus cinereus*)



Western red bat (*Lasiurus blossevillii*)

Appendix 20. Representative photos of mammal and bird species taken at camera stations within the Santa Ysabel Ranch Open Space Preserve.



Camera 1: Bobcat
(*Felis rufus*)



Camera 1: Coyote
(*Canis latrans*)



Camera 2: Mule deer
(*Odocoileus hemionus*)



Camera 2: Opossum
(*Didelphis virginiana*)



Camera 3: Striped skunk
(*Mephitis mephitis*)



Camera 3: Roadrunner
(*Geococcyx californianus*)



Camera 4: Dulzura kangaroo rat
(*Dipodomys simulans*)



Camera 4: Gray fox
(*Urocyon cinereoargenteus*)

Appendix 20 (continued)



Camera 5: Mountain lion
(*Puma concolor*)



Camera 5: Striped skunk
(*Mephitis mephitis*)



Camera 5: Mountain lion
(*Puma concolor*)



Camera 5: Wild turkeys
(*Meleagris gallopavo*)



Camera 7: Mule deer
(*Odocoileus hemionus*)



Camera 8: Bobcat (*Felis rufus*)
(*Felis rufus*)



Camera 8: Raccoon
(*Procyon lotor*)



Camera 8: Western scrub-jay with acorn
(*Aphelocoma californica*)

**Appendix 21. Santa Ysabel Ranch Open Space Preserve vertebrate species list for the 2002/2003
USGS - BRD wildlife surveys.**

<i>Common Name</i>	<i>Scientific Name</i>	<i>Detection Method^a</i>
CLASS: OSTEICHTHYES (Bony Fish)		
SALMONIFORMES		
SALMONIDAE (Trout and Salmon)		
Rainbow trout	<i>Oncorhynchus mykiss</i> ^b	IN
ATHERINIFORMES		
POECILIDAE (Livebearers)		
Mosquitofish	<i>Gambusia affinis</i> ^b	AS
CLASS: AMPHIBIA (Amphibians)		
CAUDATA (Salamanders)		
PLETHODONTIDAE (Lungless Salamanders)		
Large-blotched ensatina	<i>Ensatina klauberi</i> ^{cd}	PF
ANURA SALIENTIA (Frogs and Toads)		
PELOBATIDAE (Spadefoot Toads)		
Western spadefoot	<i>Spea hammondi</i> ^{cd}	PF
BUFONIDAE (True Toads)		
Western toad	<i>Bufo boreas</i>	AS, PF
Arroyo toad	<i>Bufo californicus</i> ^{ce}	IN
HYLIDAE (Treefrogs and relatives)		
Pacific treefrog	<i>Hyla regilla</i>	AS, PF
California treefrog	<i>Hyla cadaverina</i>	AS
Bullfrog	<i>Rana catesbeiana</i> ^b	PF
CLASS: REPTILIA (Reptiles)		
SQUAMATA (Lizards and Snakes)		
PHRYNOSOMATIDAE (Spiny Lizards and relatives)		
Granite spiny lizard	<i>Sceloporus orcutti</i>	PF
Western fence lizard	<i>Sceloporus occidentalis</i>	PF
Side-blotched lizard	<i>Uta stansburiana</i>	PF
Coast horned lizard	<i>Phrynosoma coronatum</i> ^c	PF
SCINCIDAE (Skinks)		
Western skink	<i>Eumeces skiltonianus</i> ^c	PF
Gilbert's skink	<i>Eumeces gilberti</i>	PF
TEIIDAE (Whiptails and relatives)		
Western whiptail	<i>Aspidoscelis (Cnemidophorus) tigris</i> ^f	PF
ANGUIDAE (Alligator Lizards and relatives)		
Southern alligator lizard	<i>Elgaria multicarinata</i>	PF
LEPTOTYPHLOPIDAE (Slender Blind Snakes)		
Western blind snake	<i>Leptotyphlops humilis</i>	PF
COLUBRIDAE (Colubrids)		
Ring-necked snake	<i>Diadophis punctatus</i> ^f	PF
Racer	<i>Coluber constrictor</i>	PF
Striped racer (California whipsnake)	<i>Masticophis lateralis</i>	PF
Western patch-nosed snake	<i>Salvadora hexalepis</i> ^c	PF
Gopher snake	<i>Pituophis melanoleucus</i>	PF
Common kingsnake	<i>Lampropeltis getula</i>	PF

Appendix 21 (continued)

Common Name		Scientific Name	Detection Method ^a
CLASS: REPTILIA (Reptiles) (continued)			
SQUAMATA (Lizards and Snakes) (continued)			
COLUBRIDAE (Colubrids) (continued)			
Two-striped gartersnake		<i>Thamnophis hammondi</i> ^c	PF
Night snake		<i>Hypsiglena torquata</i>	PF
VIPERIDAE (Vipers)			
Speckled rattlesnake		<i>Crotalus mitchellii</i>	PF
Western rattlesnake		<i>Crotalus viridis</i>	PF
CLASS: AVES (Birds)			
CICONIIFORMES (Hérons, Storks, Ibises, and relatives)			
ARDEIDAE (Hérons and Bitterns)			
Cattle egret		<i>Bubulcus ibis</i>	IN
CATHARTIDAE (New World Vultures)			
Turkey vulture		<i>Cathartes aura</i>	BP
ANSERIFORMES (Screamers, Ducks, and relatives)			
ANATIDAE (Swans, Geese, and Ducks)			
Mallard		<i>Anas platyrhynchos</i>	BP
FALCONIFORMES (Vultures, Hawks, and Falcons)			
ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)			
White-tailed kite		<i>Elanus leucurus</i> ^{dg}	BP
Northern harrier		<i>Circus cyaneus</i> ^{eg}	IN
Cooper's hawk		<i>Accipiter cooperii</i> ^{eg}	BP
Red-shouldered hawk		<i>Buteo lineatus</i> ^f	BP
Red-tailed hawk		<i>Buteo jamaicensis</i>	BP
Ferruginous hawk		<i>Buteo regalis</i> ^{cd}	IN
Golden eagle		<i>Aquila chrysaetos</i> ^{cgh}	BP
FALCONIDAE (Caracaras and Falcons)			
American kestrel		<i>Falco sparverius</i>	BP
GALLIFORMES (Megapodes, Curassows, Pheasants, and relatives)			
PHASIANIDAE (Quails, Pheasants, and relatives)			
Wild turkey		<i>Meleagris gallopavo</i> ^b	BP, CS, IN, SS
ODONTOPHORIDAE (New World Quail)			
Mountain quail		<i>Oreortyx pictus</i>	BP
California quail		<i>Callipepla californica</i>	BP, CS
CHARADRIIFORMES (Shorebirds, Gulls, and relatives)			
CHARADRIIDAE (Plovers and relatives)			
Killdeer		<i>Charadrius vociferus</i>	BP
LARIDAE (Jaegers, Gulls, and Terns)			
Caspian tern		<i>Sterna caspia</i>	BP
COLUMBIFORMES (Pigeons and Doves)			
COLUMBIDAE (Pigeons and Doves)			
Rock dove		<i>Columba livia</i> ^b	BP
Band-tailed pigeon		<i>Columba fasciata</i>	BP
Mourning dove		<i>Zenaida macroura</i>	BP
CUCULIFORMES (Cuckoos and relatives)			
CUCULIDAE (Typical Cuckoos)			
Greater roadrunner		<i>Geococcyx californianus</i> ^e	CS, IN

Appendix 21 (continued)

		<i>Detection Method^a</i>
<i>Common Name</i>	<i>Scientific Name</i>	
CLASS: AVES (Birds) (continued)		
STRIGIFORMES (Owls)		
TYTONIDAE (Barn Owls)		
Barn owl	<i>Tyto alba</i>	BP, NT
STRIGIDAE (Typical Owls)		
Great horned owl	<i>Bubo virginianus</i>	NT
Spotted owl	<i>Strix occidentalis^{cd}</i>	NT
Western screech owl	<i>Otus kennicottii</i>	NT
Long-eared owl	<i>Asio otus^c</i>	BP
Short-eared owl	<i>Asio flammeus^c</i>	NT
CAPRIMULGIFORMES (Goatsuckers and relatives)		
CAPRIMULGIDAE (Goatsuckers)		
Lesser nighthawk	<i>Chordeiles acutipennis</i>	NT
APODIFORMES (Swifts and Hummingbirds)		
APODIDAE (Swifts)		
White-throated swift	<i>Aeronautes saxatalis</i>	IN
TROCHILIDAE (Hummingbirds)		
Black-chinned hummingbird	<i>Archilochus alexandri</i>	BP
Anna's hummingbird	<i>Calypte anna</i>	BP
Costa's hummingbird	<i>Calypte costae^d</i>	BP
Allen's hummingbird	<i>Selasphorus sasin^d</i>	BP
PICIFORMES (Woodpeckers and relatives)		
PICIDAE (Woodpeckers and Wrynecks)		
Lewis's woodpecker	<i>Melanerpes lewis^d</i>	IN
Acorn woodpecker	<i>Melanerpes formicivorus</i>	BP
Nuttall's woodpecker	<i>Picoides nuttallii</i>	BP
Hairy Woodpecker	<i>Picoides villosus</i>	BP
Northern flicker	<i>Colaptes auratus</i>	BP
PASSERIFORMES (Perching Birds)		
TYRANNIDAE (Tyrant Flycatchers)		
Olive-sided flycatcher	<i>Contopus cooperi^d</i>	BP
Western wood-pewee	<i>Contopus sordidulus</i>	BP
Pacific-slope flycatcher	<i>Empidonax difficilis^d</i>	BP
Black phoebe	<i>Sayornis nigricans</i>	BP
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	BP
Western kingbird	<i>Tyrannus verticalis</i>	BP
VIREONIDAE (Typical Vireos)		
Cassin's vireo	<i>Vireo cassinii</i>	IN
Hutton's vireo	<i>Vireo huttoni</i>	BP
Warbling vireo	<i>Vireo gilvus</i>	BP
CORVIDAE (Jays, Magpies, and Crows)		
Steller's jay	<i>Cyanocitta stelleri</i>	BP
Western scrub-jay	<i>Aphelocoma californica</i>	BP
American crow	<i>Corvus brachyrhynchos</i>	BP
Common raven	<i>Corvus corax</i>	BP
ALAUDIDAE (Larks)		
Horned lark	<i>Eremophila alpestris^c</i>	BP

Appendix 21 (continued)

Common Name	Scientific Name	Detection Method ^a
CLASS: AVES (Birds) (continued)		
PASSERIFORMES (Perching Birds) (continued)		
HIRUNDINIDAE (Swallows) (continued)		
Purple martin	<i>Progne subis</i> ^{cg}	BP
Violet-green swallow	<i>Tachycineta thalassina</i>	BP
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	BP
Cliff swallow	<i>Petrochelidon pyrrhonota</i>	BP
PARIDAE (Titmice and relatives)		
Mountain chickadee	<i>Poecile gambeli</i>	BP
Oak titmouse	<i>Baeolophus inornatus</i>	BP
AEGITHALIDAE (Bushtit)		
Bushtit	<i>Psaltirparus minimus</i>	BP
SITTIDAE (Nuthatches)		
White-breasted nuthatch	<i>Sitta carolinensis</i>	BP
Pygmy nuthatch	<i>Sitta pygmaea</i>	IN
TROGLODYTIDAE (Wrens)		
Bewick's wren	<i>Thryomanes bewickii</i>	BP
House wren	<i>Troglodytes aedon</i>	BP
REGULIDAE (Kinglets)		
Ruby-crowned kinglet	<i>Regulus calendula</i>	BP
SYLVIIDAE		
Blue-gray gnatcatcher	<i>Poliopitila caerulea</i>	BP
TURDIDAE		
Western bluebird	<i>Sialia mexicana</i>	BP
Swainson's thrush	<i>Catharus ustulatus</i>	BP
American robin	<i>Turdus migratorius</i>	BP
Varied thrush	<i>Ixoreus naevius</i>	BP
TIMALIIDAE (Babblers)		
Wrentit	<i>Chamaea fasciata</i>	BP
MIMIDAE (Mockingbirds and Thrashers)		
Northern mockingbird	<i>Mimus polyglottos</i>	BP
California thrasher	<i>Toxostoma redivivum</i> ^d	BP
STURNIDAE (Starlings & Allies)		
European starling	<i>Sturnus vulgaris</i> ^b	BP
PTILOGONATIDAE (Silky Flycatchers)		
Phainopepla	<i>Phainopepla nitens</i>	BP
PARULIDAE (Wood Warblers and relatives)		
Orange-crowned warbler	<i>Vermivora celata</i>	BP
Yellow warbler	<i>Dendroica petechia</i> ^{cg}	BP
Yellow-rumped warbler	<i>Dendroica coronata</i>	BP
Black-throated gray warbler	<i>Dendroica nigrescens</i>	BP
Townsend's warbler	<i>Dendroica townsendi</i>	BP
Hermit warbler	<i>Dendroica occidentalis</i>	IN
Palm warbler	<i>Dendroica palmarum</i>	IN
MacGillivray's warbler	<i>Oporornis tolmiei</i>	IN
Common yellowthroat	<i>Geothlypis trichas</i>	BP
Wilson's warbler	<i>Wilsonia pusilla</i>	BP
Yellow-breasted chat	<i>Icteria virens</i> ^{cg}	BP

Appendix 21 (continued)

		<i>Detection Method^a</i>
<i>Common Name</i>	<i>Scientific Name</i>	
CLASS: AVES (Birds) (continued)		
PASSERIFORMES (Perching Birds) (continued)		
THRAUPIDAE (Tanagers)		
Western tanager	<i>Piranga ludoviciana</i>	BP
EMBERIZIDAE (Emberizines)		
Spotted towhee	<i>Pipilo maculatus</i>	BP
California towhee	<i>Pipilo crissalis</i>	BP
Rufous-crowned sparrow	<i>Aimophila ruficeps^c</i>	BP
Chipping sparrow	<i>Spizella passerina</i>	BP
Black-chinned sparrow	<i>Spizella atrogularis^f</i>	BP
Lark sparrow	<i>Chondestes grammacus^{dg}</i>	BP
Black-throated sparrow	<i>Amphispiza bilineata</i>	BP
Sage sparrow	<i>Amphispiza belli^{cd}</i>	BP
Grasshopper sparrow	<i>Ammodramus savannarum^f</i>	BP
Song sparrow	<i>Melospiza melodia</i>	BP
Dark-eyed junco	<i>Junco hyemalis</i>	BP
CARDINALIDAE (Cardinals, Grosbeaks & Allies)		
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	BP
Blue grosbeak	<i>Guiraca caerulea</i>	BP
Lazuli bunting	<i>Passerina amoena</i>	BP
ICTERIDAE (Blackbirds, Orioles & Allies)		
Red-winged blackbird	<i>Agelaius phoeniceus</i>	BP
Tricolored blackbird	<i>Agelaius tricolor^{cdg}</i>	BP
Western meadowlark	<i>Sturnella neglecta</i>	BP
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	BP
Brown-headed cowbird	<i>Molothrus ater</i>	BP
Bullock's oriole	<i>Icterus bullockii</i>	BP
FRINGILLIDAE (Finches)		
House finch	<i>Carpodacus mexicanus</i>	BP
Lesser goldfinch	<i>Carduelis psaltria</i>	BP
Lawrence's goldfinch	<i>Carduelis lawrencei^{dg}</i>	BP
CLASS: MAMMALIA (Mammals)		
DIDELPHIMORPHIA (Marsupials)		
DIDELPHIDAE (Opossums)		
Virginia opossum	<i>Didelphis virginiana^b</i>	CS, SS
INSECTIVORA (Insectivores)		
SORICIDAE (Shrews)		
Ornate shrew	<i>Sorex ornatus</i>	PF
Desert shrew	<i>Notiosorex crawfordi</i>	PF
CHIROPTERA (Bats)		
VESPERTILIONIDAE (Evening Bats)		
Yuma myotis	<i>Myotis yumanensis^d</i>	BS
California myotis	<i>Myotis californicus</i>	BS
Long-eared myotis	<i>Myotis evotis^d</i>	BS
Western Small-footed myotis	<i>Myotis ciliolabrum^d</i>	BS
Western pipistrelle	<i>Pipistrellus hesperus</i>	BS
Big brown bat	<i>Eptesicus fuscus</i>	BS
Hoary bat	<i>Lasiurus cinereus</i>	BS

Appendix 21 (continued)

Common Name		Scientific Name	Detection Method ^a
CLASS: MAMMALIA (Mammals) (continued)			
CHIROPTERA (Bats) (continued)			
VESPERTILIONIDAE (Evening Bats) (continued)			
Townsend's big-eared bat		<i>Corynorhinus townsendii</i> ^{cd}	BS
Pallid bat		<i>Antrozous pallidus</i> ^c	BS
Southwestern yellow bat		<i>Lasiurus xanthinus</i> ^f	BS
Western red bat		<i>Lasiurus blossevillei</i> ^f	BS
MOLOSSIDAE (Free-tailed Bats)			
Mexican free-tailed bat		<i>Tadarida brasiliensis</i>	BS
Pocketed free-tailed bat		<i>Nyctinomops femorosacca</i> ^c	BS
Big free-tailed bat		<i>Nyctinomops macrotis</i> ^c	BS
Western mastiff bat		<i>Eumops perotis</i> ^{cd}	BS
LAGOMORPHA (Rabbits, Hares, and Pikas)			
LEPORIDAE (Rabbits and Hares)			
Desert cottontail		<i>Sylvilagus audubonii</i>	PF
Rabbit species		<i>Sylvilagus</i> spp.	CS, SS
RODENTIA (Squirrels, Rats, Mice, and relatives)			
SCIURIDAE (Squirrels, Chipmunks, and Marmots)			
California ground squirrel		<i>Spermophilus beecheyi</i>	CS, SS
Merriam's chipmunk		<i>Tamias merriami</i>	PF
GEOMYIDAE (Pocket Gophers)			
Botta's pocket gopher		<i>Thomomys bottae</i>	PF
HETEROMYIDAE (Pocket Mice and Kangaroo Rats)			
San Diego pocket mouse		<i>Chaetodipus fallax</i> ^c	PF
Dulzura kangaroo rat		<i>Dipodomys simulans</i> ^f	CS
MURIDAE			
Western harvest mouse		<i>Reithrodontomys megalotis</i>	PF
Cactus mouse		<i>Peromyscus eremicus</i>	PF
California mouse		<i>Peromyscus californicus</i>	PF
Deer mouse		<i>Peromyscus maniculatus</i>	PF
Desert woodrat		<i>Neotoma lepida</i> ^c	PF
California vole		<i>Microtus californicus</i>	PF
CANIDAE (Foxes, Wolves, and relatives)			
Domestic dog		<i>Canis familiaris</i> ^b	SS
Coyote		<i>Canis latrans</i>	CS, IN, SS
Gray fox		<i>Urocyon cinereoargenteus</i>	CS, IN, SS
PROCYONIDAE (Raccoons and relatives)			
Raccoon		<i>Procyon lotor</i>	CS, IN
MUSTELIDAE (Weasels and relatives)			
Long-tailed weasel		<i>Mustela frenata</i> ^f	IN
MEPHITIDAE (Skunks)			
Western spotted skunk		<i>Spilogale gracilis</i> ^f	SS
Striped skunk		<i>Mephitis mephitis</i>	CS, IN, SS
FELIDAE (Cats)			
Mountain lion		<i>Puma concolor</i> ^f	CS
Bobcat		<i>Felis rufus</i>	CS, IN, SS

Appendix 21 (continued)

<i>Common Name</i>	<i>Scientific Name</i>	<i>Detection Method^a</i>
CLASS: MAMMALIA (Mammals) (continued)		
PERISSODACTYLA (Odd-toed Ungulates)		
EQUIDAE (Horses, Burros, and relatives)		
Domestic horse	<i>Equus caballus</i> ^b	CS
ARTIODACTYLA (Even-toed Ungulates)		
CERVIDAE (Deer, Elk, and relatives)		
Mule deer	<i>Odocoileus hemionus</i> ^f	CS, IN, SS
BOVIDAE (Cattle, Sheep, and relatives)		
Domestic cow	<i>Bos taurus</i> ^b	CS, IN

^a = detection methods include: aquatic survey (AS), bird point count survey (BP), bat survey (BS), camera survey (CS), incidental observation (IO), night time bird survey (NT), pitfall survey (PF), and scent station survey (SS)

^b = non-native species

^c = CDFG species of special concern

^d = federal species of concern

^e = federally endangered species

^f = species identified by expert knowledge within the San Diego Field Station as being a sensitive resource

^g = listing applicable to nesting birds

^h = listing applicable to wintering birds

Appendix 22. Sensitive and non-native species detected on Santa Ysabel Ranch Open Space Preserve.

<i>Sensitive Species</i>	<i>Listing Category</i>	<i>Non-Native Species</i>
Arroyo toad	FE, CSC	Rainbow trout
Large-blotched ensatina	FSC, CSC	Mosquito fish
Western spadefoot	FSC, CSC	Bullfrog
Western skink	CSC	Wild turkey
Western whiptail	Expert Knowledge	Rock dove
Coast horned lizard	CSC	European starling
Ring-necked snake	Expert Knowledge	Virginia opossum
Western patch-nosed snake	CSC	Domestic dog
Two-striped gartersnake	CSC	Domestic horse
White-tailed kite	FSC	Domestic cow
Northern harrier	CSC	
Cooper's hawk	CSC	
Red-shouldered hawk	Expert Knowledge	
Ferruginous hawk	FSC, CSC	
Golden eagle	CSC	
Greater roadrunner	Expert Knowledge	
Spotted owl	FSC, CSC	
Long-eared owl	CSC	
Short-eared owl	CSC	
Costa's hummingbird	FSC	
Allen's hummingbird	FSC	
Lewis's woodpecker	FSC	
Olive-sided flycatcher	FSC	
Pacific-Slope flycatcher	FSC	
Horned lark	CSC	
Purple martin	CSC	
California thrasher	FSC	
Yellow warbler	CSC	
Yellow-breasted chat	CSC	
Rufous-crowned sparrow	CSC	
Black-chinned sparrow	Expert Knowledge	
Sage sparrow	FSC, CSC	
Lark sparrow	FSC	
Grasshopper sparrow	Expert Knowledge	
Tricolored blackbird	FSC, CSC	
Lawrence's goldfinch	FSC	
Pallid bat	CSC	
Townsend's big-eared bat	FSC, CSC	
Western mastiff bat	FSC, CSC	
Western red bat	Expert Knowledge	
Western yellow bat	Expert Knowledge	
Western small-footed bat	Expert Knowledge	
Long-eared myotis	FSC	
Western small-footed bat	FSC	
Yuma myotis	FSC	
Pocketed free-tailed bat	CSC	
Big free-tailed bat	CSC	
Desert wood rat	CSC	

Appendix 22 (continued).

<i>Sensitive Species</i>	<i>Listing Category^a</i>	<i>Non-Native Species</i>
Wood rat nest	CSC	
Dulzura kangaroo rat	Expert Knowledge	
San Diego pocket mouse	CSC	
Long-tailed weasel	Expert Knowledge	
Western spotted skunk	Expert Knowledge	
Mountain lion	Expert Knowledge	
Mule deer	Expert Knowledge	

^a = listing categories include federally endangered species (FE), federal species of concern (FSC), CA DFG species of special concern (CSC), and sensitive species determined by specific knowledge of USGS San Diego Field Station

Appendix E

**Stephens' Kangaroo Rat Survey
and
Management Recommendations
for the
Santa Ysabel Open Space Reserve
San Diego County, California**

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Conservation Biology Institute (CBI) is a 501(c)3 tax-exempt research and planning institution. We work collaboratively to help conserve biological diversity through research, education, planning, and community service.



Introduction

The endangered Stephens' kangaroo rat (SKR; *Dipodomys stephensi*) is restricted largely to the San Jacinto Valley and vicinity in western Riverside County, but San Diego County supports a few scattered populations. The sparse grasslands this species requires are already rare in San Diego County, and remaining grasslands are increasingly threatened by development. Most potential habitat on private lands in San Diego County has never been surveyed for SKR, so additional populations may exist. Even currently unoccupied habitat may be essential to maintaining and recovering populations of this rare species by providing dispersal corridors and areas for population expansion.

Grasslands in and near the Santa Ysabel Valley, in central San Diego County, appear to have strong potential to support SKR, and may play an important role in long-term species viability by maintaining habitat connectivity between known SKR populations. The Nature Conservancy (TNC) recently purchased for open space preservation two properties that include grassland habitat along the edges of the Santa Ysabel Valley. These properties, formerly comprising the Edwards Ranch, are to be managed by the County of San Diego as the Santa Ysabel Open Space Reserve (SYOSR). During October 2001, Wayne Spencer (CBI) and Stephen J. Montgomery (SJM Biological Consultants) performed a reconnaissance survey for the presence of kangaroo rats on the two SYOSR properties (East and West). Our intent was to record signs of kangaroo rats, which would then trigger a trapping survey to capture individuals and identify them to species—endangered SKR versus other kangaroo rat species (*D. simulans* or *D. agilis*). This report summarizes the biology of SKR, its known and potential distribution in San Diego County, and the results of the October 2001 reconnaissance survey. It also makes recommendations for future surveys and management actions on the SYOSR.

Stephens' Kangaroo Rat Biology

The Stephens' kangaroo rat is a rare heteromyid rodent of open grasslands or very sparse scrublands. Found primarily in the inland valleys of western Riverside County, SKR are known to occupy a few scattered grassland areas in northern San Diego County, particularly on and near Marine Corps Base Camp Pendleton, Fallbrook Naval Weapons Station, and near Lake Henshaw, Rancho Guejito, and Ramona. They may occupy other areas of the county that have not been sufficiently surveyed, such as the Santa Ysabel Valley. This section describes some pertinent aspects of the species' biology in San Diego County. Appendix A details additional information.



General Biology—Kangaroo rats are saltatorial (jumping), nocturnal, burrow-dwelling rodents. The SKR is generally larger than other kangaroo rat species it co-occurs with. Although all kangaroo rat species look superficially similar, the SKR can be distinguished from other local species by generally larger body size, broader face, less distinctly striped tail, and other subtle differences in coloration and the shape and size of ears, feet, bacula, and other features. SKR habitat consists of sparse or disturbed grasslands with a high proportion of forbs (herbaceous annual plants), and few if any shrubs, particularly on well-drained and friable (easy to dig) soils. They primarily eat seeds, along with some green vegetation and occasional insects. They are highly evolved to survive arid conditions and can persist indefinitely without drinking free water. True to their name, kangaroo rats have large hind limbs for jumping, small fore limbs, and long, tufted tails for balance. Their large eyes are adapted for night vision, and their greatly enlarged tympanic bullae (ear capsules) provide keen hearing (especially for low frequency sounds) and may aid in balance when animals are rapidly zig-zag hopping to avoid predators. Kangaroo rats, like other heteromyid rodents, also have external fur-lined cheek pouches to transport seeds.

Conservation Status—California listed the SKR as Rare in 1971 and Threatened in 1984. The U.S. Fish and Wildlife Service listed it as Endangered in 1988 and prepared a Draft Recovery Plan in 1997. A Final Recovery Plan is currently being drafted based on comments received and new information on species distribution and genetics. An SKR technical team is currently discussing the potential role that the recently discovered Ramona population, and other potentially occupied areas in the county, may play in species recovery. These areas were not considered in the Draft Recovery Plan, because they were outside the species' known range at the time.

The IUCN Red List classifies SKR as Lower Risk, Conservation Dependent (O'Farrell 1998). This assignment presumes that the species is at relatively low risk of extinction in the near future so long as the Riverside County SKR Habitat Conservation Plan provides sufficient preserve sites and will be fully implemented. However, adequate management and monitoring programs have not yet been systematically designed or implemented over the species' range, making attainment of these goals uncertain; and many remaining populations are outside of habitat reserves and subject to extirpation. The Draft Multiple Species Habitat Conservation Plan for Western Riverside County proposes additional conservation of the SKR in at least two areas that were not included in the SKR Habitat Conservation Plan (P. Behrends, personal communication). Whether these areas will actually be conserved and managed to benefit the species is uncertain.

No Habitat Conservation Plans yet cover the SKR in San Diego County. Populations on Marine Corps Base Camp Pendleton and Fallbrook Naval Weapons Station are affected by military training activities and receive little protection or active habitat management. The Lake Henshaw/Warner Springs population is primarily on land managed by the Vista Irrigation District, and although recent observations indicate the population is still large and well distributed, no detailed population studies have been performed since the 1980s. The Rancho Guejito population is on private ranch land, and its current population status is unknown. The Ramona population, discovered in October 1997, is partially protected at the



Ramona Airport under an Integrated Habitat Management Plan (Federal Aviation Administration, 2000), but largely unprotected on surrounding private lands.

Threats—The SKR is threatened by habitat removal and fragmentation throughout its range. In addition, many human land uses and actions kill individual kangaroo rats or destroy or degrade their habitat. These threats include discing for weed abatement, pasture improvement, or dry farming; irrigation or spraying of sewage effluent on pastures; application of rodenticides and perhaps other pesticides; predation by domestic pets; overgrazing by livestock; and soil compaction by off-road vehicles, horses, and other livestock.

Human development and agricultural expansion have removed an estimated 60% (based on 1984 data for Riverside County only; Price and Endo 1989) to 85% (2001 estimate by P. Behrends, personal communication) of suitable habitat in the species' range. Many historical locations no longer support the species, and much of the remaining habitat consists of thin strips along roadways, at the bases of hills, or around rocky areas where discing and farming are difficult. Consequently, SKR populations are very scattered, with few large core populations and many small, isolated populations. Isolation increases the risk of extirpation, especially in smaller populations. Habitat fragmentation prevents movement between patches and threatens genetic vigor by promoting inbreeding. It also prevents colonization or recolonization of unoccupied but suitable habitat areas.

A variety of evidence suggests that the Ramona population has extremely low genetic variability and that individuals may suffer adverse health effects from inbreeding. An analysis of mitochondrial DNA samples from about 12 SKR captured near Ramona found no genetic variation (A. Metcalf, personal communication). A population of 45 SKR was salvaged prior to construction at the Ramona Airport, held in captivity for 6 months, and then released into a fenced and improved habitat area. The captive population suffered a variety of unusual and unexplained health abnormalities before their release (e.g., spontaneous bone breakage, hair loss, and sudden death associated with liver abnormalities). Although the stress of captivity undoubtedly contributed to these conditions, the captive conditions were identical to those used for SKR and other kangaroo rat species in the past with no such problems (M. O'Farrell, P. Behrends, P. Kelly, S. Montgomery, M. Price, personal communications, and W. Spencer personal observations). Moreover, 2 *Dulzura* kangaroo rats held simultaneously with the 45 SKR showed no ill effects. The Ramona population also has some unusual color variations, including individuals with almost no white in the tail. Discussions are currently ongoing with the US Fish and Wildlife Service and other biologists concerning implications of this potential population genetic problem for species recovery and SKR conservation in San Diego County.

Distribution in San Diego County—The SKR has a very restricted range for a rodent of its body size. Most populations are found in the San Jacinto Valley and adjacent areas of western Riverside County, including the Anza area. Species surveys in recent decades have extended the known range into scattered portions of San Diego County.



The Lake Henshaw population was discovered by Michael O'Farrell and Curt Uptain in 1983, and is the largest in the county (estimated at about 14,000 individuals on 11,370 acres of occupied habitat by O'Farrell and Uptain 1989). The size and distribution of the population have not been systematically studied in recent years, and biologists suspect that the population has decreased since the 1980s (S. Montgomery, personal communication). However, recent observations by W. Spencer, S. Montgomery, and D. Grout suggest that the population is still large and well distributed in the Lake Henshaw/Warner Springs grasslands.

Stephen Montgomery discovered the Guejito population on private ranch land in 1991. It's size and current status are unknown, but available habitat is considerably smaller than the area at Lake Henshaw.

Stephen Montgomery and Wayne Spencer discovered the Ramona population in October 1997 (Ogden Environmental and Energy Services 1998). This population numbers in the hundreds to perhaps a few thousand individuals on loamy alluvial soils centered in the grasslands west of the town of Ramona. Preliminary genetic analyses indicate that this and other San Diego populations are derived from the larger populations to the north and contain only a fraction of their genetic variability (A. Metcalf, unpublished data). These small, derived populations were probably established by range expansion from the San Jacinto Valley during a warmer, drier climatic period thousands of years ago, and may currently suffer from reduced genetic variability and vigor due to genetic isolation and perhaps inbreeding.

The Camp Pendleton population is scattered across active military training areas, and is relatively small and vulnerable to extirpation. The total acreage occupied by Stephens' kangaroo rats there was estimated by Steve Montgomery at about 800 acres in 1996, but may have dropped to less than half that amount by 2002 (Montgomery et al. 1996, and S. Montgomery, personal communication). Adjacent Fallbrook Naval Weapons Station has somewhat larger and more contiguous habitat areas, but occupied acreage there decreased from about 2,760 acres in 1992 to less than 400 acres in 2001 (S. Montgomery, personal communication). However, D. Grout and S. Montgomery (personal communications) suspect that this apparent reduction may be due in part to different survey methods used between these two times.

Other grasslands in San Diego County have not been surveyed for SKR. The Santa Ysabel Valley represents one of the largest remaining grassland areas in the County. The Santa Ysabel grasslands lie only about 4 km from occupied habitat at Lake Henshaw. Moreover, based on topography, the Santa Ysabel Valley appears to be a potential "stepping stone" between the Lake Henshaw grasslands and the Ramona grasslands. Thus, evidence suggests that there is a likelihood of SKR living now, or at least in the past, within the Santa Ysabel Valley.

Population Genetics—Although the genetics results are preliminary, they are consistent with an hypothesis that SKR expanded south into San Diego County about 9 or 10 thousand years



ago via two broad avenues: a western expansion from the Temecula area of Riverside County into the Pendleton/Fallbrook/Guejito areas (north and west of the San Dieguito River Valley) and an eastern expansion into the Lake Henshaw and Ramona areas from the Anza area of Riverside County. The Ramona population has the lowest genetic variability of any population tested, and is most closely related to the Henshaw population (about 5 nucleotide step changes; A. Metcalf personal communications and Metcalf et al. 2001). Thus, evidence suggests that the Ramona population was derived from the Henshaw population thousands of years ago, independently of the Guejito population, which seems more closely related to the Pendleton/Fallbrook populations. This evidence also supports the hypothesis that grasslands lying between Henshaw and Ramona might currently, and probably formerly, supported SKR. The reduced genetic variability in all southern populations of SKR (as opposed to much higher variability in the central and northern portions of the species' range) are consistent with a "bottleneck dispersion" model of SKR population expansion towards the south during a drier interglacial period 9 or 10 thousand years ago.

Habitat Requirements—SKR are habitat specialists that occupy open grassland or sparse coastal sage scrub with a preponderance of annual forbs, few if any shrubs (less than 30% shrub cover), and abundant areas of bare ground. Typical habitat consists of native and non-native forbs, such as filaree (*Erodium* sp.), dove weed (*Eremocarpus setigerus*), tar plant (*Hemizonia* sp.), and goldfields (*Lasthenia* sp.). Dense grass or shrub cover can exclude this species from otherwise suitable habitat, presumably by interfering with the species' natural bounding movements and its ability to forage efficiently. SKR are primarily found on friable, loamy soils that facilitate burrowing. They are rarely found on soils high in clay or rock content, which make burrowing difficult, or on very sandy soils, in which burrows tend to collapse. They sometimes use clayey soils near more suitable habitat areas if there are sufficient burrows created by other rodents (especially ground squirrels or pocket gophers) that they can use.

SKR have been found from near sea level to about 1,250 m elevation in grassland and sparse scrublands. Moister conditions that favor denser perennial vegetation may limit the upper elevational distribution. Although occasionally found on slopes approaching 45% (A. Davenport, personal communication), SKR tend to avoid slopes greater than about 39%, and seem most abundant on slopes of 7 to 11% (Bleich 1973, Moore-Craig 1984, Price and Endo 1989).



Study Area and Methods

The two SYOSR properties (SYOSR East and West) lie on either side of State Route 79, generally north of State Route 78, near Santa Ysabel, San Diego County, California (Figures 1 and 2). The West property lies at about 2,700 to over 3,400 feet (823 to 1,036 m) elevation and supports a mosaic of oak woodland, chaparral, and native and nonnative grasslands. The southern-most portion of this property along State Route 78 appears to have some potential to support SKR (Area A on Figures 1 and 2). This area is mapped mostly as foothill/mountain perennial grassland, but has a high proportion of non-native annual forbs mixed in. Most of this area has stony, fine sandy loam soils, although lower-lying areas tend to have high clay content, and some portions have fairly deep, fine sands.

The SYOSR East property lies at about 1,900 to 4,200 feet (580 to 1,280 m) elevation and is covered with a mosaic of oak woodlands, native and nonnative grasslands, and riparian woodlands and scrubs. Two portions of the east property were considered to have some potential to support SKR: a lower area, at about 2,000 feet (610 m) elevation along State Route 79, that supports nonnative, annual grassland on fine sandy loam soils (Area B on Figures 1 and 2) and an upper area in the eastern half of the property, at approximately 4,000 feet (1,220 m) elevation, that supports foothill/mountain perennial grassland on coarse sandy loam soils (Area C on Figures 1 and 2). Cattle have grazed both areas under former ownership. Some cattle continue to sporadically graze the eastern area when they enter through deteriorated fencing from adjacent Native American property (S. Morrison, personal communication).

Field Reconnaissance—These three areas (two on SYOSR East and one on SYOSR West) were surveyed for diagnostic sign of kangaroo rats (burrows, scats, trails, etc.) on October 17, 2001. Wayne Spencer and Steve Montgomery walked essentially all habitat considered suitable for supporting SKR, with special attention to open areas dominated by annual forbs and grasses, on gentle slopes, and having deep sandy loam soils. Conditions were highly conducive to detecting kangaroo rat sign. Vegetation had sufficiently dried and thinned throughout the summer to where bare soils, rodent burrows, trails, scats, dust baths, and other signs of occupancy would be highly visible if present. Observations in occupied SKR habitat at the Ramona Airport during the same period (mid October 2001) confirmed that kangaroo rat sign was very obvious and easy to detect at this time, as it was throughout much of the summer and fall there. Kangaroo rats in Ramona (at about 1,400 feet elevation) were very active and abundant during October, due at least in part to a particularly good reproductive year following heavy, late, spring 2001 rains.

Habitat Evaluation Model—W. Spencer has prepared and refined a habitat evaluation model for SKR based on vegetation, soils, and slope. He first developed an early version of the model for the Santa Maria Valley (Ramona area) in 1998, shortly after he and Steve Montgomery first discovered the Ramona SKR population. He later expanded and refined this model as part of conservation planning efforts for the North San Diego County MSCP plan, which has targeted SKR as a priority species for reserve design. This version of the model was reviewed in 2001 by



an independent scientific advisory panel, which includes Dr. Patrick Kelly, a recognized authority on SKR and other kangaroo rat species. Most recently, this model was expanded to cover the entire county for purposes of depicting the known and likely distribution of SKR in the county. This was done as part of The Mammals of San Diego County project, a collaborative effort to update information on all San Diego mammal species. Expert opinion and limited field reconnaissance is currently being used to edit the resulting county-wide map to show all known SKR populations and other habitat areas likely to support SKR. The current draft of this SKR distribution map is included in Appendix A and was used in preparing this report.

The following factors were combined to create the SKR model:

- 1) **Soils.** Soils were ranked as having High, Medium and Low potential to support SKR based on physical soil characteristics as described in the San Diego Area Soil Survey (USDA 1973). SKR generally require well-drained soils that allow easy burrowing to at least about 24" or as deep as 46". The soil must also be able to support a burrow (e.g., pure sands collapse too easily). The soil rankings considered the full description of soil attributes, with a bias to potentially over-representing soil value to SKR for soil types having highly variable characteristics (i.e., leading to potential errors of commission rather than omission). The following general guidelines were used in assigning value to each soil type in the study area (a full listing of ranks is available upon request):

High: Generally, any deep to very deep loamy soils (including sandy loams, loamy sands, loams, and silt loams that are generally deeper than about 32") with relatively low gravel, rock, or cobble content, and that are friable and not often saturated.

Moderate: Generally, soils that don't quite qualify as high due to higher potential for saturation or impediments to burrowing, such as loamy soils that are moderately deep (about 16-32") or that have hard subsoils. Soil types in a soil series otherwise classified as High were decremented to Moderate if they have "very high" rock, cobble, or gravel content. Soil series otherwise ranked as Low, but having potential "inclusions" of deep, friable loams, were incremented to Moderate.

Low: Non-loam soils (sands, clays, silts) or otherwise "very hard" soils (e.g., some clay loams or sandy clays that are classified as very hard or extremely hard); shallow or very shallow soils (less than 12" to a very hard subsoil or 16" to an impenetrable layer); soils in floodplains subject to periodic inundation; or predominantly unsuitable soils that may have smaller inclusions of suitable soils (e.g., clays with occasional sandy loam hillocks).

None: All non-suitable soils or non-soil surfaces, including rock quarries, tidal flats, open water, gravel pits, etc.

- 2) **Vegetation.** SKR are strongly associated with open grasslands or very sparse coastal sage scrub. They are a pioneering species that may invade fallow agricultural fields



or the edges of active agricultural areas (such as cattle pasture or edges of row crops). Vegetation was therefore ranked for SKR as follows:

High: Grasslands (includes both native perennial and non-native annual grasslands, which are not differentiated in the vegetation database).

Moderate: Most Extensive Agriculture (includes row crops, pastures, fallow lands, etc.). Extensive agricultural areas on highly suitable soils may rank high.

Low: Coastal Sage Scrub (most coastal sage scrub in the study area is likely too dense to support the species, although SKR may occupy openings in coastal sage scrub or invade following disturbances, such as fire).

None: All other vegetation communities, developed lands, or intensive agriculture (greenhouses, orchards, etc.).

- 3) **Slope.** Gentler slopes (less than 30%) were ranked as high, and slopes over 30% as low. Although SKR may sometimes occupy steeper slopes, they are most abundant on gentler slopes and seem to prefer slopes less than about 11%.

All possible combinations of soils, vegetation, and slope rankings were assigned a value of Very High, High, Moderate, or Low in the following matrices. Grasslands on high quality (deep loam) soils and gentle slopes rank Very High. As with most burrowing rodents, habitat suitability falls off quickly with decreasing soil suitability; and quality falls off as vegetation becomes denser or slopes steeper. The intent of the model is to differentiate those areas most capable of supporting SKR populations over the long term, and thereby most important to species conservation. This model is therefore not overly conservative (as it should be if the intent were to predict possible occurrence of SKR for regulatory reasons). The model might predict low or no habitat value on some areas that actually support small numbers of SKR in some years. For example, although it is possible some SKR occur in the study area on steep coastal sage scrub slopes having clay loam soils (e.g., along road berms), these should not be considered priority conservation areas for SKR relative to more open, gentle grasslands on deep loams.

On the other hand, it should be noted that available soils and vegetation maps are fairly coarse relative to the scale at which SKR select habitats, and contain some inaccuracies. For example, there is a great deal of variation in the physical soil characteristics within a polygon mapped as a single soil series or type. Soil types that generally are not very good for SKR may have inclusions of high quality areas (e.g., pockets of deep sandy loams within otherwise heavier clay loams); and soil types that are generally good for SKR may contain large, unsuitable areas (e.g., where erosion has removed deeper loams). Thus, assignment of value to specific soil types was generally very conservative, tending to over-rate rather than under-rate some soils types. Field verification of on-the-ground soil and vegetation attributes is essential to determining actual SKR habitat potential. The model predictions were therefore investigated and field verified for the SYOSR properties. In addition we looked at



specific soil attributes on the properties to more specifically address their suitability for providing SKR habitat.

Table 1
SKR Habitat Suitability Rankings

<30% slope

Vegetation Type	Soil Suitability			
	High	Moderate	Low	None
Grassland	Very High	Moderate	Low	None
Extensive Agriculture	High	Moderate	Low	None
Coastal Sage Scrub	Low	Low	None	None
Other	None	None	None	None

>30% slope

Vegetation Type	Soil Suitability			
	High	Moderate	Low	None
Grassland	Moderate	Low	None	None
Extensive Agriculture	Low	Low	None	None
Coastal Sage Scrub	Low	Low	None	None
Other	None	None	None	None



Results and Discussion

Habitat Value—All three areas we surveyed in the field were predicted to be of high habitat value by the SKR habitat evaluation model (Figure 3). Field observations confirmed that the two areas that are within or adjacent to the Santa Ysabel Valley (Areas A and B on the Figures) both appear to have very high habitat value for SKR. In contrast, the higher elevation perennial grasslands on SYOSR East (Area C) do not appear suitable to support SKR. In general, soils in that area seemed too hard and compact to be ideal for SKR, with a relatively high stone and clay content. The elevation there (about 4,000 feet) is also at the upper limits at which SKR have been previously detected (about 3,600 to 4,100 feet at Anza Valley; Montgomery personal communication). We found little evidence of burrowing rodents in those upper elevation grasslands and no sign of kangaroo rats. Thus, although the habitat model predicted Area C to be of high SKR habitat value, field reconnaissance suggests this area has little potential to support SKR.

Soils—The soils in the Santa Ysabel Valley in general, and on Areas A and B of the SYOSR properties, are generally excellent in terms of their physical characteristics to support SKR. The predominant soils in the Valley (including Areas A and B) are from the Holland series, which seem ideal for SKR, and the Crouch series, which also seems highly suitable. Holland series soils are well-drained, moderately deep and fine sandy loams that formed from weathered micaceous schists. Holland types on gentler slopes, and in particular the deeper deposits that form in gentle valley bottoms, are physically ideal for providing SKR habitat. These fine sandy loams are very friable and hold burrow structures well, and they are well enough drained that they tend to support fairly open, forb-dominated vegetation that dries and disarticulates early in the summer. Holland series on steeper slopes seem less suitable, generally being shallower and rockier and supporting more oak woodland vegetation.

Crouch series soils have a coarser sand component than the Holland series, but are also well-drained, deep to moderately deep, and formed from weathered acid igneous rock and micaceous schists. The Crouch series seems slightly stonier and rockier than the Holland soils in the study area, and may contain more clay. For example, the Crouch coarse sandy loam soils mapped in survey area C seemed quite hard and compact, and not well suited to burrowing by SKR. Much of the area mapped as Crouch series soils are forested with oak or pine woodlands or chaparral.

Other soils in the study area that seem suitable for SKR (but occur less abundantly) include Reiff fine sandy loams, Calpine coarse sandy loams, Las Posas fine sandy loam, and loamy alluvial land. Sheephead rocky fine sandy loams are abundant on steeper, higher slopes that tend to be forested with oaks and pines, and seem generally unsuitable for SKR.

Sign Survey—Although both properties appear to have some areas of very high habitat value to support SKR, no kangaroo rat sign was detected during the 2001 field reconnaissance. In contrast, during March 2000, W. Spencer noted a potential burrow and one kangaroo rat scat in Area B



during a brief reconnaissance with TNC staff. Careful searching of this area during 2001 failed to reconfirm any sign there. This is in spite of the fact that the 2001 survey was done during a more favorable season for detecting kangaroo rat sign. Late summer-early fall surveys usually reveal more sign due to higher population densities in the post-reproductive season, more open vegetation, and a longer period for sign to build up after the rains end. In addition, SKR populations were significantly higher in 2001 than 2000 at the Ramona Airport, due to a prolonged reproductive season in 2001 that was triggered by late spring rains. All of this suggests that the chances of detecting kangaroo rats during the October 2001 survey should have been high, if any kangaroo rats were present. However, a general impression of our 2001 survey was that the sites had remarkably sparse sign of *any* rodents, including ground squirrels, deer mice, and pocket gophers. Although we have no data to support or refute any particular hypothesis explaining this observation, similar observations have been made in portions of the Ramona Grasslands on or near properties where rodenticide use was observed or suspected (M.O'Farrell and D. Bittner, personal communications).

Due to lack of any sign of kangaroo rat occupancy during 2001, Spencer and Montgomery advised The Nature Conservancy that trapping this year would not be fruitful, as it was highly unlikely to capture kangaroo rats. In our professional opinion, no SKR were present on the SYOSR properties during 2001, although it is highly likely they have occurred there in the past. SKR may still occur on other private properties in the Santa Ysabel Valley, and they could possibly colonize the SYOSR in the future.

During 2003 surveys by Hathaway et al. (2004), a USGS remote camera captured 8 photos of kangaroo rats at 2 camera locations (Cameras 3 and 4) on the west property. Six of the photos were taken at Camera 3 within a single 1-hour period (G. Turschak, personal communication), and were probably the same individual. Two photos were at Camera 4. Based on the best photograph at each camera location, W. Spencer identified these as *Dipodomys simulans* based on the broad, distinct lateral tail stripe, narrow face shape, and sharply contrasting markings. Habitat in the camera locations (as described by USGS and evident in the photos) appears generally suitable for *Dipodomys simulans* kangaroo rats, but not very suitable for SKR, due to presence of shrubs, bunch grasses, and oak leaves. Although Spencer and Montgomery did not survey this area in 2001, W. Spencer did visit this general location during the 2000 reconnaissance with TNC staff and did not consider it suitable for SKR.

Biogeographic Significance of Santa Ysabel Valley for SKR—Although SKR have not yet been confirmed within the Santa Ysabel Valley, they almost certainly have occurred there at least in the past, and they could still occur in some portions today or in the future. The present survey covered only a minor proportion of the total potential SKR habitat in the valley, and not necessarily the most highly suitable habitat (which would probably include the deeper, gentler soils of the valley bottom).

The Santa Ysabel Valley lies only 3 or 4 km southeast of the larger Lake Henshaw basin and its SKR population. These two grassland areas are connected by the rift valley followed by Highway



79 and Corrista Creek, which offers generally gentle terrain for dispersing SKR. Given that SKR currently are known to occur at Lake Henshaw and Ramona, the Santa Ysabel Valley is the most likely dispersal “stepping-stone” between these occupied habitat areas. It was almost certainly occupied in the past, at least when the more southerly populations (Ramona and Guejito) were first colonized (probably during a warmer, drier period thousands of years ago). Likewise, the smaller Ballena Valley (midway between Santa Ysabel and Ramona) was likely once occupied, as it appears to be another potential stepping stone of grasslands on suitable soils; but to my knowledge the Ballena Valley has never been surveyed for SKR.

In conclusion, SKR Populations near Lake Henshaw to the north and Ramona to the west may be genetically connected to one another via the Santa Ysabel Valley (and Ballena Valley). Habitat in the Santa Ysabel Valley appears highly suitable for SKR but has never previously been surveyed for the species. Even if the Santa Ysabel Valley does not currently support SKR populations, it probably supported SKR in the past and may again in the future if potential dispersal corridors are maintained between there and nearby occupied areas. SKR are relatively strong dispersers whose populations exhibit classic metapopulation behavior, in which populations may “wink” on and off in various locations over the landscape due to environmental variation and stochastic events. So long as suitable habitat areas are sufficiently connected, any given location may be unoccupied for a time, only to be recolonized from another, occupied site in the future. Maintaining this potential for natural metapopulation dynamics is probably essential to the long-term persistence of the species (Burke et al. 1991).



Future Survey and Management Recommendations

Although surveys failed to detect SKR on the subject properties during 2001, there is potential that they could be occupied in the future. Consequently, land management should be consistent with maintaining suitable habitat conditions and minimizing potential threats to SKR or other rodent species.

Surveys—I recommend periodic reconnaissance surveys for kangaroo rat sign in Areas A and B. Surveys could be repeated every 2-3 years, or only in years where expansion of SKR populations and dispersal into new areas is considered likely (for example, the second summer following an El Niño winter). Determination of when to survey could be triggered by observations at another known population, for example, based on results of yearly monitoring surveys at the Ramona Airport. If kangaroo rat sign is detected on the SYOSR, trapping surveys should be conducted to verify species and to collect genetics samples.

Land Management—Cattle grazing at moderate stocking densities could be used to continue providing potential habitat for SKR on Areas A and B. Horse grazing should be prohibited, because horses tend to compact soils and collapse burrows with their sharper hooves, and their grazing may reduce forb species favored as food sources by SKR. Riparian areas and oak woodlands should be fenced to keep cattle out, and grazing should be confined to open grasslands not supporting wetlands or sensitive plant species. Vegetation monitoring should ascertain the relative abundance of annual forbs versus grasses. Management for SKR habitat should strive to maintain sparse cover of annual forbs and grasses, and to prevent dense invasions by exotic grasses, such as *Bromus* and *Avena*, which can crowd out forbs and perpetuate an unnatural fire cycle that eliminates native plants.

If cattle are not retained on these areas, prescribed burns should be considered as a management tool, coupled with vegetation monitoring, to increase habitat value for SKR. Fall burns (just prior to winter rains) are thought to favor annual forbs over grasses, and hence may be best for maintaining SKR habitat value (M. O'Farrell, personal communications). However, some ecologists believe that spring burning, before seed set in annual grasses, may be preferable for restoring natural vegetation patterns in southern California. Experts in fire ecology should be consulted to determine optimal timing for vegetation management, considering both SKR habitat needs (e.g., favoring annual forb growth), and other vegetation management goals (e.g., promoting "natural" fire regimes). Results of ongoing monitoring at the Ramona Airport (which includes both grazing and fire as SKR habitat management tools) should also be consulted in prescribing management actions for the SYOSR (keeping in mind differences in elevation and climate).

Rodenticides, fertilizers, disking, planting, or irrigation should be prohibited from the SYOSR, particularly in or near Areas A and B.



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Appendix A

Draft Species Account
Stephens' Kangaroo Rat
from
San Diego County Mammal Atlas Project

Stephens' Kangaroo Rat

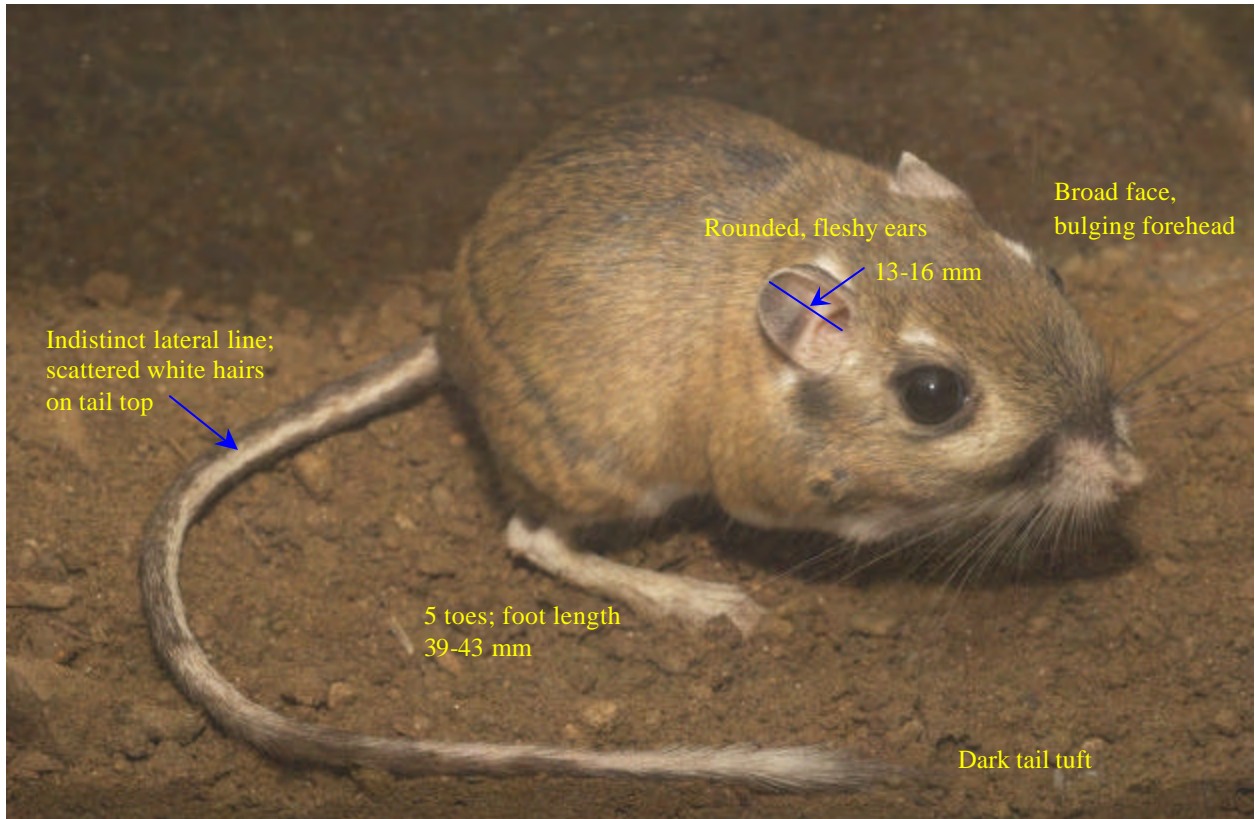


Photo by Moose Peterson.

Scientific Name: *Dipodomys stephensi*

Overview — The Stephens' kangaroo rat is a rare, endangered kangaroo rat of open grasslands or very sparse scrublands. Kangaroo rats are **saltatorial** (jumping), nocturnal, burrow-dwelling rodents. Found primarily in the inland valleys of western Riverside County, Stephens' kangaroo rats are known to occupy a few scattered grassland areas in northern San Diego County, particularly on and near Marine Corps Base Camp Pendleton, Fallbrook Naval Weapons Station, and near Lake Henshaw, Rancho Guejito, and Ramona. They may occupy other open habitat areas in the county that have not been sufficiently surveyed. Stephens' kangaroo rats are generally larger than other kangaroo rats in their range. Although all kangaroo rat species look superficially similar, Stephens' kangaroo rats are distinguished from other local species by their generally larger size, broader face, less distinctly striped tail, and other subtle differences in coloration and the shape and size of ears, feet, and other features. Their habitat consists of sparse or disturbed grasslands with a high proportion of **forbs** (herbaceous annual plants), and few if any shrubs, particularly on well-drained and **friable** (easy to dig) soils. They primarily eat seeds, along with some green vegetation and occasional insects. They are highly evolved to survive arid conditions and can persist indefinitely without drinking free water. True to their name, kangaroo rats have large hind limbs for jumping, small fore limbs, and long, tufted tails for balance. Their large eyes are adapted for night vision, and their greatly enlarged **tympanic bullae** (ear capsules) provide keen hearing (especially for low frequency sounds) and may aid in

balance when kangaroo rats are rapidly zig-zag hopping to avoid predators. Kangaroo rats, like other **heteromyid** rodents, also have external fur-lined cheek pouches to transport seeds.

Conservation Status — California listed the Stephens' kangaroo rat as Rare in 1971 and Threatened in 1984. The U.S. Fish and Wildlife Service listed it as Endangered in 1988 and prepared a Draft Recovery Plan in 1997. A Final Recovery Plan is currently being drafted based on comments received and new information on species distribution and genetics.

Conservation Status		
IUCN	USFWS	CDFG
LR(cd)	Endangered	Threatened

The IUCN Red List classifies Stephens' kangaroo rat as Lower Risk, Conservation Dependent. This assignment presumes that the species is at relatively low risk of extinction in the near future so long as the Riverside County Stephens' Kangaroo Rat Habitat Conservation Plan provides sufficient preserve sites and will be fully implemented. However, adequate management and monitoring programs have not yet been systematically designed or implemented over the species' range, making attainment of these goals uncertain; and many remaining populations are outside of habitat reserves and subject to **extirpation** (local extinction). The Multiple Species Habitat Conservation Plan for Western Riverside County proposes additional conservation of the Stephens' kangaroo rat in at least 2 areas that were not included in the Stephens' Kangaroo Rat Habitat Conservation Plan. Whether these areas will actually be conserved and managed to benefit the species is uncertain.

No Habitat Conservation Plans yet cover Stephens' kangaroo rats in San Diego County. Populations on Marine Corps Base Camp Pendleton and Fallbrook Naval Weapons Station are affected by military training activities and have no permanent protection. Camp Pendleton's Integrated Natural Resources Management Plan establishes how the Base will manage and monitor Stephens' kangaroo rat populations to minimize harm by military activities, for the period 2002 through 2007. The Lake Henshaw population is primarily on land managed by the Vista Irrigation District and has no permanent protection. The Rancho Guejito population is on private ranch land. Its current population status is unknown, and it has no permanent protection. The Ramona population, discovered in October 1997, is partially protected at the Ramona Airport under an Integrated Habitat Management Plan, but largely unprotected on surrounding private lands. The County of San Diego is targeting conservation of Stephens' kangaroo rat habitat as a priority of their North County Subarea Plan of the Multiple Species Conservation Program.

Threats — The species is threatened by habitat removal and fragmentation throughout its range. In addition, many human land uses and actions kill individual kangaroo rats or destroy or degrade their habitat. These threats include discing for weed abatement, pasture improvement, or dry farming; irrigation or spraying of sewage effluent on pastures; application of rodenticides and perhaps other pesticides; predation by domestic pets; over-grazing by livestock; and soil compaction by off-road vehicles, horses, and other livestock.

Human development and agricultural expansion have removed about 85% of suitable habitat. Many historical locations no longer support the species, and much of the remaining habitat consists of thin strips along roadways, at the bases of hills, or around rocky areas where discing and farming are difficult. Consequently, Stephens' kangaroo rat populations are very scattered,

with few large **core** populations and many small, isolated populations. Isolation increases the risk of extirpation, especially in smaller populations. Fragmentation prevents movement between patches and threatens **genetic vigor** by promoting **inbreeding**. It also prevents colonization or recolonization of unoccupied but suitable habitat areas.

Stephens' kangaroo rat populations undergo natural fluctuations in distribution and abundance that make them susceptible to extirpation from small areas. Habitat fragmentation prevents populations from naturally contracting and expanding in response to these natural cycles, and thereby impedes recovery of populations from low numbers.

Description — The Stephens' kangaroo rat is a medium-sized (average adult weight about 67 g), broad-faced kangaroo rat, with large, 5-toed hind legs (including a small **dew claw**), small front legs, and external cheek pouches. The head is large in relation to the body due to the large auditory bullae. It has a cinnamon buff overfur and pure white underfur, with a somewhat indistinct white lateral line on the flank. The tail is bicolored with a somewhat indistinct lateral white line, a long black tuft on the tip, and scattered white hairs on the nearly black dorsal and ventral surfaces (giving them a slightly grizzled appearance).

Measurements: Total length 277-300 mm., tail 164-180 mm., hind foot 39-43 mm., ear 13-16 mm.

Diagnostic characters: Broad, bulging forehead between the eyes. **Zygomatic arch** (cheek bone, beneath the eyes) as wide or wider than the **tympanic bullae** (the ear capsules below the ears). Indistinct white lateral line on tail and scattered white hairs on top of tail; black tail tuft. 5 toes, including dew claw. Relatively small, rounded, fleshy ears. **Baculum** (penis bone) of male bent at about 45-degree angle.

Dental formula: i 1/1, c 0/0, p 1/1, m 3/3, total 20.

Comparisons — Although superficially similar to other kangaroo rat species in San Diego County, the Stephens' kangaroo rat can be identified by experts familiar with subtle differences in size, coloration, and shape of various body parts. The Stephens' kangaroo rat is easily distinguished from the Merriam's kangaroo rat, which is much smaller (average 35 g) and has 4 toes on the hind foot (no dew claw). One other species in the region is closer in size to the Stephens' kangaroo rat, also has 5 toes, and is more difficult to differentiate from them. Compared with the Dulzura kangaroo rat, which is considered a "narrow-faced" species, the Stephens' has a broader, rounder face, which gives it a somewhat bulging appearance between the eyes (Photo A). In the hand, a biologist can **palpate** (feel) with the fingers that the face is as wide or wider at the **zygomatic arch** (cheekbones) than at the **auditory bullae** (the large ear capsules at the rear of the skull, felt behind the eyes and beneath the ears). In the Dulzura or other narrow-faced kangaroo rat species, the zygomatic arch is noticeably narrower than the auditory bullae and the face appears more triangular from the front (Photo B).

The white stripe on the sides of the tail is generally narrower and less sharply defined in Stephens' than in other species, and the dark hairs on the **dorsal** aspect of the tail are often intermixed with white hairs that are generally lacking in other species. Some individuals captured at the Ramona Airport almost or completely lack the white lateral tail stripe, with nearly the entire tail being black with a salting of white hairs.



Face shape of Stephens' kangaroo rat (left) and Dulzura kangaroo rat (right). Note the broader, more bulging shape of the face between the eyes in Stephens' and the more sharply triangular face of the Dulzura. Note also the greater contrast in facial coloration and markings of the Dulzura. Both individuals were captured and photographed at the Ramona Airport. *Photos by Moose Peterson.*

The ears of Stephens' kangaroo rats tend to be rounder, fleshier, and lighter in color (dusky with a pinkish hue) than the ears of the Dulzura kangaroo rat (darker “elf ears”). In males, the baculum (penis bone) also varies between the two species when extruded by palpation. The baculum of Stephens' kangaroo rat tends to be thicker with a slight bend (average about 45 degrees and a maximum of about 60 degrees). In contrast, the Dulzura's baculum is thinner and bent at about 90 degrees.

As a final confirmation of species identification, a few guard hairs can be pulled or clipped from the back and examined under a microscope. The hairs of Stephens' kangaroo rats tend to be narrower (12.39 ± 1.29 mm) than those of the Dulzura kangaroo rat (14.81 ± 1.70 mm) and have fewer and smaller **medullary cells** across the width of the hair. In the Stephens' kangaroo rat, these cells tend to be oval or rounded and are arranged in regular rows only 1 or 2 cells wide across the shaft of the hair; in the Dulzura kangaroo rat, the cells tend to be more flattened and arranged in irregular rows of 3 or 4 cells.

Distribution — The Stephens' kangaroo rat has a very restricted range for a rodent of its body size. Most populations are found in the San Jacinto Valley and adjacent areas of western Riverside County, including the Anza area. Species surveys in recent decades have extended the known range into scattered portions of San Diego County (Figure 1). The Lake Henshaw population was documented by Michael O'Farrell and Curt Uptain in 1983, and is the largest in the county. During the 1980s this population was estimated at about 14,000 individuals distributed over more than 11,000 acres. It's current size and distribution are not well documented, but it has probably declined since that time. Stephen Montgomery discovered the Guejito population on private ranch land in 1991. It's size and current status are unknown.

Stephen Montgomery postulated the existence of the Ramona population, and Wayne Spencer confirmed its presence, in October 1997. This population numbers in the hundreds to perhaps a few thousand individuals on loamy alluvial soils centered in the grasslands west of the town of Ramona. Preliminary genetic analyses indicate that this and other San Diego populations are derived from the larger populations to the north and contain only a fraction of their genetic variability. These small, derived populations were probably established by range expansion from

the San Jacinto Valley during a warmer, drier climatic period thousands of years ago, and may currently suffer from reduced genetic variability and vigor due to genetic isolation and perhaps inbreeding.

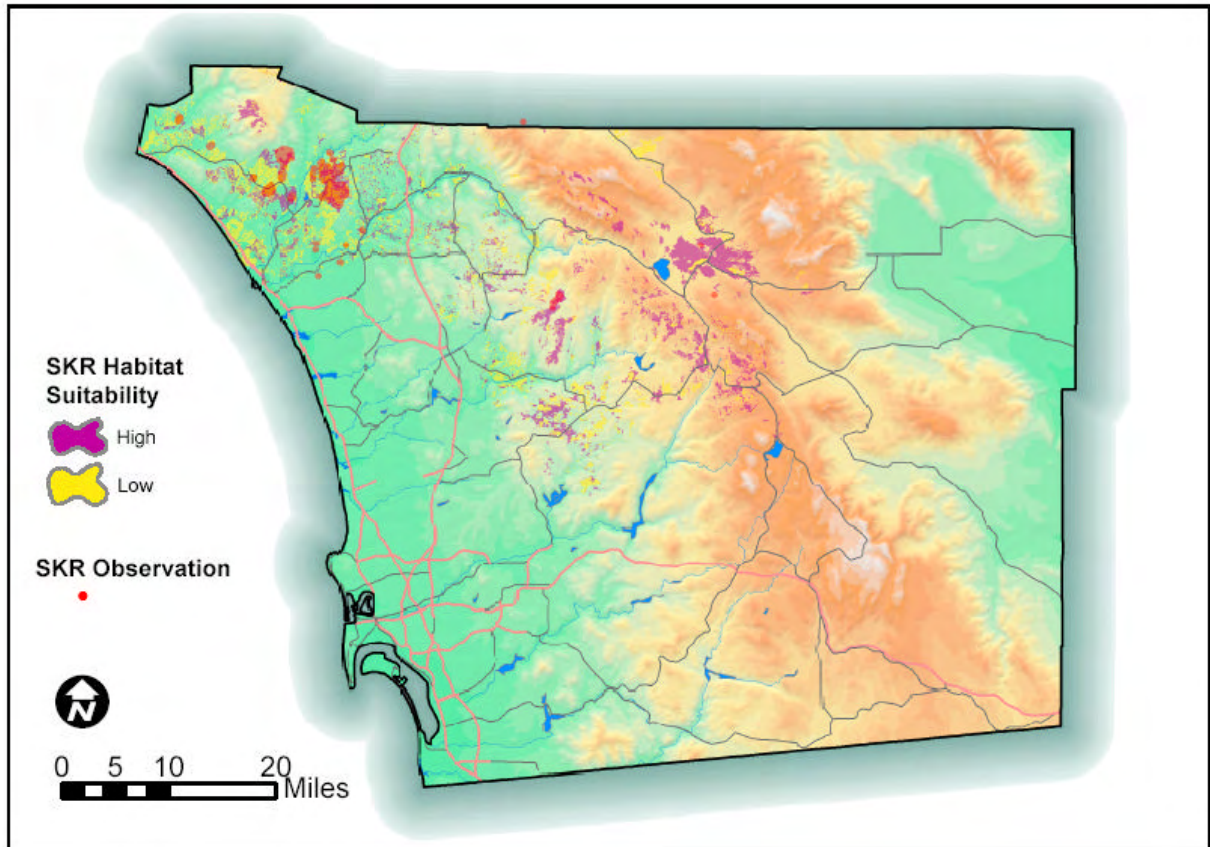


Figure 1. Known and predicted range of Stephens' kangaroo rat in San Diego County. Predicted range from a habitat suitability model based on soils, vegetation, and geography. Historic observation points and known extant populations are also shown.

The Camp Pendleton population is scattered across active military training areas, and is relatively small and vulnerable to extirpation. The total acreage occupied by Stephens' kangaroo rats there was estimated by Steve Montgomery at about 800 acres in 1996, but may have dropped to less than half that amount by 2002. Adjacent Fallbrook Naval Weapons Station has somewhat larger and more contiguous habitat areas, but occupied acreage there decreased from about 2,760 acres in 1992 to less than 400 acres in 2001.

Stephens' kangaroo rats have been found from near sea level to about 1,250 m elevation (Anza Valley, Riverside County) in arid grasslands and sparse scrublands. Moisture conditions that favor denser perennial vegetation may limit the upper elevational distribution. Other limits to the species distribution probably include steep slopes (greater than about 39%) and extensive areas of unsuitable soils (clays, rocks) or vegetation (chaparral, woodlands, etc.).

Habitat — Stephens' kangaroo rats are habitat specialists that occupy open grassland or sparse coastal sage scrub with a preponderance of annual forbs, few if any shrubs (less than 30% shrub

cover), and abundant areas of bare ground. Typical habitat consists of native and non-native forbs, such as filaree (*Erodium* sp.), dove weed (*Eremocarpus setigerus*), tar plant (*Hemizonia* sp.), and goldfields (*Lasthenia* sp.). Dense grass or shrub cover can exclude this species from otherwise suitable habitat, presumably by interfering with the species' natural bounding movements and its ability to forage efficiently. Stephens' kangaroo rats are primarily found on friable, loamy soils that facilitate burrowing. They are rarely found on soils high in clay or rock content, which make burrowing difficult, or on very sandy soils, in which burrows tend to collapse. They sometimes use clayey soils near more suitable habitat areas if there are sufficient burrows created by other rodents (especially ground squirrels or pocket gophers) for them to use. Stephens' kangaroo rats tend to avoid steep slopes (greater than about 39%) and seem most abundant on gentle slopes (about 7 to 11%).

Stephens' kangaroo rats are considered somewhat of a **pioneer species**. They often colonize areas a few years after disturbances that open up the vegetation, such as fire or grazing. They will also readily colonize fallow agricultural fields. Such disturbance factors open up the vegetation and favor weedy forb species that serve as food sources for kangaroo rats. Moderate grazing, especially by cattle, can help maintain habitat value for Stephens' kangaroo rat by thinning vegetation, creating areas of bare ground, and promoting weedy forb growth. Overgrazing, especially by horses, can degrade habitat by reducing food sources, compacting soil, and crushing burrows.

Stephens' kangaroo rat habitat value can fluctuate from year to year in response to weather cycles, although patterns are not fully established. In general, population levels increase during summer in proportion to the previous winter's rainfall. Winter rains stimulate growth of food plants and increase reproductive output in Stephens' kangaroo rats. However, prolonged or very heavy rains (e.g., El Nino years) may make vegetation so dense that it interferes with the kangaroo rat's ability to move and forage, especially on soils that hold moisture well. Drier periods allow the habitat to open up, but do not produce as much food in the form of seeds and tender vegetation. Stephens' kangaroo rat populations probably respond in complex ways to this interplay between rains, soils, and vegetation.

Diet — Stephens' kangaroo rats are **granivores** (seed eaters) that feed mostly on the seeds and young shoots of filaree and other forbs, annual grasses, and some shrubs (including plants in the genera *Artemesia*, *Amsinckia*, *Avena*, *Brassica*, *Bromus*, *Eriogonum*, *Erodium*, *Salsola*, and *Schismus*). Stephens' kangaroo rats also ingest herbaceous forbs and occasional insects when available. They will forage for seeds that they smell on or below the soil surface, and will readily clip seed heads off of growing filaree, annual grasses, or other plants. When seeds are abundant, food caches are established within burrows or buried in shallow caches scattered around the home range (based on studies of other kangaroo rat species as well as direct behavioral observations of Stephens' kangaroo rats foraging at the Ramona Airport).

Reproduction — Although breeding behavior is not well studied in this species, Stephens' kangaroo rats are probably similar to most kangaroo rats in being generally **promiscuous** (both males and females mating with multiple partners, with no strong pair bonds). Like other kangaroo rats, Stephens' have relatively low reproductive output for a rodent of their size. However, Stephens' kangaroo rats may have somewhat higher reproductive output than most

kangaroo rats, because moister conditions in their habitat can prolong the breeding season relative to that experienced in true deserts. Stephens' kangaroo rats typically produce two litters per year, with an average litter of 2-3 pups. The peak of the breeding season is in the late winter and spring, but males may be reproductive throughout the year. Reproduction is positively related to rainfall, but the pattern is not straightforward. Breeding is stimulated by young, green vegetation. In years with higher than average rainfall, Stephens' kangaroo rats may have a longer breeding season, more litters (up to 5 litters in a good year), and the possibility of females breeding in their birth year (as opposed to waiting until they are 1 year old).

Stephens' kangaroo rats are born **altricial** (naked and pink) but in captivity stop nursing by about day 18. Juveniles typically do not move far from their natal burrow, with home range centers about 30 m from their earliest record. However, they are capable of moving more than 400 m.

Space-Use Patterns — Even in suitable habitat, Stephens' kangaroo rats may be patchily distributed, with clusters of burrows often separated by unoccupied areas. Stephens' kangaroo rats are good dispersers, and probably are capable of colonizing habitat patches hundreds of meters or more from other occupied habitats, so long as there is sufficiently open and gentle terrain to facilitate travel. They often disperse along roads, trails, or the edges of agricultural fields, and will readily take advantage of off-road vehicle tracks or large mammal trails through dense grasses that they otherwise tend to avoid. Typically, however, Stephens' kangaroo rats are **sedentary** (living in one general locale) and maintain stable home ranges, averaging about 0.2 ha (0.5 ac) for males and 0.1 ha (0.25 ac) for females. Male home ranges are irregular in shape and tend to overlap one another as well as those of females. In contrast, female home ranges tend to be more circular in shape with less **intra-sexual** overlap. Population densities can range dramatically with habitat conditions, with less than 1 individual per ha to more than 8 individuals per ha. Typical densities in suitable habitat average about 2-4 individuals per ha (5-10 per ac) but can exceed 50 per ha (122 per ac) in summer in the best habitats and years.

Activity patterns — Stephens' kangaroo rats, like other kangaroo rats, are primarily nocturnal. Individuals generally emerge shortly after dusk to forage, explore, dust bathe, socialize, and carry out other surface activities. Most activity is concentrated in the early evening hours, but they may be active at any hour of the night. Stephens' kangaroo rats are active above ground all year round, but time spent outside the burrow may be reduced on cold or wet nights. Like other kangaroo rat species, they may also seem to limit aboveground movements on bright, moonlit nights, which make them more vulnerable to predators. Observations at the Ramona airport suggest that animals are more active on cloudy than on clear nights around the full moon.

Predators — Common predators of kangaroo rats include snakes (e.g., gopher snakes, rattlesnakes, and whipsnakes), owls (e.g., barn and great horned owls), loggerhead shrikes, long-tailed weasels, and coyotes. House cats also may be serious predators where habitat areas are next to residential development.

Little direct information has been collected on the anti-predatory behavior of the Stephens' kangaroo rat, but other kangaroo rats are known to reduce predation by limiting their activity in bright moonlight and switching activity from open areas to shrub habitat. W. Spencer has observed decreased activity by Stephens' kangaroo rats on moonlit nights at the Ramona airport,

and after seeing a barn owl foraging over their habitat. Kangaroo rats escape predators by **richocetal** locomotion (explosive hops) upon detecting low frequency sounds made by predators (such as air movement created by owl wings) or smelling snake odor. They may also confront snakes by **foot drumming** or kicking sand at the predator. They will also rapidly plug their burrows from the inside when they feel threatened.

Behavior — Stephens' kangaroo rats are generally solitary, with each individual (or mother with young) occupying its own burrow complex. Adult males and females probably only come together for reproduction. Although not yet documented for the Stephens' kangaroo rat, some kangaroo rats communicate their individual identities to other by foot drumming "signatures" and scent deposition at sand-bathing sites. Sand bathing is an important behavior in many rodent species, especially those adapted to arid conditions. Rubbing the body through fine, powdery, sands, and then grooming, removes excess grease from the hair and may control **ectoparasites**. Sand bathing also marks the location with the animals' scent, which is probably important to social communication and helps maintain social spacing systems.

Stephens' kangaroo rat is aggressively dominant over the slightly smaller Dulzura kangaroo rat where they occur in close association. This aggression presumably allows Stephens' kangaroo rats to occupy their favored open habitats, restricting the smaller **congeners** to denser and less ideal shrub habitats.

Sign — Sign of Stephens' kangaroo rats is fairly obvious and diagnostic where populations are dense, but can be very difficult to discern when populations are sparse or ground cover is dense. To the trained eye, the burrow and trail systems have somewhat different characteristics from those of other local species of kangaroo rat, although sign alone cannot be used to definitively discern which species is present in an area. Each Stephens' kangaroo rat generally occupies a burrow system that may have as many as 4 to 6 entrance holes connected by trails. These trails often mirror underground tunnels that connect the surface entrances. The entrance holes tend to be quite round, about 5 to 7 cm in diameter. Entrances can be larger where the kangaroo rat took over an existing ground squirrel burrow, or where gradual erosion of the burrow enlarges it. The species often clears vegetation and other obstructions from around the entrance, out to about 15 to 30 cm radius. Aprons of soil may be pushed out from the mouth of the burrow. To deter predators or to maintain a suitable **microclimate** within their burrows, kangaroo rats will sometimes plug burrow entrances from the inside by pushing dirt up from below. The Stephens' kangaroo rat will occasionally clean old seed chaff, loose soil, and other debris from their burrows, pushing them into small piles outside the entrance hole. One may often find evidence of such "house cleaning" after rain. Other local species of kangaroo rats may conceal burrow entrances beneath shrubs, use trails less habitually, and may not groom the surrounding area as meticulously as Stephens' kangaroo rats.

Need: PHOTO of BURROW with TRAILS

PHOTO or DRAWING of SCATS

Research Needs

- Basic natural history and behavior
- Genetics and effects of small, isolated populations
- Populations trends and cycles and relationships to management actions

Authors: Wayne Spencer, Stephen J. Montgomery, Philip Behrends

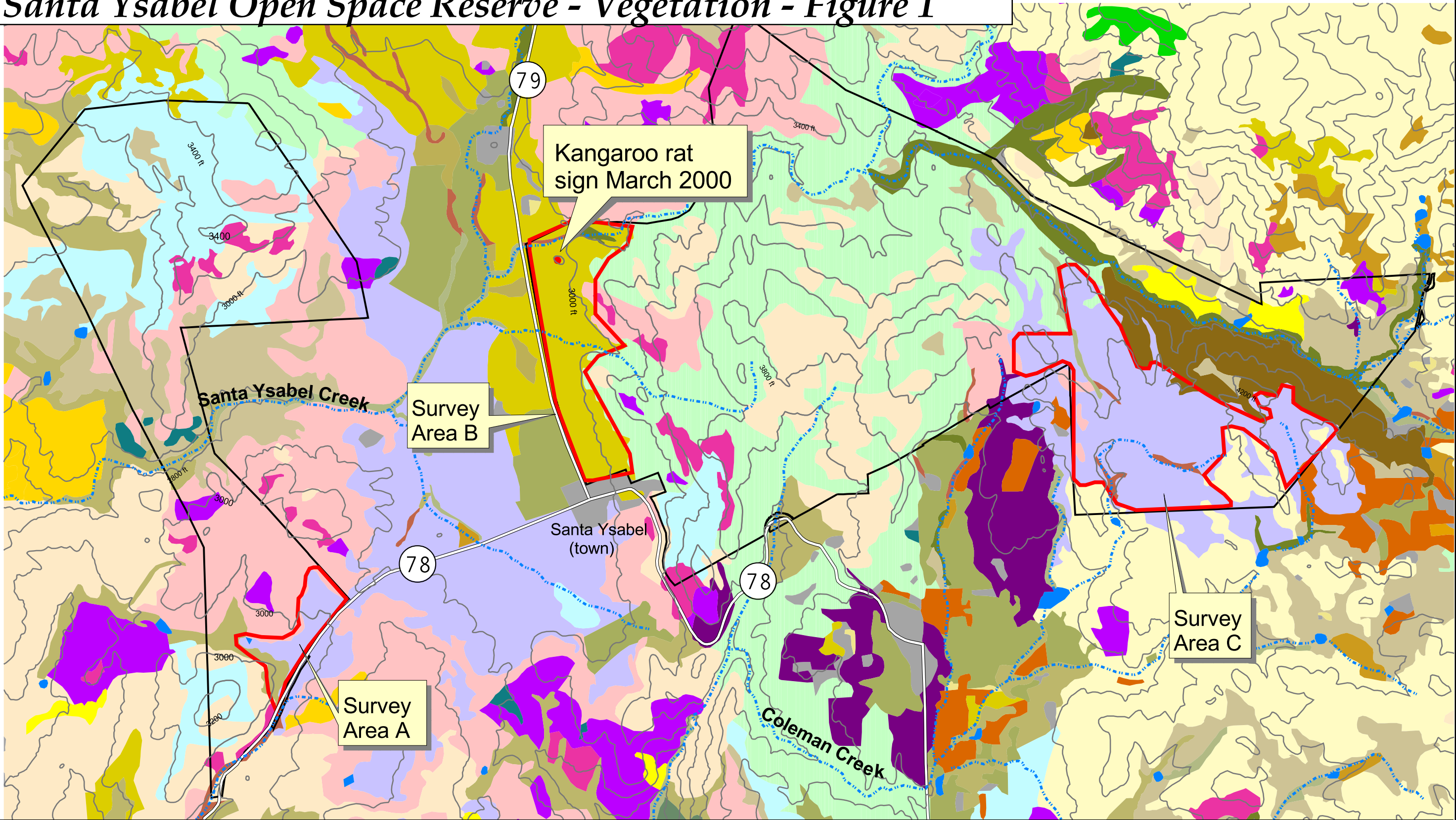
Further Reading

U.S. Fish and Wildlife Service. 1997. Draft recovery plan for the Stephens' kangaroo rat. Region 1, Portland, Oregon.

Burke, R.L., J. Tasse, C. Badgley, S.R. Jones, N. Fishbein, S. Phillips, and M.E. Soulé. 1991. Conservation of the Stephens' kangaroo rat (*Dipodomys stephensi*): Planning for persistence. Bulletin of the Southern California Academy of Science. 90(1):10-40.

O'Farrell, M. J., and C. E. Uptain. 1987. Distribution and aspects of the natural history of Stephens' kangaroo rat (*Dipodomys stephensi*) on the Warner Ranch, San Diego Co., California. Wassmann Journal of Biology 45(1-2):34-48.

Santa Ysabel Open Space Reserve - Vegetation - Figure 1

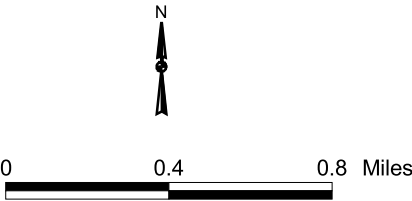


- Chamise Chaparral
- Chaparral
- Dense Coast Live Oak Woodland
- Dense Engelmann Oak Woodland
- Diegan Coastal Sage Scrub
- Dry Montane Meadows
- Eucalyptus Woodland
- Field/Pasture

- Non-Native Grassland
- Northern Mixed Chaparral*
- Open Coast Live Oak Woodland
- Open Engelmann Oak Woodland
- Orchards and Vineyards
- Row Crops
- Sagebrush Scrub
- Southern Coast Live Oak Riparian Forest

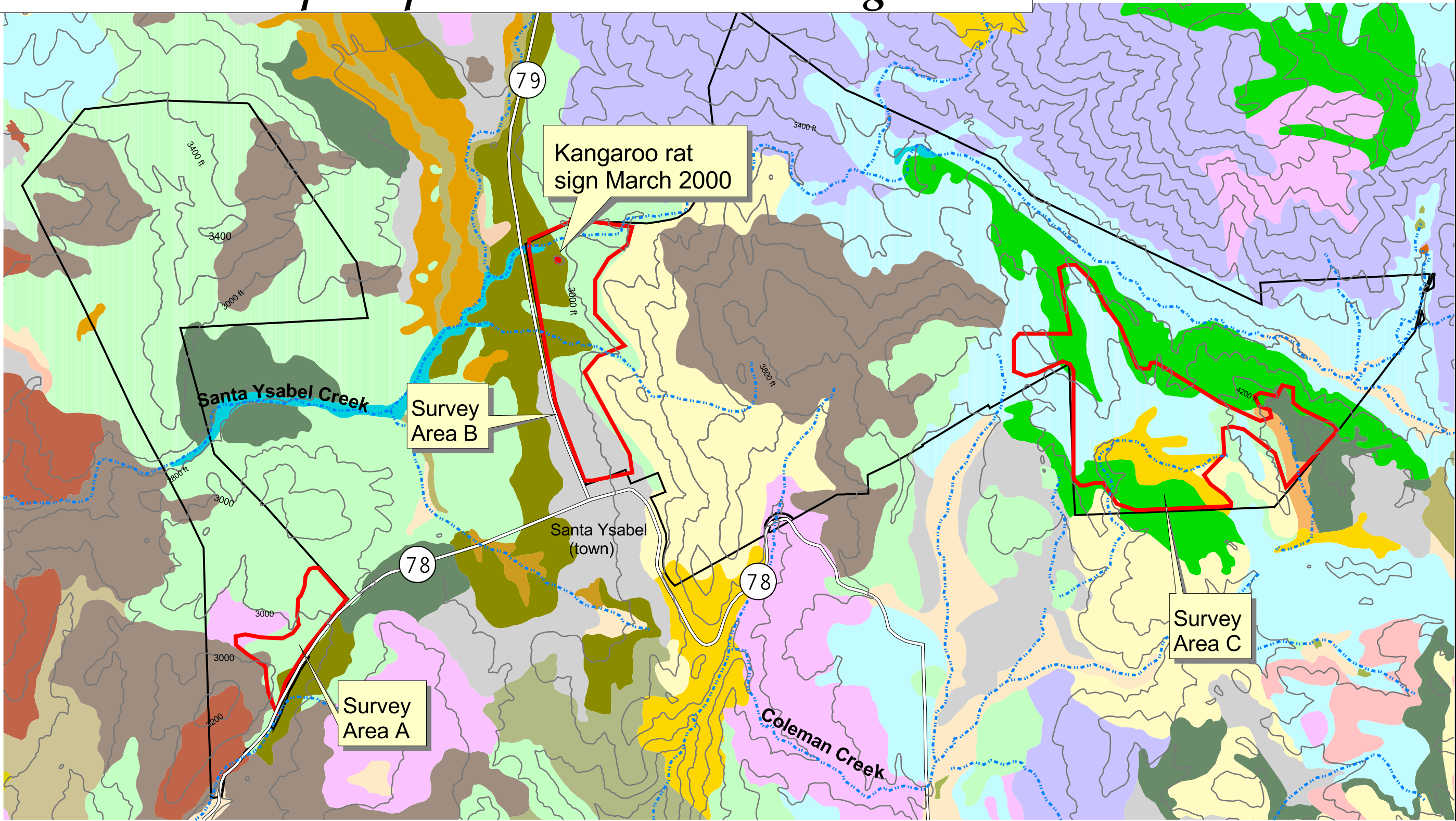
- Flat-topped Buckwheat*
- Foothill/Mountain Perennial Grassland*
- Freshwater
- Granitic Northern Mixed Chaparral*
- Lower Montane Coniferous Forest
- Mixed Oak Woodland*
- Mixed Oak/Coniferous/Bigcone/Coulter*
- Montane Meadow

- Southern Riparian Forest
- Southern Riparian Scrub
- Undifferentiated Dense Woodland*
- Undifferentiated Open Woodland*
- Urban/Developed
- Valley and Foothill Grassland
- Wet Montane Meadow



CONSERVATION
BIOLOGY
INSTITUTE

Santa Ysabel Open Space Reserve - Soils - Figure 2



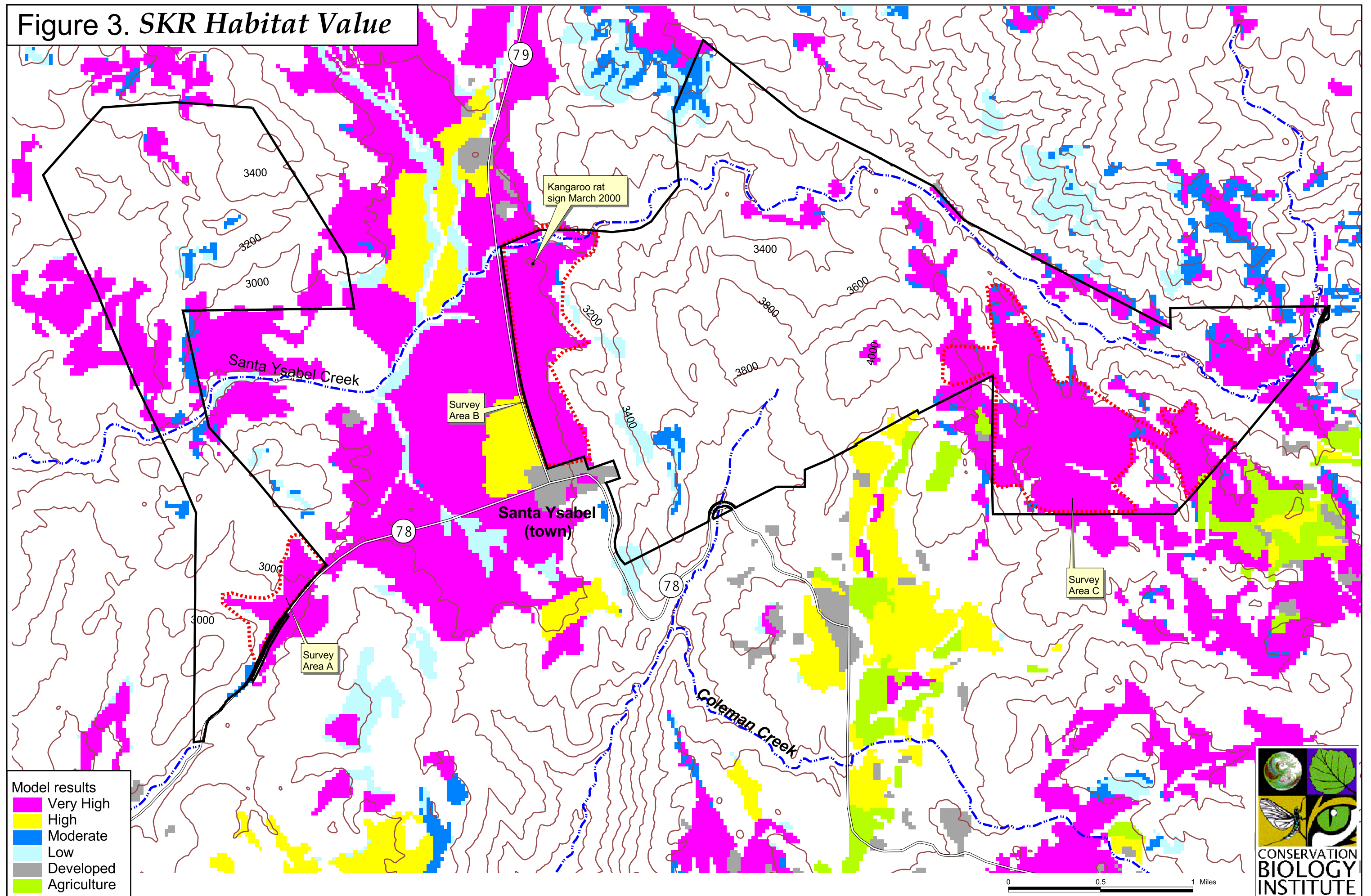
- Acid igneous rock land
- Calpine coarse sandy loam, 2 to 5 percent slopes
- Calpine coarse sandy loam, 5 to 9 percent slopes
- Calpine coarse sandy loam, 9 to 15 percent slopes, eroded
- Cienaba very rocky coarse sandy loam, 30 to 75 percent slopes
- Clayey alluvial land
- Crouch coarse sandy loam, 5 to 30 percent slopes
- Crouch rocky coarse sandy loam, 30 to 70 percent slopes
- Crouch rocky coarse sandy loam, 5 to 30 percent slopes
- Crouch stony fine sandy loam, 30 to 75 percent slopes
- Crouch coarse sandy loam, 30 to 50 percent slopes

- Holland fine sandy loam, 15 to 30 percent slopes
- Holland fine sandy loam, 5 to 15 percent slopes
- Holland fine sandy loam, deep, 2 to 9 percent slopes
- Holland stony fine sandy loam, 30 to 60 percent slopes
- Holland stony fine sandy loam, 5 to 30 percent slopes
- Las Posas fine sandy loam, 5 to 9 percent slopes
- Loamy alluvial land
- Mottsville loamy coarse sand, 2 to 9 percent slopes
- Not listed as perennial or intermittent
- Perennial
- Reiff fine sandy loam, 0 to 2 percent slopes

- Reiff fine sandy loam, 2 to 5 percent slopes
- Riverwash
- Sheephead Rocky fine sandy loam, 30 to 65 percent slopes
- Sheephead rocky fine sandy loam, 9 to 30 percent slopes
- Tollhouse rocky coarse sandy loam, 30 to 65 percent slopes
- Tujunga sand, 0 to 5 percent slopes



Figure 3. *SKR Habitat Value*



Appendix F

State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME
Wildlife and Habitat Data Analysis Branch
California Natural Diversity Database

SPECIAL ANIMALS (817 taxa)

July 2005

The California Natural Diversity Database (CNDDDB) is a continually refined and updated, computerized inventory of location information on the most rare animals, plants, and natural communities in California. The blueprint used to set up the CNDDDB was developed by The Nature Conservancy (TNC) in the early 1970's. The California program was started in 1979. TNC has helped to set up similar programs in all 50 states and a number of foreign countries. Collectively these programs are known as the Natural Heritage Network. The "Heritage Methodology" used by all of these programs sets the standards on the information we gather and the procedures we use. In 1999 TNC and the Natural Heritage Network jointly established an independent organization, the Association for Biodiversity Information (ABI), to achieve their mutual goal of using the wealth of biodiversity information in the Heritage Network to support conservation efforts. In November 2001 ABI changed its name to NatureServe. More information the Natural Heritage Network is available on the NatureServe web site: <http://www.natureserve.org>.

"Special Animals" is a general term that refers to all of the taxa the CNDDDB is interested in tracking, regardless of their legal or protection status. These taxa generally fall into one or more of the following categories:

- Officially listed or proposed for listing under the State and/or Federal Endangered Species Acts.
- State or Federal candidate for possible listing.
- Taxa which meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the California Environmental Quality Act Guidelines. (More information on CEQA is available at http://ceres.ca.gov/topic/env_law/ceqa/guidelines/)
- Taxa considered by the Department to be a Species of Special Concern (SC)
- Taxa that are biologically rare, very restricted in distribution, declining throughout their range, or have a critical, vulnerable stage in their life cycle that warrants monitoring.
- Populations in California that may be on the periphery of a taxon's range, but are threatened with extirpation in California.
- Taxa closely associated with a habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands, vernal pools, etc.)
- Taxa designated as a special status, sensitive, or declining species by other state or federal agencies, or non-governmental organization (NGO).

Taxa marked with a “+” to the left of the scientific name are those for which there is location information in the CNDDDB Geographic Information System (GIS), as of the date of this list.

Additional information on the CNDDDB is available on the Department of Fish and Game web site at: <http://www.dfg.ca.gov/whdab/html/cnddb.html>.

Additional information on other Department programs is available on the DFG web site: <http://www.dfg.ca.gov>. The Habitat Conservation Planning Branch page: <http://www.dfg.ca.gov/hcpb/species/species.shtml> is a particularly rich source of information including such topics as “Survey Standards and Guidelines”, “Threats to Wildlife”, “Habitats”, and “Plant and Animal Pictures”.

Element Occurrence (EO) Definition:

The EO definition refers to the types of information we map. For most animal taxa, the CNDDDB is interested in sightings that indicate the presence of a **resident population**. For many birds, however, the CNDDDB tracks only nesting locations, (those species are so indicated on the list). It is not necessary to actually locate the nest to confirm breeding status. Any indication of breeding (territorial males, adults carrying nest material, adults carrying food, the presence of newly fledged young, etc.) is acceptable evidence of nesting. For other taxa where we track only a certain part of their range or life history, the area or life stage is indicated on the list.

Mapping Conventions:

Our information is mapped as precisely as possible, based upon the source materials available. Generally, observations/collections within ¼ mile, within continuous habitat, are combined into a single element occurrence (EO).

Taxonomic References and Sources of Additional Information:

We follow the most current published taxonomy. There have been a number of recent taxonomic changes that are reflected in this updated list.

For butterflies we followed the taxonomy used by NatureServe:

<http://www.natureserve.org/explorer/>

For fish we made changes based on the following:

Moyle, P. B. 2002. Inland Fishes of California. University of California Press.

For reptiles and amphibians, most of these changes are explained and referenced on the Center for North American Herpetology web site: <http://www.cnah.org>. In addition, we made taxonomic changes based on the following papers:

Feldman, C. R. & J. F. Parham. 2002. Molecular Phylogenetics of Emydine Turtles: Taxonomic Revision and the Evolution of Shell Kinesis. *Molecular Phylogenetics and Evolution* 22(3): 388-398.

Hollingsworth, B. D. 1998. The systematics of chuckwalla (SAUROMALUS) with a phylogenetic analysis of other iguanid lizards. *Herpetological Monographs* (12):38-191.

Mead, Louise S., David R. Clayton, Richard S. Nauman, Deanna H. Olsen, & Michael E. Pfrender. 2005. Newly Discovered Populations of Salamanders from Siskiyou County, California, Represent a Species Distinct from *Plethodon stormi*. *Herpetologica* 61(2): 158-177.

Reeder, T., C. J Cole & H. C. Dessauer. 2002. Phylogenetic Relationships of Whiptail Lizards of the Genus *Cnemidophorus* (Squamata: Teiidae): A Test of Monophyly, Reevaluation of Karyotypic Evolution, and Review of Hybrid Origins. *American Museum Novitates* No. 3365. 61pp.

Shaffer, H. Bradley, G. M. Fellers, S. Randal Voss, J. C. Oliver & Gregory B. Pauly. 2004. Species boundaries, phylogeny and conservation genetics of the red-legged frog (*Rana aurora/draytonii*) complex. *Molecular Ecology* (2004) 13, 2667-2677.

For mammals we made taxonomic changes based on the following papers:

Baker, R. J., L. C. Bradley, R. D. Bradley, J. W. Dragoo, M. D. Engstrom, R. S. Hoffman, C. A. Jones, F. Reid, D. W. Rice, & C. Jones. 2003. Revised Checklist of North American Mammals North of Mexico, 2003. *Museum of Texas Tech University Occasional Papers* 229:1-23.

Bean, C. 2003. An Assessment of the Endangerment Status of the Santa Cruz Kangaroo Rat. MS Thesis, San Jose State University.

Best, T. L., R. K. Chesser, D. A. McCullough, & G. D. Baumgardner. 1996. Genic and Morphometric Variation in Kangaroo Rats, Genus *Dipodomys*, from Coastal California. *Journal of Mammalogy* 77(3):785-800.

Jones, C. A. & C. N. Baxter. 2004. *Thomomys bottae*. *Mammalian Species* 742:1-14.

Matocq, M. D. 2002. Morphological and Molecular Analysis of a Contact Zone in the *Neotoma fuscipes* complex. *Journal of Mammalogy* 83(3):866-883.

Patton, J. L. & M. A. Smith. 1990. The Evolutionary Dynamics of the Pocket Gopher *Thomomys bottae*, with Emphasis on California Populations. *University of California Publications in Zoology* 123:1-161.

CNDDDB RANKS:

The CNDDDB ranking codes are part of the “Heritage Methodology”. It is a shorthand formula that provides information about how rare a taxon is, both throughout its entire range and within California. We use the best information available to assign these ranks and they are changed and refined as new information becomes available. More detailed information on our ranks can be found in Appendix 1.

CALIFORNIA ENDANGERED SPECIES ACT (CESA) LISTING CODES: The listing status of each species is current as of the date of this list. The most current changes in listing status will be found in the list of “Endangered and Threatened Animals of California”, which the CNDDDB updates and issues quarterly (January, April, July, & October).

SE	State-listed as Endangered
ST	State-listed as Threatened
SCE	State candidate for listing as Endangered
SCT	State candidate for listing as Threatened

ENDANGERED SPECIES ACT (ESA) LISTING CODES: The listing status is current as of the date of this list. The most current changes in listing status will be found in the list of “Endangered and Threatened Animals of California”, which the CNDDDB updates and issues quarterly (January, April, July, & October). Federal listing actions are also available at: <http://www.epa.gov/fedrgstr/EPA-SPECIES/index.html>.

After careful consideration we have removed the USFWS Federal Species of Concern (FSC) designation from this list. The Federal Species of Concern list was not maintained on a statewide basis. The Sacramento field office, with jurisdiction over the central portion of California, maintained a list, but the Ventura, Carlsbad and Arcata offices did not.

Therefore, species in the northern and southern parts of the state were not considered.

Information on the list maintained by the Sacramento field office is available at:

http://sacramento.fws.gov/es/spp_concern.htm

FE	Federally listed as Endangered
FT	Federally listed as Threatened
FPE	Federally proposed for listing as Endangered
FPT	Federally proposed for listing as Threatened
FPD	Federally proposed for delisting
FC	Federal candidate species (former Category 1 candidates)
SC	Species of Concern – list established by National Marine Fisheries Service (NMFS) effective 15 April 2004

IUCN CODES:

IUCN - The World Conservation Union, through its **Species Survival Commission SSC**) assess, on a global scale, the conservation status of species, subspecies, varieties and even selected subpopulations in order to highlight taxa threatened with extinction, and therefore promote their conservation. The SSC is firmly committed to providing the world

with the most objective, scientifically-based information on the current status of globally threatened biodiversity. The taxa assessed for the IUCN Red List have been evaluated using the [IUCN Red List Categories and Criteria](#). Detailed information on the IUCN and the Red List is available at: <http://www.redlist.org/>.

OTHER CODES:

AFS: American Fisheries Society categories of risk for marine, estuarine & diadromous fish stocks. These categories are taken from the paper: Musick, J.T. et al. 2000. "Marine, Estuarine, and Diadromous Fish Stocks at Risk of Extinction in North America (Exclusive of Pacific Salmonids). Fisheries 25(11):6-30. Species are categorized as vulnerable, threatened, or endangered, to global extinction. The Status of these organisms was determined by applying risk criteria developed from peer-reviewed knowledge and expert scientific opinion. These criteria are 1) rarity, 2) small range and endemics, 3) specialized habitat requirements, and 4) population resilience to decline. Most stocks face more than one risk factor. Life history limitations and habitat degradation are the two most important risk factors. This paper is available at:

<http://www.fisheries.org/html/fisheries/archive/FISHNOV06-30.pdf>

Audubon: WatchList: WatchList species are those facing population declines and/or threats such as habitat loss on their breeding and wintering grounds, or with limited geographic ranges. The WatchList is a science-based system that focuses attention on at-risk bird species so that limited resources are spent where they are most needed. More information is available at: <http://www.audubon.org/bird/watchlist/index.html>.

BLM: Sensitive: Bureau of Land Management. BLM Manual §6840 defines sensitive species as "...those species that are (1) under status review by the FWS/NMFS; or (2) whose numbers are declining so rapidly that Federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats." Existing California-BLM policy concerning the designation of sensitive species identifies two conditions that must be met before a species may be considered as BLM sensitive: (1) a significant population of the species must occur on BLM-administered lands, and (2) the potential must exist for improvement of the species' condition through BLM management. The "Sensitive Species" designation is not meant to include federally listed species, proposed species, candidate species or State-listed species. It is BLM policy to provide sensitive species with the same level of protection that is given federal candidate species. The list is available at http://www5.or.blm.gov/Resources/Special-Status_species/CAIB99-86.htm.

CDF: Sensitive: California Department of Forestry and Fire Protection. The Board of Forestry classifies as "sensitive species" those species that warrant special protection during timber operations. The list of "sensitive species" is given in §895.1 (Definitions) of the California Forest Practice Rules. The Forest Practice Rules are available at: <http://www.fire.ca.gov/ResourceManagement/pdf/2005FPRulebook.pdf#page2>

DFG: CSC: California Special Concern species. It is the goal and responsibility of the Department of Fish and Game to maintain viable populations of all native species. To this

end, the Department has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "Species of Special Concern" is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long term viability. Not all "Species of Special Concern" have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing as a "Threatened" or "Endangered" species under the State and/or Federal Endangered Species Acts. More information is available on the Department's web site at: <http://www.dfg.ca.gov/hcpb/species/ssc/ssc.shtml>. All of the Species of Special Concern reports are now available on-line:

Birds: http://www.dfg.ca.gov/hcpb/info/bird_ssc.shtml.

Mammals: http://www.dfg.ca.gov/hcpb/info/mammal_ssc.shtml.

Fish: http://www.dfg.ca.gov/hcpb/info/fish_ssc.pdf.

Amphibians & Reptiles: http://www.dfg.ca.gov/hcpb/info/herp_ssc.pdf.

DFG: Fully Protected: The classification of Fully Protected was the State's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibians and reptiles, birds and mammals. Most of the species on these lists have subsequently been listed under the state and/or federal endangered species acts; white-tailed kite, golden eagle, trumpeter swan, northern elephant seal and ring-tailed cat are the exceptions. The white-tailed kite and the golden eagle are tracked in the CNDDDB; the trumpeter swan, northern elephant seal and ring-tailed cat are not.

The Fish and Game Code sections dealing with Fully Protected species state that these species "....may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected" species, although take may be authorized for necessary scientific research. This language arguably makes the "Fully Protected" designation the strongest and most restrictive regarding the "take" of these species. In 2003 the code sections dealing with fully protected species were amended to allow the Department to authorize take resulting from recovery activities for state-listed species

More information on Fully Protected species and the take provisions can be found in the Fish and Game Code, (birds at §3511, mammals at §4700, reptiles and amphibians at §5050, and fish at §5515). Additional information on Fully Protected fish can be found in the California Code of Regulations, Title 14, Division 1, Subdivision 1, Chapter 2, Article 4, §5.93. The category of Protected Amphibians and Reptiles in Title 14 has been repealed. The Fish and Game Code is available online at: <http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=fgc>. Title 14 of the California Code of Regulations is available at: <http://ccr.oal.ca.gov>.

FS: Sensitive: USDA Forest Service defines sensitive species as those plant and animal species identified by a regional forester that are not listed or proposed for listing the federal Endangered Species Act for which population viability is a concern, as evidenced by

significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. Regional Foresters shall identify sensitive species occurring within the region. The list is available at:

http://www.fs.fed.us/biology/resources/pubs/tes/fs_ss_1dec04.pdf

More information is available at: <http://www.fs.fed.us/r2/nebraska/gpng/sensitive.html>.

FWS: BCC: Fish and Wildlife Service: Birds of Conservation Concern: The goal of the *Birds of Conservation Concern 2002* report is to accurately identify the migratory and non-migratory bird species (beyond those already designated as Federally threatened or endangered) that represent our highest conservation priorities and draw attention to species in need of conservation action. We hope, that by focusing attention on these highest priority species, this report will promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby ensuring the future of healthy avian populations and communities. This report is available at:

<http://migratorybirds.fws.gov/reports/BCC02/BCC2002.pdf>

USBC Watch List: The United States Bird Conservation Watch List. Includes the Partners in Flight (PIF) Watch List, the United States Shorebird Conservation Plan Watch List, and the Waterbird Conservation for the Americas Watch List. This combined watch list is available through the American Bird Conservancy at:

<http://www.abcbirds.org/watchlist/index.htm>. Information on Partners in Flight is

available at: <http://www.partnersinflight.org/>.

Information on the United States Shorebird Conservation Plan is available at: <http://shorebirdplan.fws.gov/>. Information on the North American Waterbird Conservation Plan is available at:

<http://www.pwrc.usgs.gov/nacwcp/testarea/nacwcp/pubs/continentalplan.cfm> .

WBWG: High Priority: The Western Bat Working Group is comprised of agencies, organizations and individuals interested in bat research, management and conservation from the 13 western states and provinces. The goals are (1) to facilitate communication among interested parties and reduce risks of species decline or extinction; (2) to provide a mechanism by which current information on bat ecology, distribution and research techniques can be readily accessed; and (3) to develop a forum to discuss conservation strategies, provide technical assistance and encourage education programs. Species designated as "High Priority" are imperiled or are at high risk of imperilment based on available information on distribution, status, ecology and known threats. More information is available at: <http://www.wbwg.org>.

Xerces Society: Red list of pollinators: The Xerces Society is an international non-profit organization dedicated to protecting biological diversity through invertebrate conservation. The Society advocates for invertebrates and their habitats by working with scientists, land managers, educators, and citizens on conservation and education projects. Their core programs focus on endangered species, native pollinators, and watershed health. More information on the Red list of pollinators is available at: <http://www.xerces.org/>

CNDDDB
RANKCESAESAIUCNOTHER**INVERTEBRATES (365 taxa)****BIVALVIA** (clams and mussels)

+ <i>Anodonta californiensis</i>	G3S2?			FS: Sensitive
California floater (mussel)				
<i>Anodonta oregonensis</i>	G5S?			
Oregon floater (mussel)				
<i>Gonidea angulata</i>	G3S1S2			
Western ridged mussel				
+ <i>Margaritifera falcata</i>	G4S2S3?			
Western pearlshell				
<i>Pisidium ultramontanum</i>	G1S1			FS: Sensitive
Fingernail clam				

GASTROPODA (Snails and slugs)

<i>Algamorda newcombiana</i>	G1G2S1S2			
Newcomb's littorine snail				
+ <i>Ammonitella yatesi</i>	G1S1		VU/D2	
Tight coin (=Yates' snail)				
+ <i>Ancotrema voyanum</i>	G1			
Hooded lancetooth				
+ <i>Assiminea infima</i>	G1S1		VU/B1+2c	
Badwater snail				
+ <i>Binneya notabilis</i>	G1S1		DD	
Santa Barbara shelled slug (=slug snail)				
+ <i>Colligyrus convexus</i>	G1G2S1S2			
Canary duskysnail				
+ <i>Eremarionta</i> (=Micrarionta) <i>immaculata</i>	G1S1		VU/D2	
White desert snail				
<i>Eremarionta</i> (=Micrarionta) <i>millepalmarum</i>	G?S?		VU/D2	
Thousand Palms desert snail				
+ <i>Eremarionta</i> (=Micrarionta) <i>morongoana</i>	G1G3S1		LRnt	
Morongo (=Colorado) Desert snail				
+ <i>Eremarionta</i> (=Micrarionta) <i>rowelli bakerensis</i>	G1T1S1		DD	
Baker desert snail				
+ <i>Eremarionta</i> (=Micrarionta) <i>rowelli mccoiana</i>	G1T1S1		DD	
California McCoy snail (=McCoy desert snail)				
+ <i>Fontelicella</i> sp.	G1S1			
Deep Springs Fontelicella				
<i>Fluminicola seminalis</i>	G2S1S2			
Nugget pebblesnail				
+ <i>Haliotis cracherodii</i>	G3G4S3	SC ¹	CR/A4e	
Black abalone				
<i>Haliotis sorenseni</i>	G1S1	FE		
White abalone				
+ <i>Haplotrema catalinense</i>	G1S1			
Santa Catalina lancetooth				
+ <i>Haplotrema durantii</i>	G2G3S2S3			
Durant's snail				

¹ SC refers to the Species of Concern list established by NMFS effective 15 Apr 2004.

Special Animals list – July 2005

	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Helisoma newberryi</i> Great Basin rams-horn	G1?S1				FS: Sensitive
+ <i>Helminthoglypta allynsmithi</i> Merced Canyon shoulderband (snail)	G1S1			VU/D2	
+ <i>Helminthoglypta arrosa monticola</i> Mountain shoulderband (snail)	G2G3T1S1				
+ <i>Helminthoglypta arrosa pomoensis</i> Pomo bronze shoulderband (snail)	G2T1S1			DD	
+ <i>Helminthoglypta arrosa williamsi</i> Williams' bronze shoulderband (snail)	G2T1S1				
+ <i>Helminthoglypta ayresiana sanctaecrucis</i> Ayer's snail	G1G2T1T2S1S2				
+ <i>Helminthoglypta callistoderma</i> Kern shoulderband (snail)	G1S1			EN/B1+2c	
<i>Helminthoglypta coelata</i> Mesa shoulderband (snail)	G1S1			VU/B1+2c	
+ <i>Helminthoglypta concolor</i> Whitefir shoulderband	G1G3S1S3				
<i>Helminthoglypta hertleini</i> Oregon shoulderband	G1S1				
+ <i>Helminthoglypta milleri</i> Peak shoulderband	G1S1				
+ <i>Helminthoglypta mohaveana</i> Victorville shoulderband (snail)	G1S1			LRnt	
+ <i>Helminthoglypta nickliniana awania</i> Nicklin's Peninsula Coast Range shoulderband (snail)	G1T1S1			DD	
+ <i>Helminthoglypta nickliniana bridgesi</i> Bridges' Coast Range shoulderband (snail)	G2T1S1			DD	
+ <i>Helminthoglypta sequoicola consors</i> Redwood shoulderband (snail)	G1G2T1S1			DD	
+ <i>Helminthoglypta talmadgei</i> Trinity shoulderband (snail)	G1G3S1S3				
<i>Helminthoglypta taylori</i> West fork shoulderband	G1S1				
<i>Helminthoglypta traskii</i> Trask shoulderband (snail)	G1G2S1				
+ <i>Helminthoglypta walkeriana</i> Morro shoulderband (snail)	G1S1		FE	CR/A1ce, B1+2bc	
+ <i>Hesperarion plumbeus</i> No common name	G1G3S1S3				
+ <i>Ipnotobius robusta</i> Robust tryonia	G1S1				
+ <i>Juga acutifilosa</i> Topaz juga	G2S2				FS: Sensitive
<i>Juga chacei</i> Chace juga	G1S1				
+ <i>Juga occata</i> Scalloped juga	G1S1				FS: Sensitive
<i>Juga orickensis</i> Redwood juga	G2S1S2				
<i>Lanx alta</i> Highcap lanx	G2S1S2				
<i>Lanx klamathensis</i> Scale lanx	G1S1				

Special Animals list – July 2005

	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Lanx patelloides</i>	G1S1				
Kneecap lanx					
<i>Megomphix californicus</i>	G1G2S1S2				
Natural Bridge megomphix					
+ <i>Micrarionta facta</i>	G1G2S1S2			VU/D2	
Santa Barbara islandsnail					
+ <i>Micrarionta feralis</i>	G1S1			CR/B1+2d	
San Nicolas islandsnail					
+ <i>Micrarionta gabbi</i>	G1S1			VU/D2	
San Clemente islandsnail					
+ <i>Micrarionta opuntia</i>	G1S1			VU/D2	
Pricklypear islandsnail					
<i>Monadenia callipeplus</i>	G1G2S1S2				
Downy sideband					
<i>Monadenia chaceana</i>	G2S2				
Siskiyou sideband					
<i>Monadenia churchi</i>	G2S2				
Klamath sideband					
+ <i>Monadenia circumcarinata</i>	G1S1			VU/D2	BLM: Sensitive
Keeled sideband (snail)					
<i>Monadenia cristulata</i>	G1G2S1S2				
Crested sideband					
<i>Monadenia fidelis leonina</i>	G4G5T2S1S2				
No common name					
+ <i>Monadenia fidelis pronotis</i>	G4G5T1S1			DD	
Rocky coast Pacific sideband (= Rocky coast sideband)					
<i>Monadenia infumata ochromphalus</i>	G1G2T1S1				
No common name					
<i>Monadenia marmarotis</i>	G?S?				
Marble sideband					
+ <i>Monadenia mormonum buttoni</i>	G1G2T1S1			DD	
Button's Sierra sideband (snail)					
+ <i>Monadenia mormonum hirsuta</i>	G1G2T1S1			DD	BLM: Sensitive
Hirsute Sierra sideband (snail)					
+ <i>Monadenia setosa</i>	G2S2	ST		VU/D2	
Trinity bristle snail					
+ <i>Monadenia troglodytes</i>	G1G2S1S2			DD	FS: Sensitive
Shasta sideband (snail)					
+ <i>Monadenia tuolumneana</i>	G1S1				
Tuolumne sideband (snail)					
+ <i>Monadenia yosemitensis</i>	G1S1				
Yosemite mariposa sideband (snail)					
<i>Noyo intersessa</i>	G2S1S2				
Tenmile shoulderband					
<i>Pomatiopsis binneyi</i>	G1S1				
Robust walker					
<i>Pomatiopsis californica</i>	G1S1				
Pacific walker					
<i>Pomatiopsis chacei</i>	G1S1				
Marsh walker					
+ <i>Pristiloma shepardae</i>	G1S1				
Shepard's snail					
+ <i>Pristinicola hemphilli</i>	G3S1				
Pristine pyrg					

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
<i>Punctum hannai</i>	G1S1				
Trinity spot					
+ <i>Pyrgulopsis aardahli</i>	G1S1				
Benton Valley (=Aahrdahl's) springsnail					
<i>Pyrgulopsis archimedis</i>	G1S1				
Archimedes pyrg					
<i>Pyrgulopsis cinerana</i>	G1G2S1S2				
Ash Valley pyrg					
+ <i>Pyrgulopsis diablensis</i>	G1S1				
Diablo Range pyrg					
<i>Pyrgulopsis eremica</i>	G2S2				
Smoke Creek pyrg					
<i>Pyrgulopsis falciglans</i>	G1S1				
Likely pyrg					
+ <i>Pyrgulopsis gibba</i>	G3S2?				
Surprise Valley pyrg					
+ <i>Pyrgulopsis greggi</i>	G1S1				
Kern River pyrg					
<i>Pyrgulopsis lassenii</i>	G1G2S1S2				
Willow Creek pyrg					
+ <i>Pyrgulopsis longae</i>	G1S1				
Long Valley pyrg					
+ <i>Pyrgulopsis owensensis</i>	G1G2S1S2				FS: Sensitive
Owens Valley springsnail					
+ <i>Pyrgulopsis perturbata</i>	G1G2S1S2				
Fish Slough springsnail					
<i>Pyrgulopsis rupinicola</i>	G1S1				
Sucker Springs pyrg					
<i>Pyrgulopsis taylori</i>	G1S1				
San Luis Obispo pyrg					
<i>Pyrgulopsis ventricosa</i>	G1S1				
Clear Lake pyrg					
+ <i>Pyrgulopsis wongi</i>	G1G2S1S2				FS: Sensitive
Wong's springsnail					
+ <i>Radiocentrum</i> (=Oreohelix) <i>avalonense</i>	G1S1			CR/B1+2c	
Catalina mountainsnail					
<i>Rothelix warnerfontis</i>	G1S1				
Warner Spring shoulderband					
+ <i>Sterkia clementina</i>	G1S1			LRnt	
San Clemente Island blunt-top snail					
<i>Trilobopsis roperi</i>	G1S1				
Shasta chaparral					
<i>Trilobopsis tehamana</i>	G1S1				
Tehama chaparral					
+ <i>Tryonia imitator</i>	G2G3S2S3			DD	
Mimic Tryonia (California brackishwater snail)					
+ <i>Tryonia margae</i>	G1S1				
Grapevine Springs elongate tryonia					
+ <i>Tryonia rowlandsi</i>	G1S1				
Grapevine Springs squat tryonia					
+ <i>Vespericola karokorum</i>	G2G3S2S3			DD	
Karok Hesperian (=Karok Indian snail)					
+ <i>Vespericola marinensis</i>	G2G3S2S3				
Marin hesperian					

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Vespericola pressleyi</i> Big bar hesperian	G1S1				
+ <i>Vespericola shasta</i> Shasta hesperian	G1S1				
<i>Vespericola sierranus</i> Siskiyou hesperian	G2S1S2				
+ <i>Xerarionta intercosa</i> Horseshoe snail (=Plain cactusnail)	G1S1			VU/D2	
+ <i>Xerarionta redimita</i> Wreathed cactusnail	G1S1			VU/D2	
<i>Xerarionta tryoni</i> Bicolor cactusnail	G1S1			VU/D2	

ARACHNIDA (Spiders and relatives)

<i>Aphrastochthonius grubbsi</i> Grubbs' Cave pseudoscorpion	G1G2S1S2				
<i>Archeolarca aalbui</i> Aalbu's Cave pseudoscorpion	G1G2S1S2				
+ <i>Banksula californica</i> No common name	GHS1				
+ <i>Banksula galilei</i> Galile's cave harvestman	G1S1				
+ <i>Banksula grubbsi</i> Grubbs' cave harvestman	G1S1				
+ <i>Banksula incredula</i> Incredible harvestman	G1S1				
+ <i>Banksula martinorum</i> Martins' cave harvestman	G1S1				
+ <i>Banksula melones</i> Melones Cave harvestman	G2G3S2			VU/A2c	
+ <i>Banksula rudolphi</i> Rudolph's cave harvestman	G1S1				
+ <i>Banksula tuolumne</i> Tuolumne cave harvestman	G1S1				
+ <i>Banksula tutankhamen</i> King Tut Cave harvestman	G1S1				
+ <i>Calicina arida</i> No common name	G1S1				
+ <i>Calicina breva</i> No common name	G1S1				
+ <i>Calicina cloughensis</i> No common name	G1S1				
+ <i>Calicina conifera</i> No common name	G1S1				
+ <i>Calicina diminua</i> Marin blind harvestman	G1S1				
+ <i>Calicina dimorphica</i> No common name	G1G2?S1S2?				
+ <i>Calicina macula</i> No common name	G1S1				
+ <i>Calicina mesaensis</i> Table Mtn harvestman	G1S1				
+ <i>Calicina (=Sitalcina) minor</i> Edgewood blind harvestman	G1S1				

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Calicina piedra</i> Piedra harvestman	G1G2?S1S2?				
+ <i>Calileptoneta briggsi</i> Briggs' leptonetid spider	G1S1				
+ <i>Calileptoneta oasa</i> No common name	G1S1				
+ <i>Calilptoneta ubicki</i> Ubick's leptonetid spider	G1S1				
+ <i>Calilptoneta wapiti</i> No common name	G1S1				
+ <i>Fissilicreagris</i> (=Microcreagris) <i>imperialis</i> Empire Cave pseudoscorpion	G1S1			VU/D2	
<i>Hubbardia idria</i> No common name	G1S1				
+ <i>Hubbardia secoensis</i> No common name	G1S1				
+ <i>Hubbardia shoshonensis</i> Shoshone Cave whip-scorpion	G1S1				BLM: Sensitive
+ <i>Larca laceyi</i> Lacey's Cave pseudoscorpion	G1S1				
+ <i>Meta dolloff</i> Dolloff Cave spider	G1S1			VU/D2	
+ <i>Microcina edgewoodensis</i> Edgewood Park micro-blind harvestman	G1S1				
+ <i>Microcina homi</i> Hom's micro-blind harvestman	G1S1				
+ <i>Microcina jungi</i> Jung's micro-blind harvestman	G1S1				
+ <i>Microcina leei</i> Lee's micro-blind harvestman	G1S1				
+ <i>Microcina lumi</i> Fairmont (=Lum's) micro-blind harvestman	G1S1				
+ <i>Microcina tiburona</i> Tiburon micro-blind harvestman	G1S1				
+ <i>Neochthonius imperialis</i> No common name	G1S1				
+ <i>Pseudogarypus orpheus</i> Music Hall Cave pseudoscorpion	G1S1				
+ <i>Socalchemmis gertschi</i> Gertsch's socalchemmis spider	G1S1				
+ <i>Socalchemmis icenoglei</i> Icenogle's socalchemmis spider	G1S1				
+ <i>Socalchemmis monterey</i> Monterey socalchemmis spider	G1S1				
+ <i>Talanites moodyae</i> Moody's gnaphosid spider	G1G2S1S2				
+ <i>Talanites ubicki</i> Ubick's gnaphosid spider	G1S1				
<i>Telema</i> sp. Santa Cruz telemid spider	G1S1				
<i>Texella deserticola</i> Whitewater Canyon harvestman	G1S1				
+ <i>Texella kokoweef</i> Kokoweef Crystal Cave harvestman	G1S1				

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Texella Shoshone</i> Shoshone Cave harvestman	G1S1				
CRUSTACEA, Order Anostraca (fairy shrimp)					
+ <i>Artemia monica</i> Mono brine shrimp	G1S1			LRcd	
+ <i>Branchinecta campestris</i> Pocket pouch fairy shrimp	G4S1				
+ <i>Branchinecta conservatio</i> Conservancy fairy shrimp	G1S1		FE	EN/A2c	
+ <i>Branchinecta longiantenna</i> Longhorn fairy shrimp	G1S1		FE	EN/A2c	
+ <i>Branchinecta lynchi</i> Vernal pool fairy shrimp	G2G3S2S3		FT	VU/A2c	
+ <i>Branchinecta mesovallensis</i> Midvalley fairy shrimp	G2S2				
+ <i>Branchinecta sandiegonensis</i> San Diego fairy shrimp	G1S1		FE	EN/A2c	
+ <i>Linderiella occidentalis</i> California linderiella	G2G3S2S3			LRnt	
+ <i>Linderiella santarosae</i> Santa Rosa Plateau fairy shrimp	G1G2S1S2				
+ <i>Streptocephalus woottoni</i> Riverside fairy shrimp	G1S1		FE	EN/A2c	
CRUSTACEA, Order Notostraca (tadpole shrimp)					
+ <i>Lepidurus packardii</i> Vernal pool tadpole shrimp	G2G3S2S3		FE	VU/A2c	
CRUSTACEA, Order Anomopoda (water fleas)					
+ <i>Dumontia oregonensis</i> No common name	G1G3S1S3				
CRUSTACEA, Order Isopoda (isopods)					
+ <i>Caecidotea sequoiae</i> Isopod	G1G2S1S2				
+ <i>Caecidotea tomalensis</i> Tomales isopod	G2S2				
+ <i>Calasellus californicus</i> No common name	G2G3S2S3				
+ <i>Calasellus longus</i> No common name	G1G2S1S2				
CRUSTACEA, Order Amphipoda (amphipods)					
+ <i>Stygobromus gradyi</i> Grady's Cave amphipod	G1S1			VU/D2	
+ <i>Stygobromus harai</i> Hara's Cave amphipod	G1G2S1S2			VU/D2	
+ <i>Stygobromus mackenziei</i> MacKenzie's Cave amphipod	G1G2S1S2			VU/D2	

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Stygobromus wengerorum</i> Wengerors' Cave amphipod	G1G2S1S2			VU/D2	
CRUSTACEA, Order Decapoda (crayfish & shrimp)					
+ <i>Pacifastacus fortis</i> Shasta crayfish	G1S1	SE	FE	CR/B1+2c	
+ <i>Pacifastacus leniusculus klamathensis</i> Klamath crayfish	G5T5S3				
+ <i>Syncaris pacifica</i> California freshwater shrimp	G1S1	SE	FE	EN/A1ce	
INSECTA, Order Odonata (dragonflies & damselflies)					
+ <i>Ischnura gemina</i> San Francisco forktail damselfly	G2S2				
INSECTA, Order Plecoptera (stoneflies)					
+ <i>Capnia lacustra</i> Lake Tahoe benthic stonefly	G1S1				
+ <i>Megaleuctra sierra</i> Shirttail Creek stonefly	G1?QS1?				
INSECTA, Order Orthoptera (grasshoppers, katydids, and crickets)					
+ <i>Ammopelmatus kelsoensis</i> Kelso Jerusalem cricket	G1G3S1S2			VU/B1+2bd	
+ <i>Ammopelmatus muwu</i> Point Conception Jerusalem cricket	G1?S1?			VU/B1+2bd	
+ <i>Idiostatus kathleenae</i> Pinnacles shieldback katydid	G1G2S1S2				
+ <i>Idiostatus middlekaufi</i> Middlekauf's shieldback katydid	G1G2S1			CR/B1+2bd	
+ <i>Macrobaenetes kelsoensis</i> Kelso giant sand treader cricket	G1S1			VU/B1+2bd	
+ <i>Macrobaenetes valgum</i> Coachella giant sand treader cricket	G1G2S1S2			VU/B1+2bd	
+ <i>Neduba longipennis</i> Santa Monica shieldback katydid	G1G2S1S2			CR/B1+2bd	
+ <i>Pristoceuthophilus</i> sp Samwell Cave cricket	G1G3S1S3			VU/D1+2	
+ <i>Psychomastax deserticola</i> Desert monkey grasshopper	G1G3S1S2			VU/B1+2bd	
+ <i>Stenopelmatus cahuilaensis</i> Coachella Valley Jerusalem cricket	G1G2S1S2			VU/B1+2bd	
+ <i>Tetrix sierrana</i> Sierra pygmy grasshopper	G1G2S1S2			VU/D2	
+ <i>Trimerotropis infantilis</i> Zayante band-winged grasshopper	G1S1		FE	EN/A1c	
+ <i>Trimerotropis occidentiloides</i> Santa Monica Mountains Grasshopper	G1G2S1S2			EN/A1c	
+ <i>Trimerotropis occulens</i> Lompoc Grasshopper	G1G2S1S2			EN/A1c	

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
INSECTA, Order Heteroptera (true bugs)					
+ <i>Ambrysus funebris</i> Nevares Spring naucorid bug	G1S1		FC		
+ <i>Belostoma saratogae</i> Saratoga Springs belostoman bug	G1S1				
+ <i>Oravelia pege</i> Dry Creek cliff strider bug	G1S1				
+ <i>Pelocoris shoshone</i> Amargosa naucorid bug	G1G3S1S2				
+ <i>Saldula usingeri</i> Wilber Springs shorebug	G1S1				
INSECTA, Order Neuroptera (lacewings)					
+ <i>Nothochrysa californica</i> San Francisco lacewing	G1G3S1S3				
+ <i>Oliarces clara</i> Cheeseweed moth lacewing	G1G3S1S3				
INSECTA, Order Coleoptera (beetles)					
+ <i>Aegialia concinna</i> Ciervo aegialian scarab beetle	G1S1			VU/D2	BLM: Sensitive
+ <i>Agabus rumpffi</i> Death Valley agabus diving beetle	G1G3S1				
+ <i>Anomala carlsoni</i> Carlson's dune beetle	G2S2				
+ <i>Anomala hardyorum</i> Hardy's dune beetle	G2S2				
+ <i>Anthicus sacramento</i> Sacramento anthicid beetle	G1S1			EN/B1+2c	
+ <i>Atractelmis wawona</i> Wawona riffle beetle	G1G3S1S2				
+ <i>Chaetarthria leechi</i> Leech's chaetarthrian water scavenger beetle	G1?S1?				
+ <i>Cicindela gabbii</i> Gabb's tiger beetle	G4S1				
+ <i>Cicindela hirticollis abrupta</i> Sacramento Valley tiger beetle	G5THSH				
+ <i>Cicindela hirticollis gravida</i> Sandy beach tiger beetle	G5T4S1				
+ <i>Cicindela latesignata latesignata</i> Tiger beetle	G4T1T2S1				
+ <i>Cicindela ohlone</i> Ohlone tiger beetle	G1S1		FE		
+ <i>Cicindela senilis frosti</i> Tiger beetle	G4T1S1				
+ <i>Cicindela tranquebarica viridissima</i> Greenest tiger beetle	G5T1S1				
+ <i>Cicindela tranquebarica</i> ssp. San Joaquin tiger beetle	G5T1S1				
+ <i>Coelus globosus</i> Globose dune beetle	G1S1			VU/A1c	

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Coelus gracilis</i> San Joaquin dune beetle	G1S1			VU/A1c,D2	BLM: Sensitive
<i>Coenonycha clementina</i> San Clemente Island coenonycha beetle	G1?S1?				
+ <i>Dinacoma caseyi</i> Casey's June beetle	G1S1				
+ <i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	G3T2S2		FT		
+ <i>Dubiraphia brunnescens</i> Brownish dubiraphian riffle beetle	G1G3S1S3				
+ <i>Dubiraphia giulianii</i> Giuliani's dubiraphian riffle beetle	G1G3S1S3				
+ <i>Elaphrus viridis</i> Delta green ground beetle	G1S1		FT	CR/B1+2ab c+3a	
+ <i>Glaresis arenata</i> Kelso Dune glaresis scarab beetle	G1G3S1S3				
+ <i>Hydrochara rickseckeri</i> Ricksecker's water scavenger beetle	G1G2S1S2				
+ <i>Hydroporus hirsutus</i> Woolly hydroporus diving beetle	G1G3S1S3				
+ <i>Hydroporus leechi</i> Leech's skyline diving beetle	G1?S1?				
+ <i>Hydroporus simplex</i> Simple hydroporus diving beetle	G1?S1?				
+ <i>Hygrotus curvipes</i> Curved-foot hygrotus diving beetle	G1S1				
+ <i>Hygrotus fontinalis</i> Travertine band-thigh diving beetle	G1S1				
+ <i>Lichnanthe albipilosa</i> White sand bear scarab beetle	G1S1				
+ <i>Lichnanthe ursina</i> Pacific sand bear scarab beetle	G2S2				
+ <i>Lytta hoppingi</i> Hopping's blister beetle	G1G2S1S2				
<i>Lytta insperata</i> Mojave Desert blister beetle	G1G2S1S2				
+ <i>Lytta moesta</i> Moestan blister beetle	G2S2				
+ <i>Lytta molesta</i> Molestan blister beetle	G2S2				
+ <i>Lytta morrisoni</i> Morrison's blister beetle	G1G2S1S2				
<i>Microcylloepus formicoides</i> No common name	G?S?				
+ <i>Miloderes nelsoni</i> Nelson's miloderes weevil	G1G3S1S3				
+ <i>Nebria darlingtoni</i> South Forks ground beetle	G1S1				
+ <i>Nebria gebleri siskiyouensis</i> Siskiyou ground beetle	G4G5T4S1S3				
+ <i>Nebria sahlbergii triad</i> Trinity Alps ground beetle	G1G3T1T3S1S3				
+ <i>Necydalis rudei</i> Rude's longhorn beetle	G1G2S1S2				

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
<i>Ochthebius crassalus</i> Wing-shoulder minute moss beetle	G1G3S1S3				
+ <i>Ochthebius relictus</i> Wilbur Springs minute moss beetle	G1S1				
+ <i>Onychobaris langei</i> Lange's El Segundo dune weevil	G1S1				
+ <i>Optioservus canus</i> Pinnacles optioservus riffle beetle	G1S1				
+ <i>Polyphylla anteronivea</i> Saline Valley snow-front June beetle	G1S1				
+ <i>Polyphylla barbata</i> Mount Hermon (=barbate) June beetle	G1S1		FE		
+ <i>Polyphylla erratica</i> Death Valley June beetle	G1S1				
+ <i>Polyphylla nubila</i> Atascadero June beetle	G1S1				
+ <i>Pseudocotalpa andrewsi</i> Andrew's dune scarab (beetle)	G2G3S2S3				
<i>Scaphinotus behrensi</i> (Ground beetle, no common name)	G?S?				
+ <i>Trigonoscute brunnotessellata</i> Brown-tassel trigonoscute weevil	G1G2S1S2				
+ <i>Trigonoscute dorothea dorothea</i> Dorothy's El Segundo dune weevil	G1T1S1				
+ <i>Trigonoscute stantoni</i> Santa Cruz Island shore weevil	G1?S1?				
+ <i>Trigonoscute "doyeni"</i> (manuscript name) Doyen's trigonoscute dune weevil	G1S1				
INSECTA, Order Mecoptera (scorpionflies)					
+ <i>Orobittacus obscurus</i> Gold rush hanging scorpionfly	G1S1				
INSECTA, Order Diptera (flies)					
+ <i>Ablautus schlingeri</i> Oso Flaco robber fly	G1S1				
+ <i>Brennania belkini</i> Belkin's dune tabanid fly	G1G2S1S2			VU/A2ce	
+ <i>Efferia antiochi</i> Antioch efferian robberfly	G1G3S1S3				
+ <i>Metapogon hurdi</i> Hurd's metapogon robberfly	G1G3S1S3				
+ <i>Paracoenia calida</i> Wilbur Springs shore fly	G1S1				
+ <i>Rhaphiomidas terminatus abdominalis</i> Delhi Sands flower-loving fly	G1T1S1		FE		
INSECTA, Order Lepidoptera (butterflies & moths)					
+ <i>Adela oplerella</i> Opler's longhorn moth	G2G3S2S3				
+ <i>Apodemia mormo langei</i> Lange's metalmark butterfly	G5T1S1		FE		Xerces: Critically imperiled

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
+ <i>Areniscythis brachypteris</i> Oso Flaco flightless moth	G1S1				
+ <i>Callophrys mossii bayensis</i> San Bruno elfin butterfly	G3G4T1S1		FE		Xerces: Critically imperiled
+ <i>Callophrys mossii hidakupa</i> San Gabriel Mountains elfin butterfly	G3G4T1T2S1S2				
+ <i>Callophrys mossii marinensis</i> Marin Elfin butterfly	G3G4T1S1				
+ <i>Carolella busckana</i> Busck's gall moth	G1G3SH				
+ <i>Carterocephalus palaemon magnus</i> Sonoma arctic skipper	G5T1S1				
<i>Cercyonis pegala carsonensis</i> Carson Valley wood nymph butterfly	G5T2S1S2				
+ <i>Chlosyne leanira elegans</i> Oso Flaco patch checkerspot butterfly	G4G5T1T2S1S2				
+ <i>Coenonympha tullia yontockett</i> Yontocket satyr butterfly	G5T1S1				
+ <i>Danaus plexippus</i> (wintering sites) Monarch butterfly	G4S3				
+ <i>Euchloe hyantis andrewsi</i> Andrew's marble butterfly	G3G4T1S1				
+ <i>Eucosma hennei</i> Henne's eucosman moth	G1S1				
+ <i>Euphilotes battoides allyni</i> El Segundo blue butterfly	G5T1S1		FE		Xerces: Critically imperiled
+ <i>Euphilotes battoides comstocki</i> Comstock's blue butterfly	G5T1T3S1S3				
+ <i>Euphilotes enoptes smithi</i> Smith's blue butterfly	G5T1T2S1S2		FE		Xerces: Critically imperiled
+ <i>Euphydryas editha bayensis</i> Bay checkerspot butterfly	G5T1S1		FT		Xerces: Critically imperiled
<i>Euphydryas editha monoensis</i> Mono checkerspot butterfly	G5T3?SX				
+ <i>Euphydryas editha quino</i> Quino checkerspot butterfly	G5T1S1		FE		Xerces: Critically imperiled
<i>Euphyes vestris harbisoni</i> Dun skipper	G5T1S1				
+ <i>Euproserpinus euterpe</i> Kern primrose sphinx moth	G1S1		FT		Xerces: Critically imperiled
+ <i>Glaucopsyche lygdamus paloverdesensis</i> Palos Verdes blue butterfly	G5T1S1		FE		Xerces: Critically imperiled
+ <i>Hesperia miriamae longaevicola</i> White Mountains skipper	G2G3T1S1				
<i>Hesperopsis graciellae</i> MacNeill sooty wing skipper	G2G3S1S3				Xerces: Vulnerable
+ <i>Lycaena hermes</i> Hermes copper butterfly	G1G2S1S2			VU/D2	
<i>Lycaena rubidus incana</i> White Mountains copper butterfly	G5T1S1				
+ <i>Mitoura thornei</i> Thorne's hairstreak butterfly	G1S1				
+ <i>Panoquina errans</i> Wandering (=Saltmarsh) skipper	G4G5S1			LRnt	

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
+ <i>Philotiella speciosa bohartorum</i> Bohart's blue butterfly	G3T1S1				
+ <i>Plebejus icarioides albihalos</i> White Mountains icarioides blue butterfly	G5T2?S2?				
+ <i>Plebejus icarioides missionensis</i> Mission blue butterfly	G5T1S1		FE		Xerces: Critically imperiled
+ <i>Plebejus icarioides moroensis</i> Morro Bay blue butterfly	G5T1T3S1S3				
+ <i>Plebejus icarioides parapheres</i> Point Reyes blue butterfly	G5T1S1				
+ <i>Plebegus idas lotis</i> Lotis blue butterfly	G5T1S1		FE		Xerces: Critically imperiled ²
+ <i>Plebulina emigdionis</i> San Emigdio blue butterfly	G2G3S2S3				
+ <i>Plebejus saepiolus albomontanus</i> White Mountains saepiolus blue butterfly	G5T2S1S2				
+ <i>Plebejus saepiolus aureolus</i> San Gabriel Mountains blue butterfly	G5T1S1				
+ <i>Polites mardon</i> Mardon skipper	G2G3S1		FC		Xerces: Imperiled
+ <i>Polites sabuleti albamontana</i> White Mountains sandhill skipper	G5T2S1S2				
+ <i>Pseudocopaeodes eunus eunus</i> Alkali (=wandering) skipper	G3G4T1T3S1S3				Xerces: Critically imperiled
+ <i>Pseudocopaeodes eunus obscurus</i> Carson wandering skipper	G3G4T1S1		FE		
+ <i>Pyrgus ruralis lagunae</i> Laguna Mountains skipper	G5T1S1		FE		
+ <i>Speyeria adiastrum adiastrum</i> Unsilvered fritillary butterfly	G1G2T1S1				
+ <i>Speyeria callippe callippe</i> Callippe silverspot butterfly	G5T1S1		FE		Xerces: Critically imperiled
+ <i>Speyeria egleis tehachapina</i> Tehachapi Mountain silverspot butterfly	G5T1T2S1S2				
+ <i>Speyeria nokomis carsonensis</i> Carson Valley silverspot butterfly	G3T1S1				
+ <i>Speyeria zerene behrensii</i> Behren's silverspot butterfly	G5T1S1		FE		Xerces: Critically imperiled
+ <i>Speyeria zerene hippolyta</i> Oregon silverspot butterfly	G5T1S1		FT		Xerces: Critically imperiled
+ <i>Speyeria zerene myrtleae</i> Myrtle's silverspot butterfly	G5T1S1		FE		Xerces: Critically imperiled

INSECTA, Order Trichoptera (caddisflies)

+ <i>Cryptochia denningi</i> Denning's cryptic caddisfly	G1G2SS2				
+ <i>Cryptochia excella</i> Kings Canyon cryptochian caddisfly	G1G2S1S2				
+ <i>Cryptochia Shasta</i> Confusion caddisfly	G1G2S1S2				

² Xerces list gives name as *Lycaeides idas lotis*

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Desmona bethula</i> Amphibious caddisfly	G1G3S1S3				
+ <i>Diplectrona californica</i> California diplectronan caddisfly	G1G3S1S3				
+ <i>Ecclisomyia bilera</i> King's Creek ecclisomian caddisfly	G1G2S1S2				
+ <i>Farula praelonga</i> Long-tailed caddisfly	G1G2S1S2				
+ <i>Goeracea oregona</i> Sagehen Creek goeracean caddisfly	G2S1S2				
+ <i>Lepidostoma ermanae</i> Cold Spring caddisfly	G1G2S1S2				
+ <i>Limnephilus atercus</i> Fort Dick limnephilus caddisfly	G2?S1				
+ <i>Neothremma genella</i> Golden-horned caddisfly	G1?S1?				
+ <i>Neothremma siskiyou</i> Siskiyou caddisfly	G?S?				
+ <i>Parapsyche extensa</i> King's Creek parapsyche caddisfly	GHS				
+ <i>Rhyacophila lineata</i> Castle Crag rhyacophilan caddisfly	G1G2S1S2				
+ <i>Rhyacophila mosana</i> Bilobed rhyacophilan caddisfly	G1G2S1S2				
+ <i>Rhyacophila spinata</i> Spiny rhyacophilan caddisfly	G1G2S1S2				
INSECTA, Order Hymenoptera (ants, bees, & wasps)					
+ <i>Andrena (Diandrena) blennospermatis</i> No common name	G2S2				
+ <i>Andrena (Diandrena) macswaini</i> No common name	G1G3S1S3				
+ <i>Andrena (Diandrena) subapasta</i> No common name	G1G3S1S3				
+ <i>Argochrysis lassenae</i> No common name	G1S1				
+ <i>Ashmeadiella chumashae</i> No common name	G2?S2?				
+ <i>Bombus franklini</i> Franklin's bumblebee	G?S?				Xerces: Critically imperiled
+ <i>Bombus occidentalis</i> Western bumblebee	G?S?				
+ <i>Ceratochrysis bradleyi</i> No common name	G1S1				
+ <i>Ceratochrysis gracilis</i> No common name	G1S1				
+ <i>Ceratochrysis grisselli</i> No common name	G?S?				
+ <i>Ceratochrysis longimala</i> No common name	G1S1				
+ <i>Ceratochrysis menkei</i> No common name	G1S1				
+ <i>Chrysis tularensis</i> No common name	G1G2S1S2				

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Dufourea stagei</i> No common name	G1?S1?				
+ <i>Eucerceris ruficeps</i> Redheaded sphecid wasp	G1G2S1S2				
+ <i>Halictus harmonius</i> No common name	G1S1				Xerces: Critically imperiled
+ <i>Hedychridium argenteum</i> No common name	G1?S1?				
+ <i>Hedychridium milleri</i> No common name	G1?S1?				
+ <i>Lasioglossum channelense</i> No common name	G1S1				
+ <i>Melitta californica</i> No common name	G?S?				
+ <i>Minymischa ventura</i> No common name	G1G3S1S3				
+ <i>Myrmosula pacifica</i> Antioch mutilid wasp	G1S1				
+ <i>Paranomada californica</i> No common name	G1S1				
+ <i>Parnopes borregoensis</i> No common name	G1?S1?				
+ <i>Perdita scitula antiochensis</i> Antioch andrenid bee	G1T1S1				
+ <i>Philanthus nasalis</i> Antioch sphecid wasp	G1S1				
+ <i>Protodufourea wasbaueri</i> No common name	G1S1				Xerces: Data deficient
+ <i>Protodufourea zavortinki</i> No common name	G1S1				
+ <i>Rhopalolemma robertsi</i> No common name	G1S1				
+ <i>Sphecodogastra antiochensis</i> No common name	G1S1				Xerces: Critically imperiled
+ <i>Trachusa gummifera</i> No common name	G1S1				

	CNDDDB RANK	CESA	ESA	IUCN	OTHER
FISHES (102 taxa)					
PETROMYZONTIDAE (lampreys)					
<i>Lampetra ayresii</i> River lamprey	G4S4				DFG: CSC
+ <i>Lampetra hubbsi</i> Kern brook lamprey	G1G2S1S2			LRnt	DFG: CSC
<i>Lampetra richardsoni</i> Western brook lamprey	G4G5S?				
<i>Lampetra similis</i> Klamath River lamprey	G3G4QS3S4				DFG: CSC
<i>Lampetra tridentata</i> Pacific lamprey	G5S?				
+ <i>Lampetra tridentata</i> ssp. 1 Goose Lake lamprey	G5T1S1				DFG: CSC FS: Sensitive
ACIPENSERIDAE (sturgeon)					
<i>Acipenser medirostris</i> Green sturgeon	G3S1S2		SC ³ FPT ⁴	VU/A1ac	DFG: CSC AFS: Endangered
<i>Acipenser transmontanus</i> White sturgeon	G3S2			LC	AFS: Threatened
SALMONIDAE (trout and salmon)					
+ <i>Oncorhynchus clarkii clarkii</i> Coast cutthroat trout	G4T4S3				DFG: CSC FS: Sensitive
+ <i>Oncorhynchus clarkii henshawi</i> Lahontan cutthroat trout	G4T3S2		FT		
+ <i>Oncorhynchus clarkii seleniris</i> Paiute cutthroat trout	G4T1T2S1S2		FT		
+ <i>Oncorhynchus gorbuscha</i> Pink salmon	G5S1				DFG: CSC
<i>Oncorhynchus keta</i> Chum salmon	G5S1?				DFG: CSC
+ <i>Oncorhynchus kisutch</i> Coho salmon – Central California ESU ⁵	G4S2?	SE ⁶	FT ⁷		
+ <i>Oncorhynchus kisutch</i> Coho salmon – So. Oregon/No. Calif. ESU	G4S2?		FT ⁸		DFG: CSC
+ <i>Oncorhynchus kisutch</i> Coho Salmon – Northern California pop. ⁹	G4S2?	ST			

³ SC refers to the Species of Concern list established by NMFS effective 15 Apr 2004. The SC designation refers to the north DPS which includes spawning populations north of the Eel River (inclusive)

⁴ The FPT designation refers to the southern DPS which includes all spawning populations south of the Eel River

⁵ ESU = Evolutionarily Significant Unit

⁶ The State listing is limited to Coho south of San Francisco Bay.

⁷ The Federal listing is limited to naturally spawning populations in streams between Punta Gorda, Humboldt County and the San Lorenzo River, Santa Cruz County.

⁸ Populations between Cape Blanco, Oregon & Punta Gorda, California.

⁹ The Fish and Game Commission determined that the Coho from Punta Gorda to the Oregon border should be listed as Threatened in February 2004. As part of the normal listing process, this determination is currently under review by the Office of Administrative Law. The state listing includes the San Francisco portion of the federal Central California Coast ESU and the northern California portion of the federal So. Oregon/No. Calif. ESU

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
+ <i>Oncorhynchus mykiss aguabonita</i> Volcano Creek golden trout	G5T1S1				DFG: CSC FS: Sensitive
+ <i>Oncorhynchus mykiss aquilarum</i> Eagle Lake rainbow trout	G5T1S1				DFG: CSC FS: Sensitive
<i>Oncorhynchus mykiss</i> ¹⁰ Steelhead – Klamath Mountains Province ESU ¹¹	G5S2				DFG: CSC ¹² FS: Sensitive
+ <i>Oncorhynchus mykiss</i> Steelhead – Northern California ESU	G5S2		FT ¹³		DFG: CSC ¹⁴
+ <i>Oncorhynchus mykiss</i> Steelhead – Central California Coast ESU	G5S2		FT ¹⁵		`
+ <i>Oncorhynchus mykiss</i> Steelhead – South/Central Calif. Coast ESU	G5S2		FT ¹⁶		DFG: CSC ¹⁷
+ <i>Oncorhynchus mykiss</i> Steelhead – Southern California ESU	G5S2		FE ¹⁸		DFG: CSC ¹⁹
<i>Oncorhynchus mykiss</i> Steelhead – Central Valley ESU	G5S2		FT ²⁰		
+ <i>Oncorhynchus mykiss</i> Steelhead – Summer-run ²¹	G5QS2				DFG: CSC
<i>Oncorhynchus mykiss gilberti</i> Kern River rainbow trout	G5T1T2QS1S2				DFG: CSC
+ <i>Oncorhynchus mykiss whitei</i> Little Kern golden trout	G5T2QS2		FT		
+ <i>Oncorhynchus mykiss</i> ssp. 1 Goose Lake redband trout	G5T2QS1				DFG: CSC FS: Sensitive
+ <i>Oncorhynchus mykiss</i> ssp. 2 McCloud River redband trout	G5T1T2QS1S2				DFG: CSC FS: Sensitive
<i>Oncorhynchus mykiss</i> ssp. 3 Warner Valley redband trout	G5T2QS1?				FS: Sensitive
+ <i>Oncorhynchus tshawytscha</i> Chinook salmon – Spring-run	G5S1	ST	FT ²²		
<i>Oncorhynchus tshawytscha</i> Chinook salmon – Spring-run-Klamath-Trinity pop.	G5S1S2				DFG: CSC FS: Sensitive
<i>Oncorhynchus tshawytscha</i> Chinook salmon – Central Valley fall/late fall-run ²³	G5S2?		SC		DFG: CSC FS: Sensitive

¹⁰ All California steelhead belong to the subspecies *O. m. irideus*.

¹¹ This ESU includes all naturally spawned populations residing in streams between the Elk River in Oregon and the Klamath River in California, inclusive.

¹² CSC refers to California portion of ESU & refers only to the summer-run.

¹³ Naturally spawned populations residing below impassable barriers in coastal basins from Redwood Creek in Humboldt County to, and including, the Gualala River in Mendocino County.

¹⁴ CSC refers only to the summer-run.

¹⁵ Federal listing includes all runs in coastal basins from the Russian River in Sonoma Co, south to Soquel Creek in Santa Cruz Co, inclusive. Includes the San Francisco and San Pablo Bay basins, but excludes the Sacramento-San Joaquin River basins.

¹⁶ Federal listing includes all runs in coastal basins from the Pajaro River south to, but not including, the Santa Maria River.

¹⁷ CSC refers to southern steelhead trout.

¹⁸ Coastal basins from the Santa Maria River (inclusive), south to the U.S. – Mexico Border.

¹⁹ CSC refers to southern steelhead trout.

²⁰ Federal listing includes all runs in the Sacramento & San Joaquin Rivers and their tributaries.

²¹ Summer-run steelhead are part of both the Klamath Mountains Province ESU & the Northern California ESU.

²² Federal listing refers to the Central Valley Spring-run ESU. It includes populations spawning in the Sacramento River & its tributaries.

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
<i>Oncorhynchus tshawytscha</i> Chinook salmon – California coastal ESU	G5S1		FT ²⁴		
+ <i>Oncorhynchus tshawytscha</i> Chinook salmon – Winter-run	G5S1	SE	FE		
<i>Prosopium williamsoni</i> Mountain whitefish	G5S?				
+ <i>Salvelinus confluentus</i> Bull trout	G3SX	SE	FT	VU/A2e	
OSMERIDAE (smelt)					
+ <i>Hypomesus transpacificus</i> Delta smelt	G1S1	ST	FT	EN/B1+2cd	AFS: Threatened
<i>Spirinchus thaleichthys</i> Longfin smelt	G5S1				DFG: CSC AFS: Threatened
<i>Thaleichthys pacificus</i> Eulachon	G5S3				DFG: CSC AFS: Threatened
CYPRINIDAE (minnows and carp)					
+ <i>Gila bicolor mohavensis</i> Mohave tui chub	G4T1S1	SE	FE		DFG: Fully protected
<i>Gila bicolor pectinifer</i> Lahontan Lake tui chub	G4T3S1S2				DFG: CSC FS: Sensitive
+ <i>Gila bicolor snyderi</i> Owens tui chub	G4T1S1	SE	FE		
+ <i>Gila bicolor thalassina</i> Goose Lake tui chub	G4T2S1				DFG: CSC FS: Sensitive
+ <i>Gila bicolor vaccaceps</i> Cowhead Lake tui chub	G4T1S1		FPE		DFG: CSC
+ <i>Gila bicolor</i> ssp. 1 Eagle Lake tui chub	G4T1S1				DFG: CSC
+ <i>Gila bicolor</i> ssp. 2 High Rock Springs tui chub	G4TXSX				DFG: CSC
<i>Gila bicolor</i> ssp 3 Pit River tui chub	G4T?S?				
+ <i>Gila coerulea</i> Blue chub	G3S2S3				DFG: CSC
+ <i>Gila elegans</i> Bonytail	G1S1	SE	FE	EN/B1+2ac	
+ <i>Gila orcutti</i> Arroyo chub	G2S2				DFG: CSC FS: Sensitive
<i>Lavinia exilicauda chi</i> Clear Lake hitch	G5T2S2				DFG: CSC FS: Sensitive
<i>Lavinia exilicauda exilicauda</i> Central Valley hitch	G5T?S?				
<i>Lavinia exilicauda harengus</i> Pajaro/Salinas hitch	G5QT?S?				

²³ Central Valley fall/late fall-run ESU refers to population spawning in the Sacramento & San Joaquin Rivers and their tributaries.

²⁴ Originally proposed as part of a larger Southern Oregon & California Coastal ESU. This new ESU was revised to include only naturally spawned coastal spring & fall Chinook salmon between Redwood Creek in Humboldt County & the Russian River in Sonoma County.

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
+ <i>Lavinia symmetricus mitrulus</i> Pit roach	G5T3S2				DFG: CSC
+ <i>Lavinia symmetricus navarroensis</i> Navarro roach	G5T1T2S1S2				DFG: CSC
+ <i>Lavinia symmetricus parvipinnis</i> Gualala roach	G5T1T2S1S2				DFG: CSC
+ <i>Lavinia symmetricus subditus</i> Monterey roach	G5T2T3S2S3				DFG: CSC
+ <i>Lavinia symmetricus</i> ssp. 1 ²⁵ San Joaquin roach	G5T3QS3				DFG: CSC
+ <i>Lavinia symmetricus</i> ssp. 2 Tomales roach	G5T2T3S2S3				DFG: CSC
+ <i>Lavinia symmetricus</i> ssp. 3 Red Hills roach	G5T1S1				DFG: CSC BLM: Sensitive
<i>Lavinia symmetricus</i> ssp. 4 Clear Lake – Russian River roach	G5T?S?				
+ <i>Mylopharodon conocephalus</i> Hardhead	G3S3				DFG: CSC FS: Sensitive
+ <i>Pogonichthys macrolepidotus</i> Sacramento splittail	G2S2			EN/A1c	DFG: CSC
+ <i>Ptychocheilus lucius</i> Colorado pikeminnow	G1SX	SE	FE	VU/D2	DFG: Fully protected
+ <i>Rhinichthys osculus</i> ssp. 1 ²⁶ Amargosa Canyon Speckled dace	G5T1S1				DFG: CSC BLM: Sensitive
+ <i>Rhinichthys osculus</i> ssp. 2 ²⁷ Owens speckled dace	G5T1T2QS1S2				DFG: CSC
+ <i>Rhinichthys osculus</i> ssp. 3 Santa Ana Speckled dace	G5T1S1				DFG: CSC FS: Sensitive
<i>Rhinichthys osculus</i> ssp. 5 Long Valley speckled dace	G5T1S1				
CATOSTOMIDAE (suckers)					
+ <i>Catostomus fumeiventris</i> Owens sucker	G3S3				DFG: CSC
+ <i>Catostomus latipinnis</i> Flannelmouth sucker	G3G4S1				
+ <i>Catostomus microps</i> Modoc sucker	G1S1	SE	FE	EN/B1+2c, C1	DFG: Fully protected
+ <i>Catostomus occidentalis lacusanserinus</i> Goose Lake sucker	G5T2T3QS1				DFG: CSC FS: Sensitive
<i>Catostomus platyrhynchus</i> Mountain sucker	G5S2S3				DFG: CSC
<i>Catostomus rimiculus</i> ssp. 1 Jenny Creek sucker	G5T2QS1				
+ <i>Catostomus santaanae</i> Santa Ana sucker	G1S1		FT	VU/B1+2c,D2	DFG: CSC FS: Sensitive

²⁵ Current taxonomy considers this taxon to be a population of *Lavinia symmetricus symmetricus* the Sacramento-San Joaquin roach.

²⁶ Current taxonomy considers this taxon to be a distinct population of *Rhinichthys osculus nevadensis*

²⁷ Current taxonomy includes the Benton Valley speckled dace (formerly ssp 4) with the Owens speckled dace

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	<u>CNDDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Catostomus snyderi</i> Klamath largescale sucker	G3S2			LRnt	DFG: CSC
+ <i>Chasmistes brevirostris</i> Shortnose sucker	G1S1	SE	FE	EN/B1+2c	DFG: Fully protected
+ <i>Deltistes luxatus</i> Lost River sucker	G1S1	SE	FE	EN/B1+2cd	DFG: Fully protected
+ <i>Xyrauchen texanus</i> Razorback sucker	G1S1	SE	FE	EN/A1bc	DFG: Fully protected
CYPRINODONTIDAE (killifishes)					
+ <i>Cyprinodon macularius</i> Desert pupfish	G1S1	SE	FE		
+ <i>Cyprinodon nevadensis amargosae</i> Amargosa pupfish	G2T1S1				DFG: CSC BLM: Sensitive
+ <i>Cyprinodon nevadensis nevadensis</i> Saratoga Springs pupfish	G2T1S1				DFG: CSC
+ <i>Cyprinodon nevadensis shoshone</i> Shoshone pupfish	G2T1S1				DFG: CSC
+ <i>Cyprinodon radiosus</i> Owens pupfish	G1S1	SE	FE	EN/A2ce	DFG: Fully protected
+ <i>Cyprinodon salinus milleri</i> Cottonball Marsh pupfish	G1T1S1	ST			
+ <i>Cyprinodon salinus salinus</i> Salt Creek pupfish	G1T1S1				DFG: CSC
GASTEROSTEIDAE (sticklebacks)					
+ <i>Gasterosteus aculeatus williamsoni</i> Unarmored threespine stickleback	G5T1S1	SE	FE	LC (full species)	DFG: Fully protected FS:Sensitive (full species)
<i>Gasterosteus aculeatus santaannae</i> Santa Ana (=Shay Cr) threespine stickleback	G5T1QS1				FS:Sensitive (full species)
<i>Gasterosteus aculeatus microcephalus</i> (south of Pt. Conception) Resident three-spine stickleback ²⁸	G5T?S?				FS:Sensitive (full species)
PERCICHTHYIDAE (temperate basses)					
<i>Stereolepis gigas</i> Giant sea bass	G3?S1S2			CR/A1bd	AFS: Vulnerable
CENTRARCHIDAE (sunfishes)					
+ <i>Archoplites interruptus</i> (within native range) Sacramento perch	G3S1				DFG: CSC
EMBIOTOCIDAE (surfperches)					
<i>Hysterocarpus traski lagunae</i> Clear Lake tule perch	G5T?S?				

²⁸ This name covers isolated populations found in many coastal streams. It represents a polyphyletic group of fish, not a classic interbreeding subspecies.

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	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Hysteroecarpus traski pomo</i> Russian River tule perch	G5T2S2				DFG: CSC
<i>Hysteroecarpus traski traski</i> Sacramento-San Joaquin tule perch	G5T?S?				
GOBIIDAE (gobies)					
+ <i>Eucyclogobius newberryi</i> Tidewater goby	G3S2S3		FE	VU/A1c+2c	DFG: CSC AFS: Endangered
COTTIDAE (sculpins)					
+ <i>Cottus asperrimus</i> Rough sculpin	G2S2	ST		VU/D2	DFG: Fully protected
<i>Cottus gulosus</i> Riffle sculpin	G5S?				
<i>Cottus klamathensis klamathensis</i> Upper Klamath marbled sculpin	G4S?				
+ <i>Cottus klamathensis macrops</i> Bigeye marbled sculpin	G4T3S3				DFG: CSC
<i>Cottus klamathensis polyporus</i> Lower Klamath marbled sculpin	G4S?				
<i>Cottus perplexus</i> Reticulate sculpin	G4S2S3				DFG: CSC

	CNDDDB RANK	CESA	ESA	IUCN	OTHER
AMPHIBIANS (40 taxa)					
AMBYSTOMATIDAE (mole salamanders)					
+ <i>Ambystoma macrodactylum croceum</i> Santa Cruz long-toed salamander	G5T1S1	SE	FE		DFG: Fully protected
+ <i>Ambystoma californiense</i> California tiger salamander	G2G3S2S3		FT	VU/A2c	DFG: CSC
RHYACOTRITONIDAE (Olympic salamanders)					
+ <i>Rhyacotriton variegatus</i> Southern torrent salamander	G3G4S2S3			LC	DFG: CSC FS: Sensitive
SALAMANDRIDAE (newts)					
+ <i>Taricha torosa torosa</i> Coast Range newt (Monterey Co. south only)	G5T4S4				DFG: CSC
PLETHODONTIDAE (lungless salamanders)					
+ <i>Batrachoseps major aridus</i> Desert slender salamander	G4T1S1	SE	FE	CR/A2cd	
+ <i>Batrachoseps campi</i> Inyo Mountains slender salamander	G2S2			EN/B1ab(iii, v)+2ab (iii,v)	DFG: CSC FS: Sensitive BLM: Sensitive
<i>Batrachoseps diabolicus</i> Hell Hollow slender salamander	G2S2			DD	
+ <i>Batrachoseps gabrieli</i> San Gabriel slender salamander	G2S2			DD	FS: Sensitive
<i>Batrachoseps kawia</i> Sequoia slender salamander	G1G2S1S2			DD	
+ <i>Batrachoseps pacificus pacificus</i> Channel Islands slender salamander	G3QT2S2			LC (full species)	
<i>Batrachoseps regius</i> Kings River slender salamander	G1S1			VU/D2	
<i>Batrachoseps relictus</i> Relictual slender salamander	G2S2			DD	DFG: CSC FS: Sensitive
+ <i>Batrachoseps robustus</i> Kern Plateau salamander	G2S2			NT	FS: Sensitive
+ <i>Batrachoseps simatus</i> Kern Canyon slender salamander	G2S2	ST		VU/D2	FS: Sensitive
+ <i>Batrachoseps stebbinsi</i> Tehachapi slender salamander	G2S2	ST		VU/D2	FS: Sensitive BLM: Sensitive
+ <i>Batrachoseps</i> sp. 1 Breckenridge Mountain slender salamander	G1QS1				DFG: CSC FS: Sensitive
+ <i>Ensatina eschscholtzi croceator</i> Yellow-blotched salamander	G5T2T3S2S3			LC (full species)	DFG: CSC FS: Sensitive BLM: Sensitive
+ <i>Ensatina klauberi</i> Large-blotched salamander	G5S2S3				DFG: CSC FS: Sensitive

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+ <i>Hydromantes brunus</i> Limestone salamander	G1S1	ST		VU/D2	DFG: Fully protected FS: Sensitive
+ <i>Hydromantes platycephalus</i> Mount Lyell salamander	G3S3			LC	DFG: CSC
+ <i>Hydromantes shastae</i> Shasta salamander	G1G2S1S2	ST		VU/D2	FS: Sensitive
+ <i>Hydromantes</i> sp. 1 Owens Valley web-toed salamander (AKA Oak Creek salamander)	G1QS1				DFG: CSC
<i>Plethodon asupak</i> ²⁹ Scott River salamander	G1?S1?				
+ <i>Plethodon elongatus</i> Del Norte salamander	G3S3			LR/NT	DFG: CSC
+ <i>Plethodon stormi</i> Siskiyou Mountains salamander	G2G3S1S2	ST		EN/B1ab(iii)	FS: Sensitive
ASCAPHIDAE (tailed frogs)					
+ <i>Ascaphus truei</i> Western tailed frog	G4S2S3			LC	DFG: CSC
SCAPHIOPODIDAE (spadefoot toads)					
+ <i>Scaphiopus couchii</i> Couch's spadefoot	G5S2S3			LC	DFG: CSC BLM: Sensitive
+ <i>Spea</i> (= <i>Scaphiopus</i>) <i>hammondii</i> Western spadefoot	G3S3			LR/NT	DFG: CSC BLM: Sensitive
BUFONIDAE (true toads)					
+ <i>Bufo alvarius</i> Colorado River toad	G5SH			LC	DFG: CSC
+ <i>Bufo canorus</i> Yosemite toad	G1G2S1S2		FC	EN/A2ae,	DFG: CSC FS: Sensitive
+ <i>Bufo exsul</i> Black toad	G1QS1	ST		VU/D2	DFG: Fully protected
+ <i>Bufo californicus</i> ³⁰ Arroyo toad	G2G3S2S3		FE	EN/A2ac	DFG: CSC
RANIDAE					
+ <i>Rana aurora aurora</i> ³¹ Northern red-legged frog	G4T4S2?			LR/NT	DFG: CSC FS: Sensitive
+ <i>Rana aurora draytonii</i> ³² California red-legged frog	G4T2T3S2S3		FT ³³	LR/NT	DFG: CSC

²⁹ Newly described species from what was part of the range of *Plethodon stormi*.

³⁰ Formerly *Bufo microscaphus californicus*, now considered a full species.

³¹ A recent mtDNA study concludes that *Rana aurora aurora* and *Rana aurora draytonii* should be recognized as separate species with a narrow zone of overlap.

³² A recent mtDNA study concludes that *Rana aurora aurora* and *Rana aurora draytonii* should be recognized as separate species with a narrow zone of overlap, and that the range of *draytonii* extends about 100km further north in coastal California than previously thought.

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
+ <i>Rana boylei</i> Foothill yellow-legged frog	G3S2S3			LR/NT	DFG: CSC FS: Sensitive BLM: Sensitive
+ <i>Rana cascadae</i> Cascades frog	G3G4S3			LR/NT	DFG: CSC FS: Sensitive
+ <i>Rana muscosa</i> Mountain yellow-legged frog	G2S2		FE ³⁴ FC ³⁵	VU/A2ace	DFG: CSC FS: Sensitive
+ <i>Rana pipiens</i> Northern leopard frog	G5S2			LC	DFG: CSC FS: Sensitive
+ <i>Rana pretiosa</i> Oregon spotted frog	G2S1		FC	VU/A2ace	DFG: CSC FS: Sensitive
<i>Rana yavapaiensis</i> Lowland (=Yavapai, San Sebastian & San Felipe) leopard frog	G4SX			LC	DFG: CSC BLM: Sensitive

³³ Federal listing does not include Humboldt, Trinity, & Mendocino Counties; Glenn, Lake & Sonoma Counties west of the Central Valley Hydrologic Basin; Sonoma & Marin Counties north and west of the Napa River, Sonoma Creek & Petaluma River drainages which flow into San Francisco Bay, & north of the Walker Creek drainage which flows to the Pacific Ocean.

³⁴ Federal listing refers to populations in the San Gabriel, San Jacinto & San Bernardino Mountains only.

³⁵ Federal candidate status refers to all populations that occur north of the Tehachapi Mountains in the Sierra Nevada

	CNDDDB RANK	CEA	ESA	IUCN	OTHER
REPTILES (43 taxa)					
KINOSTERNIDAE (musk and mud turtles)					
<i>Kinosternon sonoriense</i> Sonoran mud turtle	G4SH			VU/A1c	DFG: CSC
EMYDIDAE (Box and water turtles)					
+ <i>Emys</i> (=Clemmys) <i>marmorata</i> Western pond turtle	G3G4S3			VU/A1cd	DFG: CSC
+ <i>Emys</i> (=Clemmys) <i>marmorata marmorata</i> Northwestern pond turtle	G3G4T3S3				DFG: CSC FS: Sensitive
+ <i>Emys</i> (=Clemmys) <i>marmorata pallida</i> Southwestern pond turtle	G3G4T2T3S2				DFG: CSC FS: Sensitive BLM: Sensitive
TESTUDINIDAE (land tortoises)					
+ <i>Gopherus agassizii</i> Desert tortoise	G4S2	ST	FT	VU/A1acde +2cde, E	
GEKKONIDAE (geckos)					
+ <i>Coleonyx switaki</i> Barefoot gecko	G4S1	ST			
+ <i>Coleonyx variegatus abbotti</i> San Diego banded gecko	G5T3T4S2S3				
IGUANIDAE (iguanids)					
+ <i>Sauromalus ater</i> Chuckwalla	G5S4				
CROTAPHYTIDAE					
+ <i>Gambelia sila</i> Blunt-nosed leopard lizard	G1S1	SE	FE	EN/A1ce	DFG: Fully protected
PHRYNOSOMATIDAE					
+ <i>Phrynosoma coronatum</i> Coast horned lizard (blainvillii population)	G4T3T4S2S3				DFG: CSC FS: Sensitive
+ <i>Phrynosoma coronatum</i> Coast horned lizard (frontale population)	G4T3T4S3S4				DFG: CSC BLM: Sensitive
+ <i>Phrynosoma mcallii</i> Flat-tailed horned lizard	G3S2				DFG: CSC BLM: Sensitive FS: Sensitive
+ <i>Sceloporus graciosus graciosus</i> Northern sagebrush lizard	G5T5S3				BLM: Sensitive
+ <i>Uma inornata</i> Coachella Valley fringe-toed lizard	G1S1	SE	FT	EN/A1a, B1+2c	

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	CNDDB RANK	CESA	ESA	IUCN	OTHER
+ <i>Uma notata</i> Colorado Desert fringe-toed lizard	G3QS2?				DFG: CSC BLM: Sensitive
<i>Uma scoparia</i> Mojave fringe-toed lizard	G3G4QS3S4				DFG: CSC BLM: Sensitive
XANTUSIIDAE (night lizards)					
<i>Xantusia gracilis</i> Sandstone night lizard	G1S1				DFG: CSC
+ <i>Xantusia riversiana</i> Island night lizard	G1S1		FT	VU/D2	
<i>Xantusia vigilis sierrae</i> Sierra night lizard	G5T1S1				DFG: CSC FS: Sensitive
SCINCIDAE (skinks)					
+ <i>Eumeces skiltonianus interparietalis</i> Coronado skink	G5T2T3QS1S2				DFG: CSC BLM: Sensitive
TEIIDAE (whiptails and relatives)					
+ <i>Aspidoscelis hyperythra beldingi</i> Beldings orange-throated whiptail	G5T2S2			DD (full species)	DFG: CSC
+ <i>Aspidoscelis tigris stejnegeri</i> Coastal western whiptail	G5T3T4S2S3				
ANGUIDAE (alligator lizards)					
+ <i>Elgaria</i> (=Gerrhonotus) <i>panamintina</i> Panamint alligator lizard	G1G2S1S2			VU/D2	DFG: CSC FS: Sensitive BLM: Sensitive
ANNIELLIDAE (Legless lizards)					
+ <i>Anniella pulchra pulchra</i> Silvery legless lizard	G3G4T3T4QS3				DFG: CSC FS: Sensitive (full species)
+ <i>Anniella pulchra nigra</i> Black legless lizard	G3G4T2T3QS2				DFG: CSC FS: Sensitive (full species)
HELODERMATIDAE (venomous lizards)					
+ <i>Heloderma suspectum cinctum</i> Banded gila monster (population west of Colorado River)	G4T4S1			VU/A2cd (full species)	DFG: CSC BLM: Sensitive (full species)
BOIDAE (boas)					
+ <i>Charina umbratica</i> Southern rubber boa	G5S2S3	ST			FS: Sensitive
+ <i>Charina trivirgata</i> Rosy boa	G4G5S3S4				BLM: Sensitive FS: Sensitive (ssp. <i>Roseofusca</i>)

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COLUBRIDAE (egg-laying snakes)					
<i>Bogertiphis rosaliae</i> Baja California rat snake	G4S1				DFG: CSC
+ <i>Diadophis punctatus modestus</i> San Bernardino ringneck snake	G5T2T3S2?				FS: Sensitive
+ <i>Diadophis punctatus similis</i> San Diego ringneck snake	G5T2T3S2?				FS: Sensitive
+ <i>Lampropeltis zonata</i> California mountain kingsnake (San Bernardino population)	G4G5S2?				DFG: CSC FS: Sensitive
+ <i>Lampropeltis zonata</i> California mountain kingsnake (San Diego population)	G4G5S1S2				DFG: CSC FS: Sensitive
+ <i>Masticophis flagellum ruddocki</i> San Joaquin whipsnake	G5T2T3S2?				DFG: CSC
+ <i>Masticophis lateralis euryxanthus</i> Alameda whipsnake (=striped racer)	G4T2S2	ST	FT		
<i>Pituophis catenifer pumilus</i> Santa Cruz gopher snake	G5T1T2S1?				DFG: CSC
+ <i>Salvadora hexalepis virgultea</i> Coast patch-nosed snake	G5T3S2S3				DFG: CSC
NATRICIDAE (live-bearing snakes)					
+ <i>Thamnophis gigas</i> Giant garter snake	G2G3S2S3	ST	FT	VU/A1cde+ 2cde	
+ <i>Thamnophis hammondi</i> Two-striped garter snake	G3S2			DD	DFG: CSC FS: Sensitive BLM: Sensitive
+ <i>Thamnophis hammondi</i> ssp. Santa Catalina garter snake	G3T1S1				
+ <i>Thamnophis sirtalis tetrataenia</i> San Francisco garter snake	G5T2S2	SE	FE		DFG: Fully Protected
<i>Thamnophis sirtalis</i> ssp. South Coast garter snake	G5T1T2S1S2				DFG: CSC
VIPERIIDAE (vipers)					
+ <i>Crotalus ruber ruber</i> Northern red-diamond rattlesnake	G4T3T4S2?				DFG: CSC

	CNDDDB RANK	CESA	ESA	IUCN	OTHER
BIRDS (140 taxa)					
GAVIIDAE (loons)					
<i>Gavia immer</i> (nesting) Common loon	G5S1			LC	DFG: CSC
HYDROBATIDAE (storm petrels)					
+ <i>Oceanodroma furcata</i> (rookery site) Fork-tailed storm-petrel	G5S1			LC	DFG: CSC
+ <i>Oceanodroma homochroa</i> (rookery site) Ashy storm-petrel	G2S2			EN/A2bce	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list
+ <i>Oceanodroma melania</i> (rookery site) Black storm-petrel	G2S1			LC	DFG: CSC USBC: Watch list Audubon: Watch list
PELECANIIDAE (pelicans)					
+ <i>Pelecanus erythrorhynchos</i> (nesting colony) American white pelican	G3S1			LC	DFG: CSC
+ <i>Pelecanus occidentalis californicus</i> California brown pelican (nesting colony) and (communal roosts)	G4T3S1S2	SE	FE	LC (full species)	DFG: Fully protected
PHALACROCORACIDAE (cormorants)					
+ <i>Phalacrocorax auritus</i> (rookery site) Double-crested cormorant	G5S3			LC	DFG: CSC
ARDEIDAE (herons, egrets, and bitterns)					
+ <i>Ardea alba</i> (rookery) Great egret	G5S4			LC	CDF: Sensitive
+ <i>Ardea herodias</i> (rookery) Great blue heron	G5S4			LC	CDF: Sensitive
<i>Botaurus lentiginosus</i> American bittern	G4S3			LC	
+ <i>Egretta thula</i> (rookery) Snowy egret	G5S4			LC	USBC: Watch list
+ <i>Ixobrychus exilis</i> (nesting) Least bittern	G5S1			LC	DFG: CSC
+ <i>Nycticorax nycticorax</i> (rookery) Black-crowned night heron	G5S3			LC	BLM: Sensitive
THRESKIORNITHIDAE (ibises and spoonbills)					
+ <i>Plegadis chihi</i> (rookery site) White-faced ibis	G5S1			LC	DFG: CSC

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CICONIIDAE (storks)					
<i>Mycteria americana</i> Wood stork	G4S2?			LC	DFG: CSC USBC: Watch list
CATHARTIDAE (New World vultures)					
+ <i>Gymnogyps californianus</i> California condor	G1S1	SE	FE	CR/C2(i); D	CDF: Sensitive DFG: Fully protected USBC: Watch list Audubon: Watch list
ANATIDAE (ducks, geese, and swans)					
<i>Aythya valisineria</i> (nesting) Canvasback	G5S2?			LC (full species)	
+ <i>Branta canadensis leucopareia</i> (wintering) Aleutian Canada goose	G5T3S2		Delisted ³⁶		
<i>Bucephala islandica</i> (nesting) Barrow's goldeneye	G5S1			LC	DFG: CSC
+ <i>Dendrocygna bicolor</i> (nesting) Fulvous whistling duck	G5S1			LC	DFG: CSC
+ <i>Histrionicus histrionicus</i> (nesting) Harlequin duck	G4S2			LC	DFG: CSC BLM: Sensitive
ACCIPITRIDAE (hawks, kites, harriers, & eagles)					
+ <i>Accipiter cooperii</i> (nesting) Cooper's hawk	G5S3			LC	DFG: CSC
+ <i>Accipiter gentilis</i> (nesting) Northern goshawk	G5S3			LC	DFG: CSC FS: Sensitive CDF: Sensitive
+ <i>Accipiter striatus</i> (nesting) Sharp-shinned hawk	G5S3			LC	DFG: CSC
+ <i>Aquila chrysaetos</i> (nesting and wintering) Golden eagle	G5S3			LC	DFG: CSC DFG: Fully protected FWS: BCC CDF: Sensitive BLM: Sensitive
+ <i>Buteo regalis</i> (wintering) Ferruginous hawk	G4S3S4			LRnt	DFG: CSC Audubon: Watch list FWS: BCC BLM: Sensitive
+ <i>Buteo swainsoni</i> (nesting) Swainson's hawk	G5S2	ST			FS: Sensitive USBC: Watch list FWS: BCC Audubon: Watch list
+ <i>Circus cyaneus</i> (nesting) Northern harrier	G5S3			LC	DFG: CSC

³⁶ Delisted species are monitored for 5 years.

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+ <i>Elanus leucurus</i> (nesting) White-tailed kite	G5S3				DFG: Fully protected
+ <i>Haliaeetus leucocephalus</i> (nesting & wintering) Bald eagle	G4S2	SE	FPD FT	LC	CDF: Sensitive DFG: Fully protected
+ <i>Pandion haliaetus</i> (nesting) Osprey	G5S3			LC	DFG: CSC CDF: Sensitive
<i>Parabuteo unicinctus</i> (nesting) Harris' hawk	G5SH			LC	DFG: CSC Audubon: Watch list
FALCONIDAE (falcons)					
+ <i>Falco columbarius</i> (wintering) Merlin	G5S3			LC	DFG: CSC
+ <i>Falco mexicanus</i> (nesting) Prairie falcon	G5S3			LC	DFG: CSC FWS: BCC
+ <i>Falco peregrinus anatum</i> (nesting) American peregrine falcon	G4T3S2	SE	Delisted ³⁷	LC (full species)	FWS: BCC (full species) CDF: Sensitive DFG: Fully protected FS: Sensitive
PHASIANIDAE (grouse and ptarmigan)					
<i>Bonasa umbellus</i> Ruffed grouse	G5S4			LC	DFG: CSC
+ <i>Centrocercus urophasianus</i> (nesting & leks) Greater Sage-grouse	G4S3			LR/NT	DFG: CSC Audubon: Watch list BLM: Sensitive FS: Sensitive
<i>Dendragapus obscurus howardi</i> Mount Pinos blue grouse	G5T?S?				
<i>Tympanuchus phasianellus columbianus</i> Columbian sharp-tailed grouse	G4T3SX			LC (full species)	DFG: CSC
RALLIDAE (rails, coots, and gallinules)					
+ <i>Coturnicops noveboracensis</i> Yellow rail	G4S1S2			LC	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list
+ <i>Laterallus jamaicensis coturniculus</i> California black rail	G4T1S1	ST		LR/NT (full species)	USBC: Watch list (full species) DFG: Fully protected Audubon: Watch list (full species) FWS: BCC (full species)
+ <i>Rallus longirostris levipes</i> Light-footed clapper rail	G5T1T2S1	SE	FE	LC (full species)	DFG: Fully protected USBC: Watch list (full species)

³⁷ Delisted species are monitored for 5 years.

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	<u>CNDDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Rallus longirostris obsoletus</i> California clapper rail	G5T1S1	SE	FE	LC (full species)	DFG: Fully protected USBC: Watch list (full species)
+ <i>Rallus longirostris yumanensis</i> Yuma clapper rail	G5T3S1	ST	FE	LC (full species)	DFG: Fully protected USBC: Watch list (full species)
GRUIDAE (cranes)					
+ <i>Grus canadensis tabida</i> (nesting & wintering) Greater sandhill crane	G5T4S2	ST		LC (full species)	DFG: Fully protected FS: Sensitive
CHARADRIIDAE (plovers and relatives)					
+ <i>Charadrius alexandrinus nivosus</i> (nesting) Western snowy plover (coastal population)	G4T3S2		FT		DFG: CSC FWS: BCC (full species) USBC: Watch list (full species) Audubon: Watch list (full species)
+ <i>Charadrius montanus</i> (wintering) Mountain plover	G2S2?			VU/A2bc + 3bc, C1	DFG: CSC USBC: Watch list FWS: BCC Audubon: Watch list
HAEMATOPODIDAE (oystercatchers)					
<i>Haematopus bachmani</i> (nesting) Black oystercatcher	G5S2			LC	USBC: Watch list Audubon: Watch list FWS: BCC
SCOLOPACIDAE (sandpipers and relatives)					
<i>Numenius americanus</i> (nesting) Long-billed curlew	G5S2			LR/NT	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list
LARIDAE (gulls and terns)					
+ <i>Chlidonias niger</i> (nesting colony) Black tern	G4S2			LC	DFG: CSC
<i>Larus atricilla</i> (nesting colony) Laughing gull	G5SH			LC	DFG: CSC
+ <i>Larus californicus</i> (nesting colony) California gull	G5S2			LC	DFG: CSC
+ <i>Rynchops niger</i> (nesting colony) Black skimmer	G5S1S3			LC	DFG: CSC FWS: BCC USBC: Watch list
+ <i>Sterna antillarum browni</i> (nesting colony) California least tern	G4T2T3S2S3	SE	FE		DFG: Fully protected USBC: Watch list (full species)

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
+ <i>Sterna caspia</i> (nesting colony) Caspian tern	G5S4			LC	FWS: BCC
<i>Sterna elegans</i> (nesting colony) Elegant tern	G2S1			LR/NT	DFG: CSC FWS: BCC Audubon: Watch list
<i>Sterna forsteri</i> (nesting colony) Forster's tern	G5S4			LC	
+ <i>Sterna nilotica</i> (nesting colony) Gull-billed tern	G5S1			LC	DFG: CSC FWS: BCC
ALCIDAE (auklets, puffins, and relatives)					
+ <i>Brachyramphus marmoratus</i> (nesting) Marbled murrelet	G3G4S1	SE	FT	EN/A2bcde +3bcde	CDF: Sensitive USBC: Watch list Audubon: Watch list
+ <i>Cerorhinca monocerata</i> (nesting colony) Rhinoceros auklet	G5S3			LC	DFG: CSC
+ <i>Fratercula cirrhata</i> (nesting colony) Tufted puffin	G5S2			LC	DFG: CSC
<i>Ptychoramphus aleuticus</i> (nesting colony) Cassin's auklet	G4S?				FWS: BCC
+ <i>Synthliboramphus hypoleucus</i> (nesting colony) Xantus's murrelet	G3G4S3	ST ³⁸	FC	VU/B1+ab (iv,v), C1	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list
CUCULIDAE (cuckoos and relatives)					
+ <i>Coccyzus americanus occidentalis</i> (nesting) Western yellow-billed cuckoo	G5T2S1	SE	FC	LC (full species)	FWS: BCC (full species) FS: Sensitive
STRIGIDAE (owls)					
+ <i>Asio flammeus</i> (nesting) Short-eared owl	G5S3			LC	DFG: CSC USBC: Watch list Audubon: Watch list
+ <i>Asio otus</i> (nesting) Long-eared owl	G5S3			LC	DFG: CSC
+ <i>Athene cunicularia</i> (burrow sites) Burrowing owl (also, wintering observations with or without a burrow in SFO, VEN, SON, MRN, NAP, & SCR counties)	G4S2			LC	DFG: CSC FWS: BCC BLM: Sensitive
+ <i>Micrathene whitneyi</i> (nesting) Elf owl	G5S1	SE		LC	USBC: Watch list FWS: BCC Audubon: Watch list
<i>Otus flammeolus</i> (nesting) Flammulated owl	G4S?			LC	USBC: Watch list FWS: BCC Audubon: Watch list

³⁸ The Fish and Game Commission determined that Xantus's murrelet should be listed as a Threatened species. As part of the normal listing process, this decision is currently under review by the Office of Administrative Law.

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	<u>CNDDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Strix nebulosa</i> (nesting) Great gray owl	G5S1	SE		LC	FS: Sensitive CDF: Sensitive
<i>Strix occidentalis caurina</i> ³⁹ Northern spotted owl	G3T3S2S3		FT	LR/NT (full species)	CDF: Sensitive USBC: Watch list (full species) Audubon: Watch list (full species)
<i>Strix occidentalis occidentalis</i> California spotted owl	G3T3S3			LR/NT (full species)	DFG: CSC FS: Sensitive FWS: BCC BLM: Sensitive USBC: Watch list (full species) Audubon: Watch list (full species)
APODIDAE (swifts)					
<i>Chaetura vauxi</i> (nesting) Vaux's swift	G5S3			LC	DFG: CSC
+ <i>Cypseloides niger</i> (nesting) Black swift	G4S2			LC	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list
TROCHILIDAE (hummingbirds)					
+ <i>Calypte costae</i> (nesting) Costa's hummingbird	G5S3?			LC	USBC: Watch list Audubon: Watch list
<i>Selasphorus rufus</i> (nesting) Rufous hummingbird	G5S1S2			LC	FWS: BCC USBC: Watch list Audubon: Watch list
<i>Selasphorus sasin</i> (nesting) Allen's hummingbird	G5S?			LC	USBC: Watch list Audubon: Watch list
PICIDAE (woodpeckers)					
+ <i>Colaptes chrysoides</i> Gilded flicker	G5S1	SE		LC	FWS: BCC Audubon: Watch list
<i>Melanerpes lewis</i> (nesting) Lewis' woodpecker	G4S?			LC	Audubon: Watch list FWS: BCC
+ <i>Melanerpes uropygialis</i> Gila woodpecker	G5S1S2	SE		LC	FWS: BCC
<i>Picoides albolarvatus</i> (nesting) White-headed woodpecker	G4S?			LC	FWS: BCC USBC: Watch list Audubon: Watch list

³⁹ All EOs have been removed from the CNDDDB. Spotted owl location information is available as a separate data layer from Gordon Gould (ggould@dfg.ca.gov)

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	CNDDDB RANK	CESA	ESA	IUCN	OTHER
<i>Picoides nuttallii</i> (nesting) Nuttall's woodpecker	G5S?			LC	USBC: Watch list Audubon: Watch list
<i>Sphyrapicus ruber</i> (nesting) Red-breasted sapsucker	G5S?				
TYRANNIDAE (tyrant flycatchers)					
<i>Contopus cooperi</i> (nesting) Olive-sided flycatcher	G4S4			LR/NT	Audubon: Watch list USBC: Watch list FWS: BCC
+ <i>Empidonax traillii</i> (nesting) Willow flycatcher	G5S1S2	SE ⁴⁰		LC	FS: Sensitive USBC: Watch list Audubon: Watch list
<i>Empidonax traillii brewsteri</i> (nesting) Little willow flycatcher	G5T1T2S1S2				USBC: Watch list (full species) Audubon: Watch list (full species)
+ <i>Empidonax traillii extimus</i> (nesting) Southwestern willow flycatcher	G5T1T2S1		FE		USBC: Watch list (full species) Audubon: Watch list (full species)
+ <i>Myiarchus tyrannulus</i> (nesting) Brown-crested flycatcher	G5S2S3			LC	DFG: CSC
+ <i>Pyrocephalus rubinus</i> (nesting) Vermillion flycatcher	G5S2S3			LC	DFG: CSC
LANIIDAE (shrikes)					
+ <i>Lanius ludovicianus</i> (nesting) Loggerhead shrike	G4S4			LC	DFG: CSC FWS: BCC
+ <i>Lanius ludovicianus mearnsi</i> San Clemente loggerhead shrike	G4T1S1		FE	LC (full species)	
<i>Lanius ludovicianus anthonyi</i> Island loggerhead shrike	G4T1?S1?			LC (full species)	DFG: CSC
VIREONIDAE (vireos)					
+ <i>Vireo bellii arizonae</i> (nesting) Arizona Bell's vireo	G5T4S1	SE		LR/NT (full species)	USBC: Watch list (full species) Audubon: Watch list (full species) FWS: BCC (full species)
+ <i>Vireo bellii pusillus</i> (nesting) Least Bell's vireo	G5T2S2	SE	FE	LR/NT (full species)	USBC: Watch list (full species) Audubon: Watch list (full species) FWS: BCC (full species)

⁴⁰ State listing includes all subspecies.

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	<u>CNDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Vireo vicinior</i> (nesting) Gray vireo	G4S2			LC	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list BLM: Sensitive
CORVIDAE (jays, crows, and magpies)					
<i>Aphelocoma californica cana</i> Eagle Mountain western scrub jay	G5T1T2S1S2				DFG: CSC
<i>Aphelocoma insularis</i> Island scrub jay	G1S1			LR/NT	FWS: BCC USBC: Watch list Audubon: Watch list
ALAUDIDAE (larks)					
+ <i>Eremophila alpestris actia</i> California horned lark	G5T3S3			LC (full species)	DFG: CSC
+ <i>Progne subis</i> (nesting) Purple martin	G5S3			LC	DFG: CSC
+ <i>Riparia riparia</i> (nesting) Bank swallow	G5S2S3	ST		LC	
PARIDAE (titmice and relatives)					
<i>Baeolophus inornatus</i> (nesting) Oak titmouse	G5S3?			LC	USBC: Watch list Audubon: Watch list
<i>Poecile atricapilla</i> Black-capped chickadee	G5S3			LC	DFG: CSC
TROGLODYTIDAE (wrens)					
+ <i>Campylorhynchus brunneicapillus sandiegensis</i> ⁴¹ San Diego cactus wren (San Diego & Orange Counties only)	G5T3QS3			LC (full species)	DFG: CSC FWS: BCC FS: Sensitive
SYLVIIDAE (gnatcatchers)					
+ <i>Polioptila californica californica</i> Coastal California gnatcatcher	G3T2S2		FT	LC (full species)	DFG: CSC USBC: Watch list Audubon: Watch list
+ <i>Polioptila melanura</i> Black-tailed gnatcatcher	G5S4			LC	
MIMIDAE (mockingbirds and thrashers)					
+ <i>Toxostoma bendirei</i> Bendire's thrasher	G4G5S3			VU/A2bc+3 bc	DFG: CSC USBC: Watch list FWS: BCC Audubon: Watch list BLM: Sensitive

⁴¹ Nomenclature follows the draft DFG Bird Species of Special Concern report.

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	<u>CNDDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Toxostoma crissal</i> Crissal thrasher	G5S3			LC	DFG: CSC FWS: BCC
+ <i>Toxostoma lecontei</i> Le Conte's thrasher	G3S3			LC	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list BLM: Sensitive
<i>Toxostoma lecontei macmillanorum</i> San Joaquin Le Conte's thrasher	G4T1S1			LC (full species)	DFG: CSC FWS: BCC (full species) USBC: Watch list (full species) Audubon: Watch list (full species)
<i>Toxostoma redivivum</i> California thrasher	G5S?			LC	USBC: Watch list Audubon: Watch list
PARULIDAE (wood-warblers)					
<i>Dendroica occidentalis</i> (nesting) Hermit warbler	G4G5S3?			LC	Audubon: Watch list
+ <i>Dendroica petechia brewsteri</i> (nesting) Yellow warbler	G5T3?S2			LC (full species)	DFG: CSC
+ <i>Dendroica petechia sonorana</i> (nesting) Sonoran yellow warbler	G5T2T3S1			LC (full species)	DFG: CSC FWS: BCC
+ <i>Geothlypis trichas sinuosa</i> Saltmarsh common yellowthroat	G5T2S2			LC (full species)	DFG: CSC FWS: BCC
+ <i>Icteria virens</i> (nesting) Yellow-breasted chat	G5S3			LC	DFG: CSC
+ <i>Vermivora luciae</i> (nesting) Lucy's warbler	G5S2S3			LC	USBC: Watch list Audubon: Watch list
+ <i>Vermivora virginiae</i> (nesting) Virginia's warbler	G5S2S3			LC	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list
THRAUPIDAE (tanagers)					
+ <i>Piranga flava</i> (nesting) Hepatic tanager	G5S1			LC	DFG: CSC
+ <i>Piranga rubra</i> (nesting) Summer tanager	G5S2			LC	DFG: CSC
EMBERIZIDAE (sparrows, buntings, warblers, & relatives)					
+ <i>Aimophila ruficeps canescens</i> Southern California rufous-crowned sparrow	G5T2T4S2S3			LC (full species)	DFG: CSC
+ <i>Amphispiza belli belli</i> Bell's sage sparrow	G5T2T4S2?			LC (full species)	DFG: CSC FWS: BCC (full species)
+ <i>Ammodramus savannarum</i> Grasshopper sparrow	G5S2				

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	<u>CNDDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Amphispiza belli clementeae</i> San Clemente sage sparrow	G5T1S1		FT	LC (full species)	FWS: BCC (full species)
<i>Chondestes grammacus</i> (nesting) Lark sparrow	G5S?				
+ <i>Junco hyemalis caniceps</i> (nesting) Gray-headed junco	G5T5S1			LC (full species)	DFG: CSC
+ <i>Melospiza melodia maxillaris</i> Suisun song sparrow	G5T2S2			LC (full species)	DFG: CSC FWS: BCC
+ <i>Melospiza melodia pusillula</i> Alameda song sparrow	G5T2?S2?			LC (full species)	DFG: CSC FWS: BCC
+ <i>Melospiza melodia samuelis</i> San Pablo song sparrow	G5T2?S2?			LC (full species)	DFG: CSC FWS: BCC
+ <i>Passerculus sandwichensis beldingi</i> Belding's savannah sparrow	G5T3S3	SE		LC (full species)	
<i>Passerculus sandwichensis rostratus</i> (wintering) Large-billed savannah sparrow	G5T2T3S2?			LC (full species)	DFG: CSC
<i>Pipilo aberti</i> Abert's towhee	G3G4S2?			LC	USBC: Watch list Audubon: Watch list
+ <i>Pipilo crissalis eremophilus</i> Inyo California towhee	G4G5T1S1	SE	FT	LC (full species)	
<i>Pipilo maculatus</i> (=erythrophthalmus) <i>clementae</i> San Clemente (spotted) towhee	G5T1S1			LC (full species)	DFG: CSC FWS: BCC
<i>Spizella atrogularis</i> (nesting) Black-chinned sparrow	G5S3			LC	FWS: BCC USBC: Watch list Audubon: Watch list
+ <i>Spizella breweri</i> (nesting) Brewer's sparrow	G5S3			LR/NT	USBC: Watch list Audubon: Watch list FWS: BCC
<i>Spizella passerina</i> (nesting) Chipping sparrow	G5S3S4			LC	
CARDINALIDAE (cardinals)					
+ <i>Cardinalis cardinalis</i> Northern cardinal	G5S1			LC	DFG: CSC
ICTERIDAE (blackbirds)					
+ <i>Agelaius tricolor</i> (nesting colony) Tricolored blackbird	G2G3S2			LC	DFG: CSC FWS: BCC USBC: Watch list Audubon: Watch list BLM: Sensitive
+ <i>Xanthocephalus xanthocephalus</i> (nesting) Yellow-headed blackbird	G5S3S4			LC	
FRINGILLIDAE (finches and relatives)					
+ <i>Carduelis lawrencei</i> (nesting) Lawrence's goldfinch	G3G4S3			LC	USBC: Watch list FWS: BCC Audubon: Watch list

	CNDDDB RANK	CESA	ESA	IUCN	OTHER
MAMMALS (127 taxa)					
TALPIDAE (moles)					
+ <i>Scapanus latimanus parvus</i> Alameda Island mole	G5T1S1			LC (full species)	DFG: CSC
+ <i>Scapanus latimanus insularis</i> Angel Island mole	G5T1S1			LC (full species)	
SORICIDAE (shrews)					
+ <i>Sorex lyelli</i> Mount Lyell shrew	G2G3S2S3			LC	DFG: CSC
+ <i>Sorex ornatus relictus</i> Buena Vista Lake shrew	G5T1S1		FE	LC (full species)	DFG: CSC
<i>Sorex ornatus salarius</i> Salinas ornate shrew	G5T1T2S1S2			LC (full species)	DFG: CSC
+ <i>Sorex ornatus salicornicus</i> Southern California saltmarsh shrew	G5T1S1			LC (full species)	DFG: CSC
+ <i>Sorex ornatus sinuosus</i> Suisun shrew	G5T1S1			LC (full species)	DFG: CSC
+ <i>Sorex ornatus willetti</i> Santa Catalina shrew	G5T1S1			LC (full species)	DFG: CSC
+ <i>Sorex vagrans halicoetes</i> Salt-marsh wandering shrew	G5T1S1			LC (full species)	DFG: CSC
<i>Sorex vagrans paludivagus</i> Monterey vagrant shrew	G5T1S1			LC (full species)	
PHYLLOSTOMIDAE (leaf-nosed bats)					
+ <i>Choeronycteris mexicana</i> Mexican long-tongued bat	G4S1			LR/NT	DFG: CSC WBWG: High priority
+ <i>Macrotus californicus</i> California leaf-nosed bat	G4S2S3			VU/A2c	DFG: CSC FS: Sensitive WBWG: High priority
VESPERTILIONIDAE (evening bats)					
+ <i>Antrozous pallidus</i> Pallid bat	G5S3			LR/LC	DFG: CSC FS: Sensitive BLM: Sensitive WBWG: High priority
+ <i>Corynorhinus townsendii</i> Townsend's big-eared bat	G4S2S3			VU/A2c	DFG: CSC FS: Sensitive BLM: Sensitive WBWG: High Priority
+ <i>Euderma maculatum</i> Spotted bat	G4S2S3			LC	DFG: CSC BLM: Sensitive WBWG: High priority
<i>Idionycteris phyllotis</i> Allen's big-eared bat	G3G4S1				WBWG: High priority

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+ <i>Lasionycteris noctivagans</i> Silver-haired bat	G5S3S4			LC	WBWG: Medium priority
+ <i>Lasiurus cinereus</i> Hoary bat	G5S3			LC	WBWG: Medium priority
+ <i>Lasiurus blossevillii</i> Western red bat	G5S2S3				WBWG: High priority FS: Sensitive
+ <i>Lasiurus xanthinus</i> Western yellow bat	G5S3			LC	WBWG: High priority
+ <i>Myotis ciliolabrum</i> Small-footed myotis	G5S2S3			LC	BLM: Sensitive WBWG: Medium priority
+ <i>Myotis evotis</i> Long-eared myotis	G5S4?			LC	BLM: Sensitive WBWG: Medium priority
<i>Myotis lucifugus</i> Little brown bat (San Bernardino Mts pop)	G5S2S3			LR/LC	WBWG: Medium priority
+ <i>Myotis occultus</i> (= <i>Myotis lucifugus occultus</i>) Occult little brown bat (AKA Arizona myotis)	G5T3T4S2S3				DFG: CSC WBWG: Medium priority
+ <i>Myotis thysanodes</i> Fringed myotis	G4G5S4			LC	BLM: Sensitive WBWG: High priority
+ <i>Myotis velifer</i> Cave myotis	G5S1			LC	DFG: CSC BLM: Sensitive WBWG: Medium priority
+ <i>Myotis volans</i> Long-legged myotis	G5S4?			LC	WBWG: High priority
+ <i>Myotis yumanensis</i> Yuma myotis	G5S4?			LC	BLM: Sensitive WBWG: Low-med priority
MOLOSSIDAE (free-tailed bats)					
+ <i>Eumops perotis</i> Western mastiff bat	G5S3?			LC	DFG: CSC BLM: Sensitive WBWG: High priority
+ <i>Nyctinomops femorosaccus</i> Pocketed free-tailed bat	G4S2S3			LC	DFG: CSC WBWG: Medium priority
+ <i>Nyctinomops macrotis</i> Big free-tailed bat	G5S2			LC	DFG: CSC WBWG: Med-High priority
OCHOTONIDAE (pikas)					
+ <i>Ochotona princeps sheltoni</i> White Mountains pika	G5T1T2S1S2				
LEPORIDAE (rabbits and hares)					
+ <i>Brachylagus idahoensis</i> Pygmy rabbit	G4S3			LR/NT	DFG: CSC
+ <i>Lepus americanus klamathensis</i> Oregon snowshoe hare	G5T3T4S2?			LC (full species)	DFG: CSC
+ <i>Lepus americanus tahoensis</i> Sierra Nevada snowshoe hare	G5T3T4S2?			LC (full species)	DFG: CSC
+ <i>Lepus californicus bennettii</i> San Diego black-tailed jackrabbit	G5T3S3?			LC (full species)	DFG: CSC

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	<u>CNDDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Lepus townsendii townsendii</i> Western white-tailed jackrabbit	G5T3S3?			LC (full species)	DFG: CSC
+ <i>Sylvilagus bachmani riparius</i> Riparian brush rabbit	G5T1S1	SE	FE	LC (full species)	
APLODONTIDAE (mountain beavers)					
+ <i>Aplodontia rufa californica</i> Sierra Nevada mountain beaver	G5T3T4S3?			LR/NT	DFG: CSC
+ <i>Aplodontia rufa nigra</i> Point Arena mountain beaver	G5T1S1		FE	VU/B1+2de	DFG: CSC
+ <i>Aplodontia rufa phaea</i> Point Reyes mountain beaver	G5T2S2			VU/B1+2e	DFG; CSC
SCIURIDAE (squirrels and relatives)					
+ <i>Ammospermophilus nelsoni</i> San Joaquin antelope squirrel	G2S2	ST		EN/A1a, B1+2c	
+ <i>Glaucomys sabrinus californicus</i> San Bernardino flying squirrel	G5T2T3S2S3			LC (full species)	DFG: CSC
+ <i>Spermophilus lateralis bernardinus</i> San Bernardino ground squirrel	G5T1S1			LC (full species)	FS: Sensitive
+ <i>Spermophilus mohavensis</i> Mohave ground squirrel	G2G3S2S3	ST		VU/B1+3d	
+ <i>Spermophilus tereticaudus chlorus</i> Palm Springs round-tailed ground squirrel	G5T1T2S1S2		FC	DD	DFG: CSC
+ <i>Tamias panamintinus acrus</i> Kingston Mountain chipmunk	G4T1T2S1S2			LC (full species)	
+ <i>Tamias speciosus callipeplus</i> Mount Pinos chipmunk	G4T1T2S1S2			LC (full species)	FS: Sensitive
+ <i>Tamias speciosus speciosus</i> Lodgepole chipmunk	G4T2T3S2S3			LC (full species)	
GEOMYIDAE (pocket gophers)					
<i>Thomomys bottae operarius</i> Owens Lake pocket gopher	G5T1?S1?				
HETEROMYIDAE (kangaroo rats, pockets mice, & kangaroo mice)					
+ <i>Chaetodipus californicus femoralis</i> Dulzura (California) pocket mouse	G5T3S2?			LC (full species)	DFG: CSC
+ <i>Chaetodipus fallax fallax</i> Northwestern San Diego pocket mouse	G5T3S2S3			LC (full species)	DFG: CSC (full species)
+ <i>Chaetodipus fallax pallidus</i> Pallid San Diego pocket mouse	G5T3S3			LC (full species)	DFG: CSC (full species)
+ <i>Dipodomys californicus eximus</i> Marysville California kangaroo rat	G4T1S1			LC (full species)	DFG: CSC BLM: Sensitive
+ <i>Dipodomys heermanni berkeleyensis</i> Berkeley kangaroo rat	G3G4T1S1			VU/B1+2c	
+ <i>Dipodomys heermanni dixonii</i> Merced kangaroo rat	G3G4T2T3S2S3			LR/NT	

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	<u>CNDDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Dipodomys heermanni morroensis</i> Morro bay kangaroo rat	G3G4T1S1	SE	FE	CR/B1+2c,D	DFG: Fully protected
+ <i>Dipodomys ingens</i> Giant kangaroo rat	G2S2	SE	FE	CR/A1a, B1+2c	
<i>Dipodomys merriami collinus</i> Earthquake Merriam's kangaroo rat	G5T1T2S1S2			DD	
+ <i>Dipodomys merriami parvus</i> San Bernardino Merriam's kangaroo rat	G5T1S1		FE	DD	DFG: CSC
+ <i>Dipodomys nitratoides brevinasus</i> Short-nosed kangaroo rat	G3T1T2S1S2			LR/NT	DFG: CSC BLM: Sensitive
+ <i>Dipodomys nitratoides exilis</i> Fresno kangaroo rat	G3T1S1	SE	FE	CR/B1+2c	
+ <i>Dipodomys nitratoides nitratoides</i> Tipton kangaroo rat	G3T1S1	SE	FE	CR/A1c	
+ <i>Dipodomys panamintinus argusensis</i> Argus Mountains kangaroo rat	G5T1T3S1S3				
+ <i>Dipodomys panamintinus panamintinus</i> Panamint kangaroo rat	G5T3S3				
+ <i>Dipodomys stephensi</i> Stephens' kangaroo rat	G2S2	ST	FE	LRcd	
+ <i>Dipodomys venustus elephantinus</i> Big-eared kangaroo rat	G4T2S2			LR/LC (full species)	DFG: CSC
+ <i>Dipodomys venustus venustus</i> Santa Cruz kangaroo rat	G4T1S1			LR/LC (full species)	
+ <i>Perognathus alticolus alticolus</i> White-eared pocket mouse	G1G2THSH			CR/B1+2b	DFG: CSC (full species) FS: Sensitive
+ <i>Perognathus alticolus inexpectatus</i> Tehachapi pocket mouse	G1G2T1T2S1S2			LRnt	DFG: CSC (full species) FS: Sensitive
+ <i>Perognathus inornatus inornatus</i> San Joaquin pocket mouse	G4T2T3S2S3			LC (full species)	BLM: Sensitive
<i>Perognathus inornatus neglectus</i> McKittrick pocket mouse	T4T2T3S2S3				
+ <i>Perognathus inornatus psammophilus</i> Salinus pocket mouse	G4T2?S2?			LRnt	DFG: CSC
+ <i>Perognathus longimembris bangsi</i> Palm Springs pocket mouse	G5T2T3S2S3			DD	DFG: CSC
+ <i>Perognathus longimembris brevinasus</i> Los Angeles pocket mouse	G5T1?S1?			VU/B1+2c	DFG: CSC FS: Sensitive
+ <i>Perognathus longimembris internationalis</i> Jacumba pocket mouse	G5T2T3S1S2			DD	DFG: CSC
+ <i>Perognathus longimembris pacificus</i> Pacific pocket mouse	G5T1S1		FE	CR/B1+2c, C1+2ab	DFG: CSC
<i>Perognathus longimembris salinensis</i> No common name	G5T1S1				
<i>Perognathus longimembris tularensis</i> No common name	G5T1S1				
+ <i>Perognathus parvus xanthonotus</i> Yellow-eared pocket mouse	G5T2T3S1S2				BLM: Sensitive

Special Animals list – July 2005

	CNDDDB RANK	CESA	ESA	IUCN	OTHER
MURIDAE (mice, rats, and voles)					
+ <i>Arborimus albipes</i> White-footed vole	G3G4S2S3			DD	DFG: CSC
+ <i>Arborimus pomo</i> Red tree vole	G3S3			DD	DFG: CSC
<i>Microtus californicus halophilus</i> Monterey vole	G5T1S1				
+ <i>Microtus californicus mohavensis</i> Mohave River vole	G5T1S1			VU/A1d+2d, D2	DFG: CSC
+ <i>Microtus californicus sanpabloensis</i> San Pablo vole	G5T1T2S1S2				DFG: CSC
+ <i>Microtus californicus scirpensis</i> Amargosa vole	G5T1S1	SE	FE	VU/B1+3cd	
+ <i>Microtus californicus stephensi</i> South coast marsh vole	G5T1T2S1S2			DD	DFG: CSC
+ <i>Microtus californicus vallicola</i> Owens Valley vole	G5T1S1			LRnt	DFG: CSC
+ <i>Neotoma albigula venusta</i> Colorado Valley woodrat	G5T3T4SH			LC (full species)	
<i>Neotoma fuscipes annectens</i> San Francisco dusky-footed woodrat	G5T2T3S2S3			DD	DFG: CSC
+ <i>Neotoma macrotis luciana</i> Monterey dusky-footed woodrat	G5T3?S3?			DD	DFG: CSC
+ <i>Neotoma fuscipes riparia</i> ⁴² Riparian (=San Joaquin Valley) woodrat	G5T1QS1		FE	CR/B1+2c	DFG: CSC
+ <i>Neotoma lepida intermedia</i> San Diego desert woodrat	G5T3?S3?			DD	DFG: CSC
+ <i>Onychomys torridus ramona</i> Southern grasshopper mouse	G5T3?S3?			DD	DFG: CSC
+ <i>Onychomys torridus tularensis</i> Tulare grasshopper mouse	G5T1T2S1S2			DD	DFG: CSC BLM: Sensitive
+ <i>Peromyscus maniculatus anacpae</i> Anacapa Island deer mouse	G5T1T2S1S2			LRnt	DFG: CSC
<i>Peromyscus maniculatus clementis</i> San Clemente deer mouse	G5T1T2S1S2			LRnt	DFG: CSC
+ <i>Reithrodontomys megalotus distichlus</i> Monterey Bay harvest mouse	G5THSH			LC (full species)	
+ <i>Reithrodontomys megalotus santacruzae</i> ⁴³ Santa Cruz harvest mouse	G5T1QS1			LC (full species)	
+ <i>Reithrodontomys raviventris</i> Salt-marsh harvest mouse	G1G2S1S2	SE	FE	VU/A1c+2c B1+2c	DFG: Fully protected
+ <i>Sigmodon arizonae plenus</i> Colorado River cotton rat	G3?T1SH			LRnt	DFG: CSC
+ <i>Sigmodon hispidus eremicus</i> Yuma hispid cotton rat	G5T2T3S2			LRnt	DFG: CSC
DIPODIDAE (jumping mice)					
+ <i>Zapus trinotatus orarius</i> Point Reyes jumping mouse	G5T1T3QS1S3			LRcd	DFG: CSC

⁴² This subspecies is currently undergoing taxonomic revision

⁴³ Synonymous with *Reithrodontomys megalotus longicaudus* Santa Cruz Island population

Special Animals list – July 2005

	<u>CNDDDB RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
CANIDAE (foxes, wolves, and coyotes)					
+ <i>Urocyon littoralis</i> Island fox	G1S1	ST ⁴⁴		CR/A2be +3e	
+ <i>Urocyon littoralis littoralis</i> San Miguel Island fox	G1T1S1		FE		
+ <i>Urocyon littoralis santarosae</i> Santa Rosa Island fox	G1T1S1		FE		
+ <i>Urocyon littoralis santacruzae</i> Santa Cruz Island fox	G1T1S1		FE		
+ <i>Urocyon littoralis catalinae</i> Santa Catalina Island fox	G1T1S1		FE		
+ <i>Vulpes macrotis mutica</i> San Joaquin kit fox	G4T2T3S2S3	ST	FE		
+ <i>Vulpes vulpes necator</i> Sierra Nevada red fox	G5T3S1	ST			FS: Sensitive
MUSTELIDAE (weasels and relatives)					
+ <i>Enhydra lutris nereis</i> Southern sea otter	G4T2S2		FT	EN/A1ace (full species)	DFG: Fully protected
+ <i>Gulo gulo</i> California wolverine	G4S2	ST		VU/A2c	DFG: Fully protected FS: Sensitive (ssp. <i>Luteus</i>)
+ <i>Lontra canadensis sonora</i> Southwestern river otter	G5T1S1			LC (full species)	DFG: CSC BLM: Sensitive
+ <i>Martes americana</i> American marten	G5S3S4			LC	FS: Sensitive
+ <i>Martes americana sierra</i> American (=pine) marten	G5T3T4S3S4			LC (full species)	FS: Sensitive (full species)
+ <i>Martes americana humboldtensis</i> Humboldt marten	G5T2T3S2S3			LC (full species)	DFG: CSC FS: Sensitive (full species)
+ <i>Martes pennanti pacifica</i> Pacific fisher	G5T3T4QS2S3		FC ⁴⁵	LC (full species)	DFG: CSC (full species) FS: Sensitive BLM: Sensitive DFG: CSC
+ <i>Taxidea taxus</i> American badger	G5S4			LC	
MEPHITIDAE (skunks)					
+ <i>Spilogale gracilis amphiala</i> Channel Islands spotted skunk	G5T3S3				DFG: CSC
FELIDAE (cats and relatives)					
<i>Lynx rufus pallascens</i> Pallid bobcat	G5T3?S3?				

⁴⁴ State listing includes all subspecies on all islands.

⁴⁵ Candidate status refers to the distinct population segment in Washington, Oregon and California.

Special Animals list – July 2005

	<u>CNDDDB</u> <u>RANK</u>	<u>CESA</u>	<u>ESA</u>	<u>IUCN</u>	<u>OTHER</u>
+ <i>Puma concolor browni</i> Yuma mountain lion	G5T1T2QS1				DFG: CSC
OTARIIDAE (sea lions and fur seals)					
+ <i>Arctocephalus townsendi</i> Guadalupe fur seal	G1S1	ST	FT	VU/D2	DFG: Fully protected
+ <i>Callorhinus ursinus</i> Northern fur seal	G3S1			VU/A1b	
+ <i>Eumetopias jubatus</i> (rookery) Northern (Steller) sea lion	G3S2		FT	EN/A1b	
BOVIDAE (sheep and relatives)					
+ <i>Ovis canadensis californiana</i> California (=Sierra) bighorn sheep	G4T1S1	SE	FE	LRcd	DFG: Fully protected
+ <i>Ovis canadensis nelsoni</i> DPS ⁴⁶ Peninsular bighorn sheep	G4T3S1	ST	FE	EN/C1+2a	DFG: Fully protected
+ <i>Ovis canadensis nelsoni</i> Nelson's (=Desert) bighorn sheep	G4T4S3			LRcd	BLM: Sensitive FS: Sensitive

⁴⁶ The subspecies *O. c. cremnobates* has been synonymized the *O. c. nelsoni*. Peninsular bighorn sheep are now considered to be a Distinct Population Segment.

APPENDIX 1

CNDDDB RANKS

CNDDDB ranks are shorthand formulas that provide information on the rarity of a species or subspecies, both throughout its global range and its range within the State. We use the best information available to assign these ranks and they are regularly updated as new information becomes available.

GLOBAL RANKS: Worldwide status of a *full species*: G1 to G5

G1 = Extremely endangered: <6 viable occurrences (EO's) or <1,000 individuals, or < 2,000 acres of occupied habitat

G2 = Endangered: about 6-20 EO's or 1,000 - 3,000 individuals, or 2,000 to 10,000 acres of occupied habitat

G3 = Restricted range, rare: about 21-100 EO's, or 3,000 – 10,000 individuals, or 10,000 – 50,000 acres of occupied habitat

G4 = Apparently secure; some factors exist to cause some concern such as narrow habitat or continuing threats

G5 = Demonstrably secure; commonly found throughout its historic range

STATE RANKS: Statewide status of a *full species or a subspecies*: S1 to S5

Same general definitions as global ranks, but just for the range of the taxa within California.

T-RANKS: Status of a *subspecies* throughout its range: T1 to T5

A subspecies is given a T-rank. This is attached to the G-rank for the full species. The S-rank, in this case, will refer to the status of the subspecies within California. The T-rank has the same general definitions as the global ranks.

EXAMPLES:

Island Fox (*Urocyon littoralis*) – **G1S1**

G1 – *Urocyon littoralis* is extremely endangered throughout its worldwide range

S1 – It is a California endemic, therefore its range within the state is the same as its worldwide range.

Yuma clapper rail (*Rallus longirostris yumanensis*) – **G5T3S1**

G5 – *Rallus longirostris* is common in North American coastal salt marshes and the range extends down into South America.

T3 – *R. l. yumanensis* is rare and has a restricted range within Mexico, Arizona, and California

S1 – This subspecies is extremely endangered within California

Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*) – **G5T1S1**

G5 – *Ambystoma macrodactylum* is found throughout the Pacific northwest.

T1 – The subspecies *A. m. croceum* is found only in California and is extremely endangered throughout its range.

S1 – This subspecies is extremely endangered within California

OTHER NOTATIONS: applicable to G-ranks, S-ranks, and T-ranks

G1G3 = proper rank is most likely within this range of ranks

G2? = proper rank is probably G2

G? = we don't have enough information to rank the species

GH = all sites are historical; this species may be extinct, but further field work is needed

GX = species is extinct (SX = species is extirpated from California)

GXC = species is extinct in the wild, but it exists in cultivation

G2Q = species is endangered but there is some taxonomic question about the species

Appendix G

Memorandum of Agreement
Santa Ysabel East Ranch Land Acquisition
and
Fulfillment of Responsibilities under the
National Environmental Policy Act

This Memorandum of Agreement (MOA) is among the Federal Highway Administration (FHWA), California Department of Transportation (Department), and San Diego County Department of Parks and Recreation (County), regarding fulfillment of Section 106 responsibilities pursuant to the *Santa Ysabel East Ranch* acquisition.

The Nature Conservancy (TNC), in coordination with the Wildlife Conservation Board, acquired approximately 3500 acres of land in the Santa Ysabel region of San Diego County. Roughly half, 1500 acres, were acquired through the use of Transportation Enhancement Activity (TEA) funding provided for by Transportation Equity Act (TEA-21) legislation, as administered by FHWA. TNC transferred title to the land to the County on December 31, 2001.

The *Santa Ysabel East* acquisition was primarily for open space preservation; however, cattle grazing is planned for portions of the property, and some existing access roads may be used for County maintenance vehicles and for public hiking. These activities may have the potential to affect sensitive cultural resources.

Cultural resources inventory efforts to date have concentrated on potential roads/hiking trails, and those cultural resources that might be located closest to these points of public access.

This MOA addresses future impacts to the property that might be implemented by the County, outlining the roles and responsibilities of FHWA, the Department, and the County regarding their Section 106 obligations in accordance with the National Historic Preservation Act of 1966, as amended. Only the existing roads/trails, as outlined on the attached Area of Potential Effects (APE) map, may be used by County personnel and the public.

All existing cultural resources within the APE shall be protected through the establishment of Environmentally Sensitive Areas (ESAs) that will be monitored in accordance with an ESA Action Plan, attached, and incorporated herein by reference.

No ground disturbing activities are to be allowed on the lands acquired with federal funds until additional cultural resource evaluations have been completed in accordance with the provisions outlined in this MOA. Because the APE represents lands acquired with federal funding, the County's obligations under 36CFR§800 shall remain in perpetuity.

STIPULATIONS

1. Upon approval of this MOA by all signatory parties, the County's Section 106 responsibilities shall be considered complete until such time that any of the following occurs:
 - a. County transfers APE lands to another land management agency.
 - b. County proposes an undertaking within the APE in the area of a known cultural resource, as documented in the Historic Property Survey Report and Cultural Resources Inventory and Management Plan, attached, and incorporated herein by reference.
 - c. County proposes an undertaking within the APE, but outside the areas documented in Stipulation 1.b. above.
2. In the event that Stipulation 1.a. occurs, this MOA shall be considered null and void. The Section 106 consultation process will be reopened. The County, Department, FHWA, State Historic Preservation Officer (SHPO), and land-acquiring agency will develop a new MOA outlining how those cultural resources within the APE will be managed into perpetuity.
3. In the event that Stipulation 1.b. occurs, County shall do everything it its power to avoid, minimize, and only as a last resort, mitigate for potential adverse effects to cultural resources within the APE. Potential impacts to known cultural resources will be documented and treated in accordance with the *Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* [Section 106 P.A.], which became effective January 1, 2004, is attached, and incorporated herein by reference.
 - a. Upon proposal by County of any undertaking within the APE, County shall consult with the Department on its responsibilities under Section 106, and how those responsibilities shall be fulfilled. Department District 11 Heritage Resources Coordinator (HRC) will act on behalf of the Department to ensure that County's obligations are completed in as professional and efficient manner as possible.
4. In the event that Stipulation 1.c. occurs, County shall immediately conduct a cultural resources inventory of the affected lands to determine whether cultural resources are present, and whether they can be avoided by the proposed undertaking.
 - a. Upon the results of this inventory effort, County shall consult with the Department in accordance with Stipulation 3.a.

Appendix G

By signing in the appropriate place below, all parties agree to the above stipulations.

Charles “Muggs” Stoll Date _____
Deputy District Director - Environmental/125-South
Caltrans District 11, MS-46
P.O. Box 85406, San Diego, CA 92186-5406

Renee Bahl
Director, Department of Park & Recreation
San Diego County
5201 Ruffin Road, Suite P, San Diego CA 92123

Gene K. Fong
California Division Administrator
Federal Highway Administration
650 Capitol Mall, #4-100, Sacramento, CA 95814-4708

Appendix G

Environmentally Sensitive Area (ESA) Action Plan: Tasks and Responsible Parties

Task	Responsible Party*	Task Completed (date and initial)
1. County Parks' Consulting Archaeologist will ensure that County Parks' Cultural Resources Specialist has field reviewed the cultural resources located within the Santa Ysabel East (SYE) TEA acquisition parcel.	County Parks' Consulting Archaeologist, County Parks' Cultural Resources Specialist	8/18/04 Lynne Newell Christenson
2. County Parks' Consulting Archaeologist will provide County Parks' Cultural Resources Specialist with sufficient mapping to delineate adequately the cultural resource ESAs and their protective buffers.	County Parks' Consulting Archaeologist, County Parks' Cultural Resources Specialist	8/18/04 Lynne Newell Christenson
3. This ESA Action Plan will remain in effect as part of the permanent record for the San Diego County Parks' SYE TEA Acquisition and be a part of the parks' history file.	County Parks' Project Manager for Santa Ysabel East Acquisition, County Parks' Cultural Resources Specialist	8/30/05 Mike McFedries
4. No ground disturbance will take place within the SYE TEA Acquisition within the known limits of a cultural resource ESA without reopening the Section 106 consultation process, which will involve County Parks and California Department of Transportation District 11 (Department), but may also involve the Federal Highway Administration (FHWA), the State Historic Preservation Officer (SHPO), and appropriate Native American groups; coordination will be managed by Department's Heritage Resource Coordinator.	County Parks' Project Manager for Santa Ysabel East Acquisition, County Parks' Cultural Resources Specialist, Department's Heritage Resource Coordinator	Ongoing Mike McFedries
5. No ground disturbance will take place within an area that has not been surveyed for cultural resources, as documented in the attached technical studies; depending upon the survey results and the nature of the undertaking, new ESAs may need to be created, or in the event of negative findings, documentation will be produced in accordance with the Department's statewide Section 106 Programmatic Agreement (PA); if cultural resources cannot be avoided the Section 106 will be reopened.	County Parks' Project Manager for Santa Ysabel East Acquisition, County Parks' Cultural Resources Specialist, Department's Heritage Resource Coordinator	Ongoing Mike McFedries

Appendix G

Task	Responsible Party*	Task Completed (date and initial)
6. County Parks will make a good-faith effort to maintain the cultural resources within SYE TEA Acquisition in perpetuity; including rerouting of trails away from known cultural resource ESAs, preventing cattle from grazing within ESAs, and monitoring cultural resources annually to determine the effectiveness of this ESA Action Plan; County Parks will submit an annual report to the Department documenting the results of the annual monitoring program.	County Parks' Project Manager for Santa Ysabel East Acquisition, County Parks' Cultural Resources Specialist	Ongoing Mike McFedries and Lynne Newell Christenson
7. The importance of ESAs will be discussed with park personnel so they are aware of them and the need to avoid any ground disturbances within them; sensitivity training may be needed, as well as identifying applicable local and federal regulations that protect archaeological sites against disturbance or removal of artifacts.	County Parks' Project Manager for Santa Ysabel East Acquisition, County Parks' Cultural Resources Specialist	Ongoing Mike McFedries and Lynne Newell Christenson
8. County Parks' Cultural Resources Specialist will notify the Department within two (2) business days of any ESA breach and consult immediately to determine how the breach will be addressed; County Parks' Cultural Resources Specialist will also consult with the appropriate Native American groups.	County Parks' Cultural Resources Specialist	Ongoing Lynne Newell Christenson

***Responsible Parties as of December 10, 2004:**

Title	Contact	Contact numbers
County Parks' Consulting Archaeologist	Susan M. Hector	619/501-6005, office 619/871-6005, cell
County Parks' Cultural Resources Specialist	Lynne Newell Christenson	619/472-2734, office 619/306-9504, cell
County Parks' Park Project Manager for Santa Ysabel East Acquisition	Mike McFedries	858/694/3429, office 619/981/6537, cell
Department's Heritage Resource Coordinator	Martin D. Rosen	858/616-6615, office 619/997-6751, cell

Appendix H

CALIFORNIA NATIVE PLANT SOCIETY –
VEGETATION RAPID ASSESSMENT PROTOCOL
CNPS VEGETATION COMMITTEE
(November 5, 2001, Revised September 20, 2004)

Introduction

The rapid assessment protocol is a reconnaissance-level method of vegetation and habitat sampling. It may be used to quickly assess and map the extent of all vegetation types in relatively large, ecologically defined regions. The California Native Plant Society (CNPS) has adopted this method to verify locations of known vegetation types, to gain information about new types, and to acquire general information about their composition, habitat, and site quality. Other agencies, such as California State Parks, the Department of Fish and Game, and the U.S. Forest Service, are also adopting this method for documenting vegetation patterns.

By using this method, biologists and resource managers can gain a broad ecological perspective, as the full range in ecological variation across broad landscapes can be reflected in the vegetation assessments. For example, changes in environmental elements (such as geology, aspect, topographic position) or physical processes (fire, flooding, erosion, and other natural or human-made disturbances) can influence the distribution of plants or patterning of vegetation, which are documented in the rapid assessments. In turn, these vegetation patterns can influence the distribution of animals across the landscape.

The quantitative vegetation data recorded in the rapid assessments can be described with standard classification techniques and descriptions, and they can be depicted in maps across any landscape. Additional information recorded in the assessments, such as disturbance history and anthropogenic impacts, can serve to define habitat quality and integrity for plant and animal distributions. Because this method provides an important means for representing the full array of biological diversity as well as habitat integrity in an area, it can also be an effective and efficient tool for conducting natural resource planning.

Purpose

The Vegetation Program has adopted the rapid assessment method to update the location, distribution, species composition, and disturbance information of vegetation types as identified in the first edition of *A Manual of California Vegetation* (MCV), a CNPS publication. The release of the MCV heralded a new statewide perspective on vegetation classification. The premise of the book – all vegetation can be quantified based on cover, constancy, and composition of plant species, yielding uniform defensible definitions of vegetation units – has proven to be very useful throughout California and the rest of the nation. The MCV has become the standard reference on California vegetation and has been adopted by many agencies such as California Department of Fish and Game, the National Park Service, California State Parks, and the U.S. Forest Service as the standard approach to classify vegetation statewide.

One of the most important purposes of rapid assessments is to verify the locations of each vegetation type because much about the geography of vegetation remains uncertain in this state.

To obtain a more accurate understanding of the location and distribution of the vegetation types, nothing short of systematic inventory will suffice. Using the rapid assessment method, CNPS Chapters and other organizations can work together in selected ecological regions to gather vegetation data over a short time period in a broad area. This geographic inventory of vegetation types can greatly advance the current distribution understanding of vegetation.

In addition, California is working with a new vegetation classification, and its parameters are largely untested. The rapid assessment method will be used to gather additional information on species composition, distribution, disturbance effects, and environmental influences of vegetation. Thus, this method will provide modifications to the existing vegetation classifications and information on new types.

This protocol can also be used in tandem with other resource assessment protocols such as wildlife assessments or aquatic/stream assessments. For example, the California Wildlife Habitat Relationships (CWHR) protocols have been used in conjunction with the vegetation assessment protocol to obtain detailed records on habitat quality and suitability for vertebrate animals in terrestrial habitats. The CWHR protocols can also help test the relationships between the vegetation type and habitat of various animals and thereby refine the understanding and predictability of the distribution of animals. A portion of the CWHR protocols is incorporated into the rapid assessment method to obtain suitability information for vertebrate species.

While people can quickly obtain information on the variety of vegetation types using this method, some of the vegetation types recorded in the rapid assessment process may be poorly defined in the current classification system. These poorly understood or unknown types will be identified and located and then will be prioritized for more detailed assessment using the CNPS relevé protocol. Thus, the rapid assessment method will be used in conjunction with the relevé method to provide large quantities of valuable data on the distribution and the definition of vegetation. These data will be entered into existing databases for summarizing and archiving, and they will be used to modify and improve statewide vegetation classification and conservation information.

Why do we need to know about the composition and distribution of vegetation?

- to have a more accurate understanding of the commonness and rarity of different forms of vegetation throughout the state
- to link the distribution of various rare and threatened plant species with the vegetation units
- to provide a clearer picture of relationships between vegetation types
- to help prioritize community-based land conservation goals based on the local representation of unique types, high diversity areas, etc.
- to do the same for regional vegetation throughout the state and the nation.
- to broaden the vegetation knowledge base for California
- to motivate people to do more to help identify, protect, and conserve vegetation in their area
- to link vegetation types with habitat for animals

Selecting stands to sample:

To start the rapid assessment method, stands of vegetation need to be defined.

A stand is the basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small, such as alpine meadow or tundra types, and some may be several square kilometers in size, such as desert or forest types. A stand is defined by two main unifying characteristics:

- 1) It has compositional integrity. Throughout the site, the combination of species is similar. The stand is differentiated from adjacent stands by a discernable boundary that may be abrupt or indistinct.
- 2) It has structural integrity. It has a similar history or environmental setting that affords relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest originally dominated by the same species that burned on the upper part of the slopes, but not the lower, would be divided into two stands. Likewise, a sparse woodland occupying a slope with very shallow rocky soils would be considered a different stand from an adjacent slope with deeper, moister soil and a denser woodland or forest of the same species.

The structural and compositional features of a stand are often combined into a term called homogeneity. For an area of vegetated ground to meet the requirements of a stand, it must be homogeneous.

Stands to be sampled may be selected by evaluation prior to a site visit (*e.g.* delineated from aerial photos or satellite images), or they may be selected on site (during reconnaissance to determine extent and boundaries, location of other similar stands, etc.).

Depending on the project goals, you may want to select just one or a few representative stands of each homogeneous vegetation type for sampling (*e.g.* for developing a classification for a vegetation mapping project), or you may want to sample all of them (*e.g.* to define a rare vegetation type and/or compare site quality between the few remaining stands).

Definitions of fields in the protocol

LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Polygon/Stand #: Number assigned either in the field or in the office prior to sampling. It is usually denoted with an abbreviation of the sampling location and then a sequential number of that locale (*e.g.* CRRA-001 for Coyote Ridge rapid assessment number 1).

Air photo #: The number given to the aerial photo in a vegetation-mapping project, for which photo interpreters have already done photo interpretation and delineations of polygons. If the sample site has not been photo-interpreted, leave blank.

Date: Date of the sampling.

Name(s) of surveyors: The full names of each person assisting should be provided for the first rapid assessment. In successive assessments, initials of each person assisting can be recorded. Please note: The person recording the data on the form should circle their name/initials.

GPS waypoint #: The waypoint number assigned by a Global Positioning System (GPS) unit when marking and storing a waypoint for the stand location. These waypoints can be downloaded from the GPS into a computer Geographic Information System to depict sample points accurately on a map.

GPS name: The name personally assigned to each GPS unit (especially useful if more than one GPS unit is used to mark waypoints for the project).

GPS datum: (NAD 27) The map datum that is chosen for GPS unit to document location coordinates. The default datum for CNPS projects is NAD 27. However, other agencies and organizations may prefer another datum. Please circle NAD27 or write in the appropriate datum.

Is GPS within stand? Yes / No Circle “Yes” to denote that the GPS waypoint was taken directly within or at the edge of the stand being assessed, or circle “No” to denote the waypoint was taken at a distance from the stand (such as with a binocular view of the stand).

If No cite distance (note ft/m), bearing and view from point to stand: An estimate of the number of feet or meters (please circle appropriate), the compass bearing from the waypoint of GPS to the stand, and the method of view used to verify the plot (*e.g.* binoculars, aerial photo).

Error: \pm The accuracy of the GPS location, when taking the UTM field reading. Please denote feet (ft) or meters (m). It is typical for all commercial GPS units to be accurate to within 5 m (or 16 ft.) of the actual location, because the military’s intentional imprecision (known as “selective availability”) has been “turned off” as of July 2000. Please become familiar with your GPS unit’s method of determining error. Some of the lower cost models do not have this ability. If using one of those, insert N/A in this field.

UTM field reading: Easting (UTME) and northing (UTMN) location coordinates using the Universal Transverse Mercator (UTM) grid. Record using a GPS unit or USGS topographic map.

UTM zone: Universal Transverse Mercator zone. Zone 10S for California west of the 120th longitude; zone 11S for California east of 120th longitude.

Elevation: Recorded from the GPS unit or USGS topographic map. Please denote feet (ft) or meters (m), and note if reading is from GPS unit or map. (Please note: Readings taken from a GPS unit can be hundreds of feet off.)

Photograph #'s: Note the roll number, frame number, direction, and the name of the person whose camera is being used. Take at least two photographs from different directions, and describe the location and view direction from compass bearings for each frame. Additional photographs of the stand may also be helpful. (Also, if using a digital camera or scanning the image into a computer, positions relative to the polygon/stand number can be recorded digitally.)

Topography: Check two of the provided features, characterizing both the local relief and the broad topographic position of the area. First assess the minor topographic features or the lay of the area (e.g. surface is flat, concave, etc.). Then assess the broad topographic feature or general position of the area (e.g. stand is at the bottom, lower (1/3 of slope), middle (1/3 of slope), upper (1/3 of slope), or top).

Geology: Geological parent material of site. If exact type is unknown, use a more general category (e.g. igneous, metamorphic, sedimentary). *See code list for types.*

Soil: Record soil texture or series that is characteristic of the site (e.g. sand, silt, clay, coarse loamy sand, sandy clay loam, saline, et.). *See soil texture key and code list for types.*

Rock: %Large (optional): Estimate the percent surface cover of large rocks (e.g. stones, boulders, bedrock) that are beyond 25 cm in size.

Rock: %Small (optional): Estimate the percent surface cover of small rocks (e.g. gravel, cobbles) that are greater than 2 mm and less than 25 cm in size.

%Bare/Fines (optional): Estimate the percent surface cover of bare ground and fine sediment (e.g. dirt) that is 2 mm or less in size.

%Litter (optional): Estimate the percent surface cover of litter, duff, or wood on the ground.

%BA Stems (optional): Estimate the percent surface cover of the plant basal area, i.e., the basal area of stems at the ground surface.

General slope exposure (circle one and enter actual °): Read degree aspect from a compass or clinometer (or estimate). Make sure to average the reading across entire stand. "Variable" may be selected if the same, homogenous stand of vegetation occurs across a varied range of slope exposures.

General slope steepness (circle one and enter actual °): Read degree slope from compass (or estimate), using degrees from true north (adjusting for declination). Average the reading over entire stand.

Upland or Wetland/Riparian (circle one): Indicate if the stand is in an upland or a wetland; note that a site need not be officially delineated as a wetland to qualify as such in this context (e.g. seasonally wet meadow).

Site history, stand age, and comments: Briefly describe the stand age/seral stage, disturbance history, nature and extent of land use, and other site environmental and vegetation factors. Examples of disturbance history: fire, landslides, avalanching, drought, flood, animal burrowing, or pest outbreak. Also, try to estimate year or frequency of disturbance. Examples of land use: grazing, timber harvest, or mining. Examples of other site factors: exposed rocks, soil with fine-textured sediments, high litter/duff build-up, multi-storied vegetation structure, or other stand dynamics.

Type / level of disturbance (use codes): List codes for potential or existing impacts on the stability of the plant community. Characterize each impact each as L (=Light), M (=Moderate), or H (=Heavy). *See code list for impacts.*

VEGETATION DESCRIPTION

Basic alliance and stand description

Field-assessed vegetation alliance name: Name of alliance (series) or habitat following the CNPS classification system (Sawyer and Keeler-Wolf 1995). Please use binomial nomenclature, e.g. *Quercus agrifolia* forest. An alliance is based on the dominant (or diagnostic) species of the stand, and is usually of the uppermost and/or dominant height stratum. A dominant species covers the greatest area (and a diagnostic is consistently found in some vegetation types but not others).

Please note: The field-assessed alliance name may not exist in present classification, in which you can provide a new alliance name in this field. If this is the case, also make sure to denote and explain this in the “Cannot identify alliance based on MCV classification” of the “**Problems with Interpretation**” section below.

Field-assessed association name (optional): Name of the species in the alliance and additional dominant/diagnostic species from any strata, as according to CNPS classification. In following naming conventions, species in differing strata are separated with a slash, and species in the uppermost stratum are listed first (e.g. *Quercus agrifolia/Toxicodendron diversilobum*). Species in the same stratum are separated with a dash (e.g. *Quercus agrifolia-Quercus kelloggii*).

Please note: The field-assessed association name may not exist in present classification, in which you can provide a new association name in this field.

Size of stand: Estimate the size of the entire stand in which the rapid assessment is taken. As a measure, one acre is about 0.4 hectares or about 4000 square meters.

Adjacent Alliances: Identify other vegetation types that are directly adjacent to the stand being assessed. Specifically, list up to three alliances (or associations or mapping units) by noting the dominant species; also note the distance away in meters from the GPS waypoint and the direction in degrees aspect that the adjacent alliance is found

(e.g. Abies concolor-Pinus ponderosa 50m, 360°/N Arctostaphylos patula 100m, 110°).

Habitat classification per California Wildlife-Habitat Relationships (CWHR)

For CWHR, identify the size/height class of the stand using the following tree, shrub, and/or herbaceous categories. These categories are based on functional life forms.

Tree: Circle one of the tree size classes provided when the tree canopy closure exceeds 10 percent of the total cover (except in desert types), or if young tree density indicates imminent tree dominance. Size class is based on the average dbh (diameter of trunk at breast height). In choosing a size class, make sure to estimate the mean diameter of all trees over the entire stand. Circle the size class 6 multi-layered tree if there is a size class 5 of trees over a distinct layer of size class either 3 or 4 (*i.e.* distinct height class separation between different tree species) and the total tree canopy exceeds 60%.

If tree, list 1-3 dominant overstory species: If tree canopy cover exceeds 10 percent (except in desert types), please list the dominant species that occur in the overstory canopy.

Shrub: Circle one of the shrub size classes provided when shrub canopy closure exceeds 10 percent (except in desert types). Size class is based on the average amount of crown decadence (dead standing vegetation on live shrubs when looking across the crowns of the shrubs).

Herbaceous: Circle one of the herb height classes provided when herbaceous cover exceeds 2 percent. This height class is based on the average plant height at maturity.

Desert Palm/Joshua Tree: Circle one of the palm or Joshua tree size classes by averaging all the stem-base diameters (*i.e.* mean diameter of all stem-base sizes). Diameter is measured at the plant's base above the bulge near the ground.

Desert Riparian Tree/Shrub: Circle one of the size classes by measuring mean stem height (whether tree and/or shrub stand).

Overall cover of vegetation

Provide an ocular estimate of cover for the following categories (based on functional life forms). Record a specific number for the total aerial cover or "bird's-eye view" looking from above for each category, estimating cover for the living plants only. Litter/duff should not be included in these estimates.

To come up with a specific number estimate for percent cover, first use the following CWHR cover intervals as a reference aid to get a generalized cover estimate: <2%, 2-9%, 10-24%, 25-39%, 40-59%, 60-100%. While keeping these intervals in mind, you can then refine your estimate to a specific percentage for each category below.

%Overstory Conifer/Hardwood Tree cover: The total aerial cover (canopy closure) of all live tree species that are specifically in the overstory or are emerging, disregarding overlap of individual trees. Estimate conifer and hardwood covers separately. Please note: These cover values should not include the coverage of suppressed understory trees.

Shrub cover: The total aerial cover (canopy closure) of all live shrub species, disregarding overlap of individual shrubs.

Ground cover: The total aerial cover (canopy closure) of all herbaceous species, disregarding overlap of individual herbs.

Total Veg cover: The total aerial cover of all vegetation. This is an estimate of the absolute vegetation cover, disregarding overlap of the various tree, shrub, and/or herbaceous layers.

Modal height for conifer/hardwood tree, shrub, and herbaceous categories (optional)

If height values are important in your vegetation survey project, provide an ocular estimate of height for each category listed. Record an average height value, estimating the modal height for each group. Use the following height intervals and record a height class: 01=<1/2m, 02=1/2-1m, 03=1-2m, 04=2-5m, 05=5-10m, 06=10-15m, 07=15-20m, 08=20-35m, 09=35-50m, 10=>50m.

Species list and coverage

Species (List up to 12 major species), Stratum, and Approximate % cover: (Jepson Manual nomenclature please)

List the species that are dominant or that are characteristically consistent throughout the stand.

When different layers of vegetation occur in the stand, make sure to list species from each stratum. As a general guide, make sure to list at least 1-2 of the most abundant species per stratum. Provide a stratum code for each species listed, based on height, where T (=Tall) is >5 m in height, M (=Medium) is between 0.5 and 5 m in height, and L (=Low) is <0.5 m in height.

Also, provide a numerical ocular estimate of aerial coverage for each species. When estimating, it is often helpful to think of coverage in terms of the cover intervals from the CNPS relevé form at first (*e.g.* <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%). Keeping these classes in mind, then refine your estimate to a specific percentage (*e.g.* the cover of species “x” is somewhere between 25 and 50 percent, but I think it is actually around 30%). Please note: All estimates are to be reported as absolute cover (not relative cover), and all the species percent covers may total over 100% when added up because of overlap.

Major non-native species in stand (with % cover): All exotic species occurring in the stand should be listed in this space provided (or they can be recorded in the above Species list). Make sure to give each exotic species an absolute coverage estimate.

Unusual species: List species that are either locally or regionally rare, endangered, or atypical (*e.g.* range extension or range limit) within the stand. This species list will be useful to the Program for obtaining data on regionally or locally significant populations of plants.

PROBLEMS WITH INTERPRETATION

Confidence in Identification: (L, M, H) With respect to the “field-assessed alliance name”, note whether you have L (=Low), M (=Moderate), or H (=High) confidence in the interpretation of this alliance name. Low confidence can occur from such things as a poor view of the stand, an unusual mix of species that does not meet the criteria of any described alliance, or a low confidence in your ability to identify species that are significant members of the stand.

Explain: Please elaborate if your “Confidence in Identification” is low or moderate. Similarly, if the field-assessed alliance name is not defined by CNPS’s present Manual of California Vegetation (MCV) classification, note this in the space and describe why. In some instances for specific projects, there may be the benefit of more detailed classifications than what is presented in the first edition of the MCV. If this is the case, be sure to substitute the most appropriate and detailed classification.

Other identification problems (describe): Discuss any further problems with the identification of the assessment (*e.g.* stand is observed with an oblique view using binoculars, so the species list may be incomplete, or the cover percentages may be imperfect).

Polygon is more than one type (Yes, No) (Note: type with greatest coverage in polygon should be entered in above section) This is relevant to areas that have been delineated as polygons on aerial photographs for a vegetation-mapping project. In most cases the polygon delineated is intended to represent a single stand, however mapping conventions and the constraints and interpretability of remote images will alter the ability to map actual stands on the ground. “Yes” is noted when the polygon delineated contains the field-assessed alliance and other vegetation type(s), as based on species composition and structure. “No” is noted when the polygon is primarily representative of the field-assessed alliance.

Other types: If “Yes” above, then list the other subordinate vegetation alliances that are included within the polygon. List them in order of their amount of the polygon covered.

Has the vegetation changed since air photo taken? (Yes, No) If an aerial photograph is being used for reference, evaluate if the stand of the field-assessed alliance has changed as a result of disturbance or other historic change since the photograph was taken.

If Yes, how? What has changed (write N/A if so)? If the photographic signature of the vegetation has changed (*e.g.* in structure, density, or extent), please detail here.

Simplified Key to Soil Texture (Brewer and McCann, 1982)

Place about three teaspoons of soil in the palm of your hand. Take out any particles <2mm in size, and use the following key to figure out the soil texture (e.g. loamy sand). Then figure out the texture subclass by using the Code List attached (e.g. coarse loamy sand).

- A1 Soil does not remain in a ball when squeezed..... sand
- A2 Soil remains in a ball when squeezed..... B
- B1 Add a small amount of water. Squeeze the ball between your thumb and forefinger, attempting to make a ribbon that you push up over your finger. Soil makes no ribbon.....loamy sand
- B2 Soil makes a ribbon; may be very short.....C
- C1 Ribbon extends less than 1 inch before breaking.....D
- C2 Ribbon extends 1 inch or more before breaking.....E
- D1 Add excess water to small amount of soil; soil feels very gritty or at least slightly grittyloam or sandy loam
- D2 Soil feels smooth.....silt loam
- E1 Soil makes a ribbon that breaks when 1–2 inches long; cracks if bent into a ring.....F
- E2 Soil makes a ribbon 2+ inches long; does not crack when bent into a ring.....G
- F1 Add excess water to small amount of soil; soil feels very gritty or at least slightly gritty.....sandy clay loam or clay loam
- F2 Soil feels smooth.....silty clay loam or silt
- G1 Add excess water to a small amount of soil; soil feels very gritty or at least slightly gritty.....sandy clay or clay
- G2 Soil feels smooth.....silty clay

CALIFORNIA NATIVE PLANT SOCIETY RELEVÉ FIELD FORM CODE LIST

(revised 7/8/02)

IMPACTS

- 01 Development
- 02 ORV activity
- 03 Agriculture
- 04 Grazing
- 05 Competition from exotics
- 06 Logging
- 07 Insufficient population/stand size
- 08 Altered flood/tidal regime
- 09 Mining
- 10 Hybridization
- 11 Groundwater pumping
- 12 Dam/inundation
- 13 Other
- 14 Surface water diversion
- 15 Road/trail construction/maint.
- 16 Biocides
- 17 Pollution
- 18 Unknown
- 19 Vandalism/dumping/litter
- 20 Foot traffic/trampling
- 21 Improper burning regime
- 22 Over collecting/poaching
- 23 Erosion/runoff
- 24 Altered thermal regime
- 25 Landfill
- 26 Degrading water quality
- 27 Wood cutting
- 28 Military operations
- 29 Recreational use (non ORV)
- 30 Nest parasitism
- 31 Non-native predators
- 32 Rip-rap, bank protection
- 33 Channelization (human caused)
- 34 Feral pigs
- 35 Burros
- 36 Rills
- 37 Phytogenic mounding

MACRO TOPOGRAPHY

- 00 Bench
- 01 Ridge top (interfluvial)
- 02 Upper 1/3 of slope
- 03 Middle 1/3 of slope
- 04 Lower 1/3 of slope (lowslope)
- 05 Toeslope (alluvial fan/bajada)
- 06 Bottom/plain
- 07 Basin/wetland
- 08 Draw
- 09 Other
- 10 Terrace (former shoreline or floodplain)
- 11 Entire slope
- 12 Wash (channel bed)
- 13 Badland (complex of draws & interfluvial)
- 14 Mesa/plateau
- 15 Dune/sandfield
- 16 Pediment
- 17 Backslope (cliff)

MICRO TOPOGRAPHY

- 01 Convex or rounded
- 02 Linear or even
- 03 Concave or depression
- 04 Undulating pattern
- 05 Hummock or Swale pattern
- 06 Mounded
- 07 Other

PARENT MATERIAL

- | | |
|------|--|
| ANDE | Andesite |
| ASHT | Ash (of any origin) |
| GRAN | Granitic (generic) |
| GREE | Greenstone |
| DIOR | Diorite |
| BASA | Basalt |
| OBSI | Obsidian |
| PUMI | Pumice |
| IGTU | Igneous (type unknown) |
| MONZ | Monzonite |
| PYFL | Pyroclastic flow |
| QUDI | Quartz diorite |
| RHYO | Rhyolite |
| VOLC | General volcanic extrusives |
| VOFL | Volcanic flow |
| VOMU | Volcanic mud |
| BLUE | Blue schist |
| CHER | Chert |
| DOLO | Dolomite |
| FRME | Franciscan melange |
| INTR | General igneous intrusives |
| GNBG | Gneiss/biotite gneiss |
| HORN | Hornfels |
| MARB | Marble |
| METU | Metamorphic (type unknown) |
| PHYL | Phyllite |
| SCHI | Schist |
| SESC | Semi-schist |
| SLAT | Slate |
| BREC | Breccia (non-volcanic) |
| CACO | Calcareous conglomerate |
| CASA | Calcareous sandstone |
| CASH | Calcareous shale |
| CASI | Calcareous siltstone |
| CONG | Conglomerate |
| FANG | Fanglomerate |
| GLTI | Glacial till, mixed origin, moraine |
| LALA | Large landslide (unconsolidated) |
| LIME | Limestone |
| SAND | Sandstone |
| SETU | Sedimentary (type unknown) |
| SHAL | Shale |
| SILT | Siltstone |
| DIAB | Diabase |
| GABB | Gabbro |
| PERI | Peridotite |
| SERP | Serpentine |
| ULTU | Ultramafic (type unknown) |
| CALU | Calcareous (origin unknown) |
| DUNE | Sand dunes |
| LOSS | Loess |
| MIIG | Mixed igneous |
| MIME | Mixed metamorphic |
| MIRT | Mix of two or more rock types |
| MISE | Mixed sedimentary |
| CLAL | Clayey alluvium |
| GRAL | Gravelly alluvium |
| MIAL | Mixed alluvium |
| SAAL | Sandy alluvium (most alluvial fans and washes) |
| SIAL | Silty alluvium |
| OTHE | Other than on list |

SOIL TEXTURE

- | | |
|------|---------------------------------|
| COSA | Coarse sand |
| MESN | Medium sand |
| FISN | Fine sand |
| COLS | Coarse, loamy sand |
| MELS | Medium to very fine, loamy sand |
| MCSL | Moderately coarse, sandy loam |
| MESA | Medium to very fine, sandy loam |
| MELO | Medium loam |
| MESL | Medium silt loam |
| MESI | Medium silt |
| MFCL | Moderately fine clay loam |
| MFSA | Moderately fine sandy clay loam |
| MFSL | Moderately fine silty clay loam |
| FISA | Fine sandy clay |
| FISC | Fine silty clay |
| FICL | Fine clay |
| SAND | Sand (class unknown) |
| LOAM | Loam (class unknown) |
| CLAY | Clay (class unknown) |
| UNKN | Unknown |
| PEAT | Peat |
| MUCK | Muck |

DOMINANT VEGETATION GROUP

Trees:

- | | |
|------|--|
| TBSE | Temperate broad-leaved seasonal evergreen forest |
| TNLE | Temperate or subpolar needle-leaved evergreen forest |
| CDF | Cold-deciduous forest |
| MNDF | Mixed needle-leaved evergreen-cold deciduous forest |
| TBEW | Temperate broad-leaved evergreen woodland |
| TNEW | Temperate or subpolar needle-leaved evergreen woodland |
| EXEW | Extremely xeromorphic evergreen woodland |
| CDW | Cold-deciduous woodland |
| EXDW | Extremely xeromorphic deciduous woodland |
| MBED | Mixed broad-leaved evergreen-cold deciduous woodland |
| MNDW | Mixed needle-leaved evergreen-cold deciduous woodland |

Shrubs:

- | | |
|------|---|
| TBES | Temperate broad-leaved evergreen shrubland |
| NLES | Needle-leaved evergreen shrubland |
| MIES | Microphyllous evergreen shrubland |
| EXDS | Extremely xeromorphic deciduous shrubland |
| CDS | Cold-deciduous shrubland |
| MEDS | Mixed evergreen-deciduous shrubland |
| XMED | Extremely xeromorphic mixed evergreen-deciduous shrubland |

Dwarf Shrubland:

- | | |
|------|--|
| NMED | Needle-leaved or microphyllous evergreen dwarf shrubland |
| XEDS | Extremely xeromorphic evergreen dwarf shrubland |
| DDDS | Drought-deciduous dwarf shrubland |
| MEDD | Mixed evergreen cold-deciduous dwarf shrubland |

Herbaceous:

- | | |
|------|---|
| TSPG | Temperate or subpolar grassland |
| TGST | Temperate or subpolar grassland with sparse tree |
| TGSS | Temperate or subpolar grassland with sparse shrublayer |
| TGSD | Temperate or subpolar grassland with sparse dwarf shrub layer |
| TFV | Temperate or subpolar forb vegetation |
| THRV | Temperate or subpolar hydromorphic rooted vegetation |
| TAGF | Temperate or subpolar annual grassland or forb vegetation |

Sparse Vegetation:

- | | |
|------|--|
| SVSD | Sparsely vegetated sand dunes |
| SVCS | Sparsely vegetated consolidated substrates |