PLANTS

Species Accounts

San Diego thorn mint
(Acanthomintha ilicifolia)

CA - E (1982)
FED - T (1998)

General Habitat: Chaparral
Coastal Scrub
Valley and Foothill Grassland

San Diego thorn mint

San Diego thorn mint is a small, aromatic annual in the mint family (Lamiaceae) with delicate white and rose colored flowers. The lower halves of its leaves are wedge-shaped and its flower clusters are covered by prominently spined bracts. The thorn mint genus occurs almost exclusively in California and every taxon within the genus is rare. This species is found in heavy clay soils in grasslands and in openings in the chaparral and coastal sage scrub of San Diego County and Baja California Norte, Mexico. Though the majority of known populations occur on privately owned lands, scattered populations of San Diego thorn mint are found on lands owned or managed by public agencies or conservation organizations such as the Cleveland National Forest, The Nature Conservancy's (TNC) McGinty Mountain, City of San Diego's Mission Trails Regional Park, and on DFG land in Sycamore Canyon.

Approximately 30 natural populations of San Diego thorn mint remain in San Diego County and more than 15 populations are known to have been extirpated. The extirpations are largely the result of urban development along the coastal plain of western San Diego County from Carlsbad south to Otay Mesa. Urban development, unauthorized off-highway vehicle (OHV) activity, and continuing invasion of natural habitat by weedy, non-native annual plants are ongoing threats to this species. Habitat protection and active management will be essential to the continued preservation of San Diego thorn mint. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border. It will likely be covered in the San Diego Multiple Habitat Conservation Program NCCP to be finalized in the next few years.

The status in 1999 of San Diego thorn mint: ***Declining.***

San Mateo thorn mint
(Acanthomintha obovata spp. *duttonii = A. duttonii)*

CA - E (1979)
FED - E (1985)

General Habitat: Valley and Foothill Grassland

San Mateo thorn mint

San Mateo thorn mint is a small, aromatic, annual herb in the mint family (Lamiaceae) covered with minute, grayish hairs. Its white and purple-tinged flowers occur in clusters covered by spiny bracts. This genus is almost entirely restricted to California and all of its taxa are rare. San Mateo thorn mint is known only from serpentine grassland, a specific habitat of soils derived from serpentinitic rock.

Historically, San Mateo thorn mint was known from five occurrences in the Crystal Springs region of San Mateo County. Only two of the known populations remain; the rest were extirpated by urbanization. Both populations are in serpentine grassland, one within Edgewood County Park, and the other adjacent to Edgewood in an area known as "The Triangle" which is owned by the City and County of San Francisco and managed by SFWD. The small population at Edgewood Park lies directly downhill

from a housing development; the resulting changes in drainage patterns and water chemistry threaten this population. Population sizes at both locations vary from year to year due to local rainfall and competition from nonnative plants.

This taxon was the subject of a recovery workshop conducted by the DFG in cooperation with USFWS, in which paraticipants discussed the recent population distribution and abundance information and the apparent poor state of an introduced population. Current data suggest the introduced population has not built up a sufficient seedbank. To protect this plant from extinction, both natural populations must be preserved and further reintroduction into suitable habitat should be pursued. Management and recovery actions for the species have been addressed in the federal *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

The status in 1999 of San Mateo thorn mint: ***Declining.***

Marin bent grass

Marin bent grass
(Agrostis blasdalei var. *marinensis)*

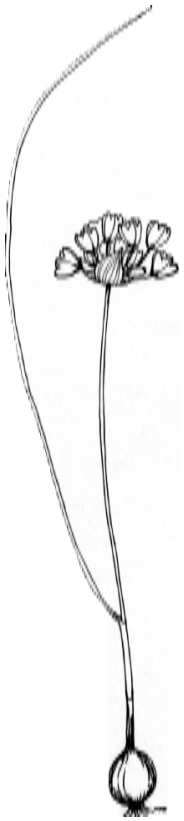
CA - R (1978)
FED - None

General Habitat: Coastal Prairie

Marin bent grass, a member of the grass family (Poaceae), has erect stems and slender leaves. Its green flowers occur in narrow, spikelike clusters. This variety grows on a decomposed granite outcrop at a single location in Marin County. It is very closely related to Blasdale's bent grass (*Agrostis blasdalei* var. *blasdalei*), which is found in northern coastal dunes, and one taxonomist questions the distinctness of the variety *marinensis*.

The continued existence of Marin bent grass is precarious. The single known population usually consists of just over a dozen individuals growing near a popular parking area for picnickers; however in 1998 no plants could be found. Because Marin bent grass occurs on private land near the junction of two roads, it is vulnerable to road maintenance and improvement activities. In addition, if it has not already been extirpated, this single surviving population could be eliminated by a chance event. There are no management efforts in effect to protect this plant.

The status in 1999 of Marin bent grass: ***Declining or possibly extirpated.***



Munz's onion

Munz's onion
(Allium munzii)

CA - T (1990)
FED - E (1998)

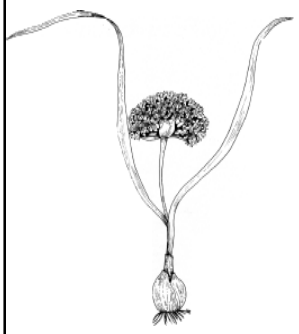
General Habitat: Coastal Scrub
Valley Foothill Grassland

Munz's onion is a small, bulb-bearing perennial herb in the lily family (Liliaceae) with white, aromatic flowers. Plants are restricted to clay soils in the rapidly disappearing grasslands of western Riverside County. It shares its range and habitat with an onion of similar appearance, the red-skinned onion (*Allium haematochiton).* The two species occur within several feet of each other at some sites, but do not interbreed. Most of Munz's onion's historical habitat has been destroyed. The 16 remaining populations are fragmented and isolated and face such threats as urbanization, OHV activity, invasions of exotic plants, and road construction. One population is on USFS land; four additional populations are within natural reserves or county parks.

A researcher at UC Riverside has shown that a portion of bulbs do not send up leaves or flowers each year, and therefore cannot be counted. This is likely correlated with broad climatic patterns in annual temperature and rainfall. The same researcher

has found that establishment of new plants in two populations is primarily by seed, rather than by bulbs.

The status in 1999 of Munz's onion: *Declining*.



Yosemite onion

Yosemite onion
(Allium yosemitense)

CA -R (1982)
FED - None

General Habitat: Broadleaved Upland Forest
Chaparral
Cismontane Woodland
Montane Conifer Forest

Yosemite onion, a member of the lily family (Liliaceae), is a perennial herb that grows from a bulb. It produces two linear, basal leaves, and its rose or white flowers occur in an umbel at the end of a leafless stem. The species occurs on open, steep, rocky slopes of metamorphic or granitic rock in the central Sierra Nevada. Populations occur in Mariposa and Tuolumne counties.

Yosemite onion is known from 13 occurrences on federal lands within Yosemite National Park and in the Sierra and Stanislaus National Forests. As of 1998, most of the occurrences appeared stable except one, which had declined. Most occurrences are in remote areas with few threats.

The status in 1999 of Yosemite onion: *Stable.*

Large-flowered fiddleneck

Large-flowered fiddleneck
(*Amsinckia grandiflora)*

CA - E (1982)
FED - E (1985)

General Habitat: Cismontane Woodland
Valley and Foothill Grassland

Large-flowered fiddleneck, the rarest of the ten California species of *Amsinckia*, is an erect, coarsely hairy annual herb in the borage family (Boraginaceae). The large, orange-red flowers are borne on stalks curved like the neck of a fiddle. The historic distribution of this species included the dry inland hills of Alameda, Contra Costa and San Joaquin counties. Much of the habitat of the species is now grazing land. The primary current threat to the species is believed to be competition from non-native, annual grasses. Other threats include stochastic extinction due to small numbers of populations, and fluctuations in numbers due to predation by rodents.

At present, only three natural populations are known. These all occur in the Altamont Hills of the Diablo Range. Two are on Lawrence Livermore National Laboratory (LLNL) land at what is known as Site 300 and are referred to as the Drop Tower and Draney Canyon populations. The third is on private ranch land in Carnegie Canyon near the southern border of Site 300. In 1989 and 1990, several experimental populations were planted in historic habitat: one at Connolly Ranch, southwest of Site 300, which is considered to have failed; one on DFG owned land at Corral Hollow, which is also considered failed; two at Black Diamond Preserve in eastern Contra Costa County, one of which has apparently been somewhat successful; one at Drop Tower (near the natural population), which still persists; and two at Los Vaqueros, also considered failed. All of the populations, both native and experimental, have experienced dramatic declines in the last three years and we believe this is due to unusually heavy rainfall years and increased in nonnative grasses therefore increasing food sources to rodents and increasing rodent populations.

Heavy rains during the winter of 1996-1997 resulted in a landslide in the area of

the Draney Canyon natural population. Only one plant was observed in 1997, and after further erosion in 1998, no plants were found. LLNL manages the populations on its land, including controlling non-native species and developing techniques for native grass restoration.

It is difficult to determine the overall trend within any given decade of monitoring, because the population size can fluctuate to a large degree every year. Because there are so few natural populations, the largest population is not protected, and reintroduction does not appear to be very successful, the long-term outlook for this species is still precarious.

Note: In April 2000, beyond the date of information included in this report, the Department of Energy entered into an agreement with the USFWS which designated 160 acres within LLNL Site 300 as the *Amsinckia grandiflora* Reserve to provide for the survival and recovery of the species.

The status in 1999 of large-flowered fiddleneck: *Declining*.

McDonald's rock cress

McDonald's rock cress
(Arabis macdonaldiana)

CA - E (1979)
FED - E (1978)

General Habitat: Lower Montane Conifer Forest

McDonald's rock cress, a member of the mustard family (Brassicaceae), is a small rosette-forming perennial herb with light purple flowers and erect flattened seed pods. It is restricted to serpentine soils in open, rocky areas of montane coniferous forests, often growing in rock crevices or on sites with naturally high soil disturbance such as steep, unstable slopes. Intolerance to competition seems to be the primary factor limiting the natural distribution of this species. McDonald's rock cress is known in California from Red Mountain in Mendocino County and from Del Norte County; it also occurs in Curry County, Oregon. Other rare taxa known to occur on the serpentine soils of Red Mountain include the State listed endangered Kellogg's buckwheat (*Eriogonum kelloggii)* and Red Mountain catchfly *(Silene campanulata* ssp. *campanulata)* as well as the unlisted but rare Red Mountain stonecrop *(Sedum laxum* ssp. *eastwoodiae)*. McDonald's rock cress on Red Mountain in Mendocino County is known from only two occurrences. The species is less restricted in Del Norte County, with nearly 30 occurrences there.

The main threat to this species is potential mining of the significant nickel and chromium deposits under or adjacent to populations. Mining claims exist over much of the restricted habitat of this plant. Within the boundaries of the Smith River National Recreation Area, about 35 percent of known occurrences could be affected by mining. In addition to direct impacts, the indirect effects of mining and nickel extraction operations (e.g., erosion and road construction) could endanger a majority of the populations located on the North Fork of the Smith River in Del Norte County. OHV activities may also threaten populations in this area. Outlying colonies growing in the Rough and Ready Creek watershed in Oregon may be threatened by a mining project in the Siskiyou National Forest. The species seems to be intolerant of competition, and fire suppression may also pose a threat to the species.

McDonald's rock cress occurs on private and BLM lands in Mendocino County and on USFS land in Del Norte County. BLM has designated Red Mountain as an ACEC and has conducted studies on the population dynamics and reproductive biology of the species there. These populations continue to be monitored as part of a long-term study being conducted by CSU Sacramento with support from BLM. The Six Rivers National Forest has designated 21,370 acres of the North Fork Smith River watershed as a Botanical Area and has developed a monitoring plan. The goals of this plan are to develop a habitat management guide, investigate habitat characteristics, and continue to survey for potential habitat.

The status in 1999 of McDonald's rock cress: *Unknown*.

Baker's manzanita
(*Arctostaphylos bakeri)*

CA - R (1979)
FED - None

General Habitat: Broadleaved Upland Forest
Chaparral

Baker's manzanita

Baker's manzanita is an upright, evergreen shrub in the heath family (Ericaceae) with pinkish flowers, dark purple bark, pungent leaves, and bright red fruits. Its branchlets and leaves have sticky glandular hairs, and its flower stems are hairless. This species is largely restricted to serpentine soils in the localized chaparral communities of Sonoma County. Nine of the 11 known occurrences are on private land, with the remaining two owned by the DFG and CNPS.

Most populations are clustered in the area near Occidental, Sonoma County. The chief threat to Baker's manzanita is residential development, followed by agricultural conversion, OHVs, dumping, nonnative plant encroachment, and hybridization with common manzanitas. Two populations occur on land planned for development. Succession toward oaks and California bay, which shade out Baker's manzanita, is also occurring as a result of fire suppression at most locations.

The status in 1999 of Baker's manzanita: *Declining*.

Vine Hill manzanita
(Arctostaphylos densiflora)

CA - E (1981)
FED - None

General Habitat: Chaparral

Vine Hill manzanita

Vine Hill manzanita is a low evergreen shrub in the heath family (Ericaceae) with shiny green leaves, black branches, and small white to pinkish flowers in a many-flowered, branched flower stalk. It roots from nodes along its spreading branches and a single plant can reach several meters across. Vine Hill manzanita is restricted to the "Sonoma Barren," an area of acid marine sand deposits in western Sonoma County.

Over the last 20 years, Vine Hill manzanita has come close to extinction. All but one population in the Vine Hill area have been destroyed by agriculture, residential development, or roadside weed abatement. The last known population, consisting of several mature individuals and a number of younger plants grown from cuttings, occurs on CNPS's one-acre Vine Hill Preserve. Plants at the preserve suffer from a persistent fungal disease.

The status in 1999 of Vine Hill manzanita: *Declining*.

Hanging Gardens manzanita
(Arctostaphylos edmundsii var. *parvifolia)*

CA - R (1981)
FED - None

General Habitat: Coastal Bluff Scrub
Chaparral

Hanging Gardens manzanita

Hanging Gardens manzanita is a prostrate evergreen shrub without a basal burl, with glossy green leaves and bright red berries. This member of the heath family (Ericaceae) grows near the ocean on eroded ridges and sandstone banks subject to strong on-shore winds. It is known from one population on private land near Point Sur in Monterey County. The plant grows down perpendicular banks in closely adherent

drapes. A recent taxonomic treatment has consolidated Hanging Gardens manzanita with Little Sur manzanita *(A. edmundsii)*, which is itself limited to only nine occurrences on the Little Sur coast, although it is not State or federally listed. DFG has no recent information on the status of this plant.

The status in 1999 of Hanging Gardens manzanita: ***Unknown.***

Hearst's manzanita

Hearst's manzanita
(Arctostaphylos hookeri ssp. *hearstiorum)*

CA - E (1979)
FED - None

General Habitat: Maritime Chaparral
Coastal Scrub
Valley and Foothill Grassland
Foothill Grassland

Hearst's manzanita is an evergreen shrub in the heath family (Ericaceae) with shiny green leaves, tiny white flowers, and bright red fruits. This subspecies lacks a basal burl and is found on grassy hills and mesas in open areas of coastal prairie and chaparral plant communities. It grows on sandy loam substrates derived from old, stabilized sand dunes near the coast. All five known occurrences of Hearst's manzanita are located on the Hearst Ranch, owned by the Hearst Corporation, in San Luis Obispo County. The DFG's most recent observation information for this species dates from the mid-1980s. The population status and habitat conditions for this species needs further investigation.

The status in 1999 of Hearst's manzanita: ***Unknown.***

Presidio manzanita
(Arctostaphylos hookeri ssp. *ravenii)*

CA - E (1978)
FED - E (1979)

General Habitat: Chaparral
Coastal Prairie

Presidio manzanita is a prostrate, evergreen shrub covered with fine gray hairs, with round leaves and compact flower stalks of urn shaped white to pink flowers. This member of the heath family (Ericaceae) grows on shallow, rocky serpentine soils in open areas with some exposure to fog within the Presidio of San Francisco. Historically, Presidio manzanita was known from three other sites in San Francisco County that were destroyed by urbanization in the late 1930s. This taxon has been reduced to a single wild plant plus some clones, which are managed by the National Park Service (NPS). The single wild plant was found in the winter of 1997-98 with a fungal pathogen resulting in approximately 10 percent dieback of branches; as of August 1998, vigorous regrowth had covered over most of the dieback. The plants are protected by fencing and are measured and weeded each year.

The status in 1999 of Presidio manzanita: ***Stable to declining.***

San Bruno Mountain manzanita

San Bruno mountain manzanita
(Arctostaphylos imbricata)

CA - E (1979)
FED - None

General Habitat: Coastal Scrub

San Bruno Mountain manzanita is a low evergreen shrub in the heath family (Ericaceae) with white flowers. This species lacks a basal burl, has branchlets with short spreading hairs, bright green, closely overlapping leaves, and fruits with glandular hairs. It forms dense, mat-like colonies on shallow soils derived from Franciscan sandstone, greywacke, or shale. San Bruno Mountain manzanita is known only from the summit of San Bruno Mountain in San Mateo County. Another endangered species, Pacific manzanita *(Arctostaphylos pacifica),* also occurs near the summit of San Bruno Mountain. At present there are six small populations of San Bruno Mountain manzanita. Five of these occur within San Mateo County Park, while one is located on privately owned property.

In 1997, USFWS withdrew its Proposed Rule to list San Bruno Mountain manzanita as threatened based on protection given to the plant under the San Bruno Mountain HCP. The HCP preserves most of San Bruno Mountain and provides for monitoring and management of San Bruno Mountain manzanita.

A fungal pathogen infected the plants beginning in about 1997 and caused significant dieback or loss of entire plants. Since then, recovery has been generally good, although some management such as controlled burning may benefit the species.

The status in 1999 of San Bruno Mountain manzanita: *Stable*.

Pacific manzanita
(Arctostaphylos pacifica)

CA - E (1979)

General Habitat: Coastal Scrub

Pacific manzanita

Pacific manzanita is a low, prostrate, evergreen shrub with white flowers in the heath family (Ericaceae). This plant has a basal burl, branchlets with fine hairs, pale green leaves with finely serrate margins, and fruits covered with short, stiff hairs. The bark of Pacific manzanita cracks and peels off, leaving the trunk a polished light tan. It is part of the north coast scrub community in two distinct, historically limited populations on San Bruno Mountain, San Mateo County. One is on private land and the other is within San Bruno Mountain County Park. The DFG has no recent information on the status of either occurrence.

Previously, some botanists had believed Pacific manzanita to be a hybrid of bearberry *(A. uva-ursi)* and *A. glandulosa.* A recent taxonomic treatment of the genus *Arctostaphylos* consolidated Pacific manzanita with bearberry. However, more recent morphological and molecular work by researchers at San Francisco State University suggests that, although there are other problems with the name *A. pacifica*, the population containing what was originally described as Pacific manzanita is distinct from bearberry found elsewhere, and may indeed be a separate taxonomic entity. The DFG is considering proposing Pacific manzanita for delisting based on invalid taxonomy.

The status in 1999 of Pacific manzanita: *Unknown*.

Alameda manzanita
(Arctostaphylos pallida)

CA - E (1979)
FED - T (1998)

General Habitat: Chaparral

Alameda manzanita

Alameda manzanita, a member of the heath family (Ericaceae), is a tall, erect, evergreen shrub without a basal burl. It has branchlets with short, bristly hairs, thin, smooth, pale green leaves that clasp the stems, white flowers, and bright red fruits. This species occurs on east or south facing slopes in pure stands on somewhat sterile mineral soils. A member of the manzanita chaparral community, Alameda manzanita is found primarily at Sobrante Ridge Preserve and Huckleberry Preserve in Contra Costa and Alameda counties. This plant's habitat has been lost primarily to residential develop-

ment, and approximately 13 occurrences remain. However, all but three populations on East Bay Regional Parks District (EBRPD) lands are so isolated and small that their long-term viability is questionable.

EBRPD has purchased some small lots that are contiguous with existing park land and that support Alameda manzanita. EBRPD's removal of non-native trees such as Monterey pine and eucalyptus also benefit the species. However, significant threats to the species include removal of the plants during construction of fuel breaks and the lack of a natural fire regime. Much of the species' habitat is close to existing homes, and controlled burns in this intermix of residential development and wildland are difficult to conduct. An additional threat is loss of the plant's habitat to the spread of periwinkle, Algerian ivy, and other landscape species from adjacent homes.

The status in 1999 of Alameda manzanita: *Stable to declining*.

Marsh sandwort

Marsh sandwort
(Arenaria paludicola)

CA - E (1990)
FED - E (1993)

General Habitat: Marsh and Swamp

Marsh sandwort is a perennial herb in the pink family (Caryophyllaceae). It has rooting, trailing stems and small white flowers which bloom from May through August. Historically, this species occurred in swamps, freshwater marshes, and other wet areas in widely disjunct localities in California and Washington. It occurred in four counties in the coastal region of Washington, as well as in San Francisco, Santa Cruz, San Luis Obispo, and San Bernardino counties in California.

Despite thorough searches, no populations of marsh sandwort have been verified in Washington in recent years. Seven of the nine known California occurrences have been lost because the fresh water habitat in which they occurred was eliminated. Today, the distribution of this species is limited to two locations in San Luis Obispo County on the Nipomo Mesa, and one recently discovered population in Mendocino County. In San Luis Obispo County, one population is in Black Lake Canyon, and one population was rediscovered in 1998 at Oso Flaco Lake. Two of three historically documented locations in Black Lake Canyon no longer appear to support plants; one was last seen during the 1980s, one in the mid-1990s, and the last site was documented in the summer of 1997. Even when extant, all the sites supported only a few plants in a limited area. Encroachment of non-native eucalyptus trees and drilling of water wells in the immediate watershed of Black Lake Canyon are serious threats to the continued existence of this species. The population in Mendocino County is in a fairly inaccessible location in Inglenook Fen.

The Land Conservancy of San Luis Obispo County has acquired two acres in Black Lake Canyon which include the existing marsh sandwort site and one of the previously occupied marsh sandwort sites; they have prepared a management plan for the canyon which addresses marsh sandwort. In addition, TNC recently purchased a conservation easement in the Nipomo Dunes which includes a large dune lakes complex; this area, which has not been surveyed by botanists for half a century, will be surveyed to determine if other populations exist and if potential habitat is available for establishment of experimental populations of this species. Beginning in 1993, research into demography, general ecology, and recovery options was conducted by researchers from the University of California, Santa Barbara. Currently, cuttings of one plant have been propagated and are proposed to be planted into suitable habitat. In addition, researchers will attempt to recover seeds from the known occupied locations for propagation and planting.

Protection measures for marsh sandwort are included in USFWS's *Recovery Plan for Marsh Sandwort (Arenaria paludicola) and Gambel's watercress (Rorippa gambellii),* completed in 1999.

The status in 1999 of marsh sandwort: *Declining*.

Humboldt milk-vetch
(Astragalus agnicidus)

CA - E (1982)
FED - None

General Habitat: Mixed Evergreen Forest

Humboldt milk-vetch

Humboldt milk-vetch, a member of the pea family (Fabaceae), is a low-shrubby perennial up to 3.5 feet tall, with hollow stems, divided leaves, and many small white flowers on a branched flower stalk. The known distribution consists of one occurrence of several small colonies on a private ranch south of Miranda in Humboldt County, and two populations discovered in 1999 on a ridge in the Jackson State Forest in Mendocino County.

The milk-vetch was the target of a weed eradication effort during the 1920s when this reportedly toxic plant was implicated in the death of lambs on the ranch. Subsequently, the plant was not seen after 1954 and was presumed extinct for many years. Several attempts to relocate the plant during the 1970s were unsuccessful. In 1987, the species was rediscovered on the original ranch in Humboldt County. Dormant seeds which had persisted in the soil were stimulated by the opening of the tree canopy when a dead tree was felled and removed a few years earlier.

Soon after rediscovery of the population on the ranch, the landowner agreed to voluntarily protect the plant in coordination with TNC and volunteers of CNPS. Portions of the population were fenced and monitored by TNC and CNPS volunteers. Results of monitoring have demonstrated that Humboldt milk-vetch is an early successional species with specific germination requirements. It requires frequent openings in the forest to allow germination and growth and is shade intolerant. Studies on this species have indicated that it is subject to inbreeding depression, but there is a persistent seed bank, presumed to be genetically diverse.

Within the last few years, the forest canopy openings have contracted in size and, since no new openings have occurred, the population size of Humboldt milk-vetch has declined. TNC had been the primary leader in coordinating protection and monitoring on Humboldt milk-vetch for ten years. However, since 1998 the local chapter of CNPS is taking over the coordination of monitoring and protection activities. A new management plan is in preparation. No monitoring was conducted in 1999. The current landowner is one of the active cooperators protecting Humboldt milk-vetch.

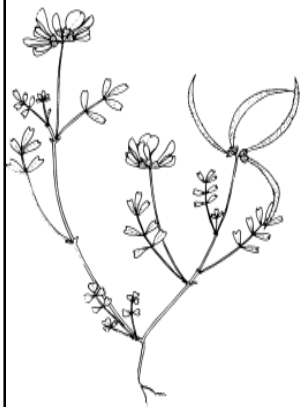
Two populations of Humboldt milk-vetch were discovered on a ridge in 1999 in the Jackson State Forest in Mendocino County during a survey for a Timber Harvest Plan. The species thrives in the canopy openings and edge habitats created by timber harvesting; the difficulty is to manage for both the vetch and timber harvesting effectively.

The status in 1999 of Humboldt milk-vetch: ***Declining.***

Clara Hunt's milk-vetch
(Astragalus clarianus)

CA - T (1990)
FED - E (1997)

General Habitat: Cismontane Woodland
Valley and Foothill Grassland



Clara Hunt's milk-vetch

Clara Hunt's milk-vetch is a small annual herb in the pea family (Fabaceae). The milk-vetch has up to nine leaflets per leaf and white, purple-tipped flowers which bloom in March and April. This species occurs in Napa and Sonoma counties on rocky clay soils in sparsely vegetated openings within blue oak woodland and grassland communities. There are five known occurrences of this plant.

A large portion of one occurrence was accidentally buried in 1990 by dredge material which was subsequently removed, although plants have not been seen in the

restored area. Forty-two plants were observed near this area in 1998, up from 9 in 1994. The second site, northeast of Santa Rosa, had 350 plants in 1997, 1100 plants in 1998, and 7 plants in 1999, down from a recorded high of 4,500 in 1992. The third site, at Bothe/ Napa Valley State Park, had 30 plants in 1998. The fourth site, south of St. Helena, supported twice as many plants in 1998 as 1997; only a portion of these plants have been monitored each year and so the total is unknown. In 1997, a fifth population of approximately 60 plants was discovered in Napa County in an area proposed for vineyard expansion. The landowner agreed to a vineyard setback that will protect at least a portion of the plants, and in 1998, 290 plants were observed. Because this milk-vetch is an annual plant with extremely small populations, sites could be eliminated through random fluctuations in population size from year to year or other chance events like drought or weed invasion.

The status in 1999 of Clara Hunt's milk-vetch: ***Stable to Declining.***

Long Valley milk-vetch

Long Valley milk-vetch
(Astragalus johannis-howellii)

CA - R (1982)
FED - None

General Habitat: Great Basin Scrub

Long Valley milk-vetch is a slender-stemmed, perennial herb in the pea family (Fabaceae) with divided yellow-green leaves and whitish, purple-veined flowers. It grows on sandy soils derived from volcanic ash and mixed alluvium in the sagebrush scrub. There are approximately 65 occurrences located in the Long Valley and Bodie Hills of Mono County.

Most of the sites are subject to the effects of seasonal cattle grazing, although light to moderate grazing may not threaten this plant. Long Valley milk-vetch is found on BLM, USFS, and LADWP lands. The BLM prevents grazing of the occurrences during the peak growth period, and limits grazing during the rest of the year. The occurrences on BLM land are stable.

The status in 1999 of Long Valley milk-vetch: ***Stable.***

Sodaville milk-vetch

Sodaville milk-vetch
(Astragalus lentiginosus var. *sesquimetralis)*

CA - E (1979)
FED - None

General Habitat: Meadow and Seep

Sodaville milk-vetch, a member of the pea family (Fabaceae), is a prostrate, perennial herb with divided leaves, an open inflorescence of purple flowers, and inflated, elongated seed pods. This species is restricted to moist, alkaline clay flats around desert seeps and springs. There is only one known occurrence in California at Big Sand Spring in Inyo County. Sodaville milk-vetch also occurs at two sites in Nevada.

The California occurrence was formerly owned and managed by BLM, and is now within Death Valley National Park. Big Sand Spring remains within a cattle grazing allotment. The population was almost destroyed by feral burros and cattle before BLM erected established a 25-acre enclosure in 1985 to keep the animals from entering the site. The only milk-vetch plants remaining at that time were being protected by shrubs. Since the fence was erected, there have been problems with breaks, so an electric fence was added in 1997, which has improved the situation. Plants have started to recover and have spread back into parts of their former areas, both inside and outside the enclosure. Census data indicate milk-vetch plants have made a substantial comeback, from only 10 individuals in 1995 to 1,500 individuals in 1997 and 3,000 in 1998.

The status in 1999 of Sodaville milk-vetch: *Increasing*.

Peirson's milk-vetch
(Astragalus magdalenae var. *peirsonii)*

CA - E (1979)
FED - T (1998)

General Habitat: Desert Dunes

Peirson's milk-vetch is a stout, herbaceous perennial that sprouts from a woody base, with leaves divided into numerous oval leaflets. This purple-flowered member of the pea family (Fabaceae) is covered with fine, silky hairs and produces inflated pods. In California, this plant occurs on sand dunes in the Algodones Dunes system of Imperial County. Historically, it was known from Borrego Valley in San Diego County and at a site southwest of the Salton Sea in Imperial County, but it has not been seen in these locations for years. Peirson's milk-vetch also occurs in Baja California Norte and Sonora, Mexico.

Recreational OHV activity has destroyed a portion of the vegetation in areas of the Algodones Dunes open to public use. A portion of the Algodones Dunes is been designated as the North Algodones Dunes Wilderness under the California Desert Protection Act and is closed to OHV activity. Approximately 75 percent of the dune system remains open to OHVs, however, which poses a major threat to the species.

In 1998 and 1999 DFG staff collaborated with the BLM, CNPS, and the USFWS to conduct spring monitoring surveys for Peirson's milk-vetch and four other plant species of concern on the Algodones Dunes in Imperial County. The purpose of the surveys is to establish and monitor transects across the dunes, both within the OHV open areas and the North Algodones Dunes Wilderness, for the presence and size of plant populations in those areas.

Peirson's milk-vetch

The status in 1999 of Peirson's milk-vetch: *Declining*.

Mono milk-vetch
(Astragalus monoensis= A. m. var. *monoensis)*

CA - R (1982)
FED - None

General Habitat: Great Basin Scrub

Mono milk-vetch is a small, prostrate, grayish perennial herb in the pea family (Fabaceae), with white to pale pink flowers in small clusters and curved, papery pods. Plants are covered by soft hairs and have leaves divided into several folded leaflets. This species is endemic to sagebrush scrub and Jeffrey pine-lodgepole pine forests of northern Mono County where it occurs on pumice flats in ashy to sandy soil. Most sites are located within the Inyo National Forest or on BLM land.

There are approximately 25 known Mono milk-vetch occurrences, five of which occur on BLM land. Some sites are threatened by livestock grazing, however BLM manages grazing to avoid impacts to the species on its land. Researchers have stated that destruction of ground-dwelling bee pollinators by grazing animals could result in reduced reproduction levels for this species. OHV use has degraded habitat at some sites.

Mono milk-vetch

The status in 1999 of Mono milk-vetch: *Stable to Declining*.

Ventura marsh milk-vetch
(*Astragalus pycnostachys* var. *lanosissimus*)

CA - Candidate E (1999) CA-E (2000)
FED - Proposed E (1999)

General Habitat: Back Dune Habitat
Coastal Meadows
Near Coastal Salt Marshes

Ventura marsh milk-vetch is a short-lived, herbaceous perennial in the pea family (Fabaceae), with dense clusters of small light yellow flowers. It has silvery white, pinnately compound leaves and flowers from June through October. Historically, Ventura marsh milk-vetch occurred in back dune habitat, coastal meadows and near coastal salt marshes from Ventura County to Orange County. Over the last century seven historical occurrences were known to exist. Ventura marsh milk-vetch was extirpated from these sites and was therefore thought to be extinct until it was rediscovered in June 1997 by a USFWS biologist at a proposed development site. It had only been seen twice in the last century.

Today, only this one population of Ventura marsh milk-vetch is known to exist near the City of Oxnard, Ventura County, California, all within a 2,854 square feet area (less than 0.6 of an acre). The population occurs on disturbed coastal backdunes on fill material at a closed oil-waste dump site. Since 1997 between 192 and 374 Ventura marsh milk-vetch individuals have been observed at the site. Most of these individuals are seedlings or small juveniles. Southern California coastal wetland habitats have declined by 80-90 percent and those remaining are frequently degraded. Very little is known about the ecological requirements of this species.

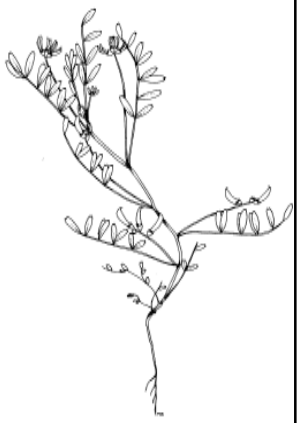
The only known population of Ventura marsh milk-vetch is threatened by predation and potential habitat modification and may be susceptible to alterations in its hydrologic regime and competition from non-native plant species.

The DFG is working closely with the landowner, the USFWS and other interested parties to identify areas that may be suitable for introducing Ventura marsh milk-vetch as part of recovery for the species. Greenhouse studies on this species are ongoing, as well as research to learn more about the ecological requirements of this species.

Note: Ventura marsh milkvetch was added to the State's list of endangered species in April 2000, beyond the date of information included in this report. The USFWS and DFG reconvened a technical working group during the Fall of 2000 to continue to work on a recovery strategy for this species. The species' status will be more thoroughly discussed in a subsequent report.

Because of the extreme rarity and restricted nature of Ventura marsh milk-vetch, the overall trend for Ventura marsh milk-vetch is one of decline to the brink of extinction.

The Status in 1999 of Ventura marsh milk-vetch: *Stable, but consisting of very low numbers at its only known occurrence.*



Coastal dunes milk-vetch

Coastal dunes milk-vetch
(Astragalus tener var. *titi)*

CA - E (1982)
FED - E (1998)

General Habitat: Coastal Dunes

Coastal dunes milk-vetch is a low, dwarf annual plant in the pea family (Fabaceae). It has slender stems, leaves divided into wedge-like or oval leaflets, terminal clusters of purple flowers, and straight or curved pods. This plant grows in moist depressions on clay soils in coastal terrace grasslands and in coastal strand vegetation on sand dunes.

Historically, coastal dunes milk-vetch was known from seven sites in Monterey, Los Angeles, and San Diego counties. Only one population, on the Monterey Peninsula, has been located in recent years, and numbers fluctuate greatly from year to year in response to local rainfall and competition with native and non-native species. The population is bisected by Seventeen-mile Drive and has two different owners. The inland side of the road is subject to golfing and equestrian activities, some of which are

detrimental to the milk-vetch. In 1997, the DFG began cooperating with the landowner on the coast side of Seventeen-mile Drive to implement a recovery program based on recommendations from a federal Section 6 research project and a 1995 DFG recovery workshop. The program includes control of competing species such as cut-leaf plantain and pansa sedge.

The status in 1999 of coastal dunes milk-vetch: *Declining*.

Trask's milk-vetch
(Astragalus traskiae)

CA - R (1979)
FED - None

General habitat: Coastal Bluff Scrub

Trask's milk-vetch

Trask's milk-vetch is a spreading perennial herb in the pea family (Fabaceae) with evergreen leaves divided into many oval leaflets, yellowish-white flowers in small clusters, and gently curved pods. The plants are covered with short hairs that give them a gray-green color. This species is restricted to Santa Barbara and San Nicolas Islands.

On San Nicolas Island, Trask's milk-vetch is widespread and abundant around the perimeter of the island, especially in sand dunes, sandy coastal flats, and on open sandstone slopes. It occurs mostly at elevations between 50 and 800 feet. The Navy's Environmental Division reviews all land use plans and activities that may affect sensitive species. Surveys were conducted in 1992 to determine the distribution, habitat preference and population status of this species. Occurrences of this milk-vetch on Santa Barbara Island were intensively studied by Clark and Halvorson in the 1980s and they reported a severe decline in the populations due to drought and severe winter storms in 1988. The DFG has no recent data on this species.

The status in 1999 of Trask's milk-vetch: *Unknown*.

Bakersfield Saltbush
(Atriplex tularensis)

CA - E (1987)
FED - None

General Habitat: Chenopod Scrub

Bakersfield saltbush

Bakersfield saltbush, a member of the goosefoot family (Chenopodiaceae), is an erect, few-branched annual with a scaly surface on the stems, smooth ovate leaves, and small dense clusters of greenish flowers. The species historically occurred on the borders of alkali sinks and on alkaline plains in the vicinity of Weed Patch in southern Kern County south of Bakersfield along Highway 99. Five of the six historically known populations have been destroyed by agricultural conversion of the habitat. First collected in the 1890s, the species had not been seen since the 1930s until rediscovered in 1983 at Kern Dry Lake. Since the discovery, the site had been leased and managed by TNC as the Kern Lake Preserve until the lease was discontinued by the private landowner.

The plants at the one known location are threatened by land conversion and lowering of the water table. This latter threat was greatly exacerbated by a series of drought years from 1987-1992. Monitoring has revealed very low numbers of plants in the population: 89 (1986); four (1988); four (1989); one (1990); five (1991); and 0 (1992), the last date for which information is available. The identity of the plants at the site has been questioned, because plants collected in the area historically differ in appearance from those observed in the 1980s. One opinion is that the plants are hybrids of Bakersfield saltbush and bracted saltbush (*A. serenana*), which also grows in the area, and that pure Bakersfield saltbush no longer occurs. Another opinion is that *A. tularensis,* as originally described, was never a distinct species, but was an variant of bracted saltbush

that only appeared in high rainfall years. USFWS is negotiating with the landowner to protect the site. Other protection measures for Bakersfield saltbush are included in USFWS's 1998 *Recovery Plan for Upland Species of the San Joaquin Valley, California.*

The status in 1999 of Bakersfield saltbush: *Unknown or Possibly Extirpated.*

Encinitas baccharis

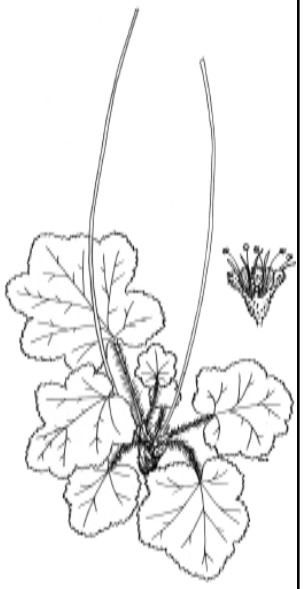
Encinitas baccharis
(Baccharis vanessae)

CA - R (1982); E (1987)
FED - T (1996)
General Habitat: Chaparral

Encinitas baccharis is a slender stemmed, dioecious shrub in the sunflower family (Asteraceae) that grows to a little over 3.5 feet tall. It has alternate leaves, reflexed floral bracts, and heads of whitish flowers. This plant occurs on steep slopes in the southern maritime chaparral communities of central San Diego County. It is known from fewer than 20 occurrences.

This species has undergone rapid habitat loss due to residential development and agricultural conversion and decline continues. A portion of the range of Encinitas baccharis occurs within the San Diego MSCP area, and the Plan addresses protection of this species from development and human-related activities. This species is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border. This species will also likely be covered in the San Diego Multiple Habitat Conservation Program NCCP to be finalized in the next few years.

The status in 1999 of Encinitas baccharis: *Declining*.



Bensoniella

Bensoniella
(Bensoniella oregona)

CA - R (1982)
FED - None

General Habitat: Lower Montane Conifer Forest
Meadow and Seep

Bensoniella is a perennial herb with basal, heart-shaped leaves, unbranched flowering stems, and small, saucer-shaped flowers with vivid orange anthers. This member of the saxifrage family (Saxifragaceae) is found only in Humboldt County in California and in Curry and Josephine counties in Oregon's Siskiyou Mountains. Bensoniella grows in the margins of moist, grassy meadows and in small openings in evergreen forests. Of the four recently observed California occurrences, three are found on private land, and one occurs on Six Rivers National Forest.

Some bensoniella populations have been damaged by cattle grazing, which appears to be the greatest threat to the species. The habitat on Six Rivers National Forest has been degraded by sedimentation, and is also threatened by channel bank erosion, increased exposure to light resulting from timber harvesting on adjacent land, and the removal of woody debris by firewood gatherers.

The status in 1999 of bensoniella: *Declining*.

Nevin's barberry
(Berberis nevinii)

CA - E (1987)
FED - E (1998)

General Habitat: Chaparral
Coastal Scrub

Nevin's barberry

Nevin's barberry is a blue-green evergreen shrub in the barberry family (Berberidaceae). It has prickly compound leaves and yellow flowers that produce round yellow-red berries. This species occurs in coastal sage scrub, alluvial scrub, and chaparral communities in the margins of dry washes in the foothills of the Transverse and Peninsular ranges. Plants are found growing on either steep north-facing slopes or low grade sandy washes. Although once more widespread, the present day range of Nevin's barberry includes less than 30 occurrences in portions of Los Angeles, San Bernardino, and Riverside counties. Ten of these are single plants last seen in the 1980s; seven are occurrences of less than ten plants last seen in the 1970s or 1980s; three are plantings; and the largest is 134 plants, last seen in 1987.

Loss of habitat continues to be a major threat to this species. Of great concern is the lack of reproduction and recruitment at most sites, and the very low number of individuals at most populations. Viable seed has been obtained from some populations and successfully grown in botanical gardens, but establishment in the wild appears limited. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

The status in 1999 of Nevin's barberry: ***Declining.***

Island barberry
(Berberis pinnata ssp. *insularis)*

CA - E (1979)
FED - FE (1997)

General Habitat: Closed-cone Conifer Forest
Cismontane Woodland
Coastal Scrub

Island barberry

Island barberry is an evergreen shrub in the barberry family (Berberidaceae). The plants have glossy, divided leaves, yellow flowers, and blue berries. The species can sprout new shoots from underground rhizomes, indicating that many stems may actually represent one genetic clone. This endemic barberry was historically known from three of the Channel Islands: West Anacapa, Santa Cruz and Santa Rosa. It grows in closed-cone pine forest, coastal chaparral, and coastal sage scrub communities. Today, only three small populations on Santa Cruz Island are known to exist. Despite repeated surveys, no plants have been found on Santa Rosa Island in recent years. The species is believed to be extirpated on Anacapa Island; the one clone located there was found to have died as of 1994.

Island Barberry is threatened by soil loss and habitat alteration caused by rooting of feral pigs. In the wild, no signs of successful reproduction have been found. Of the three Santa Cruz Island populations, the Diablo Peak occurrence has 24 large stems and 75 small stems; this may represent one or several clonal individuals. The Campo Raton occurrence was recently examined, and only two individuals were located. The Hazard Canyon population, which hadn't been seen for 15 years, was just relocated and it appears to be vigorous. The USFWS completed a recovery plan for island barberry and twelve other island plants in 1999.

The status in 1999 of Island barberry: ***Unknown.***

Sonoma sunshine
(Blennosperma bakeri)

CA - E (1992)
FED - E (1991)

General Habitat: Vernal Pools

Sonoma sunshine is a small, annual herb in the sunflower family (Asteraceae) with yellow, daisy-like flowers that bloom during February through April. The yellow disk flowers bear white pollen and stigmas, and sterile ray flowers produce red stigmas, a character that separates Sonoma sunshine from other members of this genus. Sonoma sunshine is a California endemic, restricted to vernal pools, shallow depressions, and intermittent swales on the Santa Rosa Plain and the adjacent Sonoma Valley of Sonoma County. At the DFG's Laguna de Santa Rosa Ecological Reserve, Sonoma sunshine occurs with two other State and federally listed endangered plant species: Burke's goldfields (*Lasthenia burkei)* and Sebastopol meadowfoam (*Limnanthes vinculans).*

At least 30 percent of the historic occurrences of Sonoma sunshine have been eliminated or seriously damaged, and most of the remaining sites are threatened with urbanization, irrigation with wastewater effluent, and conversion of habitat to agricultural lands. At least two of five known occurrences of Sonoma sunshine in the Sonoma Valley have been extirpated. Westward expansion of the City of Santa Rosa threatens 50 to 70 percent of the remaining Sonoma sunshine habitat. An occurrence has been preserved at the Southwest Santa Rosa vernal pool mitigation bank. The DFG has been coordinating with the County and the City, as well as with other agencies, private landowners and concerned citizens to protect vernal pools and associated endangered plants in the area since 1989. In 1998, the USFWS completed a programmatic consultation, which streamlines the development permitting process. Protection measures for this species are expected to be included in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

The status in 1999 of Sonoma sunshine: *Declining*.

Point Reyes blennosperma

Point Reyes blennosperma
(Blennosperma nanum var. *robustum)*

CA - R (1978)
FED - None

General Habitat: Coastal Prairie
Coastal Scrub

Point Reyes blennosperma, a member of the sunflower family (Asteraceae), is a yellow-flowered annual herb with hollow, sprawling stems. Plants occur mostly on sandy soils in the coastal prairie habitat of the Point Reyes Peninsula in Marin County, where there are approximately a dozen populations within Point Reyes National Seashore; one of these is being encroached upon by iceplant. One population occurs in Mendocino County in north coast bluff scrub overlying sand dunes. This population is entirely on private land; its status is unknown.

The status in 1999 of Point Reyes blennosperma: *Unknown*.

Dwarf golden star
(Bloomeria humilis)

CA - R (1978)
FED - None

General Habitat: Coastal Bluff Scrub
Chaparral
Valley and Foothill Grassland

Dwarf golden star is a perennial herb in the lily family (Liliaceae) with an umbrella-shaped cluster of bright golden flowers on thin, thread-like stalks. It grows from an underground bulb, and produces one or two linear leaves. It occurs in coastal prairie and chaparral communities on open mesas and ocean bluffs in the Arroyo de la Cruz area of San Luis Obispo County, which contains a large ensemble of rare plants. Associated State-listed species include the rare Hearst's ceanothus (*Ceanothus hearstiorum)* and maritime ceanothus *(Ceanothus maritimus)*, as well as the endangered Hearst's manzanita *(Arctostaphylos hookeri* ssp. hearstiorum).

Only two known occurrences of dwarf golden star are known to exist. There may be only about 2,000 total plants within a 10 square mile area; this is the total extent of this plant. Both known populations occur on the Hearst Ranch on land used primarily for cattle grazing. No surveys of the plants have been conducted in at least ten years, to DFG's knowledge. With so few plants in existence, its continued viability is considered precarious.

Dwarf golden star

The status in 1999 of dwarf golden star: *Unknown*.

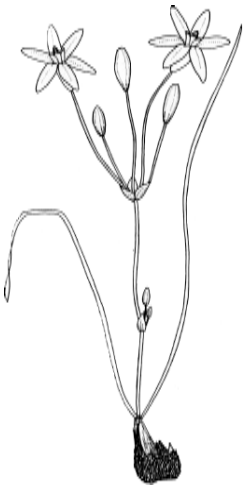
Indian Valley Brodiaea
(*Brodiaea coronaria* ssp. *rosea*)

CA - E (1979)
FED - None

General Habitat: Closed-cone Conifer Forest

Indian Valley brodiaea produces long, linear leaves from a perennial corm. This member of the lily family (Liliaceae) also produces rosy pink flowers on a leafless flowering stem. Populations are restricted to serpentine clay and gravel in open areas along creeks, meadows and flood terraces, and gravel banks of ephemeral creeks. This subspecies often occurs with other rare serpentine plants.

Historically, Indian Valley brodiaea was known from Lake, Colusa, and Glenn counties. Collections from Tehama County are believed to be erroneous. The filling of Indian Valley Reservoir in 1975 eliminated much of the historic habitat for this species. A portion of the population's occupied habitat in Glenn County is used as a local dump. BLM has established the Indian Valley Area of Critical Environmental Concern (ACEC) and Research Natural Area Management Plan to protect and enhance 40 acres of existing Indian Valley brodiaea habitat on their land.



Indian Valley brodiaea

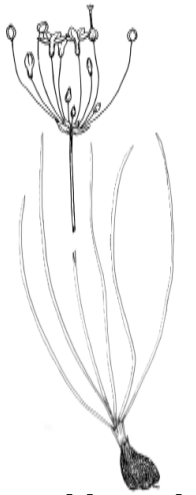
The status in 1999 of Indian Valley brodiaea: *Declining*.

Thread-leaved brodiaea
(Brodiaea filifolia)

CA - E (1982)
FED - T (1998)

General Habitat: Valley and Foothill Grassland
Vernal pools

Thread-leaved brodiaea, a member of the lily family (Liliaceae), produces several



Thread-leaved brodiaea

linear leaves from an underground corm and a leafless flowering stalk bearing blue to red-purple flowers. This species occurs on heavy soils in open grasslands, at the edges of vernal pools, in flood plains, and at the edge of hot springs (at Arrowhead Hot Springs). Thread-leaved brodiaea occurs in a few scattered localities within Los Angeles, Orange, western Riverside, and northwestern San Diego counties. The type locality at Arrowhead Hot Springs was recently rediscovered.

Thread-leaved brodiaea is known from approximately 25 to 30 occurrences, many of which are threatened by continuing residential and commercial development in Southern California. A number of habitat occurrences for the species have been lost in the past decade in northwestern San Diego County. Proposed residential/commercial developments in San Diego, Orange and Los Angeles counties threaten additional populations. Small populations of the species occur on the DFG's lands at the San Jacinto Wildlife Area in Riverside County and Carlsbad Highlands in San Diego County. A significant population occurs on TNC's Santa Rosa Plateau in western Riverside County and a small population occurs in Aliso-Wood Canyons Regional Park in Orange County. A few efforts have been made to translocate populations of thread-leaved brodiaea that occurred in areas approved for development to new areas of presumably suitable but unoccupied habitat. Several of these have failed. The others are ongoing, and it will be several years before their outcome can be reasonably assessed. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border. In addition, it will likely be covered in the San Diego Multiple Habitat Conservation Program NCCP to be finalized in the next few years.

The species has been observed to hybridize with Orcutt's brodiaea in the southwestern San Bernardino Mountains. Hybridization is facilitated by cross pollination from non-native honey bees. Studies on the biology of thread-leaved brodiaea are needed before adequate recovery strategies can be developed for this species.

The status in 1999 of thread-leaved brodiaea: ***Declining.***

Kaweah brodiaea

Kaweah brodiaea
(Brodiaea insignis)

CA - E (1979)
FED - None

General Habitat: Cismontane Woodland
Valley and Foothill Grassland

Kaweah brodiaea is a showy, herbaceous perennial in the lily family (Liliaceae). From a fibrous corm, it produces several linear leaves which are crescent-shaped in cross-section, and a leafless stalk topped by a cluster of rose-purple to pink tubular flowers. It forms pink carpets in May and June within blue oak savannahs. This species is endemic to the Kaweah and Tule rivers' drainages in Tulare County, where it grows on granitic substrates and deep, clayey soils on south- and southwest-facing slopes. Fewer than 25 extant populations are known, of which 90 percent are on private land or roadsides. Populations occur at the DFG's Kaweah and Blue Ridge Ecological Reserves, Sequoia National Forest, CALTRANS rights-of-way, and private property.

Residential development, roadside maintenance activities, road widening, and livestock activities threaten Kaweah brodiaea. The number of flowering plants appears to vary greatly from year to year, and at least some amount of grazing appears to benefit the species by reducing competition by nonnative weeds.

The status in 1999 of Kaweah brodiaea: ***Unknown.***

Chinese Camp brodiaea
(Brodiaea pallida)

CA - E (1978)
FED - T (1998)

General Habitat: Valley and Foothill Grassland

Chinese Camp brodiaea is an herbaceous perennial in the lily family (Liliaceae). It forms an underground corm, linear basal leaves, and terminal clusters of rose pink to pale blue flowers. This species is confined to one occurrence southwest of Chinese Camp in Tuolumne County. It grows along a shallow, intermittent stream in clay derived from serpentine.

Chinese Camp brodiaea is restricted to a narrow 10 to 20 foot-wide area along a half mile-long section of an intermittent stream entirely on private property. Occasional hybrids between Chinese camp brodiaea and a more common brodiaea from the area, *Brodiaea elegans*, have been observed. A portion of the population was destroyed prior to 1982. A subdivision has been proposed for the area that includes the Chinese Camp brodiaea population, which could disturb the hydrology upon which the species depends or increase disturbance from human activities, even if the plants are not directly affected by construction activities. In addition, species such as Chinese Camp brodiaea, that have very small populations and occupy only small areas, are vulnerable to decline and extinction due to genetic problems or random catastrophic events such as disease outbreaks, insect predation, or extended droughts. In 1994 a private landowner expressed interest in selling his Chinese Camp brodiaea habitat to the DFG, but after lengthy negotiations, no agreement was reached. A very small portion of the population along a road has been fenced and is being leased by CNPS in order to protect the plants.

The status in 1999 of Chinese Camp brodiaea: *Stable*.

Chinese Camp brodiaea

Leafy reed grass
(*Calamagrostis foliosa*)

CA - R (1979)
FED - None

General Habitat: Coastal Bluff Scrub

Leafy reed grass is a low-growing, tufted perennial member of the grass family (Poaceae) with compact, densely flowered inflorescences. It is an early successional species found on rocky coastal bluffs, in riparian habitats and cliff slopes, and on steep roadcuts in Mendocino, Humboldt, and Del Norte counties. It occurs on low nutrient, low moisture substrates which are unstable and eroding. There are more than 30 occurrences of leafy reed grass, two-thirds of which are in BLM's King Range National Conservation Area. Other occurrences are in State parks and on private lands. Most extant leafy reed grass occurrences are inaccessible to livestock and humans, though a few may be subject to development. DFG has no recent information on its status.

The status in 1999 of leafy reed grass: *Unknown*.

Leafy reed grass

Dunn's mariposa lily
(Calochortus dunnii)
CA - R (1979)
FED - None

General Habitat: Closed-cone Conifer Forest
Chaparral

Dunn's mariposa lily is an herbaceous perennial of the lily family (Liliaceae) that

Dunn's mariposa lily

sprouts from a bulb. It has slender basal leaves, short stem leaves, and showy, bell-shaped white to pink flowers with a red spot at each petal's base. This species is known only from the mountains of San Diego County and adjacent Baja California Norte, Mexico. It grows on dry, stony ridges and in open areas of the chaparral and yellow pine forests. Occurrences of Dunn's mariposa lily appear to be restricted to gabbroic and metavolcanic soils, and property ownership of its habitat includes the Cleveland National Forest, BLM, Cuyamaca Rancho State Park, and private property owners.

Approximately 20 occurrences of Dunn's mariposa lily are known, some of which are small populations of only a few plants. Threats to this showy plant include flower picking, as well as digging and removal of bulbs by bulb collectors. Several populations are adjacent to heavily used outdoor recreation areas and may need to be fenced to provide adequate protection for the plants. Recent proposals have been developed for introduction of non-native wild turkeys into the range of Dunn's mariposa lily. Potential impacts of turkey introductions on the growth and reproduction of small populations of Dunn's mariposa lily will be assessed. The diet of wild turkeys in other parts of California where they have been introduced included related species of mariposa lilies. Studies of the biology of Dunn's mariposa lily are needed before adequate recovery or management plans for Dunn's mariposa lily can be completed. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

The status in 1999 of Dunn's mariposa lily: *Stable to Declining*.

Siskiyou mariposa lily

Siskiyou mariposa lily
(Calochortus persistens)

CA - R (1982)
FED - None

General Habitat: Mixed Conifer Forest

Siskiyou mariposa lily is an herbaceous perennial that arises from a bulb, with slender basal leaves, reduced stem leaves, and one or two striking lavender and yellow flowers. This showy member of the lily family (Liliaceae) is found on metavolcanic rock outcrops with very dry, shallow, well drained soils, growing in open areas near Gunsight Peak in the Klamath National Forest, Siskiyou County.

In 1994, the Klamath National Forest adopted management guidelines for the entire habitat of all occurrences of Siskiyou mariposa lily. Near the summit of Gunsight Peak, the habitat has been disturbed by structures and access roads for radio repeater stations. Maintenance and further construction around these facilities may pose additional threats; however, USFS is managing all activities on this peak to minimize impacts to the lily. Weed control efforts are implemented periodically on Gunsight Peak as funding permits. Deer browsing and insect damage to floral buds and fruits may be damaging the population, but it is difficult to assess their impact as the populations vary widely in size from year to year. Further studies and monitoring are needed to assess impacts from deer, insects, and weeds on the long-term stability of Siskiyou mariposa lily.

The status in 1999 of Siskiyou mariposa lily: *Stable*.

Tiburon mariposa lily

Tiburon mariposa lily
(Calochortus tiburonensis)

CA - E (1978); T (1987)
FED - T (1995)

General Habitat: Valley and Foothill Grassland

Tiburon mariposa lily is a bulb-forming, perennial herb in the lily family

(Liliaceae) with long, narrow basal leaves and late-blooming, greenish-brown flowers. This lily was discovered on the Tiburon Peninsula of Marin County in 1972 and is known only from a serpentine grassland on Ring Mountain. Its distribution encompasses roughly three populations, all of which occur in the Ring Mountain Preserve. The Marin County Department of Parks, Open Space, and Cultural Services owns and manages the Preserve.

In 1997, the DFG held two recovery workshops to address Tiburon mariposa lily and 11 other plants known from serpentine habitats in the San Francisco Bay Area. At one workshop, a graduate student reported on her research showing that the Tiburon mariposa lily's reproduction is highly dependent on its presumed primary pollinator, the bumblebee, so management activities that would affect the bee would also affect the plant. The highest priority recovery action for the plant identified by workshop participants is research into appropriate management practices to reduce competition from weedy species and to maintain high quality habitat.

Management and recovery actions for Tiburon mariposa lily have been addressed in the federal *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

The status in 1999 of Tiburon mariposa lily: ***Stable.***

Stebbins' morning glory
(Calystegia stebbinsii)

CA - E (1981)
FED - E (1996)

General Habitat: Chaparral

Stebbins' morning glory

Stebbins' morning glory is a perennial, herbaceous vine with long slender stems, deeply divided leaves, and large, funnel-shaped, white flowers. This member of the morning glory family (Convolvulaceae) grows on red clay soils of the Pine Hill gabbro formation in the Sierra Nevada foothills of El Dorado County and on serpentine soils near Grass Valley in Nevada County. In El Dorado County, Stebbins' morning glory is often associated with two other state listed plants: Pine Hill ceanothus *(Ceanothus roderickii)* and Layne's butter-weed (*Senecio layneae*). The Pine Hill formation consists of approximately 30,000 acres, approximately half of which contains the habitat types that support these rare species.

In the southern half of the Pine Hill gabbro formation, residential development has occurred in unsurveyed habitat near known colonies of the morning glory. These projects went through the development approval process before El Dorado County was aware of these species. Potential habitat near known colonies has also been cleared under ministerial grading permits.

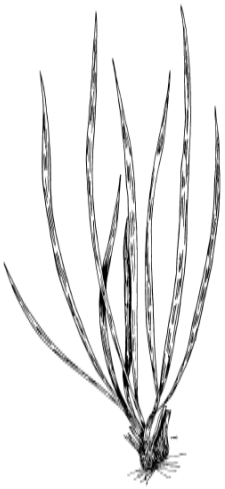
The first phase of purchasing a 315-acre site in western El Dorado County, containing four State and federally listed plant species was completed in November of 1997, through a combination of federal, State, and local funding. This preserve is being established to protect Stebbins' morning glory, Pine Hill ceanothus (*Ceanothus roderickii)*, Layne's butterweed (*Senecio layneae*), and El Dorado bedstraw (*Galium californicum* ssp. *sierrae*). This preserve, when complete, will also include a large of number species which are considered endemic to or characteristic of gabbroic and serpentine soils, including El Dorado mule ears (*Wyethia reticulata*), which is only found in the gabbro soil in western El Dorado County. The 315-acre preserve is one unit of a planned five-unit preserve system that is expected to total 3,400 acres. Approximately half of this area consists of existing public lands. The other four units will be expanding around existing public lands, if private landowners are willing to sell or dedicate title or conservation easements and if the program continues to receive support from local public agencies.

In the northern half of the gabbro soil formation, approximately 250 acres have been purchased and transferred to the DFG. This area includes a population of Stebbins' morning glory. A prescribed fire on nearby property held by BLM appears to have rejuvenated a dwindling population on that site.

The USFWS released the *Draft Recovery Plan for Gabbro Soil Plants of the Central*

Sierra Nevada Foothills in 1998 that addresses recovery needs for Stebbins' morning glory.

The status in 1999 of Stebbins' morning glory: *Declining*.



White sedge

White sedge
(*Carex albida*)

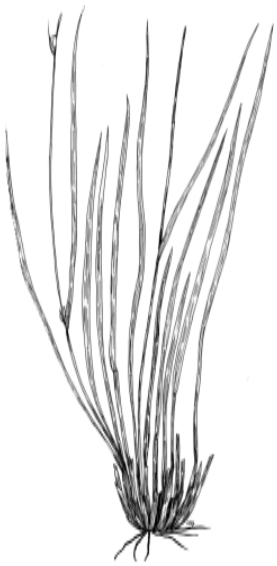
CA - E (1979)
FED - E (1997)

General Habitat: Marsh and Swamp

White sedge, a member of the sedge family (Cyperaceae), is a short, tufted, grass-like perennial herb with erect stems that sprout from a creeping rhizome, flattened leaves, and flowers in dense terminal spikes. This species is restricted to moist sites adjacent to freshwater marshes and creeks in Sonoma County. Historically, only five occurrences were reported. White sedge historically grew with two other State listed endangered plants: Pitkin Marsh lily (*Lilium pitkinense*) and Pitkin Marsh Indian paintbrush (*Castilleja uliginosa*).

Habitat conversion has eliminated four of the historic white sedge occurrences from other Sonoma County freshwater marshes. Pitkin Marsh is the only extant habitat, though the most recent documentation of white sedge is from 1988. This site is subject to persistent development pressures. Any change in the hydrology of the marsh, including draining, could eliminate the white sedge and other rare plant species there. All of the marsh habitat is privately owned.

The status in 1999 of white sedge: *Unknown*.



Tompkins' sedge

Tompkins' sedge
(Carex tompkinsii)

CA - R (1979)
FED - None

General Habitat: Chaparral
Cismontane Woodland
Lower Montane Conifer Forest
Upper Montane Conifer Forest

Tompkins' sedge, a member of the sedge family (Cyperaceae), is a perennial, densely-tufted, grass-like herb. It grows in soils derived from metamorphic or granitic rock in the Sierra Nevada in the Kings River Canyon in Fresno County and the Merced River Canyon in Mariposa County. It grows not only on steep, dry, south-facing rocky slopes, but also on shady, mesic, north-facing slopes, and occasionally in moist riparian areas. Fires reduce competition and appear to invigorate Tompkins' sedge plants. Most occurrences are on public land within Sequoia and Sierra National Forests and Kings Canyon and Yosemite National Parks.

Many additional populations have been discovered since Tompkins' sedge was State-listed in 1979, and the species is now known to occur in a wider variety of habitat types than originally thought. Some roadside populations are threatened by road maintenance, highway improvement, flooding, and emergency repairs of flood damage.

The relocation of NPS employee housing to outside of Yosemite Valley threatens some populations. In 1997, the species was reported from the Hetch Hetchy area in the Tuolumne River Canyon, and two new occurrences were discovered in Stanislaus National Forest in the area burned by the Ackerson Fire in 1996. Additionally, plants were transplanted along Highway 180 in the Kings River Canyon in Sequoia National Forest to serve as a seed source for revegetation efforts; the highway was damaged by flooding in January 1997. In 1998, the Forest Service removed this species from its Sensitive Species list because new populations have been discovered and

because most plants grow in areas unlikely to experience human impacts.

The status in 1999 of Tompkins' sedge: ***Increasing.***

Tree-anemone
(Carpenteria californica)

CA - T (1990)
FED - None

General Habitat: Cismontane Woodland
Chaparral

Tree-anemone, a member of the mock orange family (Philadelphaceae), is an erect to spreading evergreen shrub that grows to a height of three to 13 feet. It has glossy green leaves and pale bark that peels in large sheets in the fall. It has large and showy flowers with white petals and yellow centers. Tree-anemone is an extremely localized endemic species that occurs only about 30 miles northeast of Fresno in eastern Fresno County and in one small population nearby in Madera County. It grows on well-drained granitic soils and is most abundant on north-facing ravines and drainages in chaparral and cismontane woodland communities. The total range of the species covers an area of approximately 225 square miles, within which there are six extant native populations. Tree-anemone appears to require specific conditions for successful sexual reproduction. No seed germination or seedling establishment in nature had ever been observed until 1990 when germination occurred following the 1989 Powerhouse fire. Fire appears to be an important ecological requirement of this species. Burned tree-anemone plants can resprout vigorously, and fires reduce competition from native shrubs and trees. Sierra National Forest is considering using prescribed burning to conserve tree-anemone, and USFS and USFWS staff are investigating incorporating a prescribed burn plan into a habitat conservation agreement or recovery plan.

About two-thirds of the extant tree-anemones occur on the Sierra National Forest and a third on private land. It has been estimated that since the species was discovered in the 1840s, at least one-third of its distribution has been destroyed. Tree-anemone is threatened by residential development, fire suppression and fire at the wrong time of year, highway construction, OHV use, road maintenance, hydroelectric operations, and logging. USFS has established a Carpenteria Botanical Area that includes a portion of the largest tree-anemone occurrence, and its Backbone Creek Research Natural Area supports another population. A portion of a tree-anemone population is protected on the Black Mountain Preserve that was transferred from TNC to the Sierra Foothill Conservancy in 1997. Also in 1997, the Preserve was expanded through the addition of a conservation easement. In 1997, the small population was discovered in Madera County.

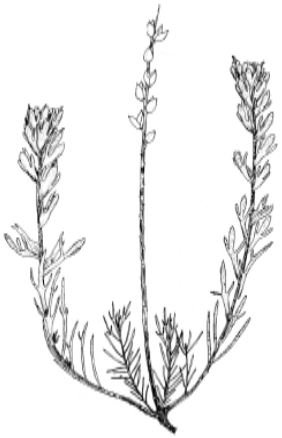
The status in 1999 of tree-anemone: ***Stable.***

Tiburon Indian paintbrush
(Castilleja affinis ssp. *neglecta)*

CA - T (1990)
FED - E (1995)

General Habitat: Valley and Foothill Grassland

Tiburon Indian paintbrush is a perennial herb in the figwort family (Scrophulariaceae) with woody basal stems, narrow lobed leaves, and showy yellow to red-yellow flowers that appear from March through June. It is a root hemiparasite, meaning its roots develop interconnections with the roots of other plants to increase water and nutrient flow. Tiburon Indian paintbrush is endemic to serpentine-derived soils on south to west-facing slopes within native bunchgrass communities. There are seven known occurrences of the plant. Three occur on the Tiburon Peninsula



Tiburon Indian paintbrush

in Marin County, with a total of approximately 250 plants in 1997. A portion of one of these three populations was recently destroyed by a residential development, and a portion of the plants formerly seen at a second population have not been observed in recent years. A bond issue that passed in 1997 allowed the purchase for open space of a parcel upslope from this latter population. Because the plants grow on thin, low-nutrient soils, preservation of this parcel was considered critical to protecting the Tiburon Indian paintbrush, as runoff containing herbicides and fertilizers from any homes built upslope could have eliminated the population. The Middle Ridge population on the Tiburon Peninsula may be impacted by human use (hiking and dog walking) in the area.

Approximately 550 plants occur at a private quarry in American Canyon in Napa County. Two sites, with a total of approximately 75 plants, occur on Golden Gate National Recreation Area lands in Marin County. One population exists on private land in Santa Clara County. A portion of this population has disappeared since 1993, possibly due to rooting by wild pigs, which was evident in 1999. Approximately 80 plants were observed at this location in 1999.

In 1997, the DFG held two recovery workshops to address Tiburon Indian paintbrush and 11 other plants known from serpentine habitats in the San Francisco Bay Area. Several participants volunteered to work to remove pampas grass and broom plants that are threatening the Tiburon Peninsula populations. Priority recovery actions identified by workshop participants included research into the management needs of the plant and protecting the populations on private lands.

Management and recovery actions for the species have been addressed in the USFWS's 1998 *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area.*

The status in 1999 of Tiburon Indian paintbrush: ***Stable.***

Succulent owl's-clover

Succulent owl's-clover
(Castilleja campestris ssp. *succulenta)*

CA - E (1979)
FED - T (1997)

General Habitat: Vernal Pools

Succulent owl's-clover is a succulent, hemiparasitic (partly parasitic) annual herb in the figwort family (Scrophulariaceae). It has brittle narrow leaves and heads of bright yellow flowers. This species grows in drying vernal pools in valley grassland areas of the San Joaquin Valley at the base of the Sierra Nevada foothills. Its discontinuous distribution extends through northern Fresno, western Madera, eastern Merced, southeastern San Joaquin, and Stanislaus counties. Thirty-two of the 35 extant populations occur on privately owned land. Succulent owl's-clover occurs in a few vernal pools on Big Table Mountain near Friant in Fresno County on land owned by the DFG and BLM. It also occurs in a vernal pool complex in Madera County owned by CALTRANS. One population occurs on land owned by BOR near the Madera Equalization Reservoir in Madera County. Seven privately owned populations occur on the Flying M Ranch in Merced County, portions over which TNC has a conservation easement. Two small occurrences were found in 1997 at the old Castle Air Force Base in Merced County.

Conversion of habitat to agriculture, urbanization, proposed gravel and aggregate mining, land fills, flood control, highway expansion, discing of vernal pools, competition from non-native weeds, and inappropriate grazing practices have all been cited as threats to succulent owl's clover. The type-locality of the species near Ryer in Merced County has been destroyed.

In 1992, the DFG purchased land on Big Table Mountain in Fresno County that supports succulent owl's-clover. In 1995, CALTRANS purchased a vernal pool complex in Madera County for mitigation purposes. Just prior to their acquisition by CALTRANS, the pools had been disced. As a result of this disturbance, these pools have been invaded by upland plants, but they still support succulent owl's-clover and other rare species. In 1995, a USFWS/DFG-funded habitat characterization study of San

Joaquin Valley vernal pools was completed. This study included vernal pools in which succulent owl's-clover occurs. Protection measures for this species are expected to be included in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

The status in 1999 of succulent owl's-clover: *Declining*.

Mount Gleason Indian paintbrush
(Castilleja gleasonii)

CA - R (1982)
FED - None

General Habitat: Lower Montane Conifer Forest

Mount Gleason Indian paintbrush

Mount Gleason Indian paintbrush is a grayish, hairy perennial herb with scarlet flowers in the figwort family (Scrophulariaceae). It occurs on open flats or slopes in the granitic soils of ponderosa pine forests and montane chaparral plant communities in the San Gabriel Mountains, Los Angeles County. There are six known occurrences near Mount Gleason in the Angeles National Forest. In 1997, a seventh occurrence was discovered in the Forest within the Knapp Ranch area, and in 1998, two additional occurrences were found in the Forest.

Threats to Mount Gleason Indian paintbrush have included illegal OHV use, foot traffic associated with campgrounds found within the plant's habitat, grazing, and timber harvest activities. DFG has no recent information on the status of species as a whole.

The status in 1999 of Mount Gleason Indian paintbrush: *Unknown*.

San Clemente Island Indian paintbrush
(Castilleja grisea)

CA - E (1982)
FED - E (1977)

General Habitat: Coastal Scrub

San Clemente Island Indian paintbrush

San Clemente Island Indian paintbrush is a branched perennial herb in the figwort family (Scrophulariaceae). Plants are covered with matted hairs and produce elongated flower stalks of yellow flowers. This paintbrush grows in maritime desert scrub on the rocky slopes and canyons of San Clemente Island. Forty-four populations are scattered around the island, and about half contain fewer than 10 individuals. The DFG has no current information on the status of this species.

The status in 1999 of San Clemente Island Indian paintbrush: *Unknown*.

Pitkin Marsh Indian paintbrush
(*Castilleja uliginosa*)

CA - E (1978)
FED - None

General Habitat: Marsh and Swamp

Pitkin Marsh Indian paintbrush

Pitkin Marsh Indian paintbrush is an herbaceous perennial in the figwort family (Scrophulariaceae). This extremely rare plant produces several unbranched stems with simple hairs and a spike of yellow flowers. Historically, it was restricted to the wet marsh habitat of upper Pitkin Marsh, Sonoma County. Reports in the 1950s suggest there was a larger population scattered throughout the area. Loss of marsh habitat has greatly reduced the distribution of this species. Since the late 1970s, only a single plant remains in the wild. Pitkin Marsh Indian paintbrush occurs with two other State listed

endangered plants at Pitkin Marsh, which is privately owned: Pitkin Marsh lily (*Lilium pitkinense)* and white sedge (*Carex albida*).

Pitkin Marsh Indian paintbrush requires two plants for pollination, so the single known plant cannot reproduce. Under a MOU with the DFG, the Jepson Herbarium developed tissue cultures and other vegetative propagation techniques to increase Pitkin March Indian paintbrush numbers. In addition, researchers have successfully hybridized and backcrossed the paintbrush with related species. In recent years, DFG personnel have not been allowed access to cut back competing vegetation or monitor the health of the single, fenced individual. This last wild plant is probably already gone. In order to properly manage the habitat, protection of the current hydrology and control of competing vegetation will be necessary.

In late 1996, the DFG, Jepson Herbarium, and other interested parties met to develop a conservation strategy for this species. The conservation strategy includes a possible reintroduction project, which would depend on the success of producing more plants for reintroduction and would depend on a successful arrangement with the landowner.

The status in 1999 of Pitkin Marsh Indian paintbrush: *Declining, possibly extirpated*.

California jewelflower

California jewelflower
(Caulanthus californicus)

CA - E (1987)
FED - E (1990)
General Habitat: Chenopod Scrub
Valley and Foothill Grassland

California jewelflower, a member of the mustard family (Brassicaceae), is an herbaceous annual that branches from the base, with upper leaves clasping the succulent stems, and purple-tipped (white upon opening) flowers arranged along one side of the stem. This species occurred historically in slightly alkaline sandy loam in native grasslands of the southern San Joaquin Valley and adjacent valleys. Its range once included Fresno, Kern, Kings, Santa Barbara, San Luis Obispo and Tulare counties, but now it is known only from occurrences on the western edge of its range in Santa Barbara, San Luis Obispo, and Fresno counties.

Loss of habitat as a result of conversion for agriculture or grazing has nearly eliminated this species from its native range. California jewelflower is now found in only three locales: the hills of southwestern Fresno County, the Carrizo Plain in eastern San Luis Obispo County, and farther south, in the Cuyama Valley of Santa Barbara County. The populations in Fresno County, owned by BLM, contain only a few hundred plants. The Carrizo Plain population is on public lands managed as part of the Carrizo Plain Natural Area, a cooperative effort between BLM, TNC, and the DFG. The Cuyama Valley population consists of 19 known sites west of the Cuyama River, both north and south of Santa Barbara Canyon. BLM owns seven of these 19 sites and has fenced them to protect them from unauthorized grazing. The remaining 12 sites are on private land.

While grazing can result in direct predation of California jewelflower, another major threat to California jewelflower is competition from non-native, annual grasses. On the Carrizo Plain, California jewelflower frequently occurs on precincts of the State- and federally-listed endangered Giant Kangaroo Rat (*Dipodomys ingens*). Although the kangaroo rats kill some of the jewelflowers, the rat's activities appear to reduce mulch and non-native seeds within their precincts, especially during the dry season, which may promote jewelflower the following year.

Several experimental introductions of California jewelflower have been attempted in the last few years. In all instances, the number of plants at each site has declined precipitously following initial seeding. For example, in 1997 Los Padres National Forest staff surveyed two experimental introduction populations that were established in 1989, and no plants were found at either site. Protection measures for California jewelflower are included in USFWS's *Recovery Plan for Upland Species of the*

San Joaquin Valley, California. The plan was completed in 1998.

The status in 1999 of California jewelflower: ***Stable to declining.***

Slender-pod jewelflower
(Caulanthus stenocarpus)

CA - R (1979)
FED - None

General Habitat: Chaparral

When listed as rare by FGC 1979, slender pod jewelflower was considered to be a distinct species, known from only approximately four reported locations in San Diego County and an unknown number of sites in Baja California. This "taxon" has since been determined to have been described from a mixed herbarium sheet containing material from *Caulanthus heterophyllus* var. *heterophyllus* and *Guillenia lasiophylla*, another mustard. The DFG has drafted a petition to delist this species because it is no longer a valid taxon.

Slender-pod jewelflower

The status in 1999 of slender-pod jewelflower: ***Not applicable.***

Hearst's ceanothus
(Ceanothus hearstiorum)

CA - R (1981)
FED - None
General Habitat: Maritime Chaparral
Coastal Prairie

Hearst's ceanothus is a prostrate, mat-forming evergreen shrub in the buckthorn family (Rhamnaceae) with bright green leaves and deep blue flowers. It grows in coastal prairie and chaparral in the Arroyo de la Cruz region of San Luis Obispo County. It is associated with a number of State-listed plants including the State-listed endangered Hearst's manzanita *(Arctostaphylos hookeri* ssp. *hearstiorum)* and the State-listed rare maritime ceanothus *(Ceanothus maritimus)* as well as several unlisted but equally rare species. All five known occurrences of Hearst's ceanothus are located on the Hearst Ranch, owned by the Hearst Corporation, in San Luis Obispo County. The DFG's most recent information on the species dates from the mid-1980s. A historical threat has been the conversion of habitat to grazing land; the DFG has no current information regarding this or other potential threats.

Hearst's ceanothus

The status in 1999 of Hearst's ceanothus: ***Unknown.***

Maritime ceanothus
(Ceanothus maritimus)

CA - R (1978)
FED - None

General Habitat: Maritime Chaparral
Valley and Foothill Grassland

Maritime ceanothus is a prostrate, mat-forming evergreen shrub in the buckthorn family (Rhamnaceae) with dark, glossy green leaves and small light to deep blue flowers. It occurs in coastal prairie and chaparral on coastal bluffs near Arroyo de la Cruz, San Luis Obispo County. Associated species include the State-listed rare Hearst's ceanothus *(Ceanothus hearstiorum)* and the endangered Hearst's manzanita *(Arctostaphylos hookeri* ssp. *hearstiorum)* as well as several unlisted but equally rare species. All six known occurrences of maritime ceanothus are located on the Hearst Ranch,

Maritime ceanothus

owned by the Hearst Corporation, in San Luis Obispo County. In the mid-1980s, several of the occurrences were noted to have declined substantially. The DFG has no recent information on this species.

The status in 1999 of maritime ceanothus: *Unknown*.

Mason's ceanothus

Mason's Ceanothus
(Ceanothus masonii)

CA - R (1978)
FED - None

General Habitat: Chaparral

Mason's ceanothus is an erect, spreading, evergreen shrub with shiny opposite leaves and dark blue to violet flowers. This member of the buckthorn family (Rhamnaceae) occurs in manzanita chaparral on Franciscan sandstone. The entire global distribution of Mason's ceanothus is one confirmed occurrence at Bolinas Ridge in Marin County. This species may be a hybrid or variety of *Ceanothus gloriosus*; taxonomic work is needed. The only known occurrence of Mason's ceanothus is owned jointly by Golden Gate National Recreation Area and Marin Municipal Water District, and thus is afforded some protection. Mason's ceanothus depends on fire to reproduce. Long-term fire suppression may be detrimental to this species as plants are overtopped by taller shrubs in the absence of fire. DFG has no recent information on the status of this plant.

The trend in 1999 for Mason's ceanothus: *Unknown.*

Vail Lake ceanothus
(Ceanothus ophiochilus)

CA - E (1994)
FED - T (1998)

General Habitat: Chaparral

Vail Lake ceanothus is a rounded, rigidly-branched shrub in the buckthorn family (Rhamnaceae) with pale blue to pinkish-lavender flowers. This species was first discovered during a spring 1989 botanical survey of the property surrounding Vail Lake in southwestern Riverside County. Two additional populations of Vail Lake ceanothus were discovered in 1993 within the Agua Tibia Wilderness of the Cleveland National Forest, also in southwestern Riverside County. Both populations include hybrids between Vail Lake ceanothus and the common hoaryleaf ceanothus (*Ceanothus crassifolius*). All occurrences of the species are on north-facing slopes and on soils derived from an unusual pyroxenite-rich rock outcrop that may be gabbroic in origin. Soil on the outcrop is nutrient poor and constitutes harsh growing conditions for most plants. Extensive botanical surveys have been conducted in the Agua Tibia Mountains, but to date, no other populations have been found.

While the Cleveland National Forest populations of Vail Lake ceanothus are adequately protected within National Wilderness, the Vail Lake population, the most genetically pure occurrence, has been threatened for nearly a decade by the potential for residential development of the area surrounding Vail Lake. Multi-agency efforts to acquire the Vail Lake property as public open space, and an attempt to establish the property as a conservation bank, to date, have been unsuccessful.

Studies of the effects of fire frequency on the establishment, survival and reproduction of Vail Lake ceanothus are critically needed. Unlike some chaparral shrubs, Vail Lake ceanothus lacks the ability to crown-sprout following a wildfire and reproduces only from seed stored in the soil. Information from studies on the ecology of this species will be essential to the development of recovery strategies and management plans, as well as the design of an adequate preserve for Vail Lake

ceanothus. There is the potential for serious decline should the Vail Lake population be lost.

The status in 1999 of Vail Lake ceanothus: *Stable*.

Pine Hill ceanothus
(Ceanothus roderickii)

CA - R (1982)
FED - E (1996)

General Habitat: Chaparral

Pine Hill ceanothus

Pine Hill ceanothus is an evergreen shrub in the buckthorn family (Rhamnaceae) with prostrate branches radiating from a central trunk as in a wagon wheel, and small white flowers tinged with blue. This ceanothus occurs on red clay soils of the Pine Hill gabbro formation within openings in chaparral in the Sierra foothills of El Dorado County. It is commonly associated with two other State-listed plants: Stebbins' morning glory *(Calystegia stebbinsii),* and Layne's butterweed *(Senecio layneae).* It also occurs in habitats near Pine Hill flannelbush *(Fremontodendron decumbens)* and El Dorado bedstraw *(Galium californicum* ssp. *sierrae).* There are approximately 15 occurrences of Pine Hill ceanothus. Portions of four occurrences of Pine Hill ceanothus are protected. Two of these sites are in the vicinity of Salmon Falls, to the north and south of the South Fork of the American River, and managed by BLM and the DFG. Another site is 240 acres managed by the DFG on Pine Hill.

Continued losses of habitat are occurring through grading being conducted under ministerial grading permits that are not subject to review under the California Environmental Quality Act, development of telecommunications facilities on property managed by CDF on top of Pine Hill, and urban development in the vicinity of Cameron Park and Shingle Springs.

The first phase of purchasing a 315-acre site in western El Dorado County, containing four State and federally listed plant species was completed in November of 1997, through a combination of federal, State, and local funding. This preserve is being established to protect Stebbins' morning glory, Pine Hill ceanothus, Layne's butterweed, and El Dorado bedstraw (*Galium californicum* ssp. *sierrae*). This preserve, when complete, will also include a large of number species which are considered endemic to or characteristic of gabbroic and serpentine soils, including El Dorado mule ears (*Wyethia reticulata*), which is only found in the gabbro soil in western El Dorado County. The 315-acre preserve is one unit of a planned five-unit preserve system that is expected to total 3,400 acres. Approximately half of this area consists of existing public lands. The other four units will be expanding around existing public lands, if private landowners are willing to sell or dedicate title or conservation easements and if the program continues to receive support from local public agencies.

The USFWS released the *Draft Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills* in 1998, which addresses recovery needs for Pine Hill ceanothus.

The status in 1999 of Pine Hill ceanothus: *Declining*.

Santa Catalina Island mountain mahogany
(Cercocarpus traskiae)

CA - E (1982)
FED - E (1997)

General Habitat: Chaparral

Santa Catalina Island mountain mahogany

Santa Catalina Island mountain mahogany is a small, evergreen tree in the rose family (Rosaceae). Plants have clusters of small greenish flowers and leathery leaves that are white-woolly beneath. It is found only on Santa Catalina Island and when first described in 1897, the population was comprised of 40 to 50 mature plants. Today, the

natural distribution is limited to one small population of seven trees and numerous seedlings in Wild Boar Gully in the Salta Verde region of the island.

Browsing by introduced deer and goats and rooting by feral pigs has disturbed the soil and inhibited the establishment and growth of seedlings. The Santa Catalina Island Conservancy owns and manages the island and is carrying out protection and recovery actions. The individual trees were fenced in 1988 with enclosures of varying sizes. In the two largest fenced enclosures, a total of several hundred seedlings of varying ages were evident in 1995. Enclosures around the remaining trees are smaller and few or no seedlings were observed. In 1999 the Conservancy fenced the entire perimeter of Wild Boar Gully. Two trees were identified as hybrids between Santa Catalina Island mountain mahogany and the more common island mountain mahogany (*C. betuloides* var. *blancheae*). Genetically, Santa Catalina Island mountain mahogany is threatened by both inbreeding depression and genetic assimilation through hybridization with island mountain mahogany. The establishment of other populations outside Wild Boar Gully will be important to the long-term survival of this species.

The status in 1999 of Santa Catalina Island mountain mahogany: *Declining*.

Camatta Canyon amole

Camatta Canyon amole
(Chlorogalum purpureum var. *reductum)*

CA - R (1978)
FED - FPT (1998)

General Habitat: Cismontane Woodland

Camatta Canyon amole is a perennial herb in the lily family (Liliaceae) that arises from a bulb. It has a basal cluster of long, linear leaves and an elongate open-branched flowering stem topped by deep blue-purple flowers. The entire global distribution of this plant is two occurrences in upper Camatta Canyon, San Luis Obispo County: one on the Los Padres National Forest and one on nearby private property. Camatta Canyon amole grows in open areas with low vegetation cover in hard-packed, gravelly, red serpentine soil within the blue oak woodland community.

In 1996, the DFG initiated research on the population on Los Padres National Forest property on Red Hill Road to determine appropriate methods for increasing numbers of Camatta Canyon amole, with funds from the California OHV Grant Program. Work continued through 1997. One indirect benefit of conducting this research was that an interested passer-by stopped to inquire about the work, and upon seeing the amole, reported that he had a population on his property. This has now been verified, and brings the total number of populations for this species to two. Though no surveys have been done for the newly discovered population, the site at Red Hill Road supported tens of thousands of individuals in 1996, indicating that 1984 fencing from OHVs has resulted in increased numbers. Although the OHV grant has run out, the DFG will continue to gather data on the experimental restoration project.

The research also revealed that using bulbs as propagules resulted in extremely high survival (approximately 90 percent) after two winters, however, the effort needed to procure the bulbs in the summer (dormant) season was very high. Propagation by seed was successful, however, seedlings grow extremely slowly and take years to mature and produce seed.

The status in 1999 of Camatta Canyon amole: *Stable to Increasing*.

Howell's spineflower

Howell's spineflower
(Chorizanthe howellii)

CA - T (1987)
FED - E (1992)

General Habitat: Coastal Dunes
Coastal Prairie

Howell's spineflower is a small, shaggy-haired annual with spine-enclosed clusters of tiny white and rose-colored flowers. Plants branch from the base and produce basal, oblong leaves. This member of the buckwheat family (Polygonaceae) is generally restricted to northern dune scrub habitat and occurs with the State-listed endangered Menzies' wallflower *(Erysimum menziesii)* and the rare North coast phacelia *(Phacelia insularis* var. *continentis).* It is known from only three populations in the vicinity of MacKerricher State Park in the Ten Mile Dunes north of Fort Bragg, Mendocino County.

The DPR is conducting dune restoration, including removal of invasive non-native species such as ice plant, which will improve some habitat for Howell's spineflower. In 1998, abundant spineflower emerged in areas from which iceplant and European beachgrass was removed. MacKerricher State Park is proposing to reconstruct or reroute a 16-foot wide, paved trail through occupied habitat, and trampling by horses and people continues to threaten the plant. The USFWS completed a recovery plan for Howell's spineflower and six other coastal plants in 1998.

The status in 1999 of Howell's spineflower: *Stable*.

Orcutt's spineflower
(Chorizanthe orcuttiana)

CA - E (1979)
FED - E (1996)

Orcutt's spineflower

General Habitat: Coastal Scrub

Orcutt's spineflower is a prostrate annual herb in the buckwheat family (Polygonaceae). It has basal leaves, leaf-like bracts in pairs, and small yellow flowers. The historic range of Orcutt's spineflower extended from Oceanside south to Point Loma in coastal San Diego County. Ten occurrences were known from sandy soils in coastal plains and mesas.

By 1970, this species was thought to be extirpated throughout its known range until it was observed in 1979 at Torrey Pines State Reserve and later at Oakcrest Community Park. The Torrey Pines State Reserve population was last seen in 1987, despite the continued presence of suitable habitat and several efforts to relocate this occurrence. In the spring of 1997 a population of Orcutt's spineflower was rediscovered on U.S. Navy lands at Point Loma. Much of the original habitat for Orcutt's spineflower in coastal San Diego County has been eliminated by residential and commercial development.

Careful surveys of all known historic sites and potential habitat are needed in good rainfall years to accurately assess the remaining distribution of Orcutt's spineflower. Studies to determine the habitat requirements and factors affecting the establishment, growth and reproduction of the species are critically needed for the development of recovery strategies and management plans. USFWS provided federal Section 6 funding to the DFG, beginning in 1998, for portions of this work. This species is covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border. It will likely also be covered in the San Diego Multiple Habitat Conservation Program NCCP to be finalized in the next few years.

The status in 1999 of Orcutt's spineflower: *Declining*.

Sonoma spineflower

Sonoma spineflower
(Chorizanthe valida)

CA - E (1990)
FED - E (1992)

General Habitat: Coastal Prairie

Sonoma spineflower is a robust, erect annual herb in the buckwheat family (Polygonaceae). It has broad, lance-shaped basal leaves, and bears large, dense headlike clusters of spine-tipped bracts and pinkish flowers that bloom from June through August. Until its rediscovery in 1980, Sonoma spineflower was thought to be extinct. The distribution of Sonoma spineflower is limited to one site in Marin County, just south of Abbott's Lagoon on a working cattle ranch within Point Reyes National Seashore at an elevation of 40 feet. This species occupies less than 2.5 acres of land within an enclosed pasture of about 360 acres, and consists of the main, native population and a reintroduction plot. The NPS believes there is a high degree of natural variability in plant numbers from year to year, and the overall population trend is unknown. NPS is attempting to secure funding to develop and implement repeatable monitoring protocols for the species. The USFWS completed a recovery plan for the Sonoma spineflower and six other coastal plants in 1998.

The status in 1999 of Sonoma spineflower: *Unknown.*

Ashland thistle

Ashland thistle
(Cirsium ciliolatum)

CA - E (1982)
FED - None

General Habitat: Cismontane Woodland

Ashland thistle is a perennial member of the sunflower family (Asteraceae), with a tall stem, short lateral branches, and yellowish-white flower heads. California populations are known from the vicinity of Montague in Siskiyou County, and populations occur in southern Oregon. This thistle often grows in dry plains and open grassland habitats, where the soils are thin with rocky outcrops present. There are only five known occurrences of Ashland thistle in California.

All occurrences are found on private land in agricultural areas devoted to grazing or grain production. Most occurrences tend to have numbers of individuals ranging from 10 to 100. An introduced beetle used as a biological control of Italian thistle, musk thistle, and milk thistle is also attracted to *Cirsium* species and may be a threat to Ashland thistle. There have been no surveys of the five known occurrences for this species in over 12 years. Efforts to locate Ashland thistle on BLM parcels in the Montague area resulted only in finds of peregrine thistle (*Cirsium cymosum*). Surveys of all known occurrences are needed, as is a monitoring program to determine the trend of Ashland thistle. The limited occurrences and small number of individuals per occurrence suggest instability with a potential for decline for this species.

The status in 1999 of Ashland thistle: *Unknown.*

Fountain thistle
(Cirsium fontinale var. *fontinale)*

CA - E (1979)
FED - E (1995)

General Habitat: Valley and Foothill Grassland (Serpentine seeps)

Fountain thistle is an herbaceous perennial with several stout, erect, reddish

stems and large white to pinkish, nodding flowering heads. This member of the sunflower family (Asteraceae) occurs only in the extremely restricted serpentine seeps of the Crystal Springs region, San Mateo County. It sometimes grows with other rare plants like fragrant fritillary (*Fritillaria liliaeca*) and San Francisco wallflower (*Erysimum franciscanum*).

The few existing fountain thistle occurrences are on public land owned and managed by CALTRANS and SFWD. An occurrence previously known from Edgewood County Park is thought to be extirpated; no plants have been seen there since one plant was observed in 1993. Construction of Interstate 280 contributed to the decline of fountain thistle by destroying habitat and altering the drainage patterns feeding the seeps in its serpentine grassland plant community; subsequent invasion of pampas grass into several of the colonies further threatens the species. The DFG, in cooperation with USFWS, conducted a recovery workshop addressing this species in April 1997, and as a result of recommendations made at that meeting, CALTRANS and SFWD have initiated pampas grass control programs to try to prevent further degradation of populations on their property. These eradication efforts will need to continue. Management and recovery actions for the species have been addressed in the USFWS's *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

The status in 1999 of fountain thistle: *Declining*.

Chorro Creek bog thistle
(Cirsium fontinale var. *obispoense)*

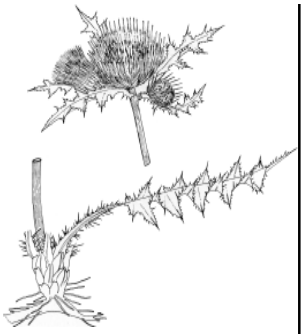
CA - E (1993)
FED - E (1994)

General Habitat: Chaparral
Cismontane Woodland

Chorro Creek bog thistle is a short-lived perennial in the sunflower family (Asteraceae). This thistle is distinguished by its nodding, pinkish flower heads which bloom from February to September. Chorro Creek bog thistle is of extremely limited distribution, found only in perennial serpentine seeps and springs in western San Luis Obispo County.

Ten populations of Chorro Creek bog thistle are known; nine populations occur within a five-mile radius of the City of San Luis Obispo, and one other about 30 miles to the northwest. Three populations are on publicly-owned property, one each managed by California Polytechnic State University, San Luis Obispo, the City of San Luis Obispo (only a portion of population), and the California National Guard. The National Guard has been monitoring the population at Camp San Luis Obispo since fencing the population from cattle grazing in October of 1994. Monitoring data indicated that in the absence of grazing by cattle, various native wetland species increased, coupled with a drastic decrease in recruitment of Chorro Creek bog thistle, resulting in an overall decline in numbers of the thistle. However, recruitment of thistle into grazed wetland areas outside of the cattle exclosure was observed. Beginning in January 1998, cattle were allowed access to about half of the population of bog thistle. Two years later, the number of plants doubled in the grazed area and remained approximately the same in the ungrazed area. Although the cows eat and trample many of the plants, the increased recruitment under controlled grazing more than makes up for the impact. Protection measures for Chorro Creek bog thistle are included in USFWS's *Recovery Plan for Morro Shoulderband Snail and Four Plants form Western San Luis Obispo County, California,* completed in 1998.

The status in 1999 of Chorro Creek bog thistle: *Stable to Declining*.



La Graciosa thistle

La Graciosa thistle
(Cirsium loncholepis)

CA - T (1990)
FED - PE (1998)

General habitat: Coastal Dunes
Marsh and Swamp
Riparian Scrub

La Graciosa thistle is a bushy biennial or short-lived, perennial herb with large, smooth to slightly hairy leaves and clustered heads of white flowers. This member of the sunflower family (Asteraceae) is known from coastal San Luis Obispo and Santa Barbara counties from Pismo Beach south to Los Alamos. Its habitat is freshwater and brackish marshes, especially among dunes, and river bottom lands with high subsurface moisture levels. Seven sites are known for this species, with the largest, consisting of several thousand plants, at the mouth of the Santa Maria River. Other populations are small, generally with less than 50 individuals. Several have declined significantly in size in recent years, and a population south of Oso Flaco Lake may have been extirpated by encroaching vegetation.

At least one population on Unocal property in the Guadalupe Dunes just north of the Santa Maria River and the population at the mouth of the Santa Maria River are at risk from long-term soil and water contamination from diluent on Unocal's property. The DFG, the County of San Luis Obispo, and other agencies are currently reviewing a proposal by Unocal to clean up their site; remediation of the site may directly impact the population in the dunes. In 1999, the DFG met with DPR and the Land Conservancy of San Luis Obispo County to outline a program of dunegrass and Veldtgrass removal within the Guadalupe Dunes. It is expected that at least one population of La Graciosa thistle will benefit from this program, to be conducted by the Land Conservancy.

The status in 1999 of La Graciosa thistle: *Declining*.

Surf thistle

Surf thistle
(Cirsium rhothophilum)

CA - T (1990)
FED - None

General Habitat: Coastal Dunes

Surf thistle is a low-growing, short-lived perennial in the sunflower family (Asteraceae) with whitish flowers in dense heads. It is characterized by large rosettes of spiny, white-woolly, deeply lobed and undulating leaves. The deep roots and white-woolly herbage are adaptations to the physical stresses of the dune habitat, such as high light intensity and sand movement and abrasion. Flowering occurs between May and July. Surf thistle is endemic to the dunes of the central California coast, from the Nipomo Dunes of southern San Luis Obispo County to Point Concepcion in Santa Barbara County. It grows in coastal foredunes on the slopes of transverse ridges in areas of active sand accumulation. At the southern extreme of its range, it is found in sand at the bases or tops of cliffs.

Several populations on Unocal property in the foredunes of the Guadalupe Dunes just north of the Santa Maria River are at risk from long-term soil and water contamination from diluent on Unocal's property. The DFG, the County of San Luis Obispo, and other agencies are currently reviewing a proposal by Unocal to clean up their site; remediation of the site may directly impact the populations in the dunes. In 1999, the DFG met with DPR and the Land Conservancy of San Luis Obispo County to outline a program of dunegrass and Veldtgrass removal within the Guadalupe Dunes. It is expected that at least one population of surf thistle will benefit from this program, to be conducted by the Land Conservancy.

The status in 1999 of surf thistle: ***Stable to declining.***

Presidio clarkia
(Clarkia franciscana)

CA - E (1978)
FED - E (1995)

General habitat: Coastal Scrub
Valley and Foothill Grassland

Presidio clarkia is a slender, branched annual herb with narrow leaves and lavender-pink flowers. This member of the evening-primrose family (Onagraceae) occurs on serpentine soils within the coastal prairie grassland community at San Francisco's Presidio and in the Oakland Hills of Alameda County. At one location within the Presidio, this species grows in association with the State and federally-listed Endangered Presidio manzanita *(Arctostaphylos hookeri* ssp. *ravenii).* Current ownership includes EBRPD, NPS, and private landowners.

The NPS is working to protect and enhance habitat for this clarkia at the Presidio in San Francisco. Non-native trees and the duff layer have been removed from its habitat, which has also been fenced. The NPS is planning experiments to determine the best habitat management techniques for the species. A portion of the Oakland population is on property that is being redeveloped; the City's permit requires protection that the site and long-term management for the benefit of the species. EBRPD recently removed nonnative trees and other vegetation that threatens the population at Redwood Regional Park. Management and recovery actions for the species have been addressed in the USFWS's *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

Presidio clarkia

The status in 1999 of Presidio clarkia: ***Stable to Declining.***

Vine Hill clarkia
(Clarkia imbricata)

CA -E (1978)
FED -E (1997)

General Habitat: Chaparral

Vine Hill clarkia, a member of the evening primrose family (Onagraceae), is a late-blooming, slender annual herb with large white or pinkish flowers. This species grows in habitats with sandy loam soils. Historically, it is known from only two natural occurrences in the Vine Hill area of Sonoma County. One of these is extirpated, leaving a single native population. A transplanted population exists at the California Native Plant Society's one-acre Vine Hill Preserve.

In the past year, Vine Hill clarkia has significantly declined and is highly endangered. The native population of Vine Hill clarkia was formerly split between two privately owned parcels. Until several years ago, TNC had cooperative agreements with both landowners to protect the population. Since then, the soil on one of the parcels was scraped, and the plants extirpated. The other parcel was sold in 1997 and a portion of the Vine Hill clarkia habitat on this second parcel was disturbed. Plants may not reestablish on the disturbed soil based on prior observations that the plant depends on the presence of an undisturbed soil crust. The new landowner wants to build on the plant's habitat, but is willing to sell the parcel instead. The DFG is seeking cooperation to protect this last remaining portion of the native population of Vine Hill clarkia.

Vine Hill clarkia

The status in 1999 of Vine Hill clarkia: ***Declining.***

Merced clarkia

Merced clarkia
(Clarkia lingulata)

CA - R (1988); E (1989)
FED - None

General Habitat: Valley and Foothill Grassland
Lower Montane Conifer Forest

Merced clarkia is a slender annual herb in the evening primrose family (Onagraceae) with bright pink flowers. The distribution of Merced clarkia consists of only two populations along Highway 140 in the Merced River Canyon of Mariposa County.

Merced clarkia grows on land administered by the Sierra National Forest; its roadside habitat is maintained by CALTRANS. The steep habitat occupied by Merced clarkia above Highway 140 is prone to rockslides and soil slippage, so road maintenance activities have the potential to harm the species. In 1989, USFS developed a species management guide for Merced clarkia.

In 1994, a multi-agency MOU for the conservation and protection of sensitive species in the Merced River Canyon was signed by USFS, BLM, CALTRANS, DFG, and PG&E. The MOU specifies guidelines for highway and power line maintenance and repair, notification requirements, species monitoring, and annual reviews. The MOU has resulted in significant protection for Merced clarkia during both routine activities and emergency actions due to rockslides, a flood, and a gasoline spill. USFS annually monitors the Merced Clarkia populations. Merced Clarkia had vigorous populations in 1995, but 1996 and 1997 were successively poorer years. The lowest numbers ever observed by Sierra National Forest personnel were in 1997, probably due to the lack of rainfall during the entire spring after the massive flooding in early January. In 1997, the DFG, USFS, and CSU - Fresno, initiated a study of the genetics of Merced clarkia. In 1998, both Merced clarkia populations had returned to full vigor.

The status in 1999 of Merced clarkia: ***Stable.***

Pismo clarkia

Pismo clarkia
(Clarkia speciosa ssp. *immaculata)*

CA - R (1978)
FED - E (1994)

General Habitat: Cismontane Woodland

Pismo clarkia is an erect annual herb in the evening primrose family (Onagraceae). Each flower has four lavender, fan-shaped petals that fade to pale yellow or white at the base. The plant flowers from May to July. This species grows on dry, sandy, often disturbed soils along the margins of oak woodland in open grassy sites. This plant is known only from 12 occurrences in the Pismo Beach area of San Luis Obispo County. All sites are on private land. Portions of two occurrences have been extirpated by residential development, and development has been proposed for six of the other sites. Additional threats to some of the sites include improper grazing and roadside mowing for vegetation control. One site was extirpated in the early 1990s, although an attempt is being made to establish a population at a new site using seed that was collected from the plants before their habitat was destroyed. The DFG has not been able to obtain data on the success or failure of this site, however. In 1998, a new location was discovered on the Nipomo Mesa north of Black Lake Canyon, however, it will be partly destroyed by road construction. A conservation easement was acquired and will be given to the City of San Luis Obispo to conserve Indian Knob, which supports a population of Pismo clarkia and the State- and federally-listed endangered Indian Knob mountainbalm (*Eriodictyon altissimum*). Protection measures for Pismo clarkia are included in USFWS's *Recovery Plan for Morro Shoulderband Snail and Four Plants form Western San Luis Obispo County, California,* completed in 1998.

The status in 1999 of Pismo clarkia: *Declining.*

Springville clarkia
(Clarkia springvillensis)

Springville clarkia

CA - E (1979)
FED - T (1998)

General Habitat: Chaparral
Cismontane Woodland

Springville clarkia is an annual herb with simple or branched stems, narrow leaves, and brilliant lavender-pink flowers punctuated by dark purplish basal spots. It is in the evening primrose family (Onagraceae). This wildflower is restricted to roadsides and grassy openings in blue oak woodland near the Tule River in the Sierra Nevada foothills of Tulare County. Fifteen extant populations occur in a small area near the North and Middle Forks of the Tule River northeast of Springville. One occurs at the DFG's Springville Ecological Reserve, eight on Sequoia National Forest, one at a Tulare County educational site, one on BLM land, and three are privately owned. An additional population occurs 16 miles to the northwest near Salt Creek, a tributary of the Kaweah River near Three Rivers.

Springville clarkia is a late-blooming species that may not develop mature seeds before its grassland habitat is mowed annually for fire protection. In 1993, the DFG funded research that found that the species had a fair amount of genetic diversity despite its small population size and considerable annual fluctuation in population numbers. In 1997, many plants dried up and died before setting seeds, probably because of the extremely dry spring that followed a major storm in early January. Sequoia National Forest and the DFG are developing a Species Management Guide that will prescribe research and management actions to maintain the species.

The status in 1999 of Springville clarkia: *Declining.*

Salt marsh bird's-beak
(Cordylanthus maritimus ssp. *maritimus)*

Salt marsh bird's-beak

CA - E (1979)
FED - E (1978)

General Habitat: Marsh and Swamp

Salt marsh bird's-beak is a diffusely branched annual herb with grayish-green, tinged purple hairy leaves. This member of the figwort family (Scrophulariaceae) has spikes of bee pollinated flowers with two-lipped petals. Upper petals are beak-like with yellowish tips, and lower petals have a purplish pouch. The plants are hemiparasitic, sometimes obtaining moisture and nutrients from the roots of their host plants, which are usually perennials. Salt marsh bird's-beak grows in the higher reaches of coastal salt marshes to intertidal and brackish areas influenced by freshwater input. Some plants occur in non-tidal areas or in areas of perched water tables; there may be different ecotypes.

Historically, salt marsh bird's-beak was widespread in coastal salt marshes from Morro Bay in San Luis Obispo County to San Diego County and northern Baja California Norte. Presently, it occurs only in scattered sites at fewer than 10 remnant salt marshes. Half of the original occurrences are now extirpated. In California, it is currently found at Tijuana Estuary and Sweetwater Marsh in San Diego County, Upper Newport Bay and possibly Anaheim Bay in Orange County, Ormond Beach and Mugu Lagoon in Ventura County, Carpenteria Marsh in Santa Barbara County, and Morro Bay in San Luis Obispo County. Occurrences are under the control of federal, State, and local governments, and private owners.

A recently completed restoration plan has been developed for the privately owned Ormond Beach population which, if implemented, is expected to improve

habitat for the bird's-beak and other associated species. A project to restore salt marsh habitat and expand the salt marsh bird's-beak population is also in progress at Carpenteria Salt Marsh by the University of California Natural Reserve System. Maintenance of appropriate hydrological conditions for this species continues to be one of the most challenging management issues. The interaction between tidal flows and local surface and subsurface freshwater flows is complex and important to the species' survival. Recently approved water diversions from Calleguas Creek may substantially reduce freshwater input into Mugu Lagoon and impair efforts being planned by the military to expand habitat for salt marsh bird's-beak. This species is also found in the DFG's Upper Newport Bay Ecological Reserve (UNBER), and UNBER's management plan addresses the conservation of the plant.

Salt marsh bird's-beak is highly vulnerable to loss of genetic variation, and future reintroduction attempts should strive to create contiguous patches of plants or to periodically reseed existing patches. Maintenance of nearby upland habitat supporting native pollinators is important to the species' survival. Several non-native competitors are displacing salt marsh bird's beak from their habitat, including sea lavender and several exotic grasses. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

The status in 1999 of salt marsh bird's-beak: ***Stable to declining.***

Soft bird's-beak

Soft bird's-beak
(Cordylanthus mollis ssp. *mollis)*

CA - R (1979)
FED - E (1997)

General Habitat: Marsh and Swamp

Soft bird's-beak is a sparingly branched, hemiparasitic, herbaceous annual plant in the figwort family (Scrophulariaceae). Its stems are covered by soft hairs, and it bears white two-lipped flowers. Soft bird's-beak grows in the coastal salt marshes and brackish marshes from northern San Francisco Bay to Suisun Bay in Napa, Solano, and Contra Costa counties. The plant likely once occurred in a ring around most of the entire estuary, but much of its habitat has been lost or fragmented due to development. Currently, there are 12 existing occurrences of soft bird's-beak. Eight historical occurrences have not been seen after extensive and repeated searches and have likely been extirpated. A DFG-sponsored study revealed that populations fluctuate greatly from year to year, depending on weather patterns. As an example, the population in Napa County increased eight-fold in 1999 from its 1998 size, but was still only eleven percent of its 1994 size.

The status in 1999 of soft bird's-beak: ***Stable.***

Mount Diablo bird's-beak

Mount Diablo bird's-beak
(Cordylanthus nidularus)

CA - R (1978)
FED - None

General Habitat: Chaparral

Mount Diablo bird's-beak, a member of the figwort family (Scrophulariaceae), is a prostrate to ascending, branched, mat-forming annual with small white and purple-veined flowers. Its interlacing branches form an unbroken mat over the serpentine chaparral habitat in which it grows. The entire global distribution of this unusual bird's-beak consists of one occurrence on the northeast slope of Mount Diablo in Contra Costa County, within Mount Diablo State Park. This population is stable, although it appears to require some disturbance, such as fire.

The status in 1999 of Mount Diablo bird's-beak: *Stable.*

Palmate-bracted (=Ferris') bird's-beak
(Cordylanthus palmatus)

CA - E (1984)
FED - E (1986)

General Habitat: Chenopod Scrub
Valley and Foothill Grassland

Palmate-bracted bird's-beak

Palmate-bracted bird's-beak is a pale green-gray annual herb in the figwort family (Scrophulariaceae). It branches from the base, and the leaves and bracts are covered by salt deposits extruded from special glands. This species is confined to the saline-alkaline soils and is a component of alkali sink scrub vegetation in relatively undisturbed, seasonally flooded lowlands in the Central and Livermore valleys. Historically, occurrences were scattered throughout the San Joaquin Valley in Fresno and Madera counties, the Livermore Valley in Alameda County and the Sacramento Valley in Colusa and Yolo counties.

Seven populations of palmate-bracted bird's-beak are currently known. In Colusa County, a large population exists at Delevan National Wildlife Refuge, and a second scattered population occurs at Colusa National Wildlife Refuge. An artificially seeded population exists at the Sacramento National Wildlife Refuge. A portion of the population in Yolo County is on property owned by the City of Woodland. The DFG's Alkali Sink Ecological Reserve in Fresno County supports a good population; however, periodic discing of its roadside habitat by a neighboring landowner, who has a right-of-way easement, is threatening it. A small population occurs on a private ranch land in Madera County.

The seventh population occurs in the Springtown alkali sink, located north of Livermore in Alameda County. This large and genetically diverse population occurs on lands owned by the Federal Communication Commission, the City of Livermore, and private landowners. A recent study of the alkali sink hydrology found that the bird's-beak occupies a narrow zone of favorable conditions depending on pH, salinity, and moisture content, and that maintaining the hydrologic functioning of the system is important to maintaining the bird's-beak at the site. A 1997 survey of the plants at the site found that the bird's-beak is thriving in the alkali sink; however, many of the existing colonies are degraded by bicycle use and by heavy grazing.

Protection measures for palmate-bracted bird's-beak are included in USFWS's *Recovery Plan for Upland Species of the San Joaquin Valley, California.* The plan was completed in 1998.

The status in 1999 of palmate-bracted bird's-beak: *Stable to Declining*.

Seaside bird's-beak
(Cordylanthus rigidus ssp. *littoralis)*

CA - E (1982)
FED - None

General Habitat: Closed-cone Conifer Forest
Central Coast Maritime Chaparral
Cismontane Woodland

Seaside bird's-beak

Seaside bird's-beak is a bushy annual herb in the figwort family (Scrophulariaceae). The yellowish green branches and leaves are covered with fine hairs, and its pale yellow flowers are clustered at the ends of branches. Seaside bird's-beak grows in sandy soils of stabilized dunes covered by closed-cone pine forest, cismontane woodland, or maritime chaparral. Plants thrive in areas of recent surface soil disturbance or in areas with reduced levels of competition from shrubs and

herbaceous plants. The historic distribution of this bird's-beak was, until recently, thought to be restricted to northern Monterey County; the recent base closure of Fort Ord resulted in the protection of several of these populations. However, in the early 1980s, several collections from Burton Mesa in Santa Barbara County were identified as this subspecies. About 10 sites are known at present on publicly and privately owned lands and on Vandenberg Air Force Base. At some of the Santa Barbara County sites, subspecies *littoralis* hybridizes with subspecies *rigidus,* with the latter also native to this area. In 1997, a new population was identified on Vandenberg AFB.

In Santa Barbara County, populations of seaside bird's-beak are located on land managed and conserved by DPR at the La Purissima Mission State Park. Several populations of this species are also protected on the 5,125-acre Burton Mesa Management Area which was acquired by the State Lands Commission and surrounds the small community of Vandenberg Village. There is currently little information on the status of these populations. Prescribed burning, wildfires, vegetation fuel break construction, invasive species, and recreational activities on protected lands may pose a threat to the rare Burton Mesa chaparral plant community and populations of seaside bird's-beak found there. High fire frequency and out-of-season burning may adversely affect the species. Fires, ground disturbing activities and recreational use contribute to the spread of invasive species like pampas grass, iceplant, and veldt grass, which are capable of overtaking bird's-beak habitat. Additional data on the status of populations and threats is needed to better understand long-term trends and guide management.

The status in 1999 of seaside bird's-beak: *Stable.*

Pennell's bird's-beak
Cordylanthus tenuis ssp. *capillaris*

CA - R (1978)
FED - E (1995)

General habitat: Closed-cone Conifer Forest
Chaparral

Pennell's bird's-beak

Pennell's bird's-beak is a tall annual herb in the figwort family (Scrophulariaceae). It has three-parted, linear-lobed leaves, dark red stems and few-flowered, branched flower stalks of white and maroon-purple flowers. Pennell's bird's-beak is restricted to open sites and clearings in the serpentine chaparral plant community. This bird's-beak is associated with the State-listed rare Baker's manzanita *(Arctostaphylos bakeri).* Both plants are found a few miles southeast of Occidental at Harrison Grade in Sonoma County. There are two occurrences of Pennell's bird's-beak. One is on private land and is being severely impacted by trespassing OHV users, campers, and hikers. A small portion of the other occurrence is on the DFG's Harrison Grade Ecological Reserve, but most of this second population is on adjacent private land.

In 1997, the DFG held two recovery workshops to address Pennell's bird's-beak and 11 other plants known from serpentine habitats in the San Francisco Bay Area. The highest priority recovery action for the plant identified by workshop participants was preserving at least the majority of one of the populations either through acquisition or conservation easement, since the ecological reserve is too small to afford long-term protection for the species as a whole. Management and recovery actions for the species have been addressed in the USFWS's *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

The status in 1999 of Pennell's bird's-beak: *Declining*.

Wiggin's croton
(Croton wigginsii)

CA - R (1982)
FED - None

General Habitat: Desert Dunes
Sonoran Desert Scrub

Wiggin's croton

Wiggin's croton is a silver-haired, much branched, perennial shrub in the spurge family (Euphorbiaceae). Male and female flowers are produced on separate plants. This species occurs on the Algodones Dunes in southeast Imperial County, with additional sites in Baja California Norte and Sonora, Mexico. In California, it grows primarily along the west side of the Algodones Dunes system.

There are just over a dozen occurrences of Wiggin's croton within the Algodones Dunes system. Approximately 75 percent of the dune system remains open to OHVs, which poses a major threat to the species. The remaining portion of the Algodones Dunes is been designated as the North Algodones Dunes Wilderness under the California Desert Protection Act and is closed to OHV activity.

In 1998 and 1999 DFG staff collaborated with the BLM, CNPS, and the USFWS to conduct spring monitoring surveys for Wiggins' croton and four other plant species of concern on the Algodones Dunes in Imperial County. The purpose of the surveys is to establish and monitor transects across the dunes, both within the OHV open areas and the North Algodones Dunes Wilderness, for the presence and size of plant populations in those areas.

The status in 1999 of Wiggin's croton: ***Declining.***

Bristlecone cryptantha
(Cryptantha roosiorum)

CA - R (1982)
FED - None

General Habitat: Subalpine Conifer Forest

Bristlecone cryptantha

Bristlecone cryptantha is a member of the borage family (Boraginaceae) that produces dense cushions of grayish leaves and compact heads of small white flowers. This diminutive perennial plant is commonly found on the gentle slopes or flats of dolomite or limestone formations, in open sunny sites of the bristlecone pine community. It occurs in the Inyo Mountains, Inyo County, where it is known from five occurrences, two of which were discovered in 1998. DFG has no recent information on the original three occurrences of this plant.

The status in 1999 of bristlecone cryptantha: ***Unknown.***

Santa Cruz cypress
(Cupressus abramsiana)

CA - E (1979)
FED - E (1987)

General Habitat: Closed-cone Conifer Forest
Chaparral

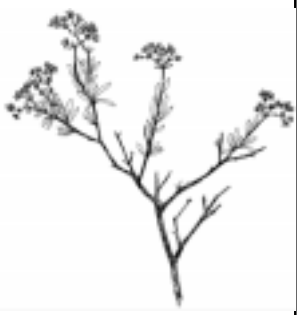
Santa Cruz cypress

Santa Cruz cypress, a member of the cypress family (Cupressaceae), is an erect, densely branched, compact, coniferous tree with slender branchlets and cones containing six to eight seeds per scale. It grows on old marine sandstones or granitic soils in chaparral and closed-cone pine forest communities. This cypress is restricted to a localized area within the Santa Cruz Mountains near Bonny Doon and Eagle Rock in

Santa Cruz County. It also occurs at Butano Ridge in San Mateo County. Its distribution suggests that Santa Cruz cypress is a relict species, representing a type of vegetation widespread during glacial times but now confined to scattered sites.

Logging, agricultural conversion, residential development, and changes in natural fire regime have reduced further Santa Cruz cypress, and it is known from only five populations with a total of approximately 5,100 individuals. Half of the one population is protected by the DFG's Bonny Doon Ecological Reserve, one population is protected within Big Basin Redwoods State Park, and a third is within Pescadero Creek County Park. Threats to the populations include competition with non-native species such as broom and pampas grass and the lack of fires to enable reproduction. USFWS released a recovery plan for Santa Cruz cypress in 1998.

The status in 1999 of Santa Cruz cypress: ***Stable to Declining.***



July gold

July gold
(*Dedeckera eurekensis*)

CA - R (1978)
FED - None

General Habitat: · Mojavean Desert Scrub

July gold, a species first described in 1976, is a low, rounded, densely branched shrub in the buckwheat family (Polygonaceae). Plants are covered with small, olive-green leaves and, when in bloom, masses of tiny golden flowers. It is a shrub of rocky ridges, cliffs, talus slopes, and washes in mixed desert shrub and shadscale scrub plant communities. About 10 small disjunct populations are known, one of which was discovered in 1998. The plants seem to be restricted to dolomite and limestone formations in the Last Chance, White, Inyo, and Panamint mountains of Inyo and Mono counties on federal land managed by USFS, BLM, and the NPS in Death Valley National Park.
Potential threats to July gold's habitat include mining, OHVs, and small hydroelectric projects. The ecological requirements of July gold remain largely unknown. No seedlings have been documented for this species; further study is needed to determine whether this shrub's reproductive capacity is so limited that it may affect the ability of this species to survive into the future.

The Status in 1999 of July gold: ***Stable.***

Baker's larkspur
(Delphinium bakeri)

CA - R (1979)
FED - PE (1997)

General Habitat: Coastal Scrub

Baker's larkspur, a member of the buttercup family (Ranunculaceae), is an erect, leafy-stemmed perennial with showy blue and white flowers. It was once known from several populations in Marin and Sonoma counties, and has become endangered through extensive livestock grazing, roadside maintenance activities, and conversion of its habitat to cultivated farmland. The single remaining occurrence is extremely small and privately owned, and appears to be declining gradually. This species is exceptionally vulnerable to chance catastrophic events. Although Baker's larkspur has always been rare, habitat losses have nearly caused its extinction.

The status in 1999 of Baker's larkspur: ***Stable.***

Cuyamaca larkspur
(Delphinium hesperium ssp. *cuyamacae)*

CA - R (1982)
FED - None
General Habitat: Meadow and Seep

Cuyamaca larkspur is a herbaceous perennial in the buttercup family (Ranunculaceae) with erect leafy stems that produce dense blue-violet blooms. This larkspur usually grows in low, moist areas within the grassy meadows bordering Cuyamaca Lake and nearby areas in eastern San Diego County. Approximately 20 occurrences of Cuyamaca larkspur are known and nearly 70 percent of these are found within the boundaries of Cuyamaca Rancho State Park.

DPR established the Cuyamaca Meadows Natural Preserve within the Park in 1990 to provide additional protection to Cuyamaca larkspur habitat as well as habitats for other listed plant species found in that portion of the State Park. Following two years of extended negotiations, in 1996 the DFG entered into an interagency MOU with USFWS, Helix Water District, Lake Cuyamaca Recreation and Park District, DPR, and USFS to protect Cuyamaca larkspur and two State-listed endangered species. These species, Cuyamaca Lake downingia *(Downingia concolor* var. *brevior)* and Parish's meadowfoam (*Limnanthes gracilis* var. *parishii*), occur in the Cuyamaca Valley and other portions of the Cuyamaca, Laguna and Palomar Mountains in eastern San Diego County. The MOU identifies particular actions to be taken by each of the signatory land managers to preserve and protect the populations of Cuyamaca larkspur on their lands. Grazing by cattle on private ranch lands, highway maintenance activities, and recreational and trail development are threats to Cuyamaca larkspur.

Cuyamaca larkspur

The status in 1999 of Cuyamaca larkspur: *Stable*.

Yellow larkspur
(Delphinium luteum)

CA - R (1979)
FED - PE (1997)

General Habitat: Coastal Scrub

Yellow larkspur is a distinctively yellow flowered, herbaceous perennial in the buttercup family (Ranunculaceae). It grows on steep, rocky outcrops within the coastal sage scrub plant community. The restricted distribution of yellow larkspur is centered near the town of Bodega Bay, Sonoma County, with fewer than a dozen historic occurrences recorded. Rock quarrying activities, overcollecting, residential development, and sheep grazing have reduced the populations such that today there are only two known remaining populations of genetically pure yellow larkspur. Both are on private land; one is completely inaccessible and must be observed with binoculars from the highway. The other population had 130 plants in 1985, 83 in 1997, and between 50 and 100 in 1998. Several additional populations appear to be hybrids with another larkspur species.

Under a research permit, a graduate student in Washington State is investigating the genetic diversity of the wild populations and two cultivated populations of the plant. It is hoped that plants from at least one of the cultivated populations can be introduced back into the wild without genetically contaminating the natural populations. To date, the study has revealed that yellow larkspur is not of hybrid origin.

Yellow larkspur

The status in 1999 of yellow larkspur: *Declining*.

San Clemente Island larkspur

San Clemente Island larkspur
(Delphinium variegatum var. kinkiense)

CA - E (1979)
FED - E (1977)

General Habitat: Valley and Foothill Grassland

San Clemente Island larkspur is a perennial herb in the buttercup family (Ranunculaceae). Plants have divided, basal leaves and elongated stalks of pale violet flowers. This species is known from about 10 sites in grasslands on the eastern slopes of San Clemente Island, Los Angeles County.

All San Clemente Island larkspur populations have been damaged by feral animals. Intense grazing by introduced goats, the accompanying soil loss, and competition from introduced, weedy, annual plants resulted in serious threats to this larkspur and its associated species. The U.S. Navy, which has jurisdiction over the island, has an ongoing program to remove feral goats and pigs in an effort to restore the native vegetation. In the summer of 1989 a new phase of this eradication effort was initiated. Two fenced larkspur populations have grown to several hundred plants each. Over the last few years, the Island's native vegetation has shown a general improvement. There is a lack of recent information, but it may be one of gradual movement toward stability.

The status in 1999 of San Clemente Island larkspur: ***Unknown.***

Geyser's dichanthelium

Geyser's Dichanthelium
(Dichanthelium lanuginosum var. *thermale)*

CA -E (1978)
FED - None

General Habitat: Closed-cone Conifer Forest

Geyser's dichanthelium, a member of the grass family (Poaceae), is a tufted, velvet-haired, perennial grass that is found only in the Big Sulfur Creek drainage of The Geysers area, Sonoma County. It is restricted to the hydrothermally altered soil near surface active geothermal sites and is adapted to the high acidity, high soil moisture, and high soil temperatures at these sites. Extensive development for geothermal power altered the largest occurrence before its entire abundance was known. Currently, Geyser's dichanthelium is known from eight occurrences.

The DFG and the California Energy Commission have been working with private companies to avoid disturbance to the plant within the Little Geysers Natural Area, and the main owner/operator is monitoring the plants yearly under a MOU with the DFG. This monitoring, which has included detailed demographic research, has provided evidence that seedling emergence and mortality are strongly affected by variation in annual rainfall. Monitoring to date has not revealed any long-term trends in the species related to geothermal development.

The status in 1999 of Geyser's dichanthelium: ***Stable.***

Beach spectacle pod

Beach spectacle pod
(Dithyrea maritima)

CA - T (1990)
FED - None

General habitat: Coastal Dunes

Beach spectacle pod is a low growing, whitish-flowered perennial herb in the mustard family (Brassicaceae). It is found in small transverse foredunes within approximately 50-300 meters from the surf. Beach spectacle pod is usually found in areas

of these fragile dunes where the sand is relatively unstable. Although historically ranging as far south as Los Angeles County and possibly Baja California Norte, Mexico, this species currently occurs in the dunes of San Luis Obispo and Santa Barbara counties and on San Nicholas and San Miguel Islands.

The U.S. Navy owns and manages San Nicolas Island, and the Navy's Environmental Division reviews all land use plans and activities that may affect sensitive species. Populations on the island appear to be healthy, and are limited to the sand dune communities on the west and southwest coasts. Expanding northern elephant seal populations are trampling some dune occurrences of this plant on the island. The Navy surveys beach spectacle pod populations regularly, and a study is being conducted to identify factors limiting population growth on the island.

Several populations on Unocal property in the foredunes of the Guadalupe Dunes just north of the Santa Maria River are at risk from long-term soil and water contamination from a diluting substance on Unocal's property. The DFG, the San Luis Obispo County, and other agencies are currently reviewing a proposal by Unocal to clean up their site; remediation of the site may directly impact the populations in the dunes. In 1999, the DFG met with DPR and the Land Conservancy of San Luis Obispo County to outline a program of dunegrass and Veldtgrass removal within the Guadalupe Dunes. It is expected that at least one population of beach spectacle pod will benefit from this program, to be conducted by the Land Conservancy.

The status in 1999 of beach spectacle pod: ***Declining***.

Slender-horned spineflower
(*Dodecahema leptoceras*)

CA- E (1982)
FED- E (1987)

General Habitat: Alluvial Scrub

Slender-horned spineflower

Slender-horned spineflower is a small annual with a rosette of leaves and spreading flowering stems. It produces up to five white flowers with a pink stripe from 12-awned involucres. This member of the buckwheat family (Polygonaceae) is generally restricted to silty, flood-deposited, older alluvial surfaces in Los Angeles, San Bernardino, and Riverside counties. The alluvial fan sage scrub where it typically occurs is an endangered natural community.

Populations occur within eight watersheds: Santa Clara River, Big Tujunga Wash, Lytle Creek, Santa Ana River, San Jacinto River, Bautista Creek, Temescal Canyon, and Vail Lake. Most of these support only a small number of subpopulations. Santa Ana River supports as many as 22 subpopulations, although eight of those have not been seen in recent years. The Vail Lake area may support 28 subpopulations. Protected populations occur on public lands at Santa Ana River, Bautista Creek, and Arroyo Seco Creek in San Bernardino and Riverside counties. Most of the remaining populations on private lands are threatened by proposed development projects, flood control activities, sand and gravel mining, and recreational uses. Seven historically known populations are presumed extirpated.

Several recently completed research projects overseen by the DFG with funding from federal Section 6 grants have increased our understanding of population biology, genetics, soils and habitat characteristics, geomorphic processes, and plant community classification.

Population size and reproduction are highly variable and are influenced by climate patterns. Spineflower exhibits multiple germination events tied to rainfall events, suggesting the presence of a stored soil seed bank. The flowers are probably pollinated by insects, but floral visitation is extremely difficult to observe. A small wasp (*Plenoculus davisii*) carrying pollen has been collected. Spineflower soils typically are about 85 percent silt, with very low nitrogen levels. Populations often occur in shallow depressions. Dispersal to new sites may be aided by overland sheetflow. Sediments supporting spineflower are usually older than 100 years and may even be remnants of late to mid-Holocene deposits (1,000 to 5,000 thousand years old).

Spineflower habitat appears to be most often associated with the most diverse phases of alluvial fan sage scrub. Future studies are planned to examine microtopographic features, soil flora, and factors that may limit seed dispersal. In 1997, a draft recovery plan for slender-horned spineflower was released by USFWS; it is currently being revised.

The status in 1999 of slender-horned spineflower: *Stable to Declining*.

Cuyamaca Lake downingia

Cuyamaca Lake downingia

(Downingia concolor var. *brevior)*

CA - E (1982)
FED - None

General Habitat: Meadow and Seep

Cuyamaca Lake downingia, a member of the bellflower family (Campanulaceae), is a small annual herb that produces blue and white flowers tinged with purple spots. It grows only on the vernally moist soils of Cuyamaca Lake and Cuyamaca Valley in the Cuyamaca Mountains of eastern San Diego County.

The annual distribution of Cuyamaca Lake downingia is dependent upon seasonal rainfall and standing water levels. Plant numbers and their locations within the Cuyamaca Valley may vary widely from year to year, depending upon these conditions. A small portion of the known population is found within Cuyamaca Rancho State Park and on private property at the eastern end of Cuyamaca Lake. The vast majority of the species habitat occurs on land owned by the Helix Water District and managed jointly by the Water District and the Lake Cuyamaca Recreation and Park District.

In 1990, DPR established the Cuyamaca Meadows Natural Preserve within Cuyamaca Rancho State Park to provide additional protection to Cuyamaca Lake downingia habitat as well as habitats for other rare species found in that portion of the State Park.

Following two years of extended negotiations, in 1996 the DFG entered into an interagency MOU with USFWS, Helix Water District, Lake Cuyamaca Recreation and Park District, DPR, and USFS to protect Cuyamaca Lake downingia, State-listed endangered Parish's meadowfoam (*Limnanthes gracilis* var. *parishii*), and State-listed rare Cuyamaca larkspur *(Delphinium hesperium* ssp. *cuyamacae).* The MOU identifies particular actions to be taken by each of the signatory land managers to preserve and protect the populations of Cuyamaca Lake downingia on their lands. Grazing by cattle on private ranch lands remains a threat to Cuyamaca Lake downingia.

The status in 1999 of Cuyamaca Lake downingia: *Stable*.

Short-leaved dudleya

Short-leaved dudleya

(Dudleya blochmaniae ssp. *brevifolia = D. brevifolia)*

CA - E (1982)

General Habitat: Chaparral
Coastal Scrub

Short-leaved dudleya is a small, succulent perennial plant with a rosette of leaves that sprout from a corm. This member of the stonecrop family (Crassulaceae) produces short stalks of white flowers with red or purple markings. Short-leaved dudleya may have never been widespread and it remains restricted to open sites in the chaparral communities of western San Diego County. It occurs on extremely shallow, sandy soils, often at the edges of canyons. Short-leaved dudleya is known from only five extant occurrences in 1997.

In 1997, USFWS withdrew its Proposed Rule to list short-leaved dudleya as

endangered based on the fact that the species will receive protection as a covered species in the MSCP of southern San Diego County. Because in some areas it grows in openings that are favored as overlooks by hikers, trampling by people and dogs is a considerable threat to these occurrences, and more site-specific measures to lessen these impacts are needed. This species is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border. It will likely also be covered in the San Diego Multiple Habitat Conservation Program NCCP to be finalized in the next few years.

The status in 1999 of short-leaved dudleya: *Stable to Declining*.

Santa Monica Mountains dudleya
(Dudleya cymosa ssp. *marcescens)*

CA - R (1978)
FED - T (1997)

General Habitat: Chaparral

Santa Monica Mountains dudleya

Santa Monica Mountains dudleya is a succulent perennial in the stonecrop family (Crassulaceae) with a basal rosette of leaves. Its flowers are bright yellow and often marked with red. This species grows on rocky volcanic cliffs and canyon walls in the Santa Monica Mountains from Hidden Valley to Malibu Creek State Park. From seven occurrences, the total number of known individuals is estimated to be less than 1,000.

Ownership is divided between NPS, DPR, and private individuals. Threats to the species include recreational activities such as rock climbing and bouldering. Alteration of surrounding vegetation and natural fire patterns and illegal collecting for garden or horticultural uses are also potential threats to habitat and population viability. Urban development may threaten privately owned populations.

The status in 1999 of Santa Monica Mountains dudleya: *Stable.*

Santa Cruz Island dudleya
(Dudleya nesiotica)

CA - R (1979)
FED - T (1997)

General Habitat: ·Coastal Bluff Scrub

Santa Cruz Island dudleya

Santa Cruz Island dudleya is a succulent perennial in the stonecrop family (Crassulaceae) with a basal rosette of leaves, and a flower stalk of white flowers with erect petals. It grows on sea bluffs and coastal terraces near Fraser Point on the west end of Santa Cruz Island. It is known from only one extensive population that occupies about 32 acres. The population is estimated to be between 30,000 and 65,000 plants. The majority of Santa Cruz Island is owned and managed by TNC. Santa Cruz Island dudleya is vulnerable to soil loss, herbivory by feral pigs, and disturbance by pig rooting.

In 1997, TNC drafted operating principles and ecological goals for the biological management of Santa Cruz Island. Island managers and resource specialists have recognized that island habitats have been substantially altered by historic activities, including impacts from feral pigs and grazing animals, invasion by non-native plant species, and changes in historic fire regimes. As drafted, the principles and goals recognize that plant and animal species are linked to ecological communities that are strongly influenced by complex ecological processes that have been severely stressed. Managers will adaptively manage the populations, and over time expect to improve the integrity of the island's ecosystems and associated rare species. The USFWS completed a recovery plan for Santa Cruz Island dudleya and twelve other island plants in 1999.

The status in 1999 of Santa Cruz Island dudleya: *Stable to Declining*.

Laguna Beach dudleya

Laguna Beach dudleya
(Dudleya stolonifera)

CA - R (1979); T (1987)
FED - T (1998)

General Habitat: Chaparral
Cismontane Woodland
Coastal Scrub
Valley and Foothill Grassland

Laguna Beach dudleya is a succulent perennial in the stonecrop family (Crassulaceae) with basal leaves and a short flower stalk of yellow-green flowers. The global distribution is restricted to steep, north-facing cliffs in canyons near Laguna Beach, Orange County. It is known from nine occurrences, all but one on privately owned land. DFG has no recent information on the status of this species.
In October 1993, a wildland fire burned habitat of Laguna Beach dudleya. Post-fire hydromulching and seeding were mistakenly undertaken at the DFG's Laguna Laurel Ecological Reserve. Biologists monitored the population in 1994 and 1995 to determine the whether these post-fire rehabilitation treatments inhibited reestablishment of Laguna Beach dudleya in the burned area; no definite conclusions were drawn. The populations appear to have survived the treatments. This species is covered in the Orange County Central-Coastal NCCP.

The status in 1999 of Laguna Beach dudleya: ***Unknown.***

Santa Barbara Island dudleya

Santa Barbara Island dudleya
(Dudleya traskiae)

CA - E (1979)
FED - E (1978)

General Habitat: Coastal Bluff Scrub

Santa Barbara Island dudleya is a small, succulent perennial in the stonecrop family (Crassulaceae). The plants have short stems and basal rosettes of broad, thickened leaves and yellow flowers on short stalks. This dudleya is endemic to Santa Barbara Island, the smallest of California's Channel Islands, and is restricted to steep, rocky slopes and outcrops within canyons. It is found in the coastal bluff scrub plant community and known from four populations.

The status in 1999 of Santa Barbara Island dudleya: ***Stable.***

Santa Ana River woolly-star

Santa Ana River woolly-star
(Eriastrum densifolium ssp. *sanctorum)*

CA - E (1987)
FED - E (1987)

General Habitat: Alluvial Scrub

Santa Ana River woolly-star is a much-branched, erect, bright blue flowered, perennial herb of the phlox family (Polemoniaceae). It occurs in the sandy soils of river flood plains or terraced alluvial deposits in the Santa Ana River drainage. Historically, it was known to extend along 60 river miles in Orange, Riverside and San Bernardino counties, but now plants occupy only about 18 linear miles of river floodplain along the Santa Ana River mainstem, City Creek, and Plunge Creek. Populations exhibiting intermediate characteristics between the subspecies *sanctorum* and a more widespread subspecies occur in the vicinity of Lytle and Cajon washes.

The biggest threat to the continued existence of the Santa Ana River woolly-star

stems from the construction of the Seven Oaks dam, currently in progress, which will substantially reduce historic floodplain areas necessary to support the species. Without habitat-rejuvenating flooding events, open, sandy substrates eventually will close in with vegetation, which is anticipated to make these areas eventually unsuitable for woolly-stars. Intensive management may be needed to artificially simulate flooding events that scour and deposit fresh sands. The species is also directly threatened by sand and gravel mining, which removes large areas of intact habitat, alters river hydrology, fragments remaining populations and generates dust which is believed to reduce pollination activity and speed up the expansion of competing vegetation. Considerable scientific information has been obtained on woolly-star pollinators, which are essential to seed production. An array of pollinators have been identified, including giant flower loving flies, sphinx moths, digger bees, hummingbirds and others.

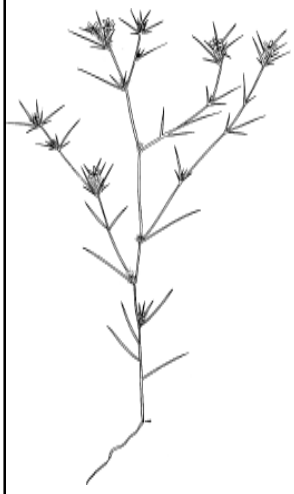
Landowners, land managers, regulatory agencies and interested stakeholders have been meeting over the past two years to develop a consensus-based land use strategy for the Santa Ana River alluvial fan, which supports most of the remaining stands of Santa Ana River woolly-star, slender-horned spineflower (*Dodecahema leptoceras*), and other rare plant and animal species. The aim of this effort is to develop a reserve design that protects the most important habitat areas while consolidating sand and gravel extraction and water spreading activities.

The status in 1999 of Santa Ana River woolly-star: ***Declining.***

Tracy's eriastrum
(*Eriastrum tracyi)*

CA - R (1982)
FED - None

General Habitat: Chaparral
Cismontane Woodland



Tracy's eriastrum

Tracy's eriastrum is a slender, brittle annual in the phlox family (Polemoniaceae). It grows a half foot high and produces light blue to white flowers in the spring. Tracy's eriastrum occurs in open, dry gravelly flats within closed-cone forest, chaparral, and serpentine scrub. Fewer than 20 Tracy's eriastrum occurrences are known. Its range includes Trinity, Tehama, Glenn, Lake, Colusa, and Santa Clara counties.

A taxonomic revision indicates that this species should be included in the species *Eriastrum brandegeae*, an equally rare taxon. Extant occurrences are being degraded by OHV activity, cattle grazing, and recreational use. Up-to-date information is lacking for several occurrences, and field surveys are needed. Site ownership is both private and public (BLM and USFS). There are no active management programs or protection plans for Tracy's eriastrum. More studies are needed to evaluate this species' population trend.

The status in 1999 of Tracy's eriastrum: ***Unknown.***

Indian Knob mountainbalm
(Eriodictyon altissimum)

CA - E (1979)
FED - E (1995)

General Habitat: Chaparral

Indian Knob mountainbalm

Indian Knob mountainbalm, a member of the waterleaf family (Hydrophyllaceae), is a tall, evergreen shrub with dark green, sticky leaves, and clusters of tubular pale lavender flowers. This shrub is restricted to a limited area in the coastal region of San Luis Obispo County. It grows on shallow, sandy soils derived from siliceous sandstone in chamise chaparral, maritime chaparral, and coastal sage scrub. Indian Knob mountainbalm is known from six occurrences, one of which was not seen when it was last searched for in 1985. A conservation easement was acquired and will be

given to the City of San Luis Obispo to conserve Indian Knob, which supports a population of Indian Knob mountainbalm and Pismo clarkia (*Clarkia speciosa* ssp. *immaculata*). The DFG has no other recent observation information for this species. Protection measures for Indian Knob mountainbalm are included in USFWS's *Recovery Plan for Morro Shoulderband Snail and Four Plants form Western San Luis Obispo County, California,* completed in 1998.

The status in 1999 of Indian Knob mountainbalm: *Unknown*.

Lompoc yerba santa

Lompoc yerba santa
(Eriodictyon capitatum)

CA - R (1979)
FED - PE (1998)

General Habitat: Closed-cone Conifer Forest
Central Maritime Chaparral

Lompoc yerba santa is an evergreen shrub with smooth, sticky leaves, and branched inflorescences of tubular, lavender flowers. It is in the waterleaf family (Hydrophyllaceae). This species is found in small populations at about 10 sites in the Santa Ynez Mountains, the Solomon Hills, and on Burton Mesa in Santa Barbara County. Communities in which it occurs are chaparral, coastal sage scrub, and closed-cone Bishop pine forest. At least three sites occur on Vandenberg Air Force Base; the rest are on private lands. None are protected.

Populations on Vandenberg Air Force Base are subjected to an intensive prescribed fire program to reduce fire risks. Reproduction of Lompoc yerba santa from seed following fire events has not been occurring; however some stems resprouted after a recent burn. Prescribed burning outside of the normal fire season may result in higher mortality of plants and seeds.

The status in 1999 of Lompoc yerba santa : *Stable to Declining*.

Trinity buckwheat

Trinity buckwheat
(Eriogonum alpinum)

CA - E (1979)
FED - None

General Habitat: Alpine Rock Fields
Subalpine Conifer Forest

Trinity buckwheat is a short, perennial herb in the buckwheat family (Polygonaceae). The plants are covered with a dense white felt and bear clusters of yellow flowers on short leafless stems. This buckwheat grows on subalpine ridges and slopes in the vicinity of the Scott and Eddy Mountains in Siskiyou and Trinity counties. It is restricted to ultrabasic rocks with serpentinitic talus and scree slopes and very little soil development. The plants prefer talus slopes where the rocks are a few inches in diameter. They are not found on sites composed of either larger (cobbles and boulders) or smaller (gravel or sand) material, or where soils are well developed.

Due to the rocky, alpine habitat of Trinity buckwheat, there are few threats to it. All known occurrences are managed by the Klamath and Shasta-Trinity National Forests and periodically monitored as part of their sensitive plant program. The lack of commercial timber and steep alpine slopes precludes impacts from timber harvesting or grazing activities. Limited threats may occur from mining, although most sites are very difficult to access. The last mining operation in the area was abandoned in 1988, and no future mining activities are currently planned.

The status in 1999 of Trinity buckwheat: *Stable*.

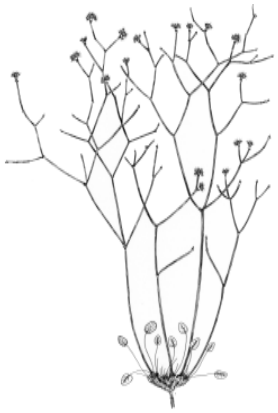
Ione buckwheat
(Eriogonum apricum var. *apricum)*

CA - E (1981)
FED - E (1999)

General Habitat: Chaparral

Ione buckwheat is a compact, erect, herbaceous perennial in the buckwheat family (Polygonaceae) with felt-covered lower leaves on short stems and white flowers with reddish midribs. It is confined to the gravelly kaolinitic clay soils of the Ione formation in the Sierra Nevada foothills of Amador County.

While portions of two populations have been protected on small preserves (less than 100 acres) owned by the State and federal governments, the overall status of the species is unknown due to lack of access to private properties on which the majority of the populations occur. Most of the known populations are within areas on these properties that are being mined for clay and other mineral resources. As far as is known, no systematic approach to reintroduction or avoidance is being conducted at present to mitigate for mining losses. Development of housing and mining continues to result in habitat loss for this species.



Ione buckwheat

The status in 1999 of Ione buckwheat: *Unknown.*

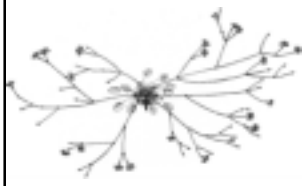
Irish Hill buckwheat
(Eriogonum apricum var. *prostratum)*

CA - R (1981); E (1987)
FED - E (1999)

General Habitat: Chaparral

Irish Hill buckwheat is a prostrate, perennial herb in the buckwheat family (Polygonaceae) with reddish-veined white flowers. This buckwheat grows on the Ione formation in a soil composed of gravelly kaolinitic clay of high acidity and high aluminum content. The two known populations occur in open barren areas within the Ione chaparral plant community on Irish Hill and Carbondale Mesa in Amador County. Both sites are on private property and the development of housing and mining continues to result in habitat loss for this species. OHV activity also impacts the plant.

A portion of one of these populations is within an area that currently is being mined. The occupied habitat is marked on the reclamation plan maps as areas to be avoided, but the mining activity occurs immediately adjacent to the colonies, and there is no fencing or posted signs to ensure that these colonies will not be inadvertently lost due to mining activity. The reclamation plan calls for transplantation to mitigate for the loss of any of this population. The DFG has recently met with the representatives of the mining company and the landowner to start to address how mining can proceed without a net loss in habitat or population size.



Irish Hill buckwheat

The status in 1999 of Irish Hill buckwheat: *Unknown.*

Butterworth's buckwheat
(Eriogonum butterworthianum)

CA - R (1979)
FED - None

General Habitat: Chaparral

Butterworth's buckwheat is a low, spreading, woody perennial herb in the buckwheat family (Polygonaceae) with reddish-brown leaves covered by white felt on both surfaces and small, yellowish flowers with reddish midribs. It resides in dry

Butterworth's buckwheat

sandstone outcrops and crevices within chaparral or mixed evergreen forests in the Santa Lucia Mountains near the headwaters of the Arroyo Seco River in Monterey County. The four known occurrences of this species are on USFS land.

Three occurrences of Butterworth's buckwheat were seen in 1994. Cattle have continued to graze throughout the habitat, without apparent damage to Butterworth's buckwheat populations. Little information is available on the ecology or population biology of this species. Updated surveys and a management plan are needed. There is a lack of information regarding the trend of this species, but the trend may be one of stability due to lack of significant threats.

The status in 1999 of Butterworth's buckwheat: *Unknown*

Conejo buckwheat

Conejo buckwheat
(*Eriogonum crocatum)*

CA - R (1979)
FED - None

General Habitat: Chaparral
Coastal Scrub
Valley and Foothill Grassland

Conejo buckwheat, a member of the buckwheat family (Polygonaceae), is a short, loosely branched, woolly perennial with bright sulfur-yellow flowers. Populations are usually found on dry slopes of volcanic rock within coastal sage scrub and chaparral plant communities. About a dozen occurrences of this species are known; these are restricted to Conejo Grade and Long Grade of the Santa Monica Mountains in Ventura County. Most are very small and on private lands. Threats include residential development in the area, rock quarrying, and trampling by hikers.

The status in 1999 of Conejo buckwheat: *Declining*.

Thorne's buckwheat

Thorne's buckwheat
(Eriogonum ericifolium var. *thornei*)

CA - E (1979)
FED - None

General Habitat: Pinyon and Juniper Woodland

Thorne's buckwheat, a low spreading subshrub in the buckwheat family (Polygonaceae), has leaves which are felty below and soft-shaggy above, and bears white flowers in a compact flower stalk. It is found in the pinyon-juniper woodland community of two canyons in the New York Mountains of the eastern Mojave Desert in San Bernardino County. It grows on sandy loam soil derived from weathered quartz monzonite that is high in copper. The density and diversity of other typical desert plants decrease on this soil type.

Past mining activities have negatively impacted Thorne's buckwheat, and because mining claims exist in the species' habitat, there is potential for renewed mining activity which could threaten this plant. Several grazing allotments exist in the region, but the effects of livestock on this species are likely minimal, since the plants occur on ridges that are difficult to reach. All of the Thorne's buckwheat occurrences are located in BLM's New York Mountains ACEC. Although 19 mining claims made prior to 1985 are still in effect, BLM has withdrawn the area from future mining claims, and BLM also plans to monitor the effects of grazing on the habitat. Monitoring and subsequent protection efforts should help to stabilize this species.

The status in 1999 of Thorne's buckwheat: *Stable*.

Santa Barbara Island buckwheat
(Eriogonum giganteum var. *compactum)*

CA - R (1979)
FED - None

General Habitat: Coastal Bluff Scrub

Santa Barbara Island buckwheat

Santa Barbara Island buckwheat is a rounded, shrubby, white-woolly perennial in the buckwheat family (Polygonaceae) with stout flowering stems and small white flowers in a dense, horizontal flower stalk. It grows on rocky sea bluffs and within the coastal grasslands on Santa Barbara Island and Sutil Island, which are part of Channel Islands National Park. One population is located on Sutil Island and about a dozen are known from Santa Barbara Island.

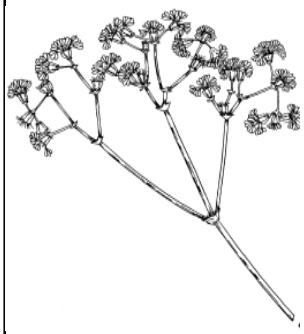
In the past, grazing by goats and rabbits, soil erosion caused by these animals, and plant collecting seriously threatened Santa Barbara Island buckwheat. Shortly after acquiring Santa Barbara Island, NPS eliminated the introduced exotic herbivores and, as a result, the native vegetation is recovering. NPS supported a monitoring program, funded in part by a federal Section 6 Grant from USFWS, that was conducted from 1985 to 1989. During this period, nine of 11 sites were monitored. Numbers of individuals increased at some sites and decreased at others, with the total population at nine sites estimated to be fewer than 4,000 individuals. Current information on these populations is needed.

The status in 1999 of Santa Barbara Island buckwheat: ***Unknown.***

San Nicolas Island buckwheat
(Eriogonum grande var. *timorum)*

CA - E (1979)
FED - None

General Habitat: Coastal Bluff Scrub



San Nicolas Island buckwheat

San Nicolas Island buckwheat is a short, white-woolly perennial from a woody base with wavy or curled leaves and clusters of white flowers. It is in the buckwheat family (Polygonaceae). This subspecies is endemic to the east and southeastern slopes of San Nicolas Island, one of California's Channel Islands. Plants are found in a variety of habitats, including exposed sandstone ridgetops and slopes, coastal flats, and sandy canyon walls and bottoms.

Sheep ranching practices at the turn of the century diminished many native species, including San Nicolas Island buckwheat, and encouraged the spread of invasive nonnative species. The U.S. Navy has owned the island since 1933, and has conducted operations and construction projects that have modified the island's vegetation over the years. Currently, the Navy's Environmental Division reviews all land use plans and activities that may affect sensitive species. Surveys were conducted in 1992 to determine the distribution, habitat preference and population status of this species. Regular removal of introduced species of buckwheat is conducted to prevent potential hybridization with San Nicolas Island buckwheat.

The status in 1999 of San Nicolas Island buckwheat: ***Stable.***

Kellogg's buckwheat
(Eriogonum kelloggii)

CA - E (1982)
FED - None

General Habitat: Lower Montane Conifer Forest

Kellogg's buckwheat, a member of the buckwheat family (Polygonaceae), is a low, spreading, loosely-matted perennial, with short, erect inflorescences bearing white flowers with reddish midribs. This species is known only from the Red Mountain and Little Red Mountain areas of Mendocino County. It occurs on serpentine soil found in open rocky areas within montane coniferous forest. Among its associates is McDonald's rock cress (*Arabis macdonaldiana)*, which is State and federally listed as endangered. Kellogg's buckwheat is known from fewer than 10 occurrences.

Much of Red Mountain is administered by BLM, but because of chromium and nickel deposits, extensive mining claims exist. Although the region has been recognized by BLM as an ACEC, it remains open to mining and the rare plants are unprotected. Further studies are being conducted to determine the location and size of existing Kellogg's buckwheat colonies and their associates on Red Mountain serpentines. Populations of this species occur on private land and on BLM land, and a small area of this species' habitat occurs within the DFG's Little Red Mountain Ecological Reserve.

The status in 1999 of Kellogg's buckwheat: *Stable*.

Twisselmann's buckwheat

Twisselmann's buckwheat
(Eriogonum twisselmannii)

CA - R (1982)
FED - None

General Habitat: Upper Montane Conifer Forest

Twisselmann's buckwheat, a member of the buckwheat family (Polygonaceae), is a loosely-matted, woody perennial with erect flowering stems and clusters of yellow-brown to reddish-brown flowers. It grows on open, granitic outcrops in the red fir forest community of the southern Sierra Nevada. It is endemic to Slate Mountain and the Needles in Sequoia National Forest. There are about 13 occurrences. All Twisselmann's buckwheat populations occur on USFS land.

The status in 1999 of Twisselmann's buckwheat: *Stable*.

Congdon's woolly sunflower

Congdon's woolly sunflower
(Eriophyllum congdonii)

CA - R (1982)
FED - None

General Habitat: Chaparral
Cismontane Woodland
Lower Montane
Conifer Forest

Congdon's woolly sunflower is an erect, freely branched annual with heads of yellow flowers. It is in the sunflower family (Asteraceae) and occurs on dry ridges of metamorphic rock, scree, and talus within chaparral and oak woodlands of the Merced River Canyon in Mariposa County. There are less than thirty occurrences, all within the Sierra or Stanislaus National Forests or near the western boundary of Yosemite National Park. Most of the occurrences on the Sierra NF are in remote areas or in areas managed for dispersed recreation and no timber harvest. Only one occurrence on the Stanislaus NF is in a remote area; the rest are in areas subject to timber harvest or mining. The Yosemite NP populations at Rancheria Flat are subject to potential development and other disturbances.

The status in 1999 of Congdon's woolly sunflower: *Stable*.

San Mateo woolly sunflower
(Eriophyllum latilobum)

CA - E (1992)
FED - E (1995)

General Habitat: Cismontane Woodland

San Mateo woolly sunflower is a late spring-flowering, short-lived herbaceous perennial in the sunflower family (Asteraceae) with golden flowers. It occurs in openings in live oak woodland. San Mateo woolly sunflower is a highly restricted endemic whose distribution is limited to several hundred individuals in less than a dozen scattered subpopulations in the Crystal Springs area of San Mateo County.

The steep slopes on which the plants grow are subject to erosion and soil slippage. One occurrence is immediately above a road, and road maintenance crews periodically reshape the slope. In addition, the lower portion of the slope is mowed periodically to reduce fuel loading. These and other road maintenance activities could inadvertently damage or eliminate San Mateo woolly sunflower plants.

This plant was the subject of a recovery workshop conducted by the DFG in cooperation with USFWS. To protect San Mateo woolly sunflower from extinction, existing populations should be protected, and reintroduction of this species into suitable habitat may be an appropriate recovery strategy. Management and recovery actions for the species have been addressed in the USFWS's *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

The status in 1999 of San Mateo woolly sunflower: ***Declining.***

San Diego button-celery
(Eryngium aristulatum var. *parishii)*

CA - E (1979)
FED - E (1993)

General habitat: Vernal Pools

San Diego button-celery, a member of the carrot family (Apiaceae), is an herbaceous perennial with heads of greenish flowers and spine-tipped bract margins at the base of the flower stalk. This species is restricted in California to vernal pools and vernally moist areas in San Diego and Riverside counties; it is also known from Baja California Norte. Associated State-listed species include San Diego mesa mint *(Pogogyne abramsii)*, California Orcutt grass *(Orcuttia californica),* and Otay mesa mint *(Pogogyne nudiuscula).* Landowners are DOD, San Diego County, the City of San Diego (Chollas Park), CALTRANS, TNC, and other private landowners. Although this species was known from almost 80 occurrences, fewer than half are still in existence. Protection measures for San Diego button-celery are provided in the USFWS's *Recovery Plan for Vernal Pools of Southern California*, released in 1998.

This species is covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border. This species also will likely be covered in the San Diego Multiple Habitat Conservation Program NCCP to be finalized in the next few years.

The status in 1999 of San Diego button-celery: ***Declining.***

San Diego button-celery

Loch Lomond button-celery
(Eryngium constancei)

CA -E (1987)
FED - E (1986)

General Habitat: Vernal Pools

Loch Lomond button-celery

Loch Lomond button-celery is a slender, herbaceous annual in the carrot family (Apiaceae). The plants are covered with fine hairs, and produce open inflorescences of tiny white to light purple flowers. This species grows in the bed of a small vernal lake, surrounded by a ponderosa pine and black oak forest, in the DFG's Loch Lomond Ecological Reserve in Lake County. Another population of Loch Lomond button-celery was discovered in 1996 in two spring-fed, shallow pools in Sonoma County. A berm has been built to prevent runoff into the pools at this location from increased sedimentation due to logging in the area. A third population was discovered in Lake County in 1997. This population was threatened by soil erosion into its pool habitat due to vegetation removal along the edges; it is also risk from planned reservoir construction.

The status in 1999 of Loch Lomond button-celery: ***Stable.***

Delta button-celery

Delta button-celery
(Eryngium racemosum)

CA - E (1981)
FED - None

General Habitat: Riparian Scrub
Subalkaline Swales

Delta button-celery, a member of the carrot family (Apiaceae), is a slender, prostrate herb with greenish, rounded flower heads. It occurs on clay soils on sparsely vegetated margins of seasonally flooded flood plains and swales. Periodic flooding maintains the species' habitat through sustenance of seasonal wetlands and reduction of competition due to scouring. The historical distribution of Delta button-celery includes Calaveras, Merced, Stanislaus, and San Joaquin counties. Currently known populations occur on private land, USFWS National Wildlife Refuges, and the DFG's North Grasslands and Los Baños Wildlife Areas.

About a fourth of the approximately 27 historically known Delta button-celery occurrences have been extirpated by flood control activities and conversion of lowlands to agriculture, including all of the occurrences in San Joaquin County and most in Stanislaus County. Most of this species' remaining occurrences are in Merced County along the historical floodplain of the San Joaquin River. Friant Dam on the San Joaquin River and an extensive levee system have greatly reduced the frequency and intensity of flooding of Delta button-celery's floodplain habitat.

In the early 1990s, the DFG funded studies of Delta button-celery at the North Grasslands Wildlife Area in Merced County. The DFG has continued to survey and monitor populations there. Winter flooding was determined to be critical to the survival of Delta button-celery. During the 1986-94 drought, Delta button-celery populations in the San Joaquin River floodplain were greatly reduced. During the wet years of 1995 to 1997, populations increased in numbers and area occupied, particularly after the major flooding in January of 1997.

Population locations and population characteristics differ in dry and wet years. In dry years, many populations occur only as annual plants. A strong population of plants that were perennial during the drought disappeared during wet years. Successful conservation of the species will require protection and maintenance of habitat with a variety of hydrological regimes. A DFG project to enhance and restore historical wetland habitat at the North Grasslands Wildlife Area may affect Delta button-celery populations there. The DFG is seeking to minimize negative impacts and maximize benefits to Delta button-celery.

The status in 1999 of Delta button-celery: ***Stable to Declining.***

Contra Costa wallflower
(Erysimum capitatum var. *angustatum)*

CA - E (1978)
FED - E (1978)

General Habitat: Island Dunes

Contra Costa wallflower, a member of the mustard family (Brassicaceae), is a coarse-stemmed, erect, herbaceous biennial herb with yellowish-orange flowers. Its distinctive habitat consists of stabilized interior sand dunes that currently are densely covered with herbs, grasses, and shrubs. Only two populations remain, both at the 70-acre Antioch Dunes along the San Joaquin River, near Antioch in Contra Costa County. The area is mainly protected as by USFWS at Antioch Dunes National Wildlife Refuge and by PG&E on its adjoining property.

Sand mining, industrial development, discing for fire control, and OHV activities have left this wallflower on the verge of extinction. The Antioch Dunes Refuge was closed to public use in 1988 to reduce erosion caused by trespass and OHVs. A recovery plan for this species and two other species endemic to the Antioch Dunes, prepared by USFWS, calls for enhancement of existing populations of Contra Costa wallflower and establishment of new populations within its historic range. PG&E designed and paid for enhancement at the Antioch Dunes which was conducted by USFWS.

Research on the Antioch Dunes populations had determined that, although Contra Costa wallflower is capable of producing large amounts of seed, seed production can be substantially reduced by environmental limitations such as low pollination rates and seed predation by insects. This species retains a large seed bank in the soil and shows some ability to grow on the clay substrate that remains in areas where overlying sand has been stripped away. However, an attempt to experimentally establish plants on this clay substrate was unsuccessful. The USFWS is currently preparing a management plan for the Antioch Dunes, with the goal of increasing the viability of Antioch Dunes evening-primrose and Contra Costa wallflower.

The status in 1999 of Contra Costa wallflower: ***Stable to Declining.***

Contra Costa wallflower

Menzies' Wallflower
(Erysimum menziesii)

CA -E (1984)
FED - E (1992)

General Habitat: Coastal Dunes

Menzies' wallflower is a biennial or perennial herb with clusters of bright yellow flowers. This member of the mustard family (Brassicaceae) is found on partially stabilized sand dunes. USFWS recognizes three subspecies of Menzies' wallflower: Menzies *(Erysimum menziesii* ssp. *menziesii)*, Humboldt Bay wallflower *(E. m.* ssp. *eurekense)*, and Yadon's wallflower *(E. m.* ssp. *yadonii)*. The entire distribution is restricted to three coastal dune systems in Humboldt, Mendocino, and Monterey counties. Ownership is divided between BLM, DPR, TNC, City of Eureka, and private parties.

Urbanization and industrialization of California's coast have eliminated many dune communities, and few undisturbed dune regions remain. Most of the remaining populations on the Humboldt County and Mendocino County coastline are threatened by invasive, non-native species such as ice plant and European beach grass.

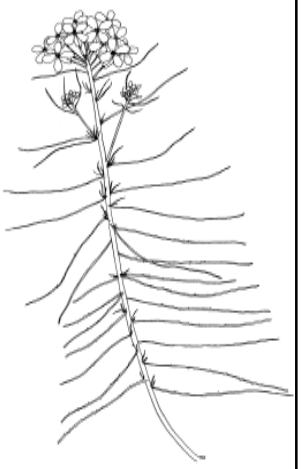
In 1998, USFWS analyzed the results of a survey conducted by TNC in 1997 of the plants (*E. m.* ssp. *eurekense*) on the North Spit of Humboldt Bay. That population had increased 43 percent since 1988. The increase was not uniform, and some populations had declined during the 9-year period. An endemic fungus known as white crucifer rust, which infests Menzies' wallflower around Humboldt Bay, was seen to decrease over the 9-year period. A complete census of the North and South Spits will be conducted again in 2003 or 2004. In 1998, a previously unknown population of approximately 500 plants was found on the Elk River spit in Humboldt County. OHV tracks and invasive species

Menzies' Wallflower

are present on the site. The population does not appear to be infected with white crucifer rust.

DPR is planning a ten-foot wide trail through Menzies' wallflower habitat at Ten Mile Dunes/MacKerricher State Park, although mitigation measures will be required. Menzies' wallflower has been particularly decimated in the Monterey area due to residential development, sand mining, and foot traffic, and most of the six remaining populations there are severely threatened by deer browsing. However, DPR has done an excellent job of restoring populations on state parks in Monterey. At Asilomar State Beach (where it is *E. m.* ssp. *menziesii*), DPR installs cages over 500 plants per year to protect them from grazing. In 1986, there were 200 plants at Asilomar, and in 1998, there were over 8,000 due to habitat restoration and protection activities. Habitat restoration at Marina State Beach (where it is *E. m.* ssp. *yadonii*) has resulted in an increase from less than 100 plants in 1985 to over 7,000 in 1994 (the last year for which numbers are available), and habitat restoration is continuing. However, many plants were lost from private lands north of Marina due to erosion caused by El Niño storms in February and March of 1998. The USFWS completed a recovery plan for Menzies' wallflower and six other coastal plants in 1998.

The status in 1999 of Menzies' wallflower: *Stable to Declining*.



Santa Cruz wallflower

Santa Cruz wallflower
(Erysimum teretifolium)

CA - E (1981)
FED - E (1994)

General Habitat: Lower Montane Conifer Forest

Santa Cruz wallflower, a member of the mustard family (Brassicaceae), is an erect, usually simple-stemmed, herbaceous short-lived perennial, with orangish yellow flowers. Its range is restricted to inland ponderosa pine sandhills near Felton, Ben Lomond, and Bonny Doon in Santa Cruz County. The habitat, which contains a combination of deep, coarse, and poorly developed dry soils in a relatively humid coastal climate, is rare in California.

Distribution of this species is highly correlated with deep sands which are valuable for mining. Only three populations are protected. The first is owned by the DFG at the Bonny Doon Ecological Reserve. The second population is on a parcel owned by the DFG and managed by the County as part of Quail Hollow Ranch County Park. The third population is at Quail Hollow Quarry. In 1998, the DFG and Santa Cruz County closed escrow on the largest block of habitat on the South Ridge at Quail Hollow Quarry; in addition, conservation easements were put over the west and north ridges of the quarry. These three ridges include the entire population of wallflower at the Quarry. These areas are managed under the terms of an HCP which covers Santa Cruz wallflower as well as Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*), Zayante band-winged grasshopper (*Trimerotropis infantilis*) and Mount Hermon June beetle (*Polyphylla barbata*). Research is ongoing to investigate the relationship between the listed species and exotic annual plant species, all of which respond positively to disturbance. In 1998, USFWS released a recovery plan on Santa Cruz wallflower and Scotts Valley spineflower (*C. robusta* var. *hartwegii*), the two previously mentioned insect species, and Scotts Valley polygonum (*Polygonum hickmanii*).

The status in 1999 of Santa Cruz wallflower: *Stable to Declining*.

Pine Hill flannelbush
(Fremontodendron decumbens)

CA - R (1979)
FED - E (1996)

General Habitat: Chaparral
Cismontane Woodland

Pine Hill flannelbush

Pine Hill flannelbush, a member of the cacao family (Sterculiaceae), is a low-growing, many-branched, spreading shrub with bright orange and yellow-orange flowers. It grows on reddish clay soils derived from gabbro. It is found in chaparral and black oak woodland of Pine Hill and on a few Sierra Nevada foothill ridges within one mile of Pine Hill in El Dorado County. Three State and federally listed rare plants grow in the same general areas as this species: El Dorado bedstraw *(Galium californicum* ssp. *sierrae),* Pine Hill ceanothus *(Ceanothus roderickii),* and Layne's butterweed (*Senecio layneae*). Approximately six occurrences of Pine Hill flannelbush are known. The largest is on Pine Hill, with the majority of the plants occurring on private property or on property managed by CDF. Plants on the private properties have recently been lost as a result of construction of homes and access roads and logging activities.

CDF manages its land on Pine Hill primarily as a telecommunications facility. Potential to expand these facilities or inadvertent losses due to maintenance activities threaten the flannelbush on this property. Some of the plants within this occurrence are protected on the DFG's 240-acre Pine Hill Ecological Reserve. There is also a small protected occurrence on land owned by BLM on the ridge to the north of Pine Hill. Four occurrences are on private lands nearby, and it is difficult to assess their status. It appears likely that at least two of these occurrences have been extirpated.

The DFG is working with federal and local agencies and private parties to establish a system of five preserves in the gabbro soil formation in El Dorado County to protect the high concentration of listed plant species that occur in this area. The goal is to protect 3,400 acres, about half of which is existing public lands, including the lands on the Pine Hill Ecological Reserve. The lands that are currently private would be acquired or protected under conservation easements with willing participants.

One population of the flannelbush occurs near Grass Valley in Nevada County on a county dump property. The dump has been closed for several years, although it is still used as a transfer station. As of 1994, the population was fenced and signed. Stebbins' morning glory *(Calystegia stebbinsii),* a State and federally listed endangered species, also occurs in this area.

The USFWS released the *Draft Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills* that addresses recovery needs for Pine Hill flannelbush.

The status in 1999 of Pine Hill flannelbush: *Declining*.

Mexican flannelbush
(Fremontodendron mexicanum)
CA - R (1982)
FED - E (1998)

General Habitat: Closed-cone Conifer Forest
Chaparral

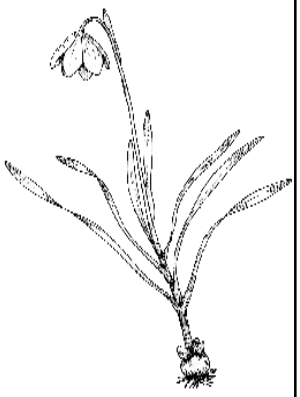
Mexican flannelbush

Mexican flannelbush, a member of the cacao family (Sterculiaceae), is a stiff, robust, tree-like shrub with bright orange flowers. It is currently restricted to the chaparral and cypress woodland plant community in Cedar Canyon on Otay Mesa in San Diego County, where it grows in the canyon bottoms. It once may have extended across the border into northern Baja California Norte, Mexico, but no plants have been seen there for years. This flannelbush is a showy plant that is used as a drought-tolerant ornamental shrub in gardens.

Although no known Mexican flannelbush have burned in decades, the habitat of Mexican flannelbush is subject to human-caused fires which may occur too

frequently to permit regrowth and reproduction of this chaparral species should the areas supporting the plants be burned. The potential for reproduction after fire is also an unknown. Occurrences of Mexican flannelbush are owned by BLM and private landowners. At the present time there are no specific management plans for this species.

The status in 1999 of Mexican flannelbush: *Declining*.



Roderick's fritillary

Roderick's fritillary
(Fritillaria roderickii)

CA - E (1979)
FED - None

General Habitat: Coastal Bluff Scrub
Coastal Prairie

Roderick's fritillary, a member of the lily family (Liliaceae), is a slender perennial that arises from a bulb, with narrow, basal leaves and nodding, greenish-brown to purplish-brown flowers. This showy wildflower is found in heavy clay soils in the oak woodland community near Boonville and in coastal prairies near sea bluffs south of Point Arena, Mendocino County.

Only five native occurrences of Roderick's fritillary have been known, one of which is extirpated. One is in the Boonville Cemetery, with approximately 340 plants at last count reported to the DFG (1992). One, near the coast and privately owned with a portion in a CALTRANS right-of-way, was partially destroyed during work to improve State Highway 1; some plants were transplanted in 1985 during construction. None of those plants survived. CALTRANS now works to avoid impacts to the plants within its right-of-way at this location. Another population, first reported in 1992 from private land and consisting of 1000 plants, had declined sharply by 1998. The DFG's most recent information from the fifth population dates from 1991, when ten plants were observed. There are no management plans for the species.

The status in 1999 of Roderick's fritillary: *Declining*.

Striped adobe lily
(Fritillaria striata)

CA - T (1987)
FED - None

General Habitat: Cismontane Woodland
Valley and Foothill Grassland

Striped adobe lily, a member of the lily family (Liliaceae), is a slender, bulbous perennial with fragrant, white to pink bell-shaped flowers with burgundy stripes. It grows on heavy clay soils in open annual grasslands and blue oak woodlands of the southern Sierra Nevada foothills of eastern Tulare and Kern counties. At least 18 extant populations are known. The known populations are scattered through the species' range. All populations occur on private land.

Conversion of habitat for agricultural uses has eliminated at least four populations of striped adobe lily. Expansion of citrus orchards threatens three populations at lower elevations on the slopes of Lewis Hill near Frazier Valley. Although heavy grazing has negatively impacted some populations, light grazing and avoidance during the flowering period appears to benefit the species. Road maintenance activities and urbanization threaten other populations.

Controversy has developed concerning the status of this species since it was proposed for federal listing as threatened in 1994. Ranchers have questioned whether grazing could be harmful to the species since most remaining populations occur on ranch lands that have been grazed for many decades. Ranchers and landowners

disputed official tabulations of the number and size of populations. A landowner-supported survey yielded: 1) population estimates much in excess of previous estimates, and 2) claims that many additional populations exist. To date, however, documentation of population numbers and new occurrences have not been shared with USFWS or reported to the DFG's Natural Diversity Date Base. Thus, resource agencies have been constrained from making informed decisions about the status of the species. In 1997, USFWS convened a mediated group of landowners, ranchers, and federal, State, and local officials, but so far, the issue has not been resolved.

The status in 1999 of striped adobe lily: ***Unknown.***

Borrego bedstraw
(Galium angustifolium ssp. *borregoense)*

CA - R (1979)
FED - None

General Habitat: Sonoran Desert Scrub

Borrego bedstraw

Borrego bedstraw is a slender, low-growing perennial in the madder family (Rubiaceae) with wiry, square stems that are woody at the base and with a pyramidal cluster of yellowish flowers. It is found primarily on north-facing steep walls and rocky slopes of canyons and on hillsides in Anza-Borrego Desert State Park in eastern San Diego County.

Surveys conducted in the spring of 1998 by the DPR as part of the preparation of a Resource Inventory for Anza-Borrego Desert State Park found Borrego bedstraw at 22 locations, primarily within the Culp Valley - Hellhole Canyon region, the Granite Mountain region, and the Pinyon Mountain area. Additional studies are needed to better understand the ecology and reproductive biology of Borrego bedstraw. Continued monitoring of the known populations would help provide information necessary for the development of a management strategy. Within Anza-Borrego Desert State Park, there are moderate threats to approximately one-third of the known populations from camping, hiking and vehicular activities. Although historical records are lacking, it is probable that this subspecies has always been rare.

The status in 1999 of Borrego bedstraw: Stable.

Box bedstraw
(Galium buxifolium)

CA - R (1979)
FED - E (1997)

General habitat: Coastal Bluff Scrub
Coastal Scrub
Closed-cone Conifer Forest

Box bedstraw

Box bedstraw, a member of the madder family (Rubiaceae), is a stout, leafy, widely branching, shrubby plant with small white flowers. It grows on dry rocky bluffs in coastal sage scrub or closed-cone pine forest plant communities on two of the Channel Islands. Eight populations are known from TNC lands on Santa Cruz Island and two from north facing sea cliffs at San Miguel Island. Most populations consist of very few plants. The species is threatened by soil loss, habitat alteration, and herbivory from feral pig rooting and sheep grazing. TNC has removed sheep from most of Santa Cruz Island and is planning additional efforts to control feral pigs. NPS recently acquired the east end of Santa Cruz Island and is removing sheep. The USFWS completed a recovery plan for box bedstraw and twelve other island plants in 1999.

The status in 1999 of box bedstraw: ***Declining.***

El Dorado bedstraw

El Dorado bedstraw
(Galium californicum ssp. *sierrae)*

CA - R (1979)
FED - E (1996)

General Habitat: Cismontane Forest
Chaparral

El Dorado bedstraw is a low, simple or branched, slender-stemmed, herbaceous perennial with pale yellow flowers at the tips of its stems. It is a member of the madder family (Rubiaceae). Plants are restricted to gabbro-derived soils underlying chaparral and black oak or live oak woodland in western El Dorado County. Four other State and federally listed plants occur on the gabbro soil formation: Stebbins' morning glory *(Calystegia stebbinsii),* Pine Hill ceanothus *(Ceanothus roderickii),* Pine Hill flannelbush *(Fremontodendron decumbens),*and Layne's butterweed *(Senecio layneae).* There are approximately ten known occurrences of El Dorado bedstraw.

The largest population of this species, consisting of thousands of individuals, occurs in colonies in the black oak woodland on Pine Hill where rural development, fire wood harvesting, and large scale clearing of the woodland understory for fuel load management threaten this population. The majority of the second largest population, also in the thousands, was destroyed for a development project in Cameron Park. The project was approved in the late 1980s and was recently built out with no mitigation for impacts to rare plants. A few small colonies, typically 50 to 200 individuals, of the bedstraw have been discovered in the last several years in the community of Shingle Springs. They receive some protection from deed restrictions, but it is unknown whether these restrictions will be sufficient to protect these colonies in the long-term, particularly as they become more isolated as surrounding habitat is developed.

The DFG is working with federal and local agencies and private parties to establish a system of five preserves in the gabbro soil formation that total 3,400 acres to protect the high concentration of State and federally listed plant species that occur in this area. About half of the 3,400 acres is existing public lands, including the lands on Pine Hill. The lands that are currently private would be acquired in fee or protected under conservation easements with willing participants. It is hoped that easements can be obtained to protect: 1) a greater proportion of the bedstraw population on Pine Hill, 2) portions of two populations in the Cameron Park-Shingle Springs area, and 3) a population near the south fork of the American River, but the outcome of these efforts remains to be seen.

The USFWS released the *Draft Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills* that addresses recovery needs for El Dorado bedstraw morning glory.

The status in 1999 of El Dorado bedstraw: *Declining*.

San Clemente Island bedstraw

San Clemente Island bedstraw
(Galium catalinense ssp. *acrispum)*

CA - E (1982)
FED - None

General Habitat: Sea Cliffs
Coastal Bluff Scrub

San Clemente Island bedstraw is a small shrub in the madder family (Rubiaceae) with four small leaves in a whorl and clusters of tiny white or greenish-yellow flowers. It grows on steep, rocky cliffs and slopes overlooking the sea or in adjoining canyons on San Clemente Island, one of California's Channel Islands.

Feral goats and pig populations caused serious degradation of the native vegetation of the island. Steep, rocky slopes offered the only refuge for San Clemente Island bedstraw. Erosion of canyon slopes, caused in part by loss of vegetation, has

eliminated some of the cliff refuges. The U.S. Navy, which has jurisdiction over the island, has removed goats and pigs as part of its Feral Animal Removal Program and noticeable improvements in the condition of the native vegetation have been noted since the completion of the program. Current management may result in a move toward population stability for San Clemente Island bedstraw. DFG has no recent information on the status of this plant.

The status in 1999 of San Clemente Island bedstraw: ***Unknown.***

Sand gilia
(Gilia tenuiflora ssp. *arenaria)*

CA - T (1987)
FED - E (1992)

General habitat: Coastal Dunes
Chaparral (openings)

Sand gilia

Sand gilia is a short, sticky-haired annual herb in the phlox family (Polemoniaceae) with a basal rosette of leaves with decumbent to semidecumbent stems that produces tiny purple flowers. Plants are confined to bare, wind-sheltered areas among the coastal sand dunes adjoining Monterey Bay and in openings in maritime chaparral. This species is typically found in the central dune scrub community from the Sunset Beach south to the Monterey Peninsula. Associated species include State-listed endangered Menzies' wallflower *(Erysimum menziesii* ssp. *menziesii)* and the federally threatened Monterey spineflower *(Chorizanthe pungens* var. *pungens).*

This species is known from approximately 20 populations in the dunes and stabilized inland dunes along Monterey Bay; two of these are large, stable populations, whose numbers fluctuate primarily in response to yearly precipitation. These are located at Fritzche Field on the Fort Ord-Marina boundary and in Sand City. The numbers and locations of the remaining sand gilia populations vary greatly from year to year in response to disturbance as well as precipitation. A substantial number of populations and individuals are found on Fort Ord. As a result of base closure and realignment of this former military training area, they are covered under a Habitat Management Plan approved by USFWS and the DFG. The plan, which will not be fully implemented for several years, allows for specified levels of development as well as set-asides and management of habitat lands of the sand gilia. Until the Implementing Agreement for the plan is finalized, it is unclear whether the Fritzche Field area, one of the two main population bases, will be protected. The USFWS completed a recovery plan for sand gilia and six other coastal plants in 1998.

The status in 1999 of sand gilia: ***Stable to Declining.***

Boggs Lake hedge-hyssop
(*Gratiola heterosepala*)

CA - E (1978)
FED - None

General Habitat: Vernal Pools
Lake Margins

Boggs Lake hedge-hyssop

Boggs Lake hedge-hyssop is a small, semi-aquatic, herbaceous annual in the figwort family (Scrophulariaceae). It has opposite leaves, blunt, unequal sepals, and yellow and white flowers on short stalks. It is found in shallow waters or moist clay soils of vernal pools and lake margins in scattered sites from Modoc County south to Fresno County. One population is known from Lake County, Oregon. South of San Joaquin County, it has not been reported from any valley floor vernal pools, but it does occur in five vernal pools in the Fresno County-Madera County Table Mountain complex near Friant.

When first described in 1954, Boggs Lake hedge-hyssop was known only from Boggs Lake in Lake County, and until the late 1980s, from only a limited number of occurrences in vernal pool habitat in the State. Surveys of vernal pool habitat in recent years have located many additional occurrences of this species. As of 1999, 79 occurrences have been documented within 11 California counties, but it is not known how many of these occurrences remain since many were found during surveys in proposed project areas. Boggs Lake hedge-hyssop occurs in vernal pools on private land and on lands owned and managed by agencies and organizations including the DFG, BLM, DPR, TNC, and USFS. In addition, many of the known sites occur at the edges of reservoirs and stock ponds, which probably should be considered temporary habitat at best.

Although the known number of occurrences of Boggs Lake hedge-hyssop has increased as more surveys have been conducted, its vernal pool habitat has been declining simultaneously. The Boggs Lake population, managed by TNC, has been declining yearly and is now at very low levels. Reasons for the decline are unknown; however negative factors such as drought, habitat invasion by weedy upland species, grazing by deer and horses may have all contributed to the decline. DFG's Dales Lake Ecological Reserve supports a natural population and several transplanted populations in created vernal pools. Several other sites are known to incur varying levels of land disturbance that adversely affect the species, such as discing, grading, and overgrazing. The species tolerates light to moderate levels of grazing, but higher levels appear to be detrimental.

The status in 1999 of Boggs Lake hedge-hyssop: *Unknown.*

Algodones Dunes sunflower

Algodones Dunes sunflower
(Helianthus niveus ssp. *tephrodes)*

CA - E (1979)
FED - None

General habitat: Desert Dunes

Algodones Dunes sunflower is a silvery-white, semi-shrubby perennial in the sunflower family (Asteraceae) with a woody base, large hairy leaves, and reddish-purple centered flowers surrounded with bright yellow rays. It occurs on unstabilized sand dunes in the Algodones Dunes system of Imperial County.

Recreational OHV activity has destroyed a large portion of the vegetation in areas of the Algodones Dunes open to public use. A portion of the Algodones Dunes is designated the North Algodones Dunes Wilderness under the California Desert Protection Act and is closed to OHV activity. Nearly 75 percent of the dune system remains open to OHVs, however, which poses a major threat to the species.

The status in 1999 of Algodones Dunes sunflower: *Declining*.

Red Rock tarplant

Red Rock tarplant
(Hemizonia arida)

CA - R (1982)
FED - None

General Habitat: Mojavean Desert Scrub

Red Rock tarplant, a member of the sunflower family (Asteraceae), is a much-branched, glandular and mildly odorous annual, with deep yellow flowers. It occurs in washes along ephemeral seeps and streams and on adjacent sand flats in moist, gravelly sand. In wetter years, it may appear at the bases and on the lower slopes of ridges and cliffs. There is some evidence that it may prefer soils produced by decomposition of rhyolitic tuffs as well as arkosic sandstones high in iron content. The species is a local endemic to Red Rock Canyon and adjacent south-draining canyons of the Mojave

Desert in Kern County. There are seven occurrences scattered in the canyons around Red Rock Canyon State Park, one of which was discovered in Last Chance Canyon in 1997.

Red Rock tarplant is threatened by disruption of its habitat by OHVs, mineral exploration, and competition from tamarisk, a non-native tree that invades desert wetlands. Red Rock Canyon State Park has established two natural preserves to protect Red Rock tarplant, and rock barriers, signs, and patrols have been established to restrict OHVs from tarplant habitat. Through an MOU, the Park also has management responsibility for adjacent BLM lands, beyond the allowable mining managed by BLM, and tarplant on these lands has received additional protection. Thus, all known populations exist on lands managed by Red Rock Canyon State Park. The Park has initiated a tamarisk eradication program.

The status in 1999 of Red Rock tarplant: ***Stable to increasing.***

Otay tarplant
(Hemizonia conjugens)

CA - E (1979)
FED - T (1998)

General Habitat: Coastal Scrub

Otay tarplant

Otay tarplant is an aromatic, glandular, and much-branched herbaceous annual with mostly solitary, yellow flower heads. This member of the sunflower family (Asteraceae) grows on clay soils in coastal southwestern San Diego County and northwestern Baja California, Mexico. It is found within coastal sage scrub and grassland communities in open, sometimes mildly disturbed areas.

Only a few remaining occurrences of Otay tarplant are known from southwestern San Diego County, in the vicinity of San Miguel Mountain, Telegraph Canyon, and Otay Mesa. Residential and commercial development, as well as highway construction in this region have led to a serious decline of the species. Habitat acquisition and/or protection is urgently needed in order to conserve Otay tarplant. Studies of the ecology and population biology of Otay tarplant are critically needed in order to develop prudent recovery and management strategies for the species. The role of wildfire in the maintenance of habitat for Otay tarplant is a management issue that has been previously identified, but not studied. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

The status in 1999 of Otay tarplant: ***Declining.***

Gaviota tarplant
(Hemizonia increscens ssp. *villosa)*

CA - E (1990)
FED - PE (1998)

General Habitat: Coastal Scrub
Coastal Grassland

Gaviota tarplant

Gaviota tarplant is a summer-flowering, aromatic annual herb in the sunflower family (Asteraceae). Plants are widely branched, with small, gray-green, sticky leaves, and heads of small yellow flowers. This tarplant is largely restricted to one extended population along a two-mile stretch of coastal terrace near Gaviota in Santa Barbara County. Recently, several small populations have been identified up the coast on Hollister Ranch and near Pt. Sal. It grows only on sandy loam soils of the Milpitas-Positas-Concepcion series that have a subsurface clay layer. These areas are dominated by annual grassland containing purple needle grass and scattered shrubs of the coastal

sage scrub community. Ownership includes DPR and private landowners. The DFG owns and manages a 35-acre preserve and mitigation bank for the species which was established in 1995 with the cooperation of Chevron USA and the All American Pipeline Company.

The primary threat to Gaviota tarplant stems from loss of habitat and habitat disturbance associated with oil and gas development. Most of the range of Gaviota tarplant lies within one of two county-designated Consolidated Oil and Gas Development Zones. In 1996, voters approved a county initiative requiring voter approval for any onshore oil facility proposed for locations outside the Consolidated Zone. As a result, the Molino Gas Project, originally planned for outside the range of Gaviota tarplant, was relocated to a parcel that supported the largest remaining intact habitat area for the species. A direct loss of four more acres of tarplant habitat has occurred there, further fragmenting remaining habitat areas. Project mitigation will include participation in the Gaviota Tarplant mitigation bank and dedication of other lands in the area supporting the species.

The status in 1999 of Gaviota tarplant: ***Declining.***

Santa Susana tarplant

Santa Susana tarplant
(Hemizonia minthornii)

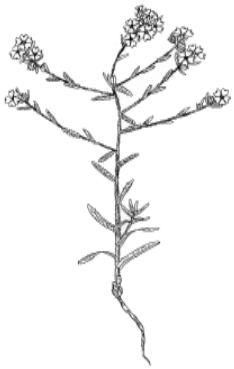
CA - R (1978)
FED -None

General Habitat: Santa Susana Sandstone Outcrops

Santa Susana tarplant is a perennial subshrub with slender ascending stems, sticky leaves, and yellow flower heads. This sunflower relative (Asteraceae) grows in crevices of sandstone bluffs and outcrops in chaparral and coastal sage scrub in the Santa Susana and Santa Monica Mountains of Los Angeles and Ventura counties. There are over 20 recorded occurrences of this tarplant, but one-fourth of these have not been seen in many years and their status is unknown. Land ownership is both private and public (LADWP, Santa Monica Mountains Conservancy, and Rancho Simi Park and Recreation District).

Santa Susana tarplant appears to be locally common within its limited geographic range around Santa Susana Pass. The species' affinity for steep, rocky terrain has afforded some protection for its habitat. Populations in the Santa Monica Mountains are far more localized and isolated.

The status in 1999 of Santa Susana tarplant: ***Stable.***



Mojave tarplant

Mojave tarplant
(Hemizonia mohavensis)

CA - E (1981)
FED - None

General Habitat: Meadow and Seep

Mojave tarplant is a sparsely branched, aromatic, sticky annual herb of the sunflower family (Asteraceae) with yellow flower heads arranged in compact clusters. Despite early floras that described the species as growing to 18 inches in height, it actually can be up to four feet in height in good conditions. This plant was rediscovered in 1994 at several localized sites within the Peninsular Ranges. It had not been seen since 1933 at the type locality on the Mojave River, although the plant had been collected twice at other locations but misidentified as another *Hemizonia* species after that year.

Today Mojave tarplant is known from more than 10 highly localized populations in Riverside and San Diego counties. Eight populations occur on the north slope of the San Jacinto Mountains in Riverside County in grassy swales and seeps along

low gradient stretches of intermittent streams in mountainous terrain. It typically occurs in clay, silty or gravelly seasonally saturated soils. It is also known from two sites in the Cutca Valley east of Eagle Crag Summit in San Diego County in vernally moist grassy areas, where it numbered over 10,000 individuals in 1995. The Riverside County occurrences are on the Morongo Indian Reservation and the San Bernardino National Forest; the San Diego County populations occur within the Cleveland National Forest. Unconfirmed reports indicate the species may also occur in the Cross Mountain area of Kern County and Red Rock State Park.

The status in 1999 of Mojave tarplant: ***Stable.***

Marin western flax
(Hesperolinon congestum)

CA - T (1992)
FED - T (1995)

General Habitat: Serpentine Grassland
Serpentine Chaparral

Marin western flax is a delicate annual plant in the flax family (Linaceae), with congested clusters of small rose to whitish flowers. It is found on serpentine ridges covered with bunchgrass from Marin County to San Mateo County and in a serpentine chaparral association in Marin County. There are now 20 known existing occurrences. Residential development and road and freeway construction have eliminated five of the historically known populations of Marin western flax.

In 1997, the DFG held two recovery workshops to address Marin western flax and 11 other plants known from serpentine habitats in the San Francisco Bay Area. The workshop participants identified invasive species such as broom, pampas grass, and yellow star thistle as threats to the species. The non-native weed goat grass threatens a population on land owned by the Marin Municipal Water District. In San Mateo County, a population is protected within a County Park; another population occurs on San Francisco Water District land. NPS, which manages two occurrences within the Golden Gate National Recreation Area in San Francisco, is restoring one historical site by eradicating eucalyptus and other non-native trees. Research is needed to determine appropriate habitat management practices to conserve Marin western flax. Management and recovery actions for the species have been addressed in the USFWS's *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

The status in 1999 of Marin western flax: ***Stable to Declining.***

Lake County western flax
(*Hesperolinon didymocarpum*)

CA - E (1981)
FED - None

General Habitat: Chaparral
Cismontane Woodland
Valley and Foothill Grassland

Lake County western flax is an erect, narrow-stemmed, annual herb with widely spreading branches and open inflorescences of white to pink flowers. This member of the flax family (Linaceae) is known only from serpentine soils in the Big Canyon drainage north of Middletown, Lake County. The surrounding plant community includes grassland and chaparral. Presently there are six known occurrences of this species on serpentine islands in a six square mile area.

Lake County western flax habitat is entirely privately owned and subject to moderate to heavy cattle grazing that reduces seed production in some populations. Increased grazing or other land use changes could seriously endanger Lake County

western flax populations because of its restricted distribution. DFG has no recent information on the status of this plant.

The status in 1999 of Lake County western flax: *Unknown.*

Santa Cruz tarplant
(Holocarpha macradenia)

CA - E (1979)
FED - FTP (1998)

General Habitat: Coastal Prairie
Valley and Foothill Grassland

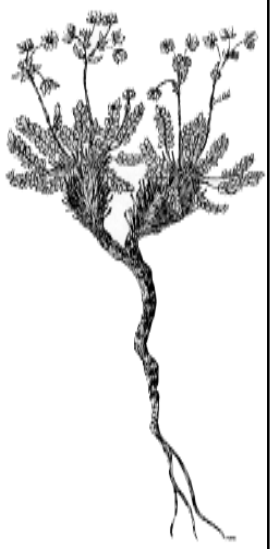
Santa Cruz tarplant is a spreading, aromatic and glandular annual herb in the sunflower family (Asteraceae) with yellow flowers in dense heads. It occurs in clay soils in grasslands and competes poorly with introduced annual grasses. This tarplant was once found in most San Francisco Bay Area counties and south to Monterey County. Development has resulted in the extirpation of all natural populations in the counties surrounding the Bay. The last of these was destroyed in 1993. The species is now limited to 12 natural occurrences in Santa Cruz and Monterey counties.

In 1982, seed salvaged from a development site in Pinole was introduced to 22 sites in Wildcat Canyon Regional Park and onto East Bay Municipal Utilities District (EBMUD) lands. These introduction sites have been monitored fairly regularly for the past 17 years by EBRPD, EBMUD, CNPS volunteers, and DFG staff. In 1999, four of the 22 sites had 74, 59, 2, and 10,000 plants, respectively. Only the last site consistently has over 100 plants, and 13 of the sites have not supported any plants in the past four years. Artichoke thistle, a noxious weed, has been invading several of these sites; EBRPD recently began an artichoke thistle control program.

In 1997, the DFG and the City of Santa Cruz entered into a MOU to continue the City's successful active management of the Arana Gulch population of Santa Cruz tarplant. This population once numbered over 100,000 plants. Cessation of grazing in the 1980s allowed non-native annual grasses to outcompete the tarplant, and by 1994 no tarplants were observed. Although botanists believed that a substantial number of viable seeds were still present in the soil, the seeds would not last indefinitely. In 1996 the DFG and City experimented with mowing, raking, and hoeing techniques to remove the considerable amount of built-up thatch; more than 7,000 plants emerged. In 1997, 1998, and 1999 the City mowed a portion of the plant's habitat in the spring and conducted two fall controlled burns. These management actions resulted in increases in the number of tarplant onsite; however, the El Nino winter of 1998-99 appears to have depressed germination of tarplant, as numbers of tarplant in 1999 were very low. The largest population of Santa Cruz tarplant occurs at the Watsonville Airport, which is attempting to establish new sites and enhance existing sites on the airport as mitigation for expansion activities.

In 1998, Wildlife Conservation Board (WCB) acquired a conservation easement over the one natural population of Santa Cruz tarplant in Monterey County. This site has the advantage of being able to be grazed in an economically viable way, and the long-term prospects for the population are excellent. In 1999, the DFG met with DPR to plan management of the population at the Twin Lakes State Park site in Santa Cruz County.

The status in 1999 of Santa Cruz tarplant: *Declining.*



Tahquitz ivesia

Tahquitz ivesia
(Ivesia callida)

CA - R (1982)
FED - None

General Habitat: Upper Montane Conifer Forest

The Tahquitz ivesia is a spreading dwarf perennial, with glandular, hairy, divided leaves, and small white flowers on a short flowering stalk. This member of the rose family (Rosaceae) is found on steep slopes of decomposing granitic outcrops in the San Jacinto Mountains of Riverside County. Previously presumed extinct, this plant was rediscovered in 1980 at two sites in the San Jacinto Wilderness Area of the San Bernardino National Forest.

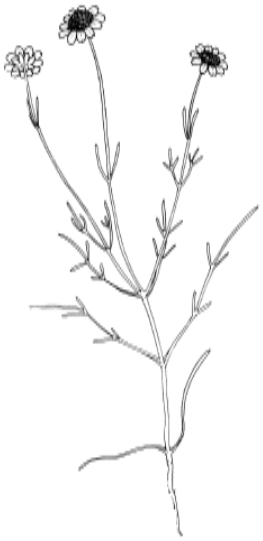
Human disturbances are unlikely due to the relative inaccessibility of Tahquitz ivesia's rocky habitat. Potential threats include disturbance during fire suppression actions, trail building, and rock climbing activities. There are no management or protection plans for this species, although USFS is aware of the populations. In 1988, the DFG monitored both occurrences and found them to be stable; this is the last information the DFG has for the species.

The status in 1999 of Tahquitz ivesia: ***Unknown.***

Burke's goldfields
(*Lasthenia burkei)*

CA - E (1979)
FED - E (1991)

General Habitat: Vernal Pools
Meadows and Seeps



Burke's goldfields

Burke's goldfields is an erect, herbaceous annual, with narrow opposite leaves and small heads of yellow flowers. This sunflower relative (Asteraceae) grows in vernal pools and moist depressions in the vicinity of Santa Rosa in Sonoma County and to a lesser extent at sites in Lake County. It has been known to occur with two other State and federally listed endangered plants: Sebastopol meadowfoam (*Limnanthes vinculans)* and Sonoma sunshine (*Blennosperma bakeri).*

Urbanization, conversion of land to row crops, widening along Highway 101, effluent irrigation, and overgrazing by sheep and cattle have impacted this species in Sonoma County. Less than 30 percent of its historic occurrences remain. The species has been nearly extirpated in the Windsor area, although it had previously been quite extensive there. Gully erosion at Manning Flat in Lake County is destroying the habitat there. In recent years, many development projects have been approved in the Santa Rosa area with significant impacts to Burke's goldfields and other vernal pool species. Approved mitigation focuses on preservation and restoration of existing habitat. Burke's goldfields was known to occur at the DFG's Todd Road Ecological Preserve in Santa Rosa, but has not been seen in several years, possibly due to the cessation of grazing and subsequent invasion by non-native annual grasses.

The DFG has been coordinating with the County and the City, as well as with other agencies, private landowners, and concerned citizens, to protect vernal pools and associated endangered plants in the area since 1989. Protection measures for this species are be included in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

The status in 1999 of Burke's goldfields: ***Declining.***

Beach layia
(Layia carnosa)

CA - E (1990)
FED - E (1992)

General Habitat: Coastal Dunes

Beach layia

Beach layia is a small, succulent annual herb with low spreading branches and heads of small white to pink ray flowers and yellow disk flowers. The leaves and branches have sticky glands that allow sand to adhere to the plant. This sunflower relative (Asteraceae) occurs on semi-stabilized sand in sparse coastal dune scrub

vegetation.

This plant is known to occur on five dune systems along the California coastline: in northern Santa Barbara County, on the Monterey Peninsula, at Point Reyes in Marin County, and in two dune systems in Humboldt County. Beach layia has been extirpated from at least four historic sites, and was assumed extirpated from Santa Barbara County until recent discoveries of two occurrences roughly 300 yards apart on Vandenberg Air Force Base. A new occurrence with 10-15 plants was discovered in 1999 on NPS land in Humboldt County. Beach layia is now known from 20 occurrences, 12 of which are at Point Reyes National Seashore. At various sites the species occurs with other State-listed plants, including Menzies' wallflower *(Erysimum menziesii)* and Tidestrom's lupine *(Lupinus tidestromii)*.

Threats include residential development, trampling, OHVs, and encroachment by non-native plants. Beach layia has shown a steady decrease in numbers since 1989 on the Lanphere-Christensen Dunes in Humboldt County, and habitat for the species is being lost to invasion by ice plant, European beachgrass, and non-native annual grasses. A number of agencies involved in a group called the Dune Forum are cooperating on a study of annual grasses and possible methods for their control. Beach layia is in particular trouble on the Monterey Peninsula, where there were less than 100 plants at last count. The USFWS completed a recovery plan for beach layia and six other coastal plants in 1998.

The status in 1999 of beach layia: ***Declining.***

San Francisco lessingia
(Lessingia germanorum)

CA - E (1990)
FED - E (1997)

General Habitat: Coastal Dunes
Coastal Scrub

San Francisco lessingia, a member of the sunflower family (Asteraceae), is a slender, annual herb with clusters of lemon-yellow flowers. This species occurs in remnant areas of coastal dune scrub habitat on the San Francisco Peninsula. It appears to require open sandy soils that are relatively free of competing plants. San Francisco lessingia probably evolved on semi-active dunes, for it appears to require some degree of sand movement and disturbance. Historic collections of San Francisco lessingia are all from the San Francisco area, including northern San Mateo County. Today, four natural populations and one experimentally introduced population exist within the Presidio of San Francisco, previously under the jurisdiction of the U.S. Army, and now administered by NPS. These populations are within one-half mile of each other on remnant areas of coastal dune scrub habitat. An additional occurrence was discovered in 1989 on San Bruno Mountain in San Mateo County. An HCP is in effect there which protects all endangered species on the mountain from development.

Damage to lessingia habitat has occurred in the past from trampling by hikers, bikers, and joggers. At the Presidio, the NPS has been actively managing habitat for the species, and the populations are increasing in both suitable habitat area and population numbers; in 1998, there were over 300,000 plants. The populations there will be tracked to determine natural fluctuations in population size and the effects of the invasion of native shrubs filling in areas currently open to lessingia colonization. Ice plant is a direct threat to San Francisco lessingia. In addition, pampas grass is encroaching on lessingia habitat on San Bruno Mountain.

The status in 1999 of San Francisco lessingia: ***Stable.***

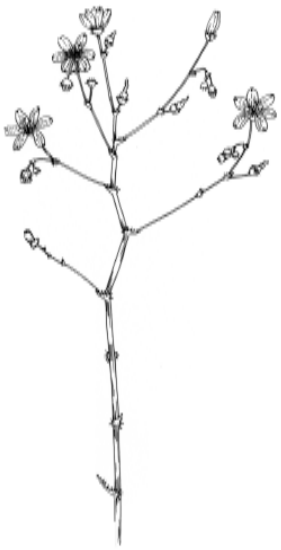
Congdon's lewisia
(Lewisia congdonii)

CA - R (1982)
FED - None

General Habitat: Chaparral
Lower Montane Conifer Forest

Congdon's lewisia, a perennial member of the purslane family (Portulacaceae), has a basal rosette of semi-succulent leaves and produces rose-colored flowers. It grows on dry talus slopes and in rock crevices in the chaparral and oak woodland plant communities of the Merced River Canyon in Mariposa County, and along the Kings River Canyon in Fresno County. Fewer than ten occurrences of Congdon's lewisia are known, and several of these are along roads where herbicide spraying, road improvement and maintenance, and trash dumping are threats. Most of the occurrences are on USFS lands. Additional field surveys may result in the discovery of new populations in suitable habitat between the presently known, scattered occurrences.

In 1994, a multi-agency MOU for the conservation and protection of sensitive species in the Merced River Canyon was signed by the DFG, USFS, BLM, CALTRANS, and PG&E. The MOU specifies guidelines for highway and power line maintenance and repair, notification requirements, species monitoring, and annual reviews. The MOU emphasizes protection measures for State listed endangered Merced clarkia (*Clarkia lingulata*) but also improves protection for Congdon's lewisia and other species.



Congdon's lewisia

The status in 1999 of Congdon's lewisia: ***Stable.***

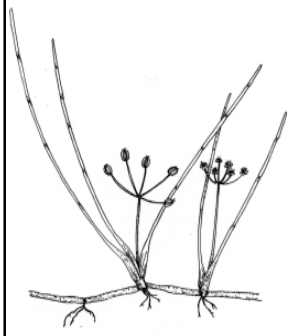
Mason's lilaeopsis
(Lilaeopsis masonii)

CA - R (1979)
FED - None

General Habitat: Marsh and Swamp

Mason's lilaeopsis is a minute, turf-forming, perennial plant in the carrot family (Apiaceae). It spreads by rhizomes and produces narrow, jointed leaves. This species is semi-aquatic and is usually found on saturated clay soils that are regularly inundated by waves and tidal action. Its known distribution extends from the margins of the Napa River in Napa County, east to the channels and sloughs of the Sacramento-San Joaquin Delta in Contra Costa, Solano, Sacramento, Yolo, and San Joaquin counties.

Currently, approximately 130 occurrences of Mason's lilaeopsis are recorded, some as small as one square foot, although DFG does not know how many of these still exist. Continuing threats include levee maintenance and construction, widening of Delta channels for water transport, dredging and dumping of spoils, recreation, erosion and, potentially, changes in water quality in the Delta. Although much of the habitat is privately owned, several State and federal agencies have jurisdiction over the Delta waterways. The DFG owns one site in Solano County.



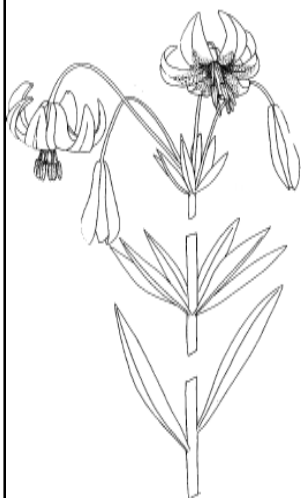
Mason's lilaeopsis

The status in 1999 of Mason's lilaeopsis: ***Stable to Declining.***

Western lily
(Lilium occidentale)

CA - E (1982)
FED - E (1994)

General Habitat: Coastal Scrub
Marsh and Swamp
North Coast Conifer Forest



Western lily

Western lily is a tall, perennial herb that arises from a rhizome. It has a slender stem and long, narrow, whorled leaves. The flowers of this member of the lily family (Liliaceae) are crimson, except at the base of the petals, where they are yellow-orange or green with maroon spots. In California, this showy lily is known from near the southern perimeter of Humboldt Bay, Humboldt County, and from several sites approximately 90 miles to the north in Del Norte County. Approximately 20 small populations occur in Oregon between Brookings and Coos Bay. Overall, about 12 sites are monitored annually by volunteers or DFG.

Habitat loss, bulb collecting, and livestock grazing threaten western lily. Yearly monitoring is needed to assess the rate of advancement by competing vegetation and the need for vegetation control, and the effects of illegal bulb collecting and grazing on all populations. Some measures have already been taken to protect this species. The DFG's Table Bluff Ecological Reserve contains a population that is monitored annually. Where shading spruces were thinned as part of an experimental management program, western lily has increased and successfully flowered. Additionally, seedlings grown from seed from this population have been transplanted back to the Ecological Reserve to attempt to establish four new sites there. The Crescent City Marsh population, a portion of which occurs within the DFG's Crescent City Marsh Wildlife Area, is the largest population known. In 1997, the *Draft Recovery Plan for Western Lily* was developed by USFWS's Oregon State office.

In 1998, using Section 6 funds, work was initiated with California State University, Humboldt to evaluate two vegetation management techniques, controlled late season grazing and manual removal, and to develop strategies for maintaining and expanding suitable habitat for the western lily. Information provided through this work, which will improve habitat management on DFG lands and help achieve recovery goals for the species in both California and Oregon, will be available in June 2000.

In 1999, the DFG initiated a western lily working group to share information and develop recovery goals with the USFWS, the BLM, the Oregon Department of Agriculture, the Oregon DPR, TNC, local counties and cities and other interested parties. The group discussed population trends and threats, reviewed management actions for western lily in California and Oregon, and discussed how to develop a cooperative monitoring plan, share data, fund recovery actions, and continue ongoing communication. The group will meet annually and may form a USFWS recovery team.

The status in 1999 of western lily: ***Declining.***

Pitkin Marsh lily

Pitkin Marsh lily
(*Lilium pardalinum* ssp. *pitkinense)*

CA - E (1978)
FED - E (1997)

General Habitat: Marsh and Swamp

Pitkin Marsh lily is an herbaceous perennial with tall slender stems, narrow whorled leaves, and showy, nodding yellow-orange flowers with deep maroon dots and red tips. This member of the lily family (Liliaceae) arises from a rhizome. There are only three recorded occurrences of Pitkin Marsh lily, only two of which have been seen recently. These privately owned occurrences are confined to a small portion of Sonoma County, near fresh water marshes in the vicinity of Sebastopol and Cunningham.

Land clearing and draining operations, cattle grazing, and horticultural bulb collecting have impacted all Pitkin Marsh lily populations. Introduced blackberry plants also compete with the lily at Pitkin Marsh.

The status in 1999 of Pitkin Marsh lily: ***Declining.***

Baker's meadowfoam
(*Limnanthes bakeri)*

CA - R (1978)
FED - None

General Habitat: Marsh and Swamp
Valley and Foothill Grassland

Baker's meadowfoam is an herbaceous annual in the false mermaid family (Limnanthaceae) with dissected leaves and funnel-shaped flowers of white or cream. The primary habitat for this species is seasonally saturated or inundated clay soil in low swales, roadside ditches, and along margins of marshy areas. Its distribution is restricted to Mendocino County near Laytonville, Ukiah, and Little Lake Valley near Willits. Less than a dozen occurrences are known, and all are found on private lands. An occurrence at Covelo was destroyed by development.

Most of the habitat for Baker's meadowfoam is used for grazing. Some discing has occurred, but meadowfoam populations appear to tolerate light disturbance or grazing. The greatest threats to this plant are the alteration of local drainage patterns and the removal of standing water for agriculture and residential development. Through an MOU between the DFG and CALTRANS, completed in 1997, resulted in the analyses of genetic variation between and within populations and assessed germination, dormancy, population size, and vigor of Baker's meadowfoam populations. Previously unknown populations were discovered as a result of the study. Results are being used to evaluate impacts caused by a realignment of State Highway 101 around the City of Willits in Little Lake Valley, which supports most Baker's meadowfoam populations.

Baker's meadowfoam

The status in 1999 of Baker's meadowfoam: ***Stable to Declining.***

Point Reyes meadowfoam
(Limnanthes douglasii var. *sulphurea)*

CA -E (1982)
FED - None

General Habitat: Marsh and Swamp

Point Reyes meadowfoam, a member of the false mermaid family (Limnanthaceae), is an herbaceous annual with three- to five-lobed leaves and bell-shaped, yellow flowers. There are 13 occurrences of this species known; 12 of these are within the Point Reyes National Seashore in Marin County, and the other is on private property near Pescadero in San Mateo County. This species occurs primarily in vernally moist depressions in open, rolling coastal prairies and meadows. At Point Reyes, it is also found in roadside ditches. Plant numbers fluctuate widely year to year, and so a general trend is difficult to discern.

Point Reyes meadowfoam

The status in 1999 of Point Reyes meadowfoam: ***Stable.***

Butte County meadowfoam
(Limnanthes floccosa ssp. *californica)*

CA - E (1982)
FED - E (1992)

General Habitat: Vernal Pools
Valley and Foothill Grassland

Butte County meadowfoam is a small, white-flowered, annual herb in the false mermaid family (*Limnanthaceae*). The plants are covered with soft hairs and have sparsely distributed leaves divided into five to 11 leaflets. This subspecies is potentially

Butte County meadowfoam

economically valuable because it possesses important traits that breeders are using to develop a commercial substitute for sperm whale oil. Butte County meadowfoam is restricted to vernal swales and the margins of vernal pools. There are approximately 13 occurrences of Butte County Meadowfoam, 11 of which are in the City of Chico's designated sphere of influence. Development is the primary threat to this species.

The City decided not to pursue a multispecies HCP for State and federally listed species and sensitive habitat types within its jurisdiction. This plan would have focused conservation on fewer, larger preserves, including the majority of the meadowfoam populations, rather than the current project by project approach, which has a greater likelihood of resulting in a larger number of small, and potentially unviable, set-aside areas. With the termination of the conservation planning effort, the potential for decline of this species has increased.

The status in 1999 of Butte County meadowfoam: ***Declining.***

Parish's meadowfoam

Parish's meadowfoam
(Limnanthes gracilis var. *parishii)*

CA - E (1979)
FED - None

General Habitat: Meadow and Seep

Parish's meadowfoam is a small, herbaceous annual in the meadowfoam family (Limnanthaceae) with wide-spreading branches, divided leaves, and white bowl-shaped flowers that fade to pink. This species is known from the mountain meadows of northern and eastern San Diego County, as well as the Santa Rosa Plateau region in western Riverside County. It is a plant of moist habitats, often growing in vernal pools, wet meadows, and near springs and seeps.

Today there are fewer than 30 known occurrences of Parish's meadowfoam, mostly centered around the wet meadow habitats of the Cuyamaca Valley and Laguna Mountains in eastern San Diego County. Populations are also known from the Cleveland National Forest on Palomar Mountain in northern San Diego County and the Santa Rosa Plateau Preserve in Riverside County. A significant amount of habitat for Parish's meadowfoam was probably lost in Cuyamaca Valley in the 1880s with the construction of Cuyamaca Dam and the permanent inundation of Cuyamaca Lake over a portion of what previously had been a vernal lake.

DPR established the Cuyamaca Meadows Natural Preserve within Cuyamaca Rancho State Park in 1990 to provide additional protection to Parish's meadowfoam habitat as well as habitats for other rare species found in that portion of the State Park. In 1996, following two years of extended negotiations, the DFG entered into an interagency MOU together with USFWS, Helix Water District, Lake Cuyamaca Recreation and Park District, DPR and USFS to protect Parish's meadowfoam, State-listed endangered Cuyamaca Lake downingia (*Downingia concolor* var. brevior), and State-listed rare Cuyamaca larkspur *(Delphinium hesperium* ssp. *cuyamacae).* The MOU identifies particular actions to be taken by each of the signatory land managers to preserve and protect the populations of Parish's meadowfoam on their lands. Grazing, highway maintenance activities, and recreational and trail development are threats to Parish's meadowfoam.

The status in 1999 of Parish's meadowfoam: ***Stable to Declining.***

Sebastopol meadowfoam

Sebastopol meadowfoam
(Limnanthes vinculans)

CA - E (1979)
FED - E (1991)

General Habitat: Meadow and Seep
Vernal Pools

Sebastopol meadowfoam is an annual herb with divided leaves and bowl-shaped white flowers. This member of the false mermaid family (Limnanthaceae) grows in seasonally wet meadows, pastures, and vernal pools primarily in the drainage of the Laguna de Santa Rosa in Sonoma County. Most occurrences are on private land within five miles of the City of Santa Rosa. Sebastopol meadowfoam often occurs with two other State and federally listed endangered plants: Burke's goldfields (*Lasthenia burkei)* and Sonoma sunshine (*Blennosperma bakeri).*

Residential and commercial development, as well as indirect effects of urban growth, such as alteration of local and regional drainage patterns and effluent irrigation, also threaten this species. Heavy grazing and OHV recreation adversely affect populations as well. Populations occur on privately owned lands as well as lands owned by CALTRANS, the U.S. Army, and the City of Santa Rosa. The DFG protects populations at its Laguna de Santa Rosa Ecological Reserve and one of its nearby extensions. In recent years, many development projects with significant impacts to vernal pool species have been approved in the Santa Rosa area. Approved mitigation focuses on preservation and restoration of existing habitat. Some recent acquisitions and approved preservation banks protect Sebastopol meadowfoam, although the remaining populations continue to be significantly threatened by urban development and agriculture.

The DFG has been coordinating with the County and the City, as well as with other agencies, private landowners, and concerned citizens, to protect vernal pools and associated endangered plants in the area since 1989. Protection measures for this species are expected to be included in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

The status in 1999 of Sebastopol meadowfoam: ***Declining.***

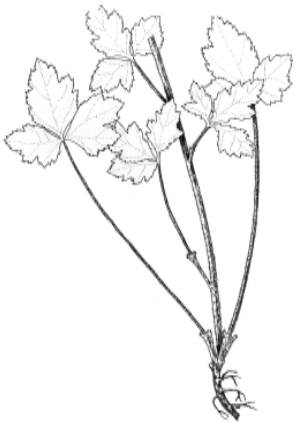
San Clemente Island woodland star
(Lithophragma maximum)

CA - E (1982)
FED - E (1997)

General Habitat: Coastal Bluff Scrub
Coastal Scrub

San Clemente Island woodland star is a perennial herb in the saxifrage family (*Saxifragaceae*). It has three-parted leaves, stout stems, and white to pinkish flowers. This species is extremely rare and at one time was thought to be extinct. Today, about 200 plants are thought to remain in the wild, in moister habitats primarily on north-facing slopes in nearly inaccessible canyons on the east side of San Clemente Island.

Much of this species' essential habitat has been damaged by feral goats, feral pigs, former ranching activities, and military operations. The U.S. Navy, which has jurisdiction over the Island, removed goats and pigs as part of its Feral Animal Removal Program and the condition of the native vegetation improved. A propagation program may be needed to achieve recovery for this species.



San Clemente Island woodland star

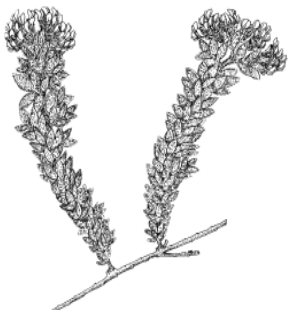
The status in 1999 of San Clemente Island woodland star: ***Unknown.***

San Clemente Island bird's-foot trefoil
(Lotus argophyllus var. *adsurgens)*

CA - (1979)
FED - None

General habitat: Coastal Scrub

San Clemente Island bird's-foot trefoil is an erect, shrubby perennial with crowded silvery leaves, short fruits, and small yellow-orange flowers. It is a member of the pea family (Fabaceae). This species inhabits only a few sites on the southern tip of



San Clemente Island bird's-foot trefoil

San Clemente Island. Each site has fewer than 50 individuals. This plant grows on marine terraces in the cholla phase of maritime desert scrub vegetation.

Ranching operations on the island resulted in overgrazing and elimination of much of the native vegetation before the distribution of several rare plants were determined. The U.S. Navy, which has jurisdiction over San Clemente Island, uses it as a bombing and gunnery range, but military operations have only occasionally directly affected this plant. The Navy has removed goats and pigs as part of its Feral Animal Removal Program, and the condition of the native vegetation has improved since the completion of the program.

The status in 1999 of San Clemente Island bird's-foot trefoil: *Unknown.*

Santa Cruz Island bird's-foot trefoil

Santa Cruz Island bird's-foot trefoil
(Lotus argophyllus var. *niveus)*

CA - E (1981)
FED - None

General Habitat: Chaparral
Coastal Scrub

Santa Cruz Island bird's-foot trefoil is a low, much-branched perennial covered with silvery silky hairs. The plants have divided leaves and produce yellow and brown or purple flowers. It is a member of the pea family (Fabaceae). This subspecies is found only on Santa Cruz Island, the largest of the Channel Islands. It grows on rocky slopes, stony flood plains, and dry canyon streambeds in coastal sage or chaparral plant communities.

Long-term grazing by sheep and cattle degraded much of the native vegetation on Santa Cruz Island, and weedy exotic plants became established. TNC now owns and manages most of the island and has eliminated all of the sheep. As a result, Santa Cruz Island bird's-foot trefoil populations have recovered, especially on high ground within floodplain areas. DFG has no recent information on the status of this plant.

The status in 1999 of Santa Cruz Island bird's-foot trefoil: *Unknown.*

San Clemente Island lotus

San Clemente Island lotus
(Lotus dendroideus var. *traskiae)*

CA - E (1982)
FED - E (1977)

General Habitat: Coastal Scrub
Valley and Foothill Grassland

San Clemente Island lotus is a subshrub with erect, glabrous branches, leaflets usually in threes, and yellow or red-tinged flowers. This member of the pea family (Fabaceae) grows on open, grassy north-facing slopes at canyon mouths and on hillsides at several sites on San Clemente Island. The extent of its historic distribution is unknown. Currently, there are about 30 existing sites.

San Clemente Island is under the jurisdiction of the U.S. Navy, which has completed a Feral Animal Control Program to remove the pigs and goats that destroyed much of the island's native vegetation. Many populations have increased slightly in size since the removal of some feral animals.

The status in 1999 of San Clemente Island lotus: *Stable to Increasing*.

Mariposa lupine
(*Lupinus citrinus* var. *deflexus*)

CA - T (1990)
FED - None

General Habitat: Chaparral
Cismontane Woodland

Mariposa lupine, a member of the pea family (Fabaceae), is an annual plant with long spikes of white or pinkish flowers. This species occurs in foothill woodlands on decomposed granite domes on the western slope of the Sierra Nevada in southwestern Mariposa County, south of the town of Mariposa.

Although historical records are lacking, it is likely that this species was always rare. All six known occurrences of Mariposa lupine occur on private land; the total area covered by this species is less than 125 acres. Urban expansion into this foothill area poses a serious threat to Mariposa lupine.

Mariposa lupine

The status in 1999 of Mariposa lupine: *Unknown.*

Milo Baker's lupine
(*Lupinus milo-bakeri)*

CA - R (1978); T (1987)
FED - None

General Habitat: Cismontane Woodland

Milo Baker's lupine, a member of the pea family (Fabaceae), is a tall, herbaceous annual with pale blue to yellow flowers and silky leaves. It occurs in the wet roadside ditches and streams of Round Valley near the town of Covelo in Mendocino County, and in the Bear Valley region of Colusa County. Approximately a dozen known occurrences of this species are known; most are in Mendocino County. Four occurrences in Mendocino County populations have been extirpated.

Milo Baker's lupine occurs on private land and on highway rights-of-way. Up-to-date information is needed on the status of this plant.

Milo Baker's lupine

The status in 1999 of Milo Baker's lupine: *Unknown.*

Nipomo Mesa lupine
(Lupinus nipomensis)

CA - E (1987)
FED - PE (1998)

General Habitat: Coastal Dunes

Nipomo Mesa lupine is a low-growing, blue-flowered, annual herb in the pea family (Fabaceae). It is restricted to dry sandy flats of stabilized coastal dunes that lie west of Nipomo Mesa in San Luis Obispo County. Five populations are known. At least three historically known populations have been extirpated, including the type-locality.

OHV activity and coastal development threaten the existing populations of Nipomo Mesa lupine. Expansion of introduced weedy plants, such as veldt grass and ice plant within the backdune scrub community, also threatens this species. All but one existing occurrence are on private land and remain unprotected. One occurrence is known from a CALTRANS right of way. In 1999, the DFG met with DPR and the Land Conservancy of San Luis Obispo County to outline a program of dunegrass and Veldtgrass removal on private land within the Guadalupe Dunes. It is expected that at least one population of Nipomo Mesa lupine will benefit from this program, to be conducted by the Land Conservancy.

Nipomo Mesa lupine

The status in 1999 of Nipomo Mesa lupine: *Declining*.

Father Crowley's lupine

Father Crowley's lupine
(Lupinus padre-crowleyi)

CA - R (1981)
FED - None

General Habitat: Great Basin Scrub
Riparian Scrub
Upper Montane Conifer Forest

Father Crowley's lupine is a bushy perennial herb in the pea family (Fabaceae) that is covered with gray, spreading hairs. It has creamy white flowers, and its leaves are divided into seven to eight leaflets. It occurs in the understory of red fir forest and on sagebrush flats on the eastern slope of the Sierra Nevada in Inyo County. There are four reported populations consisting of about 10 subpopulations. Local subpopulations are generally comprised of scattered individuals on steep avalanche chutes, in sunny sites in drainages, and in valley bottoms. All known sites are within Inyo National Forest.

In 1998, the Inyo National Forest collected seed from a population of Father Crowley's lupine for propagation and outplanting in the area of a former airstrip which is being restored. DFG has no recent information on the status of this species as a whole.

The status in 1999 of Father Crowley's lupine: *Unknown*.

Tidestrom's lupine

Tidestrom's lupine
(Lupinus tidestromii var. *tidestromii)*

CA - E (1987)
FED - E (1992)

General Habitat: Coastal Dunes

Tidestrom's lupine is a low, creeping perennial with whorls of light blue to lavender flowers, black-spotted pods, and bright yellow roots. It occurs on partially stabilized coastal dunes of the Monterey Peninsula in Monterey County, at Point Reyes National Seashore and near Dillon Beach in Marin County, and at the Sonoma Coast State Beach in Sonoma County. This member of the pea family (Fabaceae) is sometimes associated with two other State-listed endangered plants: Menzies' wallflower *(Erysimum menziesii* ssp. *menziesii)* and beach layia *(Layia carnosa).* There are 15 extant, natural occurrences of the species, one introduced occurrence, and two extirpated, historical occurrences of Tidestrom's lupine.

In November of 1996, the DFG held a recovery workshop for seven coastal plants, including Tidestrom's lupine. At the workshop, participants discussed current threats, including residential development, trampling, and OHVs. In addition to these threats, non-native species such as ice plant threaten Tidestrom's lupine at all occurrences. NPS is beginning a dune restoration program at Point Reyes National Seashore, which will benefit the seven Tidestrom's lupine occurrences there. While the species' status on Point Reyes is unknown, the species overall is declining. The USFWS completed a recovery plan for Tidestrom's lupine and six other coastal plants in 1998.

The status in 1999 of Tidestrom's lupine: *Declining*.

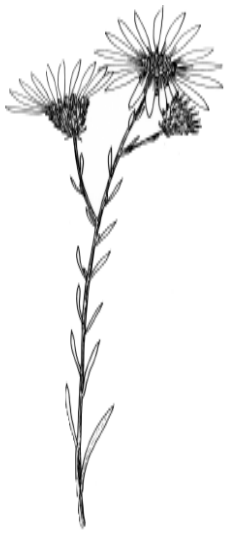
Laguna Mountains aster
(Machaeranthera asteroides var. *lagunensis)*

CA - R (1979)
FED - None

General Habitat: Lower Montane Conifer Forest

Laguna Mountains aster is an herbaceous perennial in the sunflower family (Asteraceae). It has stout, branching stems covered with fine, gray hairs, and large lavender flowers. This species is found in a localized area of the southern Laguna Mountains in San Diego County growing on dry, sandy loam soils, often in disturbed sites of oak-pine woodland plant community.

The several known California occurrences of Laguna Mountains aster are found on Cleveland National Forest and private lands. USFS has developed a management strategy to reduce or eliminate threats to these populations. Threats include heavy grazing, which prevents seed set, recreational activities, and roadside maintenance. Fencing to exclude cattle, and light soil disturbance to stimulate colonization by seedlings, have been suggested as management measures for this species.



Laguna Mountains aster

The status in 1999 of Laguna Mountains aster: ***Unknown.***

Truckee barberry
(Mahonia (=Berberis) sonnei)

CA - E (1979)
FED - E (1979)

General Habitat: Riparian Forest

Truckee barberry is an upright, evergreen shrub in the barberry family (Berberidaceae) with divided spiny leaves, small clusters of yellow flowers, and blue-black berries. Only one natural occurrence of Truckee barberry exists. It occurs on alluvial granitic soils along the upper banks of the Truckee River in the town of Truckee, Nevada County. The only other occurrence of this species is a population that was experimentally introduced in 1988 to a site about five miles northeast of Truckee.

Recent taxonomic treatments have merged the Truckee barberry with a common variety, *Berberis aquifolium* var. *repens.* The DFG plans to work with FGC to remove Truckee barberry from the State's list of endangered species, and so has not changed the name of the genus to *Berberis* in the Fish and Game Code, as it has done for other valid barberry species.

Truckee barberry

The 1999 Status of Truckee barberry: ***Not applicable (not a valid taxon).***

San Clemente Island bush mallow
(Malacothamnus clementinus)

CA - E (1982)
FED - E (1977)

General Habitat: Valley and Foothill Grassland

San Clemente Island bush mallow is a rounded, evergreen shrub with numerous ascending branches, large leaves that are lobed and hairy, and inflorescences of crowded, pink flowers. This member of the mallow family (Malvaceae) is found on sedimentary rock walls and ridges of San Clemente Island, Los Angeles County. The U.S. Navy manages San Clemente Island.

Feral goats and pig populations caused serious degradation of the native vegetation of the island. The surviving populations of San Clemente Island bush mallow

San Clemente Island bush mallow

are restricted to cliffs and steep slopes that isolated them from feral goat and pig browsing. Goats were removed during the Navy's eradication program, and vegetation has recovered. San Clemente Island is used for military activities. Bush mallow habitat in one canyon is in an area used as a bombing impact zone, resulting in increased erosion and potentially posing a direct threat to the plants. USFWS has prepared a recovery plan that makes management recommendations for all the federally listed plant species on the island. The total population of San Clemente Island bush mallow is so small that it remains critically endangered.

The status in 1999 of San Clemente Island bush mallow:*Stable.*

Santa Cruz Island bush mallow

Santa Cruz Island bush mallow
(Malacothamnus fasciculatus var. *nesioticus)*

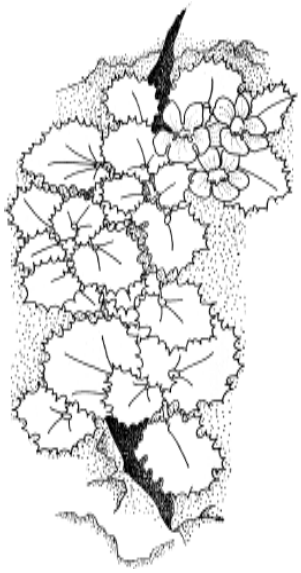
CA - E (1979)
FED - FE (1997)

General habitat: Coastal Sage Scrub

Santa Cruz Island bush mallow is a tall evergreen shrub with slender, wand-like branches covered with woolly hairs, large, lobed leaves, and open inflorescences of pinkish flowers. It is a member of the mallow family (Malvaceae). This plant is known from two occurrences on Santa Cruz Island. It grows on a dry, south-facing canyon slope on the west end of Santa Cruz Island in coastal sage scrub vegetation; the more recently discovered population occurs further east in the island's Central Valley.

Recent genetic studies confirm that Santa Cruz Island bush mallow is a distinct variety. Genetic analyses of the Central Valley population indicate that although there are 19 individual shrubs, these shrubs consist of only three genotypes or three clones. The western population consists of about 50 individuals representing 10 clones. Soil loss, habitat alteration, and feral pig rooting threaten both populations. The USFWS completed a recovery plan for Santa Cruz Island bush mallow and twelve other island plants in 1999.

The status in 1999 of the Santa Cruz Island bush mallow: *Declining.*



Rock lady

Rock lady
(Maurandya (=Holmgrenanthe) petrophila)

CA - R (1982)
FED - None

General Habitat: Mojavean Desert Scrub

Rock lady is a soft-hairy, herbaceous perennial in the figwort family (Scrophulariaceae). It has short, hanging stems from a woody base, rounded, bristly leaves, and creamy yellow flowers. Rock lady is found in the transition zone of the mixed desert scrub and creosote bush scrub plant communities of one or more canyons in the Grapevine Mountains in Inyo County. It grows as scattered individuals in limestone rock crevices of steep canyon walls. The habitat is owned by NPS and is located in Death Valley National Park.

This beautiful and extremely rare plant has been recently confirmed at three sites in Titus Canyon. Only 26 individuals were documented in 1998. Habitat that appears suitable for this species exists in unsearched canyons nearby, and the plant has been reported from Fall Canyon, immediately north of Titus Canyon. Little is known of the ecology or population biology of rock lady. Before a management plan can be developed, a full status survey and identification of any potential threats is needed. No threats to this plant are currently known.

The status in 1999 of rock lady: *Stable.*

Willowy monardella
(Monardella linoides ssp. *viminea)*

CA - E (1979)
FED - E (1998)

General Habitat: Riparian Scrub

Willowy monardella, a member of the mint family (Lamiaceae), is a perennial with erect stems from a woody base, silvery minute hairs, narrow leaves, and tiny rose-lavender flowers in dense heads. It grows on secondary alluvial benches in cobbly, vernal washes. In California, it is restricted to San Diego County, mostly north of San Diego, just south and west of Poway. This subspecies also occurs in Baja California, although its status there is unknown. Most occurrences are on DOD and private lands, with a few on City and County of San Diego property.

Because of its location, willowy monardella is vulnerable to urbanization and highway construction. Habitat that has not been directly lost to development is seriously threatened by increased flows from upstream development, increased moisture in stream from upstream urban landscaping, and invasion by exotic species. About half of the approximately two dozen known occurrences of willowy monardella in California have been extirpated. Early attempts to translocate this plant as part of mitigation for highway construction have all failed. Two occurrences were lost in spring 1999 due to erosion, and one of the remaining occurrences is slated for destruction in 1999/2000. Seeds will be collected from this occurrence to attempt to establish the plant elsewhere. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

Willowy monardella

The status in 1999 of willowy monardella: *Declining*

Few-flowered navarretia
(Navarretia leucocephala ssp. pauciflora)

CA - T (1990)
FED - E (1997)

General Habitat: Vernal Pools

Few-flowered navarretia is a small, annual herb in the phlox family (Polemoniaceae). This plant grows unbranched or with a few short, spreading branches. The tiny white or pale blue flowers occur in clusters. Few-flowered navarretia occurs in drying vernal pools on volcanic substrate in the north coast ranges of Lake and Napa counties, where it is known from six sites. One is on the DFG's Loch Lomond Ecological Reserve, where the plants appear to be the result of hybridization with many-flowered navarretia *(Navarretia leucocephala* ssp. *plieantha).* All other sites for few-flowered navarretia are on private land, and several are threatened with habitat loss and degradation.

The status in 1999 of few-flowered navarretia: *Declining*.

Many-flowered navarretia
(Navarretia leucocephala ssp. plieantha)

CA - E (1979)
FED - E (1997)

General Habitat: Vernal Pools

Many-flowered navarretia is a prostrate, mat-forming, spiny annual herb with widely spaced, narrow leaves and heads of small, pale blue flowers. This member of the

phlox family (Polemoniaceae) is known from moist habitats in volcanic ash vernal pool systems in Lake and Sonoma counties. Historically, about eight sites for many-flowered navarretia were known. Two of these have been extirpated. One occurrence is protected at the DFG's Loch Lomond Ecological Reserve in Lake County. TNC and DFG own another Lake County occurrence, at Boggs Lake. In 1997, surveys revealed a large population of many-flowered navarretia, perhaps because it was a good rainfall year. The remaining four occurrences are on private land and have not been observed in several years. The status of these four occurrences is unknown.

The status in 1999 of many-flowered navarretia: *Unknown*.

Twisselmann's nemacladus

Twisselmann's nemacladus
(Nemacladus twisselmannii)

CA - R (1982)
FED - None

General habitat: Upper Montane Conifer Forest

Twisselmann's nemacladus is an inch-high, gray, hairy annual herb with basal leaves in rosettes, and small, short stemmed, white flowers. This member of the bellflower family (Campanulaceae) grows in small colonies on loose gravels and granitic soils amid sparse Jeffrey pine forests at the rim of the Kern Plateau in Kern and Tulare counties. Both known occurrences are small in size (a few hundred plants at last count) and are on Sequoia National Forest lands. DFG has no recent information on the status of this plant.

The status in 1999 of Twisselmann's nemacladus: *Unknown*.

Colusa grass

Colusa grass
(Neostapfia colusana)
CA - E (1979)
FED - T (1997)

General habitat: Vernal Pools

Colusa grass is a coarse, pale green, sticky and aromatic annual member of the grass family (Poaceae) with several stems of loosely folded, clasping leaves, and thick, cylindrical terminal spikes of flowers. This grass occurs only on the muds of large or deep vernal pools in Merced, Stanislaus, Solano, and Yolo counties. Colusa grass has been extirpated at its type-locality in Colusa County. Associated species in some locations include State and federally listed hairy Orcutt grass (*Orcuttia pilosa*) and San Joaquin Valley Orcutt grass (*O. inaequalis*).

Populations of Colusa grass and other associated species have been lost because much of California's Central Valley vernal pool habitat has been converted for agriculture and urbanization. A 1989 USFWS-funded status survey on the Central Valley Orcuttieae, including Colusa grass, indicated that of the 47 historically known occurrences of Colusa grass, 20 percent had been eliminated, and an additional 20 percent had been damaged or were declining. Heavy grazing and competition from introduced weedy species have been identified as threats. Unprotected occurrences on private lands are subject to agricultural conversion. Solano County Farmlands and Open Space Foundation protects one occurrence at its Jepson Prairie Preserve in Solano County. Protection measures for this species are expected to be included in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

The status in 1999 of Colusa grass: *Declining*.

Amargosa nitrophila
(Nitrophila mohavensis)

CA - E (1979)
FED - E (1985)

General Habitat: Meadow and Seep

Amargosa nitrophila

Amargosa nitrophila is a small, erect perennial in the goosefoot family (Chenopodiaceae). This compact plant has smooth, pinkish stems with rounded, opposite leaves which clasp the stems and minute rose-colored flowers at the base of the leaves. It is found in open alkali flats and low sand deposits in the Amargosa River drainage of Inyo County, California, and Nye County, Nevada. This area includes the Carson Slough drainage near Tecopa, and Ash Meadows, a unique desert oasis.

Only two populations are known to occur in California. Maintenance of natural hydrological regimes is essential to this species' survival. A private development project has damaged and reduced habitat at one population. The other is managed by BLM.

The status in 1999 of Amargosa nitrophila: *Declining*.

Dehesa nolina
(Nolina interrata)

CA - E (1979)
FED - None

General Habitat: Chaparral

Dehesa nolina

Dehesa nolina is a large, yucca-like perennial with rosettes of long, flat leaves and tall, much-branched flower stalks. The white male and female flowers occur on separate plants. This member of the lily family (Liliaceae) is found in chaparral plant communities in a limited area of southwestern San Diego County and adjacent Baja California, Mexico.

Dehesa nolina is limited to approximately six occurrences in San Diego County and three small occurrences in Baja California Norte. The San Diego County occurrences are threatened by expanding residential development and potential road-widening projects. Recent efforts to protect the largest populations should help stabilize the trend and greatly reduce further loss of habitat. The three largest populations of Dehesa nolina are found on Sycuan Peak, McGinty Mountain, and Dehesa mountains in southwestern San Diego County. A cooperative preserve on McGinty Mountain managed by the DFG, TNC, the County of San Diego DPR, and the Environmental Trust has protected much, but not all, of the Dehesa nolina population there. Since July 1995, the DFG and WCB have worked successfully with private landowners to acquire more than 1, 270 acres of habitat on Sycuan Peak. An additional 220 acres of habitat in private ownership is needed to ensure to complete protection of the Sycuan Peak population. The San Diego MSCP by will ensure that a minimum of 80 percent of these three populations will be preserved.

Studies are needed to determine the role of wildfire management and/or prescribed burning with respect to reproduction in populations of Dehesa nolina and the sexual demography of the major populations. Wildfire has been noted to induce mass flowering in populations of Dehesa nolina and related species, but fire frequency and its role in establishment and perpetuation of the species has not been studied. At least one known small population of Dehesa nolina is, in fact, a unisexual clone representing a single genetic individual that has an areal extent of one-quarter acre or more. Information from these studies will be crucial to the development of recovery strategies for Dehesa nolina and essential for management of the species in the actual and proposed reserves. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

The status in 1999 of Dehesa nolina: ***Stable to declining.***

Eureka Dunes evening-primrose

Eureka Dunes evening-primrose
(Oenothera californica ssp. *eurekensis)*

CA - R (1978)
FED - E (1978)

General Habitat: Desert Dunes

Eureka Dunes evening-primrose is a perennial herb with large, showy, white flowers that age to red. This member of the evening primrose family (Onagraceae) grows in the flat to gently sloping sand areas bordering larger desert sand dunes of Eureka Valley in Inyo County. Eureka Dunes evening-primrose is short-lived, suffers high mortality, and produces abundant, long-lived seeds. It is associated with the State-listed rare Eureka Valley dune grass *(Swallenia alexandrae)*, although the grass generally grows much higher on the dunes. There are only three known occurrences of Eureka Dunes evening-primrose; all are confined to the southern portion of Eureka Valley. The Eureka Dunes are part of Death Valley National Park. Trampling and occasional OHV damage are threats and expansion of Russian thistle also threatens the habitat. This invasive non-native plant became established on the dunes during the period of intense disturbance by OHVs prior to 1976 when the dunes were closed to OHVs. Populations vary tremendously based upon rainfall. In 1997, only 20 individuals were observed around the main dunes. In 1998, a high rainfall year, extensive fields of evening-primrose were observed around the entire main dune system. There is no monitoring program in place currently.

The status in 1999 of Eureka Dunes evening-primrose: ***Stable.***

Antioch Dunes evening-primrose

Antioch Dunes evening-primrose
(Oenothera deltoides var. *howellii)*

CA - E (1978)
FED - E (1978)

General Habitat: Inland Dunes

Antioch Dunes evening-primrose is a showy, white-flowered, highly branched, perennial herb with grayish toothed or divided leaves. It is a member of the evening-primrose family (Onagraceae). This plant grows in loose sand and semi-stabilized dunes in a small area along the San Joaquin River near Antioch in Contra Costa County. The area is protected by San Francisco Bay National Wildlife Refuge and PG&E. The State and federally endangered Contra Costa wallflower *(Erysimum capitatum)* grows in the same area as the evening-primrose.

The Antioch Dunes have been reduced to about 70 acres as a result of industrial development, sand mining, and agricultural conversion. The remaining habitat has been degraded by fire control activities, OHV use, and invasion by exotic species. In 1970, seed of Antioch dunes evening-primrose was introduced to Brannan Island State Recreation Area. The DFG does not have information on the current status or threats to this population.

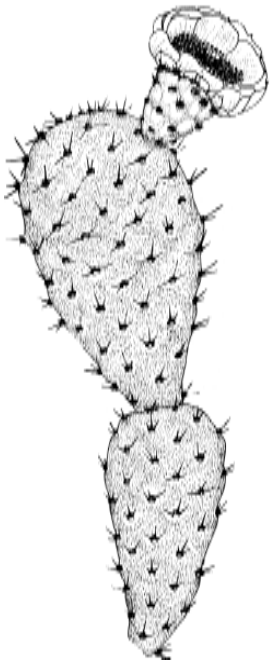
The native site on the Refuge was closed to public use to reduce erosion caused by trespass and OHVs. Research has shown that, although this species typically produces large amounts of seed, seed set by the plants at Antioch Dunes is low, possibly due to pollination limitations. This research also showed that seedlings were unable to survive on the clay soils now present in areas where overlaying dune sand was removed. The most recent population trend for Antioch Dunes evening-primrose is one of increase, but the taxon is still in a very precarious position. The USFWS is currently preparing a management plan for the Antioch Dunes, with the goal of increasing the viability of Antioch Dunes evening-primrose and Contra Costa wallflower.

The status in 1999 of Antioch Dunes evening-primrose: ***Stable.***

Bakersfield cactus
(Opuntia basilaris var. *treleasei)*

CA - E (1990)
FED - E (1990)

General Habitat: Chenopod Scrub
Valley and Foothill Grassland



Bakersfield cactus

Bakersfield cactus is a succulent, spiny member of the cactus family (Cactaceae) with large, showy magenta flowers that bloom from March through June. It is a spreading perennial plant with gray-green stems which form flat joints (pads). This species grows on coarse, cobbly, well-drained granitic sand on bluffs, low hills, and flats in the valley and foothill grasslands of Kern County.

Bakersfield cactus once formed extensive colonies in the area around Bakersfield, extending up the Kern River Canyon to the northeast, through the Caliente Creek drainage to the southeast, and to the Tejon Hills, about 20 miles to the south. Much of the historical habitat for the species has been destroyed by impacts associated with human activities. The rapidly accelerating urbanization of this area poses a severe threat to the species today. Agricultural conversion of land, oil field development, overgrazing by sheep and cattle, OHV activity, dumping, and sand mining have contributed to the decline of this species and destruction of its habitat throughout its range. Dense stands of non-native grasses compete with Bakersfield cactus. In wet years, these invasive grasses cover the cactus, and when dry, greatly increase the likelihood and destructiveness of wildfires. The grasses may reduce vegetative reproduction of the cactus by preventing broken pads from contacting and rooting in the soil. In 1995, extensive die-back in some populations was discovered, perhaps caused by high rainfall during the winter of 1994-1995.

In 1997, three important areas of Bakersfield cactus habitat were acquired as mitigation under the Metropolitan Bakersfield HCP. These parcels are being managed for Bakersfield cactus. Protection measures for Bakersfield cactus are included in USFWS's *Draft Recovery Plan for Upland Species of the San Joaquin Valley, California,* completed 1998.

The status in 1999 of Bakersfield cactus: ***Declining.***

California Orcutt grass
(Orcuttia californica)

CA - E (1979)
FED - E (1993)

General Habitat: Vernal Pools

California Orcutt grass

California Orcutt grass, a member of the grass family *(Poaceae)*, is a bright green, sticky, aromatic annual with flowers borne in dense spikes. This species was once commonly found in the volcanic terrace and valley vernal pool systems of Southern California in Los Angeles, Riverside and San Diego counties.

Within the northern portion of this species' range, three populations of Orcutt grass remain in Ventura and Los Angeles counties. A large population was discovered in 1992 near Moorpark; a housing development is in progress there which is slated to eliminate the natural watershed for the pool and will be replaced by an artificially maintained, hydrologic system. Two populations were discovered recently in northern Los Angeles County in the vicinity of Cruzan Mesa and Plum Canyon in the upper watershed of the Santa Clara River. The largest of these, at Cruzan Mesa, was discovered after the County of Los Angeles approved a housing project for the area that has yet to be constructed. Recent discing and tilling of the watershed has caused sedimentation into the pool basin which may threaten the habitat integrity of the pool. A very small

population of several hundred plants was recently located in the Plum Canyon area. This population appears to occupy a pool created by a landslide on a slide slope above a small stream. Development around Skunk Hollow in Riverside County will truncate a portion of the watershed which maintains this vary large vernal pool. Protection measures for California Orcutt grass are provided in the USFWS's *Recovery Plan for Vernal Pools of Southern California*, released in 1998.

This species is covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border. It will likely be covered in the San Diego Multiple Habitat Conservation Program NCCP to be finalized in the next few years.

The status in 1999 of California Orcutt grass: *Declining*.

San Joaquin Valley Orcutt grass

San Joaquin Valley Orcutt grass
(Orcuttia inaequalis)

CA - E (1979)
FED - T (1997)

General Habitat: Vernal Pools

San Joaquin Valley Orcutt grass is a grayish-green, sticky, aromatic annual in the grass family (Poaceae) with a terminal inflorescence of overlapping flowers. This grass was once common in vernal pools in Stanislaus, Merced, Fresno, Madera, and Tulare counties. Associated species in some locations include Colusa grass *(Neostapfia colusana),* Boggs Lake hedge-hyssop *(Gratiola heterosepala),* and succulent owl's-clover *(Castilleja campestris* ssp. *succulenta)*, all of which are State listed as endangered.

Nearly half of the approximately 45 historically known occurrences of San Joaquin Valley Orcutt grass have been destroyed, primarily due to conversion of habitat to agriculture. Discing, hydrological modification, urbanization, and late spring grazing have also degraded and destroyed the species' habitat. Since San Joaquin Valley Orcutt grass matures in early summer and occupies large vernal pools that retain water the longest, it is vulnerable to trampling by cattle, which are attracted to vernal pools as the annual grasses in the surrounding upland dry out. Disturbed vernal pool soils are vulnerable to invasion by non-native, upland grasses and forbs that may compete with San Joaquin Valley Orcutt grass and other vernal pool species. Most of the remaining occurrences of San Joaquin Valley Orcutt grass are concentrated in two small areas in eastern Merced County.

Most of the approximately 25 remaining occurrences are privately owned. The species occurs in two vernal pools that are partially owned by BLM and partially on private land on Big Table Mountain near Friant in Fresno County. It also occurs in a vernal pool complex in Madera County that was acquired by CALTRANS in 1995 for mitigation purposes. Just prior to their acquisition by CALTRANS, the pools had been disced. As a result of this disturbance, these pools have been invaded by upland plants, but they still support rare species. In 1997, a small population of San Joaquin Valley Orcutt grass was discovered in one vernal pool on the DFG's Stone Corral Ecological Reserve in Tulare County. Three occurrences of the species on the Flying M Ranch in Merced County are protected through conservation easements with TNC. Protection measures for this species are expected to be included in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

Hairy Orcutt grass

The status in 1999 of San Joaquin Valley Orcutt grass: *Declining*.

Hairy Orcutt grass
(Orcuttia pilosa)

CA - E (1979)
FED - E (1997)

General Habitat: Vernal Pools

Hairy Orcutt grass is a yellow-green, aromatic, tufted, annual in the grass family (Poaceae), with dense hairs throughout and a flower stalk of numerous flowers, which are crowded near the tip. This grass occurs in vernal pools in Butte, Glenn, and Tehama counties in the Sacramento Valley and Stanislaus and Madera counties in the San Joaquin Valley. It had been known from Merced County, but all occurrences appear to have been extirpated. Associated species in some locations include two other State-listed grasses: Colusa grass *(Neostapfia colusana)* and Greene's tuctoria *(Tuctoria greenei).*

Habitat loss through conversion of vernal pool habitat to agricultural uses or development continues to threaten hairy Orcutt grass. Competition from weeds appears to be an increasing problem for hairy Orcutt grass throughout its range. Several extant occurrences are damaged or declining, and at least 11 occurrences contain less than 1,000 individuals. Occurrences with such small numbers of individuals are particularly susceptible to decline over time and ultimate extirpation. Hairy Orcutt grass can tolerate some grazing, but ecologically appropriate livestock numbers, timing, and intensity are unknown. At TNC's Vina Plains Preserve, where one-half of the 26 extant occurrences of the plant are located, a three-year study was recently completed to determine the effects of grazing and burning on vernal pool habitat; results of this study will be useful in guiding management. Protection measures for this species are expected to be included in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

The status in 1999 Hairy Orcutt grass: ***Declining.***

Slender Orcutt grass
(Orcuttia tenuis)

CA - E (1979)
FED - T (1997)

General Habitat: Vernal Pools

Slender Orcutt grass is a blue-green, somewhat sticky and aromatic annual member of the grass family (Poaceae), with a branched flower stalk. This grass occurs in the bottom of vernal pools associated with valley grassland, blue oak woodland, and lower montane conifer forest. It has been reported from Lake, Lassen, Plumas, Sacramento, Shasta, Siskiyou, and Tehama counties. Associated species that are also State-listed include many-flowered navarretia *(Navarretia plieantha),* Boggs lake hedge-hyssop *(Gratiola heterosepala),* and Greene's tuctoria *(Tuctoria greenei).*

Much of slender Orcutt grass' vernal pool habitat has been damaged or lost as a result of agricultural conversion. Approximately 70 occurrences of slender Orcutt grass are known, approximately half of which occur on private lands. The DFG is protecting a large population of slender Orcutt grass at Dales Lake Ecological Reserve in Tehama County. BLM is protecting populations at Hog Lake Plateau, Sevenmile Lake, and Spring Branch Plain in Tehama County. TNC protects populations at their Vina Plains and Boggs Lake preserves. Other occurrences are on BLM, USFS, and privately owned lands. Two new occurrences were discovered in Lassen National Forest in 1997, and two more in 1998. The USFS has fenced four of the occurrences on their land to protect them from grazing; one occurrence is not on a grazing allotment, and the remaining populations are monitored for grazing effects and appear to be stable.

Recently, a 139-acre parcel on the Stillwater Plains in Shasta County with two vernal pools supporting slender Orcutt grass was enrolled in the National Resource Conservation Service Wetland Reserve Program, which will protect the species there. The same landowner is nearing completion of a vernal pool mitigation bank that will protect the species in three additional pools on adjacent lands. Additionally, CVPIA Conservation Program funds have been authorized for additional pool protection actions within the Stillwater Plains. Protection measures for this species are included in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

The status in 1999 of slender Orcutt grass: ***Stable.***

Slender Orcutt grass

Sacramento Orcutt grass

Sacramento Orcutt grass
(Orcuttia viscida)

CA - E (1979)
FED - E (1997)

General Habitat: Vernal Pools

Sacramento Orcutt grass is a blue-green, tufted, sticky aromatic annual plant in the grass family (Poaceae) with flowers crowded into bristly heads. It grows in dry vernal pool beds within either blue oak woodland or valley grassland communities. This grass is restricted to several vernal pool complexes in Sacramento County and is the rarest and most narrowly distributed member of the genus *Orcuttia.* At one site, Sacramento Orcutt grass is associated with the State-listed endangered Boggs Lake hedge-hyssop *(Gratiola heterosepala).* Fewer than 10 occurrences of Sacramento Orcutt grass have been reported; one of these was artificially established in 1979 by seeding a vernal pool. Most occurrences are on private land and remain unprotected.

One population occurs in the DFG's Phoenix Field Ecological Reserve in Sacramento County. The population there has been threatened by displacement by wetland species not typically associated with vernal pools that are spreading within the ecological reserve. This is occurring due to the alteration of the hydrology of the site that has occurred as a result of runoff entering the ecological reserve from a nearby housing development. Precautions planned for the road grading of the developed property were unsuccessful in directing runoff away from the ecological reserve. Money from a federal Section 6 grant was used in July 1998 to construct a drainage along the northern boundary of the Phoenix Field Ecological Reserve in Sacramento County. This drainage is now successfully diverting runoff from the housing development away from the Ecological Reserve, including the pools containing Sacramento Orcutt grass. A wildfire on the reserve in June 1999 made it difficult to assess any immediate effects of the new drain on the Orcutt grass population.

Sacramento Orcutt grass is targeted for protection in the developing Sacramento County HCP, which should result in protection of the remaining populations in the County.

The status in 1999 of Sacramento Orcutt grass: *Declining*.

Baja California birdbush
(Ornithostaphylos oppositifolia)

CA - Candidate (1999)
FED - None

General Habitat: Chaparral

Baja California birdbush is a rigidly-branched, erect shrub in the Heath family (Ericaceae) with leathery, narrow leaves, reddish-brown bark that peels to expose white or gray-green stems, and small greenish-white flowers in clusters. The 6' tall species grows slowly, is long-lived, and has low reproduction rates. It is known from only one location in the United States, just north of the U.S. - Mexico border on a mesa and adjacent slopes in the Tijuana Hills in San Diego County. A total of 103 Baja California birdbush shrubs has been documented there. The plants grow in cobbly loam soil in a chaparral community intermixed with coastal sage species. This birdbush is also known from northwestern Baja California Norte, Mexico.

The sole U.S. population is threatened by fragmentation of its habitat by dirt roads and trails, brush clearing and cutting associated with illegal border crossings and U.S. Border Patrol activities, and, possibly, a fire frequency that is too high. This population occurs within an area proposed for construction of the U.S. Border Patrol's Border Fence project, which is still in the planning stages. It is likely that some of the birdbush plants will be destroyed during construction, so the DFG is working with the federal agencies involved to determine mitigation and conservation measures.

The status in 1999 of Baja California birdbush: ***Declining.***

Lake County stonecrop
(Parvisedum leiocarpum)

CA - E (1990)
FED - E (1997)

General Habitat: Valley and Foothill Grassland
Vernal Pools

Lake County stonecrop is a diminutive, succulent annual in the stonecrop family (Crassulaceae). It has reddish stems one to two inches tall, small fleshy leaves, and pale yellow flowers that appear in April or May. This stonecrop grows in volcanic ash vernal pools that are seasonally wet and dry out in late spring. Lake County stonecrop has always been rare and is restricted to a few sites in Lake County.

At least half of the historical habitat of Lake County stonecrop has been lost. Recent surveys documented only three sites, covering about three acres on private land. These small populations remain vulnerable to changes in land use, which could degrade or eliminate their habitat.

Lake County stonecrop

The status in 1999 of Lake County stonecrop: ***Declining.***

Dudley's lousewort
(Pedicularis dudleyi)

CA - R (1979)
FED - None

General Habitat: Chaparral
North Coast Conifer Forest
Valley and Foothill Grassland

Dudley's lousewort is a short, perennial herb with mostly compound, basal leaves and stalks of pinkish flowers. This member of the figwort family (Scrophulariaceae) grows under shaded conditions in the coastal redwood and mixed evergreen forest communities of San Luis Obispo, Monterey, Santa Cruz, and San Mateo counties.

There are fewer than 10 known occurrences of Dudley's lousewort. The majority of these are within Los Padres National Forest or on DPR land and in areas of recreational activities such as horseback riding and mountain biking. Two occurrences are located on the Hearst Ranch. Permanent management programs for this species are needed. DFG has no recent information on the status of this plant.

Dudley's lousewort

The status in 1999 of Dudley's lousewort: ***Unknown.***

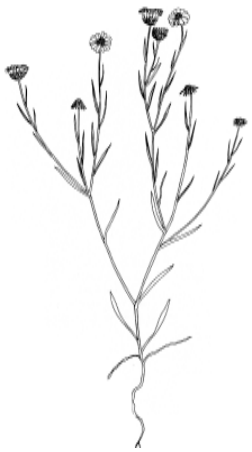
White-rayed pentachaeta
(Pentachaeta bellidiflora)

CA - E (1992)
FED - E (1995)

General Habitat: Serpentine Grassland
Valley and Foothill Grassland

White-rayed pentachaeta is a small, annual plant with heads of yellow disk flowers surrounded by white to purple ray flowers. This member of the sunflower family (Asteraceae) is currently known from a serpentine bunchgrass community and native prairie in two small areas of San Mateo County, both on San Francisco Water District lands. It was formerly known from Marin to Santa Cruz counties.

Population sizes vary from year to year due to local rainfall and competition



Lyon's pentachaeta

from non-native plants. In 1997, this species was the subject of a recovery workshop conducted by the DFG in cooperation with USFWS. Participants discussed the need for permanently protecting and managing the existing populations, as well attempting to reintroduce populations into suitable protected habitat. Management and recovery actions for the species have been addressed in the USFWS's *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

The status in 1999 of white-rayed pentachaeta: *Declining*.

Lyon's pentachaeta
(Pentachaeta lyonii)

CA - E (1990)
FED - FE (1997)

General Habitat: Chaparral
Coastal Sage Scrub
Valley and Foothill Grassland

Lyon's pentachaeta is an herbaceous, annual plant in the sunflower family (Asteraceae). It has yellow ray and disk flowers arranged in heads that bloom from March to August. Habitat for Lyon's pentachaeta consists of sparsely vegetated openings in grassland, coastal sage scrub, and chaparral. Currently, Lyon's pentachaeta is known only from the coastal mountain region of northern Los Angeles County and southern Ventura County in the Santa Monica Mountains and in the Simi Valley. Populations on the Palos Verdes Peninsula and on Santa Catalina Island have not been seen for many years.

Approximately 27 populations remain. Two protected populations occur on lands managed by the Santa Monica Mountains Conservancy and Conejo Open Space Agency. Two populations on NPS and DPR lands are now extirpated, and another on NPS land is in poor condition. The remaining populations are all on private lands, largely within areas of proposed development. Lack of adequate land buffers, increases in invasive plant species, unpermitted fuel clearance, loss of suitable habitat for population expansion, fragmentation of habitat connectivity, and lack of management of competing vegetation threaten most of these populations. Several populations have been severely damaged in recent years by activities including geotechnical trenching, vegetation fuel clearance, and bulldozing.

An ongoing federal Section 6-funded research project is shedding light on biological and habitat requirements for this species. The plant's natural habitat has been altered over many decades by the introduction of non-native annual grasses and other weeds. The species is a poor competitor, and is currently limited to areas of shallow soils or heavy clay with reduced shrub and grass competition. Areas of reduced competition have also been created by human activities that compact the soil or scrape the surface, such as construction of dirt roads, foot trails, and vegetation fuelbreaks. Lyon's pentachaeta is a poor disperser, and plants are fragile and easily damaged by trampling and vehicular activity. Maintenance of suitable pollinator habitat and pollinator access should also be considered in order to preserve the species. Protection measures for Lyon's pentachaeta are provided in the USFWS's *Draft Recovery Plan for Six Plants from the Mountains Surrounding the Los Angeles Basin, California*, released in 1999.

The status in 1999 of Lyon's pentachaeta: *Declining*.

Yreka phlox

Yreka phlox
(Phlox hirsuta)

CA - E (1987)
FED - E (1998)

General Habitat: Lower Montane Conifer Forest

Yreka phlox is a low, cushion-like, perennial subshrub, with hairs throughout, leaves crowded on short stems, and attractive pink to purple flowers. This member of the phlox family (*Polemoniaceae*) occurs in juniper woodlands and open Jeffrey pine forests on serpentine soils in the general vicinity of Yreka, Siskiyou County. There are two known occurrences, spread over private land, Klamath National Forest land, and a CALTRANS right-of-way.

Historically, Yreka phlox occurrences have been disturbed by activities associated with road building and logging. USFS protects the occurrence on its land, and some landowners are voluntarily protecting the phlox on their lands. The China Hill site was last reported on in 1995 when 500 plants were seen. The Soap Creek Ridge occurrence was last seen in 1997 when 200 plants were seen on part of the site. Part of this latter occurrence burned in 1994, and there may have been damage from the fire abatement activities.

The status in 1999 of Yreka phlox: ***Unknown.***

San Francisco popcornflower
(Plagiobothrys diffusus)

CA - E (1979)
FED - None

General Habitat: Coastal Prairie
Vernal Pools

San Francisco popcornflower

San Francisco popcornflower is a low, herbaceous annual, with narrow leaves and a branched flower stalk of white flowers. This member of the borage family (Boraginaceae) is known from a historic location on the Presidio of San Francisco and from several occurrences in Santa Cruz County and one in northwest San Benito County. The type-locality near Mountain Lake in San Francisco has been altered by landscaping with trees and shrubs and introduced annual grasses, and the popcornflower may be extirpated from that site.

One population of San Francisco popcornflower is in joint public ownership under the University of California Natural Reserve System and DPR. Both portions of this population are vulnerable to disturbance by recreational activities such as horseback riding and biking. A portion of a population on Moore Creek Uplands was purchased by the City of Santa Cruz and WCB in 1998. A management plan for that property will be developed by the DFG, City of Santa Cruz, and the Land Trust of Santa Cruz County. The remaining portion of that population is on private land. The City is also developing a management plan for Pogonip, the location of another population. A population in the City of Scotts Valley is included in a grassland preserve, established by the Scotts Valley Unified School District. Four other populations on private property have the potential to be adversely affected by proposed residential development.

The status in 1999 of San Francisco popcornflower: ***Stable.***

Calistoga popcornflower
(Plagiobothrys strictus)
CA - T (1990)
FED - E (1997)

General habitat: Meadow and Seep
Valley and Foothill Grassland

Calistoga popcornflower

Calistoga popcornflower is an annual herb in the borage family (Boraginaceae). It is slender-stemmed with narrow leaves and small white flowers. This species grows in swales adjacent to active geysers and hot springs. These seasonal wetlands are underlain by a gravelly loam intermixed with clay, and water tables are close to the surface. Concentrations of boron, arsenic, and sulphates are high in these areas and a unique flora has evolved in them. Only two of the three known occurrences of Calistoga

popcornflower ever known still remain. These are near the town of Calistoga in Napa County. Urbanization and viticulture have extirpated one historic occurrence and eliminated much of the species' habitat. Both remaining occurrences are on privately owned land.

The status in 1999 of Calistoga popcornflower: *Unknown*.

North coast semaphore grass

North Coast semaphore grass
(Pleuropogon hooverianus)

CA - R (1979)
FED - None

General Habitat: Broadleaved Upland Forest

North Coast semaphore grass, a member of the grass family (Poaceae), is a large, succulent, perennial grass, with long and flat ribbon-like leaves and a terminal unbranched spike or widely spaced spikelets. It grows in moist sites of redwood forests and mixed evergreen forest communities and in the margins of vernal pools. This species is a northwest California endemic known only from Marin, Sonoma, and Mendocino counties.

There are about a dozen historically known occurrences of North Coast semaphore grass. Ten of these are likely extirpated, and two additional populations have been found. Elimination of habitat and disruption of natural hydrologic conditions have resulted in population declines at all sites. The Sonoma and Mendocino county occurrences are privately owned and subject to land conversion.

The status in 1999 of North Coast semaphore grass: *Declining*.

Napa blue grass

Napa blue grass
(Poa napensis)

CA - E (1979)
FED - E (1997)

General Habitat: Meadow and Seep

Napa blue grass is a tufted, perennial bunchgrass that lacks rhizomes and has fertile stems crowded with purplish flowers. This rare grass is known from just two sites near Calistoga in Napa County, which also correspond to the two known sites for the State-listed threatened Calistoga popcornflower (*Plagiobothrys strictus*), although Napa blue grass occurs in slightly higher, drier areas. It grows in moist meadows that are fed by runoff from nearby hot springs. Both Napa blue grass populations are on private land and have been reduced by the development of health spas and other construction at both sites. Alteration of the hot springs hydrology, early season mowing prior to flowering or setting of seed, and residential and commercial development continue to threaten this species. Although both occurrences were still extant in 1997, they are small and at risk of extirpation by random events such as a severe disease outbreak or other natural or human-caused events.

The status in 1999 of Napa blue grass: *Declining*.

San Diego mesa mint

San Diego mesa mint
(Pogogyne abramsii)

CA - E (1979)
FED - E (1978)

General Habitat: Vernal Pools

San Diego mesa mint, a member of the mint family (Lamiaceae), is a small, aromatic, herbaceous annual with opposite leaves and two-lipped, violet to reddish-purple flowers. It is restricted to vernal pools within grasslands, chamise chaparral, and coastal sage scrub on the mesas of western San Diego County. In some locations, this species is associated with San Diego button-celery *(Eryngium aristulatum* var. *parishii)*, also State and federally listed as endangered. Most of the approximately 35 known, extant occurrences are on DOD lands. Protection measures for San Diego mesa mint are provided in the USFWS's *Recovery Plan for Vernal Pools of Southern California*, released in 1998.

This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

The status in 1999 of San Diego mesa mint: *Unknown*.

Santa Lucia mint
(Pogogyne clareana)

CA - E (1979)
FED - None

General Habitat: Riparian Woodland

Santa Lucia mint

Santa Lucia mint is a strong-smelling, herbaceous annual, with low-spreading branches, and narrow head-like clusters of reddish-purple flowers. This member of the mint family (Lamiaceae) is known only from the tributaries of the Nacimiento River on the Hunter-Liggett Military Reservation in Monterey County. It grows in moist, sandy soil in riparian habitats.

A few new occurrences were located on Fort Hunter-Liggett in 1994 and 1995, but these new populations do not increase the range of the species. All occurrences on Army land may be vulnerable to livestock grazing, feral pigs, military activities, road maintenance, too frequent fire, trampling, and OHVs, although all known sites seemed to be doing well as of 1998. A management plan should be developed and implemented to help protect the populations of Santa Lucia mint. Emphasis should be placed on working cooperatively with the Army to secure known occurrences and prevent their accidental destruction by military activities or by lack of management.

The status in 1999 of Santa Lucia mint: *Stable.*

Otay Mesa mint
(Pogogyne nudiuscula)

CA - E (1987)
FED - E (1993)

General Habitat: Vernal Pools

Otay Mesa mint

Otay Mesa mint is an aromatic, annual herb with two-lipped, lavender flowers and a branched and somewhat spreading habit. This small member of the mint family (Lamiaceae) grows in vernal pools on Otay Mesa in southwestern San Diego County in association with San Diego button-celery *(Eryngium aristulatum* var. *parishii).* Otay Mesa mint also occurs on the extension of Otay Mesa in Baja California Norte.

Approximately six occurrences of Otay Mesa mint are known to exist in California. Although once considered widespread near Balboa Park, Mission Valley, and University Heights, urbanization has destroyed those occurrences. Urbanization, livestock grazing, agricultural conversion, and activities around the second International Border crossing with Mexico threaten Otay Mesa mint habitat. Most of this plant's habitat is privately owned. Protection measures for Otay Mesa mint are provided in the USFWS's *Recovery Plan for Vernal Pools of Southern California*, released in 1998.

This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

The status in 1999 of Otay Mesa mint: ***Declining.***

Hickman's cinquefoil

Hickman's cinquefoil
(Potentilla hickmanii)

CA - E (1979)
FED - E (1998)

General Habitats: Coastal Bluff Scrub
Coastal Prairie

Hickman's cinquefoil is an herbaceous, slender-stemmed perennial member of the rose family (Rosaceae) with leaves divided into many leaflets and numerous yellow flowers. Historically, there were four occurrences of Hickman's cinquefoil, one in coastal San Mateo County and three sites on the Monterey Peninsula. It was known from seepage areas and other wet sites in coastal prairies or open forested areas along the central coast.

In 1995, a population of Hickman's cinquefoil was discovered in San Mateo County. This population, a portion of which is located within a proposed construction zone of the State Highway 1 Devil's Slide Bypass, was estimated to consist of 2,000 to 3,000 individuals. In 1997 a decision was made to route Highway 1 through a tunnel, thus avoiding the population, which remains on private land.

Currently, only one of the Monterey peninsula populations, at Indian Village in Pebble Beach, is extant; fewer than 30 individuals were seen there in 1997. In 1995, the Del Monte Forest Foundation, owners of the property, relocated volleyball and horseshoe areas to reduce impact to the population. Clones of one plant were planted in several locations in the vicinity of Indian Village to help identify suitable habitat in the winter of 1996-97; survival has not been very good, and the plants continue to be monitored. Seeds have been collected, and seedlings are proposed to be planted in those areas that the clones indicate will support plants.

The status in 1999 of Hickman's cinquefoil: ***Declining.***

Hartweg's golden sunburst

Hartweg's golden sunburst
(Pseudobahia bahiifolia)

CA - E (1981)
FED - E (1997)

General habitat: Valley and Foothill Grassland

Hartweg's golden sunburst is a small, sometimes branched, annual herb in the sunflower family (Asteraceae). It is covered with white, woolly hairs, has small heads of bright yellow flowers, and its alternate leaves are entire or three-lobed but not divided. Historically, Hartweg's golden sunburst was scattered but locally abundant in valley and foothill grasslands of the Central Valley from Yuba County south to Fresno County. It is now concentrated in two localized areas of the eastern San Joaquin Valley: the Friant region in Madera and Fresno counties and the Cooperstown-La Grange region in Stanislaus County. Its range is strongly correlated with the distribution of the Amador and Rocklin soil series. Hartweg's golden sunburst typically occurs on the north- or northeast-facing slopes of mima mounds, with the highest densities on upper slopes with minimal grass cover. Mima mounds are small mounds often associated with vernal pools. Only 14 extant occurrences are known, 8 in Stanislaus County, two in Madera County, and four in Fresno County. Part of one population in Fresno County occurs on land owned by BOR, and another part of the same population is protected by a conservation easement with TNC. All other populations are privately owned.

Five of the historical occurrences of Hartweg's golden sunburst have been extirpated, including the type-locality in Yuba County. Of the 14 extant occurrences of Hartweg's golden sunburst, 11 are very small and contained fewer than 200 plants each in 1990. Conversion of habitat to residential development is currently the most significant threat to the species. Additional threats include competition from non-native grasses, incompatible grazing practices, mining, and conversion of habitat to agriculture. Approximately half of all Hartweg's golden sunburst plants occur in Madera County in an area proposed for residential development. The two privately owned populations in Fresno County are in an area also planned for residential development. Species such as Hartweg's golden sunburst that have very small populations are vulnerable to decline and extinction due to genetic problems or to random catastrophic events such as floods, attack by insects, disease outbreaks, or extended droughts.

The status in 1999 of Hartweg's golden sunburst: *Declining*.

San Joaquin adobe sunburst
(Pseudobahia peirsonii)

CA - E (1987)
FED - T (1997)

General Habitat: Valley and Foothill Grassland

San Joaquin adobe sunburst

San Joaquin adobe sunburst is a small, erect, yellow-flowered, woolly annual herb in the sunflower family (Asteraceae). Its leaves are twice divided and are arranged alternately on the stem. It is restricted to heavy adobe clay soils on the grassy valley floor and rolling foothills of the eastern San Joaquin Valley. It is concentrated in three major locations: east of Fresno in Fresno County, west of Lake Success in Tulare County, and northeast of Bakersfield in Kern County. One population occurs on land owned and managed by the Fresno Flood Control District, and two populations occur on land owned by COE. All other populations occur on privately owned land.

Twelve of the 43 historically known occurrences of San Joaquin adobe sunburst have been destroyed or are presumed destroyed, all in Tulare County. Of the 31 extant occurrences, 18 are small and contain fewer than 250 plants. Approximately 80 percent of all plants are contained in four populations. Conversion of natural habitat to residential development is the major current threat to the species. Other threats include flood control, competition from non-native grasses, incompatible grazing practices, road maintenance activities, conversion of habitat to agriculture, transmission line maintenance, and recreational activities. Species such as San Joaquin adobe sunburst that have very small populations are vulnerable to decline and extinction due to genetic problems or to random catastrophic events such as floods, attack by insects, disease outbreaks, or extended droughts.

The largest historically known population of San Joaquin adobe sunburst has been reduced by a residential development in Fresno County east of Clovis. The species occurred as four subpopulations at the site. Mitigation for the project included protection of the two subpopulations with the highest density of plants, and an attempt was made to create a new subpopulation in 1993 from seeds and topsoil salvaged from a high density subpopulation that was destroyed. In 1994 and 1995, a few plants of San Joaquin adobe sunburst were seen at both the preserved and transplanted subpopulations, but no plants were seen in 1996 and 1997. The status of this population is unclear. The second-largest historically known population of San Joaquin adobe sunburst occurs within the Redbank-Fancher Creek Flood Control Project area, in Fresno County east of Clovis. Redbank Reservoir was constructed several years ago by the Fresno Metropolitan Flood Control District to temporarily detain water during floods. This project was predicted to impact approximately 40 percent of this population of San Joaquin adobe sunburst. The current status of this population is unknown. A population in Tulare County east of Porterville is threatened by a proposal to raise the water level of Lake Success.

The status in 1999 of San Joaquin adobe sunburst: *Declining*.

Gambel's watercress

Gambel's watercress
(Rorippa gambellii)

CA - T (1990)
FED - E (1993)

General Habitat: Marsh and Swamp

Gambel's watercress is an herbaceous perennial in the mustard family (Brassicaceae). This species characteristically roots from the stem, which bears scattered compound leaves and dense clusters of white flowers. Gambel's watercress is found in freshwater or brackish marsh habitats at the margins of lakes and along slow-flowing streams. It grows in or just above the water level and requires a permanent source of water. Historically, Gambel's watercress occurred in interior wetland areas of San Diego, San Bernardino, and Los Angeles counties, as well as coastal wetland areas of San Luis Obispo and Santa Barbara counties. A population from Mexico is thought to be extirpated.

Of a dozen historical locations of Gambel's watercress in California, only two small populations remain. Both are in San Luis Obispo County, one at Little Oso Flaco Lake and one at Oso Flaco Lake. Additionally there is one newly discovered population on Vandenberg Air Force Base in northern Santa Barbara County. These three populations support a total of approximately 700 plants. A historically known population in Black Lake Canyon in San Luis Obispo County has not been seen since 1997. Encroachment of non-native eucalyptus trees and drilling of water wells in the immediate watershed are serious threats to the habitat of this species in Black Lake Canyon.

The Land Conservancy of San Luis Obispo County has prepared a management plan for Black Lake Canyon that addresses Gambel's watercress. In addition, TNC recently purchased a conservation easement in the Nipomo Dunes that includes a large dune lakes complex. This area, which has not been surveyed by botanists for half a century, will be surveyed to determine if other populations exist and if potential habitat is available for establishment of experimental populations of this species. Beginning in 1993, research into demography, general ecology, and recovery options has been conducted by researchers from the University of California, Santa Barbara. During 1999, researchers recovered seeds from the known occupied locations for propagation and planting. A cooperative effort to establish more populations of this species at Vandenberg Air Force Base is in progress. Protection measures for Gambel's watercress are included in USFWS's *Recovery Plan for Marsh Sandwort (Arenaria paludicola) and Gambel's watercress (Rorippa gambellii)* completed in 1999.

The status in 1999 of Gambel's watercress: *Declining*.

Tahoe yellow cress

Tahoe yellow cress
(Rorippa subumbellata)

CA - E (1982)
FED - None

General Habitat: Lower Montane Conifer Forest
Meadow and Seep

Tahoe yellow cress is a creeping, herbaceous perennial with divided leaves and terminal, elongated inflorescences of yellow to white flowers. This member of the mustard family (Brassicaceae) grows on course sand and cobble deposits in riparian communities and along lakeshore margins. Today, populations exist on the margins of Lake Tahoe in El Dorado and Placer counties and in Nevada's Douglas and Washoe counties. The plant was historically reported from Tallac Lake near Truckee in Nevada County, but this site does not contain suitable habitat; it has been postulated that the reference actually was meant to refer to a population near the mouth of Tallac Creek, which enters Lake Tahoe.

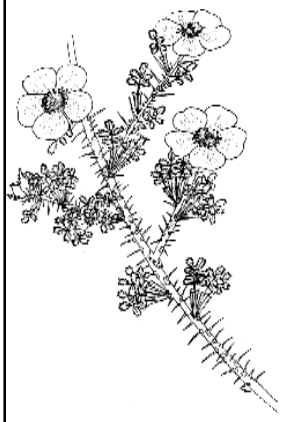
In the early 1990s, surveys documented an increase in the number and size of Tahoe yellow cress colonies. This was thought to be caused by more habitat being available due to lower lake levels. In recent years, including 1997, increased lake levels have "drowned" about half of the known colonies, and the remaining colonies have been heavily impacted by recreation activities being concentrated on upper levels of the beaches and back dunes. The plant appears to depend on a moisture-retaining crust that forms in the upper portion of the sand. When this crust is churned and broken by heavy foot traffic or raking of beaches to remove litter and cobbles, the area is rendered inhabitable for this species. Beach raking has become much more prevalent in the last few years and poses a serious threat to the continued existence of Tahoe yellow cress.

The status in 1999 of Tahoe yellow cress: *Unknown.*

Small-leaved rose
(Rosa minutifolia)

CA - E (1989)
FED - None

General Habitat: Coastal Scrub



Small-leaved rose

Small-leaved rose is a densely spiny, low-growing shrub in the rose family (Rosaceae). It has slender, gray shoots, small compound leaves, and showy rose-pink flowers. It grows in the coastal sage scrub plant community of Southern California and Baja California, Mexico. In the United States, this species was known from a single population, discovered in 1985 on private property on Otay Mesa in southwestern San Diego County.

The Otay Mesa population of small-leaved rose was a large, healthy thicket occupying an area of approximately 100 square yards. The population appeared to represent a large clone, or single genetic individual. A major residential and commercial subdivision approved by the City of San Diego resulted in the elimination of the existing population in 1997. Efforts are presently underway by the developer to establish replacement populations on adjacent habitat in protected, open space preserves on Otay Mesa to serve as mitigation for the loss of the only known U.S. population. A number of years following establishment of these replacement populations will be needed before a reasonable assessment of the translocation efforts can be made, although several hundred cuttings are surviving to date. This species is covered in the San Diego Multiple Species Conservation Plan NCCP. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican Border.

Development of the coastal plain in western Baja California is rapidly converting much of the Mexican habitat for small-leaved rose to farmland and other commercial or residential uses.

The status in 1999 of small-leaved rose: *Unknown.*

Adobe sanicle
(Sanicula maritima)

CA - R (1981)
FED - None

General Habitat: Meadow and Seep
Valley and Foothill Grassland

Adobe sanicle grows as a stout, aromatic, perennial herb with large basal leaves, smaller upper leaves, and yellow flowers in head-like clusters. This member of the carrot family (Apiaceae) is found in wet to dry clay soils of coastal prairie and coastal sage scrub plant communities. Its distribution is centered in the coastal hills of San Luis Obispo and Monterey counties with additional historical records from the San Francisco

Bay Area.

Fewer than 10 occurrences of adobe sanicle are still extant and all but two, located in the Los Padres National Forest and Andrew Molera State Park, are privately owned. Adobe sanicle would benefit from protection of both the privately and publicly owned occurrences. Studies to determine its ecological requirements would also aid efforts to protect this plant. DFG has no recent information on the status of this plant.

The status in 1999 of adobe sanicle: *Unknown.*

Rock sanicle

Rock sanicle
(Sanicula saxatilis)

CA - R (1982)
FED - None

General Habitat: Broadleaved Upland Forest
Chaparral

Rock sanicle is a low, stout, perennial herb in the carrot family (Apiaceae) with numerous dissected basal leaves and small pale yellow flowers borne in round stalked clusters. It can be found on rocky soil, rock outcrops, and talus slopes, usually within the chaparral plant community.

About 10 occurrences of rock sanicle are known. In Contra Costa County, this species occurs on the main and north peaks in Mount Diablo State Park. Several populations along trails there appear stable and receive few impacts from hikers. In Santa Clara County, rock sanicle is known from the vicinity of Mount Hamilton, on privately owned land or on property of the University of California's Lick Observatory, and are located in remote areas and so receive little impacts.

The status in 1999 of rock sanicle: *Stable.*

Gander's ragwort

Gander's ragwort
(Senecio ganderi)

CA - R (1982)
FED - None

General Habitat: Chaparral

Gander's ragwort is a member of the sunflower family (Asteraceae). This basal-leaved, perennial herb has compact, yellow-orange flowerheads and leaves suffused with purple. Gander's ragwort usually grows in the understory of mature mixed chaparral, or in open areas of recently burned chaparral. It is found in the very southwestern part of Riverside County and the foothills of western San Diego County, and its habitat is limited to areas of gabbro soils on Lawson, Sycuan, and Tecate peaks; Barber, Black, El Cajon, and McGinty Mountains; and Magee Ridge.

Fewer than a dozen occurrences of Gander's ragwort have been reported. Some occurrences are in undisturbed, protected sites, while others exist in areas threatened by residential development. A cooperative preserve on McGinty Mountain managed by the DFG, TNC, the County of San Diego DPR, and the Environmental Trust protects the known population there. Since July 1995, the DFG and WCB have worked successfully with private landowners to acquire 1,270 acres of habitat on Sycuan Peak. An additional 220 acres of habitat in private ownership is needed to ensure to complete protection of the Sycuan Peak population. Cleveland National Forest manages the Barber Mountain, Black Mountain, El Cajon Mountain, and Lawson Peak populations. At this time, the population most at risk is the northernmost occurrence of Gander's ragwort on Magee Ridge, where residential development has been proposed. Recent efforts to protect the largest populations should help stabilize the current population trend and greatly reduce further loss of habitat.

Studies are needed to determine the role of wildfire management and/or prescribed burning with respect to establishment and reproduction in populations of Gander's ragwort. Information from these studies will be crucial to the development of recovery strategies for Gander's ragwort and essential for management of the species in the actual and proposed reserves. This species is covered in the San Diego Multiple Species Conservation Plan NCCP, which should ensure that a minimum of 80 percent of the populations within the southwestern portion of San Diego County will be preserved. It is also covered in the San Diego Gas & Electric Company Subregional NCCP, a linear NCCP from Orange County to the Mexican border.

The status in 1999 of Gander's ragwort: ***Declining.***

Layne's ragwort
(Senecio layneae)

CA - R (1979)
FED - T (1996)

General Habitat: Chaparral
Cismontane Woodland

Layne's ragwort

Layne's ragwort is a perennial herb with basal leaves and reduced stem leaves and yellow flowers in small heads. The flowers have five to 10 petals arranged in a unique, irregular pattern around the head. It is a member of the sunflower family (Asteraceae). Its habitat is the gabbro- and serpentine-derived soils of chaparral and black oak and interior live oak woodlands in the vicinity of Pine Hill in western El Dorado County and the Red Hills of Tuolumne County. Associated species in El Dorado County include four other State listed plants: Stebbins' morning glory *(Calystegia stebbinsii),* Pine Hill ceanothus *(Ceanothus roderickii),* Pine Hill flannel-bush *(Fremontodendron decumbens),* and El Dorado bedstraw *(Galium californicum* ssp. *sierrae).*

The primary threat to Layne's ragwort is the rapid urbanization of western El Dorado County. Although mitigation for impacts to habitat occurs when the County approves discretionary projects, the forms of protection that can be conducted on relatively small individual parcels is unlikely to result in long-term viability of the colonies located on these sites. Rural property owners can clear native understory vegetation, graze livestock, or build access roads and outbuildings under ministerial permits, resulting in unregulated losses of Layne's ragwort.

The DFG is working with federal agencies, local agencies, and interested private parties to establish a system of five preserves in the gabbro soil formation that total 3,400 acres to protect the high concentration of State and federally listed plant species that occur in this area. About half of the 3,400 acres is existing public lands, including the lands on Pine Hill. Additional lands would be acquired in fee or protected under conservation easements with willing participants. Although the County Board of Supervisors and the El Dorado Irrigation District are currently participating in the development of this plan and recently contributed substantial funds towards the first phase of purchasing one of the preserve sites (117 acres), there are many details to be resolved regarding how all of the preserve sites will be protected and managed. These preserves would ensure at least the partial recovery of this species.

One of the five preserves is an approximately 400-acre area of occupied habitat in the southern half of the Pine Hill gabbro formation in Cameron Park. The first phase of this project, protecting 117 acres, was implemented in 1997. This was accomplished through funding provided by the federal government, CALTRANS, the National Fish and Wildlife Foundation, El Dorado County, and the El Dorado Irrigation District. In 1998 the community of Cameron Park purchased another 68 acres of habitat. This parcel is adjacent to the 117 acres owned by the BLM that were purchased in 1997. Funding for the 1998 purchase was from federal and local government sources and the parcel is owned by the County. A draft cooperative management agreement is currently being circulated among federal, state and local agencies responsible for managing rare plant habitat in western El Dorado County.

During 1997 in El Dorado National Forest, USFS staff worked to eradicate yellow

star thistle, a non-native species competing with Layne's ragwort. Also in 1997, a BLM botanist discovered a new population of Layne's ragwort in Yuba County on BLM property. Research is being conducted to compare the level of genetic diversity between populations of this species.

The USFWS released the *Draft Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills* in 1998, which addresses recovery needs for Layne's butterweed.

The status in 1999 of Layne's ragwort: ***Declining.***

Owens Valley checkerbloom

Owens Valley checkerbloom
(Sidalcea covillei)

CA - E (1979)
FED - None

General Habitat: Meadow and Seep

Owens Valley checkerbloom, a member of the mallow family (Malvaceae), is a several-stemmed, herbaceous perennial with mostly lobed basal leaves and pinkish-lavender flowers in an elongated flower stalk. This species is endemic to moist, alkaline meadows, and freshwater seeps in Owens Valley, east of the Sierra Nevada, in Inyo County.

Most of the occurrences of Owens Valley checkerbloom occur on land owned by the LADWP; the others are owned by BLM, Bureau of Indian Affairs, and private landowners. Historically, the species declined due to loss of moist habitat from groundwater pumping and water diversions. This threat has been reduced in recent years at most sites. Many populations are located in areas of livestock grazing. Studies into the effect of grazing on checkerbloom populations are needed. Moderate levels of grazing appear to be compatible with maintaining populations, particularly where livestock graze down competing vegetation. Field studies have shown that plants in grazed areas produced fewer flowers and fruits than in ungrazed areas. In areas of very heavy grazing, plants appear stunted and sometimes fail to bloom. At certain sites, moist meadow habitat supporting this species is being overtaken by an invasive peppergrass. In 1998 USFWS, in cooperation with the DFG and other participants, developed the *Owens Basin Wetland and Aquatic Species Recovery Plan*; a multispecies recovery plan for aquatic and wetland habitats in the Owens Basin, including areas supporting Owens Valley checkerbloom. The plan proposes to create an array of large conservation areas, for which management plans will be prepared to address improvement in habitat conditions for a suite of rare, endemic species found here.

The status in 1999 of Owens Valley checkerbloom: ***Stable.***

Cuesta Pass checkerbloom

Cuesta Pass checkerbloom
(Sidalcea hickmanii ssp. *anomala)*

CA - R (1979)
FED - None

General Habitat: Closed-cone Conifer Forest
Chaparral

Cuesta Pass checkerbloom is a perennial herb in the mallow family (Malvaceae), distinguished by its covering of grayish, star-shaped hairs, rounded basal leaves and deeply lobed stem leaves and pinkish-lavender flowers above broad bracts. It grows in open sites on serpentine rock and soils at in the vicinity of Sargent cypress forest. It is restricted to a small area of San Luis Obispo County on West Cuesta Ridge.

The Highway 41 wildfire of August 1994 burned tens of thousands of acres in Los Padres National Forest including the known population of the checkerbloom on West Cuesta Ridge. Prior to the fire, this population consisted of fewer than 50 individuals. Surveys in 1995 and 1996 revealed that the checkerbloom extends

throughout the Cuesta Ridge Botanical Area and beyond, including most of the serpentine soils on west Cuesta Ridge. The population boomed to tens of thousands of individuals after the 1994 wildfire.

The status in 1999 of Cuesta Pass checkerbloom: ***Stable.***

Parish's checkerbloom
(Sidalcea hickmanii ssp. *parishii)*

CA - R (1979)
FED - None

General Habitat: Chaparral
Lower Montane Conifer Forest

Parish's checkerbloom is a woody, root-crowned perennial covered with coarse, gray hairs. This member of the mallow family (Malvaceae) has rounded leaves with scalloped edges and elongated inflorescences of pinkish-lavender flowers. It grows in burned or cleared areas on dry, rocky slopes of both scrub oak and yellow pine forest communities in the San Bernardino Mountains, San Bernardino County, and in several ranges of Santa Barbara County. Most sites are on land owned by USFS.

Thirteen occurrences of Parish's checkerbloom are known, primarily from Los Padres and San Bernardino National Forests. Recent field surveys updated information on six of the occurrences in the Los Padres National Forest. All but one of these supported fewer than 25 plants, and most were threatened by road work and grazing. One population appeared to be extirpated. Parish's checkerbloom would benefit from a management plan and from studies designed to determine the effects of grazing and wildland fire suppression.

Parish's checkerbloom

The status in 1999 of Parish's checkerbloom: ***Declining.***

Kenwood Marsh checkerbloom
(Sidalcea oregana ssp. *valida)*

CA - E (1982)
FED - E (1997)

General Habitat: Marsh and Swamp

Kenwood Marsh checkerbloom, a member of the mallow family (Malvaceae), is a many-stemmed, perennial herb with deeply lobed stem leaves and dense, spike-like inflorescences of pink to mauve flowers. Only two occurrences of this California endemic are known, one in Kenwood Marsh and the other in Knights Valley, both in Sonoma County.

Both sites are located on private land and have had the natural hydrology altered and habitat eliminated by nearby housing development, cattle grazing, and agricultural practices. There are no management agreements with the private landowners. Up-to-date information and conservation actions are needed to prevent further impacts to Kenwood marsh checkerbloom and its marsh habitat.

The status in 1999 of Kenwood Marsh checkerbloom: ***Declining.***

Pedate checkerbloom
(Sidalcea pedata)

CA - E (1982)
FED - E (1984)

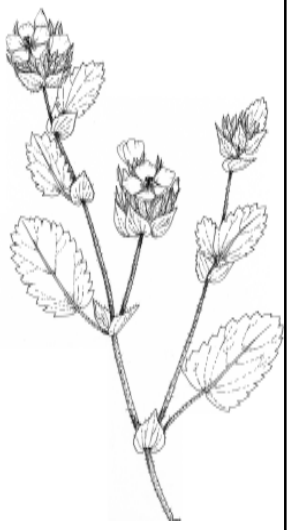
General Habitat: Meadow and Seep

Pedate checkerbloom

Pedate checkerbloom is a slender, pinkish-rose flowered perennial in the mallow family (Malvaceae). This species is restricted to moist meadows, sparsely vegetated drier meadow margins and forested areas in Big Bear Valley, San Bernardino County. A large number of endemic species occur in the area, including the State and federally endangered slender-petaled mustard *(Thelypodium stenopetalum).* Most occurrences are privately owned, although some of these are voluntarily protected through TNC's Registry of Natural Areas. The other occurrences are on property owned by the DFG, the City of Big Bear, and USFS.

Pedate checkerbloom was probably more widespread prior to construction of a dam in the 1890s that flooded much of its meadow habitat and created Big Bear Lake. The western portion of its range has been highly fragmented by urban development in the City of Big Bear Lake. Populations in the eastern portion around Baldwin Lake are in better condition. The chief threat to the species is loss of habitat from development, recreation, alterations in hydrology, intensive grazing, and excessive growth of competing vegetation. The DFG carefully monitored protected populations at the North Baldwin Lake Ecological Reserve from 1990 through 1994 and found that the numbers of adult plants and first year plants increased in years with more rainfall. WCB recently acquired a 16-acre property on the western border of the ecological reserve, which will further strengthen protection of this remarkable botanical area. Habitat protection is urgently needed for populations in the City of Big Bear Lake. Unmitigated losses of plants continue in this area. In 1997, USFWS released a draft recovery plan, which provides a strategy to address protection and recovery of the species. Additional habitat acquisition and protection is key to preventing further declines.

The status in 1999 of pedate checkerbloom: ***Stable to Declining.***



Scadden Flat checkerbloom

Scadden Flat checkerbloom
(Sidalcea stipularis)

CA - E (1982)
FED - None

General Habitat: Marsh and Swamp

Scadden Flat checkerbloom is a perennial herb in the mallow family (Malvaceae). It grows from elongated rhizomes and has basal leaves without lobes, and mauve flowers in densely branched inflorescences. It grows in a wet montane marsh habitat fed by local springs, which also supports many plants normally found at higher elevations. It is known from three small populations in Nevada County. One of the populations, in the vicinity of Peardale, is thought to have been established through transplanting. A portion of the Scadden Flat population is on a CALTRANS right-of-way. DFG has no recent information on the status of this plant.

The status in 1999 of Scadden Flat checkerbloom: ***Unknown.***

Red Mountain catchfly

Red Mountain catchfly
(Silene campanulata ssp. *campanulata)*

CA - E (1982)
FED - None

General Habitat: Lower Montane Conifer Forest

Red Mountain catchfly, a member of the pink family (Caryophyllaceae), is a short, much-branched, perennial herb with long, narrow leaves, short, glandular hairs and cream to greenish or pink flowers. It occurs on rocky, dry serpentine soils within lower montane coniferous forest and montane chaparral communities on Red Mountain and Little Red Mountain in Mendocino County. Among its associates in Mendocino County is McDonald's rock cress (*Arabis macdonaldiana)*, which is State and

federally listed as endangered. A population of Red Mountain catchfly also occurs on serpentine soils in the vicinity of Cook Springs, Colusa County.

There are fewer than 13 occurrences of Red Mountain catchfly, 3 of which were discovered on the Shasta-Trinity National Forests in 1998. It occurs on private land in Colusa County and on mining company land, public land administered by BLM and USFS, and on the DFG's Little Red Mountain Ecological Reserve in Mendocino County. Although there are no active mining claims in the Red Mountain area, all of the occurrences owned privately and by BLM are subject to mineral extraction by strip mining operations for nickel and chromium. BLM has designated Red Mountain as an ACEC and conducted studies on the population dynamics and reproductive biology of the species there. These populations continue to be monitored as part of a long-term study being conducted by CSU Sacramento, with support from BLM.

The status in 1999 of Red Mountain catchfly: *Stable*.

Tiburon jewelflower
(Streptanthus niger)

CA - E (1990)
FE - E (1995)

General Habitat: Valley and Foothill Grassland

Tiburon jewelflower is a simple to much branched, annual herb in the mustard family (Brassicaceae). The flowers with dark purple sepals and narrow, white petals with light-purple centers appear at the end of May. The long, narrow seed capsules open in late June, releasing seeds. Seedlings appear in March and April. This species grows on shallow, rocky soils derived from serpentine rock on south- or west-facing slopes within a native bunchgrass plant community. Tiburon jewelflower is known from only two occurrences on the Tiburon Peninsula in Marin County. Combined, the two occurrences of Tiburon jewelflower cover approximately 12 acres of habitat. Both occurrences are partially privately and publicly owned. This species was possibly once more widespread on the Peninsula, since other serpentine outcrop areas have been lost to residential development.

Tiburon jewelflower

In 1997, the DFG held two recovery workshops to address Tiburon jewelflower and 11 other plants known from serpentine habitats in the San Francisco Bay Area. Habitat loss to invasive species such as broom, pampas grass, and Himalaya berry, and loss of some habitat to a proposed residential development were identified as threats to the two remaining populations. The workshop identified the development of habitat management methods to increase regeneration as a primary need. In 1998, plant numbers were up significantly from 1997, a very poor year for the species. Management and recovery actions for the species have been addressed in the USFWS's *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area*, finalized in 1998.

The status in 1999 of Tiburon jewelflower: *Declining*.

Eureka Valley dune grass
(Swallenia alexandrae)

CA - R (1981)
FED - E (1978)

General Habitat: Desert Dunes

Eureka Valley dune grass is a stiff, branched, perennial member of the grass family (Poaceae). This species grows from a long, branched, scaly rhizome, which spreads through the sandy substrate. Eureka Valley dune grass is confined to a few occurrences on the active desert dunes of Eureka Valley, Inyo County. Research done under contract with the DFG, using federal Section 6 grant funds, revealed that although seed production in Eureka Valley dune grass is low and variable, seeds and

Eureka Valley dune grass

plants are long-lived.

The Eureka Dunes are part of Death Valley National Park. The native vegetation of the Eureka Dunes is threatened by expansion of Russian thistle, which became established on the dunes during the period of intense disturbance by OHVs prior to closure to such vehicles when the dunes were managed by BLM. A new, legal recreational activity, sandboarding, also poses a direct threat to the dune grass.

The status in 1999 of Eureka Valley dune grass: *Stable to Declining.*

Slender-petaled thelypodium

Slender-petaled thelypodium
(Thelypodium stenopetalum)

CA - E (1982)
FED - E (1984)

General Habitat: Meadow and Seep

Slender-petaled thelypodium, a member of the mustard family (Brassicaceae), is a much-branched biennial herb with an open flower stalk of mauve flowers. This mustard is endemic to Big Bear Valley in San Bernardino County and grows in seasonally moist, alkaline clay soils associated with seeps, springs, and meadows. A large number of endemic species occurs in the area, including the State and federally endangered pedate checkerbloom *(Sidalcea pedata).*

Slender-petaled thelypodium occurs in the north, south and west end of Baldwin Lake, Eagle Point in the City of Big Bear Lake, and Upper Holcomb Valley. Populations at the North Baldwin Lake Ecological Reserve are protected by the DFG, and Upper Holcomb Valley is a USFS-designated Botanical Special Interest Area. The Big Bear Community Services District owns several populations around Pan Hot Springs (West Baldwin) and south Baldwin Lake and has cooperated with the DFG in providing protective management for some sites. The Eagle Point occurrence occupies a seven-acre meadow-pebble plain complex within a developing housing tract, and is partially protected through an open space designation. This site represents one of the few protected habitat areas for slender-petaled mustard, pedate checkerbloom, and other rare endemics on the west end of Big Bear Valley. In 1997, USFWS released a draft recovery plan for this species, which should aid in guiding management and recovery efforts.

The status in 1999 of slender-petaled mustard: *Stable.*

Santa Ynez false-lupine

Santa Ynez false-lupine
(Thermopsis macrophylla var. *agnina)*

CA - R (1981)
FED - None

General Habitat: Chaparral

Santa Ynez false-lupine is a stout, herbaceous perennial with woolly stems and leaves and spikes of yellow flowers. It reaches a height of about six feet. This member of the pea family (Fabaceae) occurs in the Santa Ynez Mountains of Santa Barbara County. It can be seen growing in disturbed sites and openings in the chaparral, and it germinates well after fire. The occurrences are entirely within Los Padres National Forest.

There are about 10 occurrences of the Santa Ynez false-lupine; only five have been seen since 1960. According to a recent study, this species responds to fire by producing great numbers of seed and may depend on fire to maintain a sizable seed bank in the soil. Although recognized as a sensitive species, Santa Ynez false-lupine lacks active management programs.

The status in 1999 of Santa Ynez false-lupine: *Declining.*

Pacific Grove clover
(Trifolium polyodon)

CA - R (1979)
FED - None

General Habitat: Vernal Pools
Coastal Prairie

Pacific Grove clover

Pacific Grove clover is a low, annual herb in the pea family (Fabaceae). This small clover has muted purple flowers with lighter tips and occurs in moist grassland areas in the vicinity of the Monterey Peninsula.

This species is known from 13 sites on the Monterey and Point Lobos Peninsulas, sites immediately inland from these areas, and from Fort Ord. The Fort Ord populations are owned and managed by the BLM. All of the remaining occurrences for Pacific Grove clover are in private ownership. In 1997, the DFG initiated recovery activities on the Monterey peninsula for the Pacific Grove clover, in cooperation with the landowners, the Del Monte Forest Foundation, and the Pebble Beach Company. Actions include mowing and weeding to reduce competition by weedy native and non-native plants.

The status in 1999 of Pacific Grove clover: *Stable*.

Monterey clover
(Trifolium trichocalyx)

CA - E (1979)
FED - E (1998)

General Habitat: Closed-cone Conifer Forest

Monterey clover

Monterey clover is a small, low-growing, branched, herbaceous annual with wedge-shaped leaflets and small, pale purple flowers. This member of the pea family (Fabaceae) has an extremely limited distribution. It is confined to a small portion of the Monterey Peninsula in the Bishop pine/Monterey pine/pygmy cypress plant community. Nutrient-poor ancient podzol-like soils in this habitat are poorly drained and underlain with hardpan.

This species appears in large numbers only after fire burns through its habitat removing the vegetative cover. Before the 1987 fire at Huckleberry hill, Monterey clover was known only from small occurrences at the Morse Botanical Reserve and near Highway 68 in the central portion of the Monterey peninsula. In spring 1988, much larger populations were identified along Costanilla Way and Los Altos Road and in the Morse Botanical Reserve. A small number of plants were observed near Highway 68 following a fire in 1990. Surveys in 1995 identified two occurrences of Monterey clover with a total of 22 plants along Costanilla Way.

As recommended in a 1995 recovery workshop that the DFG held in cooperation with USFWS, the DFG is using federal Section 6 grant funds to investigate the potential for different management scenarios, including prescribed fire, to encourage the Monterey clover. Various management techniques were applied to clover habitat in 1998 and continue to be monitored. In the absence of fire, or a reasonable habitat disturbance alternative, this species could become extirpated and potentially rendered extinct.

The status in 1999 of Monterey clover: *Stable to Declining*.

Greene's Orcutt grass
(Tuctoria greenei)

CA - R (1979)
FED - E (1997)

General Habitat: Vernal Pools
Valley and Foothill Grassland

Greene's Orcutt grass is a pale green, hairy, tufted annual grass. This unusual member of the grass family (Poaceae) grows in the dried bottom of vernal pools of the Central Valley. It is currently found in Butte, Merced, Shasta, and Tehama counties and is believed to be extirpated from Fresno, Madera, San Joaquin, Stanislaus, and Tulare counties. Associated species in some locations include the State listed hairy Orcutt grass (*Orcuttia pilosa*), slender Orcutt grass (*O. tenuis*), San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*), and Boggs Lake hedge-hyssop (*Gratiola heterosepala*).

Over half of the nearly 40 known occurrences of Greene's Orcutt grass have been extirpated through habitat conversion to irrigated agriculture and intensive cattle grazing. It continues to be threatened by destruction of vernal pools for agriculture and urban developments. Additional threats to Greene's Orcutt grass include competition from weeds, particularly cocklebur and swamp grass or swamp timothy, and consumption by grasshoppers. Greene's Orcutt grass is particularly sensitive to livestock trampling because it germinates as the pool water is receding, whereas many other vernal pool plants are already established at this phase. Research is currently being conducted on the effects of grazing. Despite intensive surveys of vernal pools during the past 10 years, only five new occurrences have been located. Protection measures for this species should be in USFWS's *Draft California Vernal Pool Ecosystem Recovery Plan.*

The status in 1999 of Greene's Orcutt grass: *Declining.*

Crampton's Orcutt grass (= Solano grass)
(Tuctoria mucronata)

CA - E (1979)
FED - E (1978)

General Habitat: Vernal Pools

Crampton's Orcutt grass, a member of the grass family (Poaceae), is a sticky, aromatic annual grass with a dense spike of overlapping flower spikelets that emerge from the upper leaves. It grows in the clay bottoms of vernal pools of the Central Valley grassland. Crampton's Orcutt grass is known from only three locations.

Only two plants have been observed since 1987 at the site at which Crampton's Orcutt grass was first discovered, and despite extensive surveys, none have been seen in the past six years. The cause of the decline of this population is unknown; possible causes are overcollection, changes in hydrology, displacement by other species, or a combination of these or other factors. The second population, which has always been very small, occurs in Solano County on private land and has not been visited since 1992; its status is unknown. The third population occurs at a communications facility in Yolo County owned by DOD, where 10,000 plants were observed in 1993 and 2,700 in 1996, the last year for which the DFG has data.

The 1999 Status of Crampton's Orcutt grass: *Declining.*

California verbena
(Verbena californica)

CA - T (1994)
FED - T (1998)

General Habitat: Riparian Woodland

California verbena, a member of the vervain family (Verbenaceae), is a tall, perennial herb with spikes of small, light purple flowers. It is restricted to intermittent or small, perennial streams underlain by serpentine rocks within the Red Hills area of Tuolumne County. Only 10 populations of California verbena are known, all within a band approximately one-half mile wide and five miles long.

Historical placer mining activities appear to have reduced the size of several California verbena populations. Some existing populations are threatened by recreational gold mining and by livestock grazing and trampling. The greatest current threat to its survival is conversion of habitat to residential development. Tuolumne County is one of California's fastest growing counties. Seven of the populations are located on BLM land within the Red Hills Management Area, which has been designated an ACEC. The remaining three populations are on private land, including the two largest populations which comprise approximately 85 percent of the total known plants. The second largest population, at Andrews Creek, adjoins BLM land. In 1996, after a planned high-density subdivision at the Andrews Creek site was blocked in the courts, a previously county approved development with 38-acre lots became effective. Current zoning allows two residences to be built upon each of these lots. In 1997, after the DFG and BLM effort to purchase and add it to the Red Hills Management Area were unsuccessful, access roads for the development were built. There is great concern that the development will threaten the California verbena and many other rare species at the site through habitat destruction and fragmentation, groundwater depletion, decline in groundwater quality from septic system leachate, and livestock trampling. A major concern is that residential wells could lower the water table and dry up the moist areas that support California verbena at this site.

The status in 1999 of California verbena: *Declining*.

Big-leaved crown-beard
(Verbesina dissita)

CA - T (1990)
FED - T (1996)

General Habitat: Coastal Scrub
Chaparral

Big-leaved crown-beard

Big-leaved crown-beard is a semi-woody, perennial shrub in the sunflower family (Asteraceae). It grows up to three feet tall and bears terminal clusters of bright yellow flowers. This species occurs primarily on steep, rocky, north-facing slopes within 1.5 miles of the ocean in a maritime chaparral plant community. The densest populations are found on shaded slopes under a layer of shrubs. Native occurrences of big-leaved crown-beard are in two widely disjunct areas. In California, this species is restricted to a few canyons in southern Laguna Beach, Orange County. It also occurs in Baja California Norte approximately 90 miles south of San Diego. Slash and burn practices and resort and residential development have impacted Baja populations.

In California, only two populations exist. They are located two miles from each other and cover between 20 and 25 acres. The primary threat to big-leaved crown-beard is destruction and modification of its habitat. In California, small-scale residential development continues to destroy and fragment suitable habitat. Other threats are grading, fire break maintenance, and vegetation fuel clearance zones.

The status in 1999 of big-leaved crown-beard: *Declining*.