

**RARE PLANTS
OF SAN DIEGO COUNTY**

by

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Copyright July 2001*

*Aquafir Press
2001 edition*

San Diego County's rapidly diminishing native vegetation includes an extraordinary number of rare or uncommon plant species. The varied geology of the region and unusual edaphic factors account for much of this diversity which is bolstered by relictual Sierran elements found in the mountains, typical Baja species with ranges extending north of the border, and a wide array of plants occupying unusual microhabitats in the Anza-Borrego Desert. This present work attempts to compile as much available site information as possible for over three hundred species that are generally considered sensitive by local, state, and federal agencies.

A wide variety of resources were utilized and information has been compiled in a cumulative fashion over a quarter century. During this period the following biologists have graciously provided significant information concerning their own field experiences: Kara Altwater, Ellen Bauder, Mitch Beauchamp, Ellen Berryman, Roxanne Bittman, Steve Boyd, Dave Bramlet, John Brown, Tim Cass, Duffie Clemons, Vince Coleman, Mike Curto, Jim Dice, Richard Felger, Judy Gibson, Patricia Gordon-Reedy, Antonette Gutierrez, Dylan Hannon, Bruce Hanson, Holly Henderson, Bonnie Hendricks, Larry Hendrickson, Kyle Ince, Navroop Jassal, Diana Jensen, Eric Jonsson, Robin Knehr, Dawn Lawson, Vanessa Lee, Geoff Levin, Eric Lichtwardt, Maggie Loy, Marcia Mann, Karlin Marsh, Dave Mayer, Barbara Merkel, Keith Merkel, Reid Moran, Tom Oberbauer, John Rebman, Alaina Reiser, Elaine Reiser, Evan Reiser, Steve Rink, Fred Roberts, Andrew Sanders, Mark Skinner, Fred Sproul, Colin Steele, Janet Stuckrath, Gary Suttle, Larry Sward, Gilbert Voss, Peter Warren, Carl Wishner, Rachel Woodfield, Julie Vanderweir, Howie Wier, and Rick York.

These invaluable recollections have been supplemented by extensive botanical field work in southern California (1975-2001). The latter includes site visits and follow-up biological survey reports (primarily from 1987-2001 as a biological consultant) for approximately 700 separate locales covering well over 300,000 acres in this region. These reports were typically prepared for California Environmental Quality Act (CEQA) documentation. Field work, performed at various seasons, generally required a floristic census of the site as part of the standard report methodology. Rare plant searches were a focus of such field censuses. Included here was a comprehensive botanical survey over a three year period of 125,000 acre Camp Joseph Pendleton in northwestern San Diego County; as well as extensive field work conducted on the 23,000 acre Otay Ranch near the Mexican border. A vegetation community mapping project for approximately 1.3 million acres of western Riverside County also included substantial field work and yielded information about range extensions into that region. Most large tracts of land in coastal portions of San Diego County were sampled during various surveys. Unfortunately, these activities strongly correlated with proposed development and underscored the trend towards massive losses of native habitat and consequent losses of sensitive plant populations. Also compiled over the last twenty-five years was a photographic flora covering most of the approximately 1600 native plant species and almost all of the CNPS designated sensitive plant species for the County which are discussed within this work.

Also utilized were numerous historical site reports compiled by various other biologists, the California Natural Diversity Data Base (CNDDB), and the herbarium at the San Diego Natural History Museum. The last mentioned was regularly scoured for significant details regarding rare plant information. An attempt was made to weed out spurious reports and misidentified herbarium specimens which might skew an objective assessment of a species' current status. Some plants have ranges strongly correlating with areas now urbanized, and an effort was made to comment upon clusters of historical sightings which might represent locales where the native vegetation is no longer extant.

Organization of this work has several parameters necessitating discussion. All sites mentioned have been visited by the author, except those specifically prefaced with a term denoting that a rare plant population was not seen. Hence, all "reported" sites have been culled from other sources which are presumed to be accurate, but which were not independently verified. While this general methodology can result in the redundant use of several terms, this was considered the most pragmatic way to clearly separate out rare plant sites discovered or re-examined and presumed extant, and those reports which may have inherent problems (*e.g.*, extirpated sites which have long since ceased to harbor sensitive plants, sites which may represent misidentifications based on outdated taxonomic keys, or reports which may contain erroneous or overgeneralized locality information). "Herbarium" specimens usually refer to pressed plants kept in the collection at the San Diego Natural History Museum, which were examined at that facility. Unfortunately, time constraints would not allow me to cite specific collection numbers; other than to note for purposes of range information, southernmost collections from Baja California.

An additional reason for some redundancy was to consistently maintain comparative assessment terms from one species' discussion to the next; particularly under the "Status" section. "Stable" implies that population numbers overall are static or may be slowly diminishing, but for which the vigor of the cumulative populations is not immediately imperiled. "Presumed stable" is regularly used for species in mountain, desert, or transmontane areas with limited ongoing development, for which little new data is available, but for which such an assessment may be inferred. "Declining" implies that a noticeable and significant reduction in numbers is evident, and for which the perceived reduction is apparently a trend which cannot bode well for the future of this species in San Diego County. "Severely declining" constitutes a red flag which will require proactive remedies to counter. A handful of other (hopefully self-explanatory) adverbs are utilized as variants. "Unknown" indicates there is a dearth of information on the status of this species in San Diego County, and a more subjective assessment would not be productive. As a general rule it should be stated that information for species with predominantly coastal ranges, far exceeds what is available for montane and desert species. Hopefully this work will focus attention on specific plant taxa which warrant substantially more field research.

Plants are arranged alphabetically by scientific name, but include the common name given by the CNPS to these often uncommon species. CNDDDB information is current as of the 2000 CNPS Inventory. It is recognized that state and federal listings will invariably change as more information is gathered. Future plans call for an "electronic" system in which an updated plant status can be accessed or altered within the State database system at any time. This avoids the cumbersome annual or semi-annual updates of the past, but ironically, it implies data may be outdated immediately after it is accessed. Such a system can antiquate listing information presented in this work, and readers are urged to stay abreast of such changes via communications with the Sacramento database.

Soils information is cursorily taken from the U.S. Soil Conservation Service's 1973 work covering San Diego County. No attempt was made to comprehensively research all locales, only to choose typical sites and supply some initial soil information. Future versions of the current work should attempt to refine the soils analysis by listing prevalent versus secondary soil types utilized by specific rare plant species. Soil analysis is considered critical for refining our understanding of the microhabitat preferences of many of the species noted in this work. This detailed chemical information, in concert with slope preferences and elevational information could revolutionize the ability to restore habitat for many sensitive plant species. County range maps and color plates illustrating many of the rare plants in flower are proposed for a future CD version of this book.

An attempt was made to provisionally summarize the status of San Diego County's rare plants in Baja California (within a paragraph separated from the general site information). This information relies primarily on a number of herbarium specimens collected at the San Diego Natural History Museum (fewer total collection numbers typically indicating greater rarity); as well as a latitude for the southernmost locale represented. The incomparable Reid Moran has field collected the majority of these specimens. Forays by the author into northern Baja California are appended to this information. It should be understood that vast areas of Baja California have only been superficially examined by botanists. The goal of this added information is to indicate which San Diego County plant species may also be extremely rare in Mexico, not to designate which "sensitive" species can be disregarded in the U.S. because they are more common elsewhere. Development of northern Baja California is already preceding along the lines of southern California in earlier parts of the last century, with widespread destruction of habitat for agriculture and orchards, and substantial beach bluff residential development. Given similar development pressures, species greatly reduced in historical numbers in the U.S. may decline for similar reasons in Baja California. In some cases, particularly in regard to beach dune habitat, this is already happening.

Goals for future editions of this work include an entomological component. This could ultimately include listings of primary insect pollinators for each sensitive plant species; as well as insects that use these specific species as primary host plants. The slurry of factors leading to plant rarity in general needs to be addressed within a broader context of inter-relationships that includes animal life histories, historical weather patterns, subtle but ongoing changes in topography, and soil preferences. In fact, an astonishing amount of information is still to be learned that will not fit within a mere lifetime.

San Diego County has gone from a population in 1900 of approximately 35,000 people, to a population in 2000 of greater than 2.8 million people. An alarming trend at the end of the 20th century was the proliferation in San Diego

County of regional multi-species habitat conservation plans that made unsubstantiated and in some cases spurious claims concerning the conservation of specific sensitive plant species. Particularly egregious was the tendency to cite the protection of a handful of reputedly large and well protected populations as a rationale for the potential "take" of any other populations. In general, such blanket statements may 1) be based on minimal or no biological data whatsoever to support assumptions on the long-term vigor of the handful of protected populations; 2) not take into account the genetic variability associated with the range of individual species; 3) ignore the possibility historical reports only address a small portion of a rare plant population because additional plants occur on adjacent unexamined properties; 4) treat flowering plants as if they were truly mobile animals that could expand along narrow wildlife linkage corridors of varying and potentially unsuitable habitat; and, 5) ignore the potential adaptability of very different plant species by utilizing a one-rule fits all format for determining survivability expectations. Torrey Pine populations can not be assessed and recommendations for conservation made using the same criteria as for the annual San Diego Thorn-Mint. Such programs can represent the worst sort of biological negligence. Given such misuse or potential misuse of limited historical information, I have strenuously avoided placing population numbers on individual reports. Such numbers are often subject to seasonal and yearly variability, depend on the varying skill levels of field botanists, and may clearly misrepresent the character of a specific population by reporting huge numbers of annuals that actually are concentrated in surprisingly small areas readily subject to minor stochastic events. While numbers may ultimately need to be considered in order to make long-term protection plans, I have no intention of supplying fodder for decisions that rely on inadequate information. The only ethical solution for long-term planning is to do legitimate and thorough studies -- on a species by species basis -- that include field work to revisit reported sites during seasonally optimal conditions for observation. Subsequently, recommendations for protection should address the unique characteristics of each species, should err on the conservative side, and should provide an objective scientific analysis that is independent of political remedy.

It should also be underscored that recommendation statements given in this work are advisory and based on my own potentially fallible judgment. Vocabulary definitions are sometimes clearly too vague to make practical decisions. For instance, protecting "significant proportions of larger populations" would require legitimately determining via research what is a large population, and what is a significant proportion of that population. Pragmatically this may equate with requiring the U.S. Fish and Wildlife Service and/or the California Department of Fish and Game to fund scientific studies on a species by species basis for those plants most at risk. What clearly is intended is a reliance on scientific substance.

Despite obvious shortcomings, it is hoped this work will provide some needed refinement for assessing specific sensitive plant resources in the region. Adios... craig reiser... July 1, 2001

RED SAND-VERBENA [*Abronia maritima* Nutt. ex Wats.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-2
State/Fed. Status -- None NYCTAGINACEAE Feb.-Nov.
Global Rank G3? State Rank S3?
- DISTRIBUTION:** San Diego County, Orange County, Los Angeles County, Santa Catalina Island, San Clemente Island, San Nicolas Island, Santa Cruz Island, Santa Rosa, Anacapa Island, San Miguel Island, Ventura County, Santa Barbara County, San Luis Obispo County; Baja California
- HABITAT:** This fleshy herbaceous perennial grows in prostrate mats on well developed beach dunes. It occurs optimally on semi-stabilized dunes away from the heavy foot traffic of humans which has severely degraded habitat on most of the southern California beaches. Possible Associates: *Abronia umbellata*, *Camissonia cheiranthifolia*, *Ambrosia chamissonis*. A few sensitive invertebrates such as the Globose Dune Beetle (*Coelus globosus*) may be associated with thickets of sand-verbena.
- KNOWN SITES:** In San Diego County this plant still occurs in some numbers on the hummocky back dunes north of the Tijuana River where a preservation plan is helping to expand its numbers. It also is well distributed in protected locales at Border Field State Park, near the mouth of the San Dieguito Lagoon, and near the mouth of the Santa Margarita River. It is localized on sandy hummocks at the southern end of the Silver Strand in some of the last remaining well preserved beach dune habitat left in the County. This species is now quite uncommon along the beaches of Camp Pendleton, such as near Las Flores. Herbarium specimens examined from San Diego County are from Solana Beach, San Onofre Bluffs, Agua Hedionda Lagoon, Ocean Beach, and Coronado. Old reports are from Cardiff, Torrey Pines Beach, Mission Beach, and a site north of Via de la Valle and west of El Camino Real. Also noted in the herbarium are specimens from four of the Channel Islands; El Segundo in Los Angeles County; Port Hueneme in Ventura County; 14 miles north of Santa Barbara, Guadalupe, and Surf in Santa Barbara County; and Oceano and Morro Bay in San Luis Obispo County. Roberts reports this species for coastal Orange County. Raven reports this species for Los Angeles County along the coast of the Santa Monica Mountains -- occurring in local colonies from Point Dume west. Smith reports this sand verbena in the Santa Barbara area as commonly scattered on the upper beaches and ocean dunes as well as on all four of the Channel Islands. Hoover reports this plant in San Luis Obispo County from Piedras Blancas Point where possibly of hybrid origin, and abundant from just north of Morro Bay southward (Oso Flaco is also a reported site).
- Collected south in Baja California to 24° 9' North on the southwestern corner of Cerralvo Island by Moran (SD 66497). There are 36 specimens deposited in the San Diego Natural History Museum's herbarium from Baja California; as well as three from Sonora, Mexico. Many of the specimens are from islands located off the Baja Peninsula such as San Martin, Natividad, Isla Salsipuedes, Magdalena, Isla San Jose, Catalina, San Francisco, and Tiburon.
- STATUS:** Red Sand-verbena is substantially declining in coastal southern California. This beach-dwelling species has been severely impacted by the millions of beachgoers who pursue recreational activities along the California beaches. It is generally only stabilized in protected locales which are closed or have constraints on public access. Munz notes that this deep red-purple flowering species hybridizes with both the pink-petaled *Abronia umbellata* and the yellow-petaled *Abronia latifolia*. All substantial colonies of this species should be protected. It is regularly re-introduced into appropriate habitat which has been fenced; it is an appropriate species for re-introduction at many beach locales in southern California with appropriate design precautions. Efforts should be made to protect the genetic integrity of small, isolated plant populations along the southern beaches. For instance, material from San Luis Obispo County that could carry *A. umbellata* traits, may be inappropriate for re-planting at beach restoration sites in distant San Diego County where the yellow-flowered *A. umbellata* may never have occurred naturally.

FOOTHILL SAND-VERBENA [*Abronia villosa* S. Watson var. *aurita* (Abrams) Jepson]

- LISTING:** CNPS List 1B R-E-D Code 2-3-3
State/Fed. Status -- None NYCTAGINACEAE Mar.-Aug.
Global Rank G5T3 State Rank S3.1
- DISTRIBUTION:** San Diego County, Riverside County, Orange County
- HABITAT:** This showy annual grows in sandy floodplains or flats in generally, inland, arid areas of sage scrub and open chaparral. Soils are mapped as Riverwash at a site north of Fallbrook in the bed of the Santa Margarita River. In the Garner Valley of the San Jacinto Mountains it occurs near conifers in sandy, outwash floodplains. Possible Associates: *Croton californicus*, *Camissonia bistorta*, *Lotus heermannii*.
- KNOWN SITES:** Scattered plants occur on sandy benches on the Santa Margarita River near De Luz Road and Fallbrook. West of Aguanga near the highway turnoff to Anza in western Riverside County, Foothill Sand-verbena is occasional on broad, sandy plains. In the Garner Valley this annual is sporadically distributed in areas of ranch-style homes along a number of sparsely vegetated drainages where pockets of sand accumulate; as well as nearby in sandy openings in dry coniferous forest. A population was observed in the creekbed at Temescal Canyon, not far from Alberhill and the freeway. Herbarium specimens were examined from near Lake Elsinore, as well as the north side of Hemet Valley. Sanders notes it is associated with the outwash plain of the San Jacinto River in the vicinity of Hemet and San Jacinto.
- STATUS:** This sand-verbena has relatively restrictive microhabitat requirements that limit its distribution. While it can be locally common, available sandy bottomland habitat is comparatively limited in cement flood-channelized southern California. Significant portions of all larger populations are recommended for protection. During the past several hundred years, active flooding would have temporarily opened up new habitat for this species, and Foothill Sand-Verbena may have expanded and contracted its local populations in concert with the flooding cycles. Seed would have been dispersed downstream during major storms onto newly established sandy alluvial benches. However, the restriction of a flood regime by dams and other regional flood control measures, may now deter its population expansion. Moreover, populations can still be locally extirpated during major storm events, without the option of re-establishment nearby and downstream where habitat options may now be poor. Sanders reports that the variety *pinetorum* in Garner Valley is not necessarily synonymous with variety *aurita*, and needs taxonomic clarification. Foothill Sand-Verbena is most closely related to the widely dispersed *Abronia villosa* variety *villosa*, a desert subspecies, and may have shared an ancestral desert origin. A number of desert species have pioneered the arid coastal plain, presumably entering through the San Geronio Pass or similar natural passageways that at least historically provided suitable habitat linkages. Geographic isolation following initial immigration into the region might partly account for its origin and present limited distribution.

PALMER'S INDIAN MALLOW [*Abutilon palmeri* A. Gray]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None MALVACEAE Apr.-May
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Riverside County; Arizona; Sonora and Baja California, Mexico
- HABITAT:** This perennial shrub is woody primarily at the base; and occupies dry, generally east-facing rocky slopes in Sonoran Desert Scrub. Possible Associates: *Pleucocoronis pluriseta*, *Horsfordia newberryi*, *Salvia eremostachya*.
- KNOWN SITES:** Palmer's Indian Mallow has been reported from only a few locales in San Diego County at Potrero Canyon, the Inner Pasture area at the base of the Laguna Mountains, and the hills south

of Vallecito Stage Station. A herbarium specimen was seen which was taken from between Shaw Canyon and Potrero Canyon. It is also reported from the Chuckwalla Mountains of Riverside County. Additional herbarium specimens were examined from the La Abra Valley in Pima County, Arizona; and from Sinoloa and Sonora in mainland Mexico. Reported by Felger & Lowe from Tiburon Island and San Pedro Martir Island in the Gulf of California. Unpublished notes by S. Boyd mention a collection from Corn Springs in Riverside County.

Thirty-six specimens from Baja California are found at the herbarium of the San Diego Natural History Museum. It was collected as far south as near Rancho Las Cabras at 23°26' North where collected by Moran (SD 51178).

STATUS: This mallow may be more common than collections suggest. Its rugged habitat on rocky desert slopes is relatively poorly explored; and the species in southern California is at the northwestern end of its much broader range. Rarity is regional rather than global; as evidenced by the relatively high number of collections in Baja California. Some sites in Riverside County and San Bernardino represent recent horticultural introductions. Given its apparent rarity in the region, all U.S. populations should be protected. Palmer's Indian Mallow should be carefully differentiated in the field from other shrubby desert mallows such as *Hibiscus denudata*, *Horsfordia newberryi*, and *Sphaeralcea ambigua* that may grow in a similar habitat. See the line drawings of each in the Jepson Manual for leaf differences.

SWEET ACACIA [*Acacia farnesiana* (L.) Willd. var *farnesiana*]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None FABACEAE Jan.-Mar.
Global Rank None State Rank None

DISTRIBUTION: San Diego County; Arizona; Baja California, Mexico

HABITAT: In Chollas Creek this small tree is found on a sandy alluvial embankment with large cobbles, adjacent to a seasonally dry creek bed and surrounded by Diegan Coastal Sage Scrub. In northern Baja California these small trees are established on open slopes with a light sage scrub vegetation and a surficial, rocky substrate. Possible Associates: *Baccharis sarothroides*, *Baccharis salicifolia*, *Sambucus mexicana*.

KNOWN SITES: A lone tree is growing in Chollas Creek just east of Kelton Road and south of Highway 94. One small shrub was reported in the Tijuana River drainage east of Dairy Mart Road, and represents a washdown element from across the border. The Montgomery Park site has been extirpated owing to an urban planning error; an historical report from the northern banks of the San Dieguito River near Via de la Valle cannot be relocated. A small population is found in a canyon drainage south of the Otay River, east of the 805 Freeway, in a residential development called Dennery Ranch. This population, which is imperiled by nearby Year 2000 housing construction, begins near the toe of the north-facing slopes and meanders approximately fifty yards upstream. Seed from these plants is reportedly being propagated for planting at the California Terraces Mitigation Project. Reported by Shreve and Wiggins in Pima County, Arizona. Sweet Acacia is native from western Florida to southern Texas; as well as being found in southern Arizona.

Twelve specimens from Baja California are deposited in the San Diego Natural History Museum's herbarium; south to near the tip of the peninsula at 23° North latitude. It is well distributed in mainland Mexico. Three small shrubs grow on a rocky hillside overlooking Rodriguez Dam east of Tijuana, Mexico; numerous others are scattered in the barren hills to the northeast. Sweet Acacia is also known from tropical America.

STATUS: The Sweet Acacia is almost extirpated as a native plant in California. Taxonomic concerns still surround the identity of the San Diego County and northern Baja California trees. Some

reputable botanists still maintain this population is best referred to *Acacia minuta* (M.E. Jones) ssp. *minuta*, the Coastal Scrub Acacia, and is native to the region. Although there is some doubt about whether the species is native or introduced, many shrubs immediately south of the U.S. border occupy relatively undisturbed habitat, and do not appear to be introduced. If not a distinct regional species, the Sweet Acacia's rarity is local and not global. If it is a distinct species, it is close to extirpation in the United States. Given this uncertainty, and until it can be shown conclusively it is not native to the region, all remaining San Diego County populations should be protected. The long (4-8 cm) pods and array (10-25 pairs on the pinnae) of tiny leaflets are quite distinctive; and this large shrub should not be confused in the field in southwestern San Diego County with any other native species.

SAN DIEGO THORN-MINT [*Acanthomintha ilicifolia* (Gray) Gray]

- LISTING:** CNPS List 1B R-E-D Code 2-3-2
State/Fed. Status -- CE/FT LAMIACEAE Apr.-Jun.
Global Rank G1 State Rank S1.1
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Grassy openings in the chaparral or sage scrub with friable or broken clay soils are the preferred habitat of this species. These small clay lenses may be associated with Las Posas or San Miguel-Exchequer soils. Typically, the microhabitat favored by San Diego Thorn Mint is quite distinctive. Only spring annuals, bulbous perennials, and a few herbaceous elements are found with this small, but colorfully flowering annual. The introduced *Centaurea melitensis* often grows with the thorn mint, and spiny and superficially similar seedlings of *Centaurea* can make a quick census for the mint difficult. All sites examined have a crumbly and/or deeply fissured soil which noticeably compresses, even during the dry season, when one treads nearby. Possible Associates: *Sisyrinchium bellum*, *Bloomeria crocea*, *Convolvulus simulans*. Grass runways created by the California Vole (*Microtus californicus*) may occur in areas of bunchgrass (*i.e.*, *Nasella pulchra*) and San Diego Thorn Mint.
- KNOWN SITES:** Known populations of San Diego Thorn Mint are typically small. Extant colonies are found in Mission Trails Park on a proposed Jackson Drive alignment, on the northern bluffs of Poggi Canyon east of the 1991 terminus of Orange Avenue (an eastward extension is proposed), west of the Las Brisas Mobile Home Park, north of Mustang Country Road in Alpine, and at several locations near the summit of McGinty Mountain. A large population with extensive habitat was found south of Poway Road and east of Interstate 15 near an abandoned wastewater treatment plant, but was heavily impacted by a haul road virtually bisecting the site in early 1989. A new site was reported 1 mile south of the community of Suncrest in a broad native grassland on a plateau overlooking the Sweetwater River. A population on a barren hillside north of the eastern arm of Lower Otay Reservoir was found in 1990; a second population was reported from a nearby hillside to the north. West of Rolling Ridge Road and just south of Proctor Valley Road near Chula Vista, a population of several hundred plants was observed in 1994 with some thornmints growing to twenty-six inches in height. Also, reports are of San Diego Thorn Mint isolated within a residential development in Rice Canyon, Chula Vista; east of Victoria Lane and north of Otto in Alpine; south of Pomerado Road in southeastern Poway; near Black Mountain Road; at the Carillo Ranch near El Fuerte Street in Carlsbad; near Lone Jack Road in Olivenhain; a site near South Grade Road and Interstate 8 in Alpine, and the California Terraces Mitigation Project on Otay Mesa. An old biological survey report notes a site near Black Mountain Road and south of Horseman's Park. Herbarium specimens at the San Diego Natural History Museum record occurrences at an old burn on Poway Grade, near vernal pools by Las Posas Road in San Marcos, near the Carlsbad Raceway in San Marcos, at Bonita, a slope at the mouth of Mahogany Canyon, the mouth of Alvarado Canyon, in the Merriam Mountains southeast of Twin Oaks Valley, north of San Diego State, on Viejas Grade at Poser Mountain, at Encinitas Heritage Park, at La Mesa Springs, west of Interstate 15 near Black Mountain Road on the Alva Ranch, at the Junction of 6th Street near the junction of

Highway 395, the junction of Encinitas Road and Rancho Santa Fe Road, and 4 miles south of Vista. Very old collections (from herbariums outside the County) include a dry hillside near El Nido, a field near Sweetwater, University Heights, Mission Valley, 0.5 mile east of San Diego State, a mesa 2 miles west of San Diego State, in Spring Valley, Chollas Mesa, Paradise Valley in National City, and a dry hillside near Bernardo. CNDDDB records note sites north of Lusardi Creek and over a mile from the confluence of San Dieguito River, 0.25 mile northwest of the mouth of Mission Gorge, north of La Moree Road and south of Highway 78 east of San Marcos, 0.5 mile south of the San Dieguito River near Artesian Road, 0.7 mile east of Rancho Santa Fe Road and Avenida Esteban, 1 mile east of Rancho Santa Fe Road near Desert Rose Way, on Viejas Mountain, the southwestern corner of Linda Visa Street and Bent Street in San Marcos, east of Carlsbad 0.25 mile west of Letterbox Canyon and 0.7 mile east of Evans Point Peak, 0.6 mile southwest of Rancho de Los Quiotes near El Fuerte Street, at the mouth of a canyon south of Proctor Valley Road west of Upper Otay Reservoir, at the corner of La Mirada Drive and Pacific Street in San Marcos, north of Los Peñasquitos Creek near an overlook for the Peñasquitos Canyon Park's small waterfall, the southeast corner of the junction of La Costa Avenue and Rancho Santa Fe Road, near Rancho Bernardo 1.5 mile west of Interstate 15 and above Thornmint Court, on a ridgeline at Lux Canyon in Encinitas, and near Mission Gorge by Colina Dorado Street and Tierra Santa Boulevard. A site east of Twin Oaks Valley north of San Marcos in the Merriam Mountains is apparently no longer extant. The species is now likely extirpated at many of these historical sites. A small site is found in a grassy opening on the southern flanks of Poser Mountain. During 1999 a population of perhaps a hundred plants was observed at the edge of the previously known range about a mile and a half northeast of Spangler Peak and three quarters of a mile northwest of the Bassett Ranch in the southwestern corner of Section 19 near the San Vicente Valley. The site lies in an isolated grassy opening on a steep east-facing chaparral slope west of the bend in Vista Ramona Road. Another reported site on the periphery of the range, is on a ridgeline north of Longs Gulch, on the knoll west of the 1405' summit marked on the El Cajon Mountain Quadrangle. The entire knoll here consists of the friable clays associated with the thornmint. Recent CNDDDB reports are from Emerald Heights Residential Development in the Merriam Mountains of San Marcos, Stagecoach Ranch between Tavern Road and South Grade Road in Alpine, south of Slaughterhouse Canyon .5 mile west of Highway 67 in Lakeside, adjacent to Sycamore Canyon Park .7 mile NNW of Goodan Ranch, north of the Sweetwater Reservoir, northeast of junction of Palomar Airport Road and El Camino Real, .7 mile east of Rancho Santa Fe Road in Brighton Homes Development in Olivenhain, .4 mile northwest of mouth of Mission Gorge, and northeast of the Gooden Ranch in Sycamore and Slaughterhouse canyons.

Collected south in Baja California to 30° 39' North on a ridge 6 mile northeast of Las Escobas by Moran (SD 951509). San Diego Thorn Mint is lightly collected with 11 Baja specimens deposited in the San Diego Natural History Museum's herbarium.

STATUS: San Diego Thorn Mint is substantially declining; many historical populations are extirpated and many extant sites are imperiled by urban pressures. This species may be difficult to detect in the fall and winter unless one is familiar with its distinctive microhabitat. These often tiny plants remain rigid and retain their distinctive shape (particularly their box-like enclosure of spiny bracts) well into the dry season. While this annual can be raised from seed, suitable friable clay microhabitats are quite uncommon and place strict limitations on establishment of new populations. Given the very small total area utilized by a typical population, and the tenuous long-term prognosis for such limited microhabitats in a heavily urbanized region, existing smaller sites with under 100 plants flowering in a typical rainfall year would strongly benefit from fencing as protection from human incursions. All larger populations should be fully protected by significant biological buffers. Given the current scattered populations on the coastal plain and in the lower foothills, it is presumed this species was once much more common two hundred years ago; and its current plight is the result of urban sprawl and continued urban infill development. Regionwide open space designs often ignore the significance of now isolated and still undeveloped enclaves of native vegetation on the coastal

plain; and their overall designs have a decidedly zoological focus meant to connect larger tracts of mammal or avian habitat. Oftentimes such designs ignore the distribution of rare coastal plant species; and can be negligently exclusive.

SAN DIEGO COUNTY NEEDLEGRASS [*Achnatherum diegoense* (Swallen) Barkworth]

- LISTING:** CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- None POACEAE May-Jun.
Global Rank G3 State Rank S3.2
- DISTRIBUTION:** San Diego County, Santa Cruz Island, Anacapa Island, Santa Rosa Island, San Miguel Island, San Nicolas Island; Baja California, Mexico
- HABITAT:** Chaparral and Sage Scrub ecotone is utilized by this robust perennial bunchgrass. The soil on McGinty Mountain is mapped as Las Posas stony fine sandy loam; populations elsewhere sometimes occur on San Miguel Exchequer rocky silt loams. This needlegrass is closely associated with metavolcanic soils. Possible Associates: *Viguiera laciniata*, *Salvia munzii*, *Solanum tenuilobatum*.
- KNOWN SITES:** This is a quixotic bunchgrass found in coastal sage scrub in southwestern San Diego County. A healthy population grows on the lower slopes of McGinty Peak. It is also seen south of Lower Otay Lake, and on hillsides west of Spring Canyon on Otay Mesa such as south of SR 905 and west of Otay Mesa Road. It grows on reddish metavolcanic soils west of Rolling Ridge Road and south of a sharp bend in Proctor Valley Road near Chula Vista. Old reports are from Proctor Valley and Lee Valley. Reports of substantial populations come from the Jamul Mountains. Limited plantings are being proposed for mitigation sites in Wolf Canyon north of Otay Valley. There are also reports of extensive populations on the Channel Islands which have heretofore gone unnoticed. Given this unusual disjunction, these plants should be carefully compared with those from southern San Diego County; they may comprise a different species or closely related subspecies.

Eleven specimens for Baja are found in the San Diego Natural History Museum's herbarium. It is recorded as far south as 30° 27' North where it was collected by Moran (SD 100745) on a rocky slope at Agua de Tanilo. It was seen growing on a hill overlooking Rodriguez Dam east of Tijuana, Mexico, intermixed with both *Nassella lepida* and *Nassella pulchra*. At this locale all three species were in seed and quite distinct, with the leaf blades of *N. lepida* noticeably narrower than the other two species. Also, the strongly twice bent awn of *A. diegoense* was very distinctive (see below).

- STATUS:** San Diego County Needlegrass, formerly included in the genus *Stipa*, is slowly declining on the periphery of urban expansion, and is likely to sustain more impacts in the 21st century as the southern foothills receive development pressures. When not in seed, it is only with extreme difficulty that this grass species is distinguished from other related bunchgrasses in the field. Coastal hillsides in Chula Vista, Otay Valley, Jamul, and San Ysidro should be carefully scrutinized for this species. Fall and winter surveys in these areas may miss this cryptic grass that can mimic the common *Nassella pulchra*, *Nasella cernua*, and *Nassella lepida*. The awn of San Diego County Needlegrass is strongly bent twice and shaped like a flat-topped mesa with two diagonal sides, unlike these three *Nasella* species. *Nasella pulchra* has a much longer awn (6-9 cm versus 2-3 cm), *Nasella cernua* has a long wavy awn (6-9 cm), and *Nasella lepida* has a similar short but zigzagging awn. In addition, the panicle is substantially more contracted and not as open in San Diego County Needlegrass. Additional field collection data is needed for southwestern San Diego County, to more accurately determine its local rarity. Provisionally, all sizeable populations should be protected, and substantial portions of smaller populations are recommended for biological open space. The present day rarity of this species is attributed to its preference for metavolcanic derived soils that are in naturally limited supply locally.

CALIFORNIA ADOLPHIA [*Adolphia californica* Wats.]

- LISTING:** CNPS List 2 R-E-D Code 1-3-1
State/Fed. Status -- None RHAMNACEAE Dec.-Apr.
Global Rank G3 State Rank S3.1
- DISTRIBUTION:** Coastal San Diego County; Baja California, Mexico
- HABITAT:** This short spiny shrub is often intermixed with Diegan Coastal Sage Scrub, but occasionally occurs in peripheral chaparral habitats, particularly hillsides near creeks. The California Adolphia (sometimes called California Spinebush) is usually associated with xeric locales where shrub canopy reaches four or five feet in height. During late summer and fall it may be virtually leafless, and therefore not readily apparent from a distance; however, its spiny stems are noted at close range. The San Miguel and Friant soils are both quite amenable to California Adolphia. Possible Associates: *Ferocactus viridescens*, *Artemisia californica*, *Nasella lepida*. Presence of California Adolphia strongly correlates with presence of the Federally Threatened California Gnatcatcher (*Polioptila californica*) so long as a suitable tract of sage scrub is present to comprise a breeding territory.
- KNOWN SITES:** California Adolphia is still found at a variety of coastal San Diego County locales. Substantial populations occur south of Del Dios Highway and 1 mile southwest of Lake Hodges Dam on steep north-facing slopes, and on south-facing slopes of Escondido Creek east of Lake Val Soreno. A very extensive colony with over 1000 shrubs was found in 1990 near the Inspiration Point Cross north of the Questhaven Retreat. One of the largest sites noted is a football field sized colony almost entirely composed of *Adolphia* upstream of the Sweetwater Reservoir, south of the old wooden bridge, on the south side of the river. Several thousand are also found across the river and just upstream where they are a dominant element within the sage scrub. Scattered sites are in the hills south of the Sweetwater Reservoir and on the flanks of Mother Miguel Mountain. Other large populations occur on a west-facing slope east of Saxony Road near Batiquitos Lagoon; on the northern flanks of Escondido Creek southeast of Paint Mountain Road; as well as on the south-facing slopes of Escondido Creek east of Vista Canon Road. Many colonies of *Adolphia* occur in the finger canyons in the northern portions of the Peñasquitos Canyon Preserve, west of Park Village Drive, and east of I-5. Included here are several hillsides which are predominantly California Adolphia; populations number in the thousands. This shrub was noted in limited numbers at numerous other surveyed sites including the finger canyon east of Dillon Road on southern Otay Mesa, at scattered locales in Otay Valley east of Interstate 805, in the sage scrub north of Lower Otay Lake, below Sweetwater Dam, a hillside west of Lake Murray Dam, on the southwestern flanks of Black Mountain near Rancho Penasquitos, along San Marcos Creek below San Marcos Dam, west of Melrose Drive and south of Shadowridge Drive in Vista, in the canyonlands east of Lundquist Drive in Encinitas, on a knoll west of the cul-de-sac of La Bella in Encinitas, near the creek north of Loma Linda Drive in Rancho Santa Fe, below the ridge on the north side of Otay Valley west of the landfill, and on north-facing slopes of Peñasquitos Canyon just south of the water treatment plant near Poway. Small populations were seen near Akita Lane in Rancho Santa Fe, at the eastern terminus of Rosemont Street in La Jolla, near the Fairbanks Country Club south of San Dieguito Road, south of Aliso Canyon Road near Rancho Santa Fe, on the Green Oaks Ranch at Agua Hedionda Creek, on canyon slopes west of Black Mountain Road and north of Peñasquitos Canyon, on the eastern boundary of Fairbanks Ranch, near Mercy Road east of Interstate 15, and near the intersection of Poinsettia Avenue and Palomar Airport Road. Also, old reports on the periphery of its known range are near southern Camp Pendleton at Moro Hill, a hill west of San Vicente Dam, near the Carlsbad Raceway, as well as to the southeast of most reports near Barrett Junction. Old Biological survey reports note sites northwest of Lake Hodges Dam, near Lake Calavera, west of the Olivenhain Cemetery, on Rancho Agua Hedionda Y Los Manos near Agua Hedionda Creek, near El Apajo Road just south and beyond the Rancho San Dieguito boundary, 0.5 mile north of La Zanja Canyon and 1 mile east of San Dieguito Valley, southwest of Sienna Canyon Drive in Encinitas, Sundance Mountain near

Carmel Mountain Drive, between Evans Point and Letterbox Canyon, and near the intersection of Fairmont and Montezuma Roads in the vicinity of San Diego State University. CNDDDB records are from the Otay River near the mouth of Johnson Canyon, northeast of Agua Hedionda Lagoon west of El Camino Real Road between Skyline Road and Neblina Drive, 2 miles north of San Marcos Creek and east of El Camino Real to the north of the golf course, 2 miles east of the San Dieguito Reservoir and 0.6 mile south of the San Dieguito River north of a dammed pond, the Kelly Ranch about 1.1 mile south of Calavera Lake in Carlsbad, 0.8 mile south of Highway 78 and 0.9 mile east of El Camino Real in Carlsbad, between Interstate 15 and Black Mountain Road 0.5 mile north of Mira Mesa Boulevard, adjacent to Interstate 15 and Chicarita Creek from 1.0 to 1.7 miles north of Poway Road and to the northeast, the southwest flank of Paint Mountain near Rancho Santa Fe, north of the confluence of Lusardi Creek and San Dieguito River east of Rancho Santa Fe, north of Artesian Road and 1.5 miles south of the San Dieguito River, 1 mile east of the San Dieguito Reservoir, 1 mile from San Diego State University near the western corner of Yerba Santa Drive and Montezuma Road, one block south of Mission Gorge Road near Margerum Avenue, Alvarado Canyon 0.5 mile southwest of Lake Murray, on Black Mountain Road about 0.4 mile northeast of 4-S Ranch and 0.5 mile east of Artesian Road, the east slope of Battle Mountain, north and south of Paco Lago Road and west of Via Abertura Road near Fairbanks Ranch, north of Manchester overlooking the San Elijo Lagoon, Lux Canyon in Encinitas, southwest side of Evans Point Headland near Agua Hedionda Lagoon, just south of Encinitas Road about 400 yards from the junction with Linda Vista Road, Lopez Ridge, south of Lake Hodges and 2.5 miles west of Battle Mountain, northern tributary canyons of La Jolla Valley on the 4-S Ranch 3.5-4.5 miles south of Lake Hodges, 1.2 miles north of San Marcos Creek between El Camino Real and Unicornio Street, 1.2 and 1.8 and 2.1 miles southwest of Lake San Marcos Dam near the Santa Fe Road realignment, north of San Marcos Creek and 0.3 mile south of Alga Road, San Marcos Creek near Rancho de los Quiotes, 0.5 mile west of San Francisco Peak and 0.4 mile northeast of Cerro de la Calavera, Evans Point east to approximately 0.5 mile west of Mount Hinton, near Carlsbad 0.5 mile south of Mount Hinton, southwest of Mount Hinton near the intersection of Palomar Airport Road and El Camino Real, west side of Green Valley on the Ecke Ranch 0.6 mile southwest of intersection of La Costa Avenue and El Camino Real, 2 miles north of intersection of Encinitas Boulevard with Manchester Avenue and 1 mile east of El Camino Real, 1 mile southeast of La Costa Country Club east of Green Valley, north of Batiquitos Lagoon and 1.2 miles northwest of La Costa Country Club, Batiquitos Lagoon approximately 1 mile northeast of the intersection of Interstate 5 and La Costa Avenue, 0.25 mile west of intersection of El Camino Real and Arenal Road, north of bend on Lusardi Creek approximately 2-2.5 km from its confluence with the San Dieguito River, 1 km south southeast of confluence of Lusardi Creek and the San Dieguito River, south of La Jolla Valley and 4.8 km due south of Lake Hodges Dam, near Carmel Mountain, and a number of locales northeast and northwest of intersection of Black Mountain Road and McGonigle Road on Black Mountain Ranch.

Collected south in Baja California to 30° 6' North by Moran (SD 87216) at Sauzalito-2. Lightly collected in Baja with 14 specimens deposited in the San Diego Natural History Museum's herbarium.

STATUS: California *Adolphia* is substantially declining due to urban growth; still healthy populations are extant. This very spiny species is sometimes a dominant shrub on hillsides, and such sites should be protected. Although *Adolphia* is not uncommon in southwestern San Diego County, a decade of continued urbanization along the coast could significantly reduce the populations now extant. California *Adolphia* should be considered for native revegetation projects in suitable habitat. This shrub was once one of the dominant species of sage scrub on clay-laden soils in southern coastal San Diego County. Its continued decline, and now ironic concerns about its "rarity", underscore the extraordinary loss of sage scrub habitat in the region.

SHAW'S AGAVE [*Agave shawii* Engelm.]

- LISTING:** CNPS List 2 R-E-D Code 3-3-1
State/Fed. Status -- /Species of Concern AGAVACEAE Sep.-May
Global Rank G3 State Rank S1.2
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Coastal Diegan Coastal Sage Scrub and Maritime Succulent Scrub are the two U.S. habitats utilized by this agave (Marina coarse loamy sand is mapped at Border Field). South of the U.S. border Shaw's Agave is often found on volcanic soils in a distinctive and quite diverse succulent scrub. Shrubs here are low-growing and habitat is quite open. Possible Associates: *Bergerocactus ermoyi*, *Coreopsis maritima*, *Euphorbia misera*.
- KNOWN SITES:** A small population still grows at Border Field State Park within meters of Mexico. Intense fire at this site could pose a threat. It has been introduced at Cabrillo National Monument, Torrey Pines, and other locales such as the national wildlife refuge headquarters in Imperial Beach. A few plants which occur just south of Point Loma College on the seacliffs may be native. A small but vigorous population farther south of Point Loma College near and upslope of Gatchell Road, (at spaced intervals) on the Fleet Combat Training Center is considered introduced.
- Shaw's Agave is an abundant and sometimes dominant shrub of the northern Baja coast, growing by the tens of thousands. North of Ensenada, near La Fonda, it covers hundreds of acres. Thirty-one specimens are deposited at the San Diego Natural History Museum's herbarium; south to 28° 41' North latitude where collected by Clemons (SD 118992) north of Guerrero Negro.
- STATUS:** Shaw's Agave is almost extirpated in the U.S. and should be reintroduced at selected coastal sites utilizing plants grown from native seed as source material. It is a much smaller and more compact plant than the introduced *Agave americana* which may grow nearby. All existing native sites should be protected. Rarity of this species is attributed to politics and geography -- most of its population lies south of the Mexican border.

EARLY ONION [*Allium praecox* Bdg.]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None LILIACEAE Feb.May
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County; Orange County, Riverside County, San Bernardino County, Ventura County, Santa Barbara County, Santa Rosa Island, San Miguel Island, Santa Cruz Island, Santa Catalina Island, San Clemente Island, Santa Barbara Island; and Baja California, Mexico
- HABITAT:** Early Onion is found in open sage scrub, often intermingled with bunchgrasses. It also occurs in chaparral openings, and can be relatively common on steep slopes following a fire. Possible Associates: *Sisyrinchium bellum*, *Nasella pulchra*, *Dicholostemma capitatum*.
- KNOWN SITES:** This onion still occurs at numerous locations in coastal sage scrub throughout San Diego County. A sampling of sites where observed include Florida Canyon in Balboa Park, in tributary canyons of upper Otay Valley south of Otay Lakes Park, on the north-facing slopes of Otay Valley on Otay Mesa near Roll Reservoir, on Mother Miguel Mountain in Chula Vista, in the hills east of the Sweetwater Reservoir, on the north-facing hillsides south of Poway Road and Penasquitos Creek near Sabre Springs, near the vernal pool complexes on Miramar Air Station, in chaparral on the Gildred Ranch north of Rangeland Road in Ramona, on the eastern flanks of Bernardo Mountain in Escondido, and on Military Area Papa One on Camp Pendleton. Also reported from El Cajon, Encanto, Point Loma, Oceanside, and Bernardo. Populations in the many thousands are occasionally encountered such as on a massive burn in canyonlands north of Honey Springs Road near Campo Road. In unpublished CNPS assessment

comments Scott White mentions this species as common in the Santa Ana Mountains; however, Roberts says it is rare and declining in Orange County. Wilken has found it locally abundant on Santa Cruz, Santa Rosa, and San Miguel islands. Smith reports it "possibly" at Pt. Sal, Oceano, and the west slopes of Figueroa Mountain in Santa Barbara County. Lathrop and Thorne report it for the Santa Ana Mountains on the Bedford Truck Trail, the Cold Water Canyon Trail above Glen Ivy, at the head of Claymine and Coal canyons, and Rice and Santa Ana River canyons, primarily in the northern part of the range. Boyd reports it as widespread on granitic substrates in the Gavilan Hills of western Riverside County; Thorne reports it as rare on Santa Catalina Island such as behind Avalon and on road to Little Harbor; however, Boyd in unpublished notes mentions it is fairly common on the east side of San Clemente Island.

Nine specimens from Baja California are deposited in the San Diego Natural History Museum's herbarium. Mulroy reports it as infrequent on grassy slopes at Punta Banda.

STATUS: Early Onion was once very common throughout the coastal plains and foothills of San Diego County where it was well distributed within sage scrub habitat; particularly on clayey mesic slopes. Loss of sage scrub via urban development has led to a significant decline in numbers and the complete extirpation of many sizeable sub-populations. While it occasionally is found in chaparral, sometimes it is "replaced" on coastal clay lenses in Chamise Chaparral by *Allium haematochiton*; and in somewhat more interior areas within mixed chaparral and on metavolcanic substrates by *Allium peninsulare* var. *peninsulare*. *Allium haematochiton* generally has a distinctive oblong and long necked bulb and 4-6 leaves, rather than the roundish bulb and 2-3 leaves of Early Onion. *Allium peninsulare* var. *peninsulare* has distinctive herringbone patterned serrate sculpturing on the bulb coat, unlike the indistinct wavy lateral rows on the bulb of Early Onion. One can still find small localized colonies of Early Onion in openings on north-facing slopes in most sizeable tracts of hilly coastal sage scrub in San Diego County. However, large populations are seldom encountered nowadays. As a result, sizeable populations should merit some level of protection in San Diego County.

SAN DIEGO BUR-SAGE [*Ambrosia chenopodiifolia* (Benth.) Payne]

LISTING: CNPS List 2 R-E-D Code 3-3-1
State/Fed. Status -- None ASTERACEAE Apr.-Jun.
Global Rank G5 State Rank S2.1

DISTRIBUTION: Southern San Diego County; Baja California, Mexico

HABITAT: An arid phase of Diegan Coastal Sage Scrub is the preferred U.S. habitat of this shrub. Typically, San Diego Bur-Sage grows in a low-growing, fairly open sage scrub. Olivenhain cobbly loam is the soil type mapped for the San Ysidro population. Possible Associates: *Simmondsia chinensis*, *Opuntia prolifera*, *Artemisia californica*.

KNOWN SITES: Sizeable populations occur on the hillsides of northern Spring Canyon in Otay Mesa, as far eastward as near Heritage Road. A small population of the San Diego Bur-sage was extirpated near Greg Rogers Park by a housing development and subsequent brushfire. The northernmost population occurred in Rice Canyon north of H Street where the two shrubs noted were likely extirpated by a major development. The site of an old report from near Brandywine Avenue in Chula Vista may have been developed for housing. Thousands of shrubs grow east of Beyer Boulevard and south of San Ysidro Junior High School where it is the dominant plant. Scattered shrubs occur on Otay Mesa eastward from here to Dillon Truck Trail and the northern flanks of Spring Canyon. A hillside dominated by San Diego Bur-Sage is found east of Otay Mesa Place. A single shrub was observed in the hills on the north side of Otay Valley below the ridgeline and west of the landfill. Another isolated shrub was observed yards north of the old road situated in the floodplain of eastern Otay Valley, just beyond a drainage on the east side of Rock Mountain. An old biological report notes a population in Moody Canyon on

Otay Mesa. CNDDDB reports are from east of Dennery Canyon on Otay Mesa, and in Johnson Canyon on Otay Mesa. This shrub is currently being planted at the California Terraces Mitigation Site on Otay Mesa.

Forty-nine specimens from Baja are deposited in the San Diego Herbarium for this regionally common shrub, ranging south to 28° 17' North latitude where collected by Moran (SD 64959) near the peninsular divide at the Barril Road. Old reports range even farther south to below 25° North.

STATUS: San Diego Bur-Sage is declining in the United States with the development of western Otay Mesa. The broad leaves and shrubby appearance readily separate it from other *Ambrosia* species in southwestern San Diego County. The northern range of this shrub barely enters the U.S.; significant portions of all substantial stands should be protected. Rarity of this species is attributed to politics and geography; most of its population lies south of the Mexican border.

SAN DIEGO AMBROSIA [*Ambrosia pumila* (Nutt. Gray)]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- /FE ASTERACEAE Jun.-Sep.
Global Rank G1 State Rank S1.1

DISTRIBUTION: Coastal San Diego County, western Riverside County; Baja California, Mexico
HABITAT: Creek beds, seasonally dry drainages, and floodplains are the preferred habitats. Usually a protective tree canopy is absent and it is growing on the periphery of willow woodland. Riverwash and sandy alluvium may underlie these locales. Some anomalous populations of this small herbaceous perennial are found in semi-urban locales in National City. Possible Associates: *Heliotropium curvassavicum*, *Juncus mexicanus*, *Anemopsis californica*.

KNOWN SITES: Many reports from the Otay Valley area have proven to be the superficially similar *Ambrosia confertiflora*; some of these, likely misidentified, are carried in the CNDDDB. A thorough report was compiled by V. Marquez during her proposal to list this species as Federally Endangered. Her reported sites are from the intersection of Steele Canyon Road and Jamul Drive (approximately 250 plants), east of Joe Crosson Drive south of the El Cajon Speedway where at least a portion of the extensive population is scheduled for transplantation, near Mission Gorge Road and Fanita Drive where possibly extirpated, one mile west of Bostonia where the site is poorly identified from an old report and likely extirpated during construction of a health spa, 0.5 mile north of Santee where site poorly identified in old report near Edgemoor County Health Facility and possibly extirpated, near the Bostonia cutoff and Lakeside Road where possibly extirpated, near Granite Hills High School where likely extirpated by a racketball court, downtown National City on 12th Avenue east of Highland where observed in small numbers, near Lake Hollins/Kumeyaay Lake where observed and numbering in the thousands (the largest known U.S. site), about one mile west of Mission San Diego de Alcalá near San Diego Stadium where likely extirpated, one mile north of Lake Hodges where poorly mapped and not recently observed, San Luis Rey Valley about 0.75 mile east of Mission San Luis Rey where last reported in 1936, the south side of San Luis Rey River near the confluence with Moosa Canyon where observed in small numbers but subsequently graded and possibly extirpated, one mile east of I-805 and 0.5 mile south of Valley Road where probably misidentified *A. confertiflora*, in Rice Canyon in Chula Vista where extirpated by Terra Nova Shopping Center, in Rice Canyon approximately one mile south/southeast of Allen School in Chula Vista within an area of dedicated open space but possibly no longer extant due to passive recreation and invasive plant growth, a mitigation site in Mission Trails Regional Park on the the north side of the San Diego River west of SR 52, near the corner of Sweetwater Road and Jamacha Road where subsequently extirpated by a bank and gas station, near Quarry Road southwest of Sweetwater Dam in an area where possibly extirpated by invasive Giant Cane infestation, near Jamacha Road and Jamacha Boulevard where subsequently extirpated by

Caltrans with some plants removed for future translocation, a small population observed on an embankment at Lincoln Acres School in National City where under siege by invasive iceplant, on a vacant lot near 3rd and 1511 Oakdale in El Cajon where owned by Caltrans and proposed for sale, Washington Street in El Cajon where likely extirpated by urban development, near the Steele Canyon Bridge on SR 94 in Rancho San Diego, approximately 35 plants observed at Mission Trails Regional Park across Father Serra Trail from Mission Dam Parking Lot, near Big Rock Park in Santee where original site cannot be relocated, at Mission Gorge Road and Big Rock Road in Santee where extirpated by Caltrans with some transplantation north of the river approximately one mile westward, a small population near Black Mountain Road and Penasquitos Creek where it cannot be relocated and is likely extirpated, near Del Dios Highway one-two miles west of Lake Hodges growing for approximately 150 feet along a dirt road and slated for development as a golf course, near the intersection of El Camino Real and Mission Avenue where a large population was extirpated and most lost during transplantation efforts and a portion remaining at San Diego State for possible future transplantation, below the Bonsall Bridge on the San Luis Rey River where severely impacted by Caltrans following bungled protection measures, near Calle Del Vuelta in Bonsall close to the San Luis Rey River in a horse corral and a Caltrans right-of-way proposed to be expanded, and an extirpated site in Castle Park in El Cajon. A small disjunct population of San Diego Ambrosia was observed alongside a vernal pool on unimproved Nichols Road northeast of Lake Elsinore in western Riverside County, approximately 0.5 mile west of Interstate 15 in mildly disturbed grasslands. This populations is threatened by road construction and general urban expansion. A CNDDDB report is well to the east of this site in Skunk Hollow in the Lake Skinner region.

Collected by Reeder and Reeder (SD 109597) south in Baja California to Laguna Seca, 23 km south of Parador Catavina, where a pure stand covers much of the dried lake bed. Only six specimens are deposited at the San Diego Natural History Museum's herbarium for Mexico. Reports from Baja include sandy arroyo margins near Colonel Mesa, at San Telmo to the south, and at the head of Paso San Matias in a sandy wash north of Highway 3.

STATUS: San Diego Ambrosia is approaching extirpation in the United States. All existing sites should be fully protected. While many species of related "ragweeds" are quite invasive, the San Diego Ambrosia has good site tenacity but apparently does not readily colonize seemingly appropriate habitat. Field studies are needed to determine better methods to propagate and successfully plant this species. Seed from the Hollins Lake site should be introduced at similar habitats in the region where other species of *Ambrosia* are not aggressively established. It is difficult to account for the comparatively limited number of historical collections, given its current extended coastal plain distribution (including southward into Mexico), and the widespread bottomland habitat available both historically and at present. At least several key factors are probably at work. This species may have very exacting microhabitat requirements, or may be relictual in nature and poorly adapted to the current climatic regime. Regardless, this species would benefit from studies to determine its optimal habitat requirements; as well as efforts to artificially expand its local presence, and stabilize the existing very limited meta-population. *Ambrosia confertiflora* is sometimes mistaken for this species; however *Ambrosia pumila* has more compact and hairier leaves, considerably less bur-like and spiny fruits, and as an adult is a substantially smaller plant. Problems arise primarily with young plants of both species which do not show mature characters.

CALIFORNIA ANDROSACE [*Androsace elongata* L. ssp. *acuta* (Greene) Robbins

LISTING:	CNPS List 4	R-E-D Code 1-2-2
	State/Fed. Status -- None	PRIMULACEAE Mar.-Jun.
	Global Rank G?T3? State Rank S3.2?	

DISTRIBUTION: San Diego County, Los Angeles County, San Bernardino County, Kern County, Fremont County, Alameda County, Contra Costa County, San Joaquin County, Siskiyou County, San Luis Obispo County; Oregon; Baja California

HABITAT: This minute annual grows in openings in chaparral, coastal scrub, and cismontane woodlands. In the Cuyamaca Mountains it was observed in the broad, grassy openings of a montane meadow. Possible Associates: *Eriogonum wrightii*, *Lupinus excubitus*, *Elymus elymoides*.

KNOWN SITES: A limited colony was seen on East Mesa in the Cuyamaca Mountains. An historical report is from Warner Hot Springs; an herbarium specimen was seen from Montezuma Valley. Hoover reports this species from San Luis Obispo County in grasslands from Cottonwood Pass to the Temblor Range and Carrizo Plain. Thomas reports this species from the Santa Cruz Mountains on serpentine in the Santa Clara Valley, near Stanford, four miles south of San Jose, and at Edenvale. Twisselmann reports California Androsace from Kern County as rare in small dense colonies in grasslands and Douglas oak woodland. Bowerman reports this species in the Mount Diablo region on grassy flats or open woodlands from locales in Alamo Canyon, a ridge east of Donner Canyon, and a ridge west of the Pioneer Road junction (including both white and pink flowered forms).

One specimen from Baja California was found at the herbarium of the San Diego Natural History Museum. It was collected at 32° 27 1/2' North south southeast of El Condor by Moran (SD 110736).

STATUS: This inconspicuous species (2-8 cm tall) with microscopic white flowers and a tiny rosette of linear-lanceolate basal leaves is likely undercollected. It usually must be carefully searched for even when its general location is known. Given the limited number of collections and known sites, California Androsace is still presumed to be quite uncommon in the mountains of southern California. All known sites in the southern California region should be protected until collection information indicates a substantially greater number of populations. Range information indicates California Androsace was probably once more common in the State, and is now relictual in nature in San Diego County. Retrenchment for ranges of various montane species following changing climatic conditions after the Pleistocene, may be a factor in the rarity of this species in the County.

APHANISMA [*Aphanisma blitoides* Nutt. ex Moq. in DC]

LISTING: CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- / Species of Concern CHENOPODIACEAE Apr.-May
Global Rank G2 State Rank S1.1

DISTRIBUTION: San Diego County, Orange County, Los Angeles County, Santa Barbara County, Ventura County, Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Nicolas Island, Santa Rosa Island; Baja California, Mexico

HABITAT: Coastal bluffs near the ocean and beach dunes were the historical mainland habitat of *Aphanisma*. Soils at the Newport Back Bay site are mapped as Myford and Cieneba sandy loams. Possible Associates: *Eriogonum parvifolium*, *Atriplex californica*, *Calandrinia maritima*.

KNOWN SITES: *Aphanisma* is close to or may be extirpated in San Diego County. Heavy recreational use of beaches and housing construction have removed or degraded most dune/bluff habitat from San Onofre south to the Mexican border. A sighting on Point Loma is now extirpated by Navy construction, but the plant may survive in low numbers on the steep southern face of the Point. It could not be relocated growing on bluffs at San Onofre. Old historical collections are from the bluffs north of San Dieguito Creek, in the Tijuana Valley on alkaline flats near the ocean, the Silver Strand, San Diego Bay, Pacific Beach, a headland just south of Torrey Pines, on the north side of the mouth of San Dieguito Creek, and at La Jolla. Aside from a limited potential

at the Tijuana Valley site and near Torrey Pines, these former populations have little likelihood of still being extant. Historical sites reported by Roberts from Orange County are from Costa Mesa, Newport Beach, and Arch Beach in South Laguna. A report is from near the Delhi Channel bike crossing at Newport Back Bay. Also reported by Thorne as rare on Catalina Island near Ballast Point on the east side of Catalina Harbor, as well as 0.5 mile southeast of West Cove. Herbarium collections were examined at SD from Pyramid Cove and Wilson Cove on San Clemente Island, and Landing Cove on Santa Barbara Island. Also reported by Smith at the headlands near Lion's Head south of Point Sal, at the west end of Santa Rosa Island, and on the bluffs west of Ventura. CNDDB sites for Los Angeles County are from near Portuguese Bend southward to near Royal Palms Beach Park, as well as in the Palos Verdes Hills; from Santa Barbara Island at Landing Cove, Cave Canyon, Cat Canyon, East Slope, Middle Canyon, just south of Graveyard Canyon, and the west end of the island; for Ventura County about 1.5 miles west of the Ventura River at the base of a coastal bluff on the Taylor Ranch; from San Clemente Island about 0.4 mile north of Eel Point; from the west end of Santa Cruz Island at the mouth of Canada de los Sauces, along a stream between Christy Ranch and the Beach; on Santa Catalina Island on the east side of Catalina Harbor near Ballast Point, near Avalon; from San Clemente Canyon in the second canyon south of Seal Cove, the lower half of China Canyon; from Orange County near Costa Mesa along the base of sea cliffs near Highway 1 and 55, and 2 miles northwest of Laguna Beach in the vicinity of Reef Point and Crystal Cove.

This plant grows south in Baja California on a hillside near Cuesta de la Piedra Parada at 28° 17' North where collected by Moran (SD 65065). Over 20 specimens are deposited from Baja in the San Diego Natural History Museum's herbarium.

STATUS: *Aphanisma* is possibly extirpated in San Diego County, and severely declining throughout its mainland United States range. If viable seed can be acquired, this is a good candidate for reintroduction in appropriate coastal habitats. Horticultural requirements for growing *Aphanisma* are poorly understood and should be investigated. All mainland populations should be protected. Rarity of this species is attributed in part to coastal development of the sea bluffs in tandem with significant natural erosion; native bluff species being regularly replaced by weedy or non-native species introduced from upslope agriculture or housing. *Aphanisma* is a relatively nondescript and easily overlooked species. It has small sessile triangulate leaves alternating up a narrow stem and microscopic flowers - but a distinctive black spheric seed tucked into the base of the leaf.

STICKY COLUMBINE [*Aquilegia formosa* Fisher var. *hypolasia* (Greene) Munz]

LISTING: CNPS Unlisted R-E-D Code None
 State/Fed. Status -- None RANUNCULACEAE Jun.-Aug.
 Global Rank None State Rank None

DISTRIBUTION: San Diego County, Los Angeles County; Baja California, Mexico

HABITAT: This perennial herb is to be looked for along mountain streambeds with a relatively well developed tree canopy. It may also occur at springs or other vernal mesic locales. Possible Associates: *Salix* species, *Cornus sericea*, *Rhododendron occidentale*.

Eleven herbarium specimens of columbine from Baja California are found at the San Diego Natural History Museum; south to 30° 55' North where collected by Moran beneath willows at Rancho el Potrero (SD 75321).

KNOWN SITES: The type locality for this columbine is in San Diego County from between the Campbell and Cameron Ranches. Herbarium specimens were examined from Middle Peak and below Cuyamaca Dam in the Cuyamaca Mountains; as well as from Fry Creek in the Palomar Mountains. Small populations of Sticky Columbine are found along Azalea Spring Trail in the Cuyamaca Mountains, and near Doane Pond in the Palomar Mountains.

STATUS: Sticky Columbine is a poorly differentiated form of the wide-ranging *Aquilegia formosa*. It is identified by its viscid-pubescent stems, rather than glabrous or sparingly pubescent stems. More taxonomic work is needed on this species throughout its western United States range before this local, southern California form can be properly assessed. Herbarium specimens examined from northern California showed the densely viscid traits associated with Sticky Columbine, and indicate this trait by itself may be a poor marker for differentiating varieties of columbine. In San Diego County columbines are relatively uncommon, and restricted, typically, to semi-shaded locales alongside fast-moving streams. Provisionally, no recommendations are made for protection.

CUYAMACA ROCK CRESS [*Arabis hirshbergiae* S. D. Boyd]

LISTING: CNPS List 1B R-E-D Code 3-2-3
State/Fed. Status -- None BRASSICACEAE March
Global Rank G1 State Rank S1.2

DISTRIBUTION: San Diego County

HABITAT: Pebble plain microhabitat on the periphery of Lake Cuyamaca with cobbles and gravel of gabbro and quartzite; weathered to a vernal saturated clay. No large shrubs occur near the one known population. Possible Associates: *Eriogonum wrightii*, *Viola douglasii*, *Ranunculus californicus*.

KNOWN SITES: Growing in limited numbers at the type locality approximately a mile southeast of the junction of the Sunrise Highway and Highway 79 near Lake Cuyamaca.

STATUS: The showy, deep rose-purple flowered Cuyamaca Rock Cress is a miniature herbaceous perennial with small leaves that flowers early following snow melt while the meadow soils are still moist. It has only recently been described and additional field data is needed to more accurately assess its montane distribution. It may well be a relictual species that is close to extinction. All populations of this endemic species should be protected. Boyd notes this species is similar to *Arabis johnstonii* but has longer and broader petals (12.8 - 14 mm. versus 8-10mm.), a shorter style (1mm. versus 1-2mm.); shorter and broader gynophore; and broader siliques (3-4mm. versus 2-3mm.). In addition, this species lacks the long filiform style (4-8mm.) of *Arabis parishii*, which may also be related to the Cuyamaca Rock Cress. Also growing near the type locality, but in upland rocky terrain, is the much more robust (3-9 dm versus 5-15 cm) *Arabis sparsiflora* with recurved fruits and smaller petals (*i.e.*, 9-12 mm). Cuyamaca Rock Cress could be a montane element which was once much more common in the meadows around the lake, but is now subject to warming trends over the last several millennia for which it may be poorly adapted. Historically severe grazing in the pebble plain habitat near the type locality could in part be responsible for its present rarity. Pebble plain habitat is poorly evolved within the comparatively low-lying San Diego County mountains; and is more widely dispersed to the north in the San Bernardino Mountains (where this species should also be searched for in similar habitat). This species blooms very early when many herbaceous montane plants are just beginning to leaf out. Cuyamaca Rock Cress should be strongly considered for federally endangered status.

ADAMS' MANZANITA [*Arctostaphylos glandulosa* Eastw. ssp. *adamsii* (Munz)Munz]

LISTING: CNPS Unlisted R-E-D Code -- None
State/Fed. Status -- None ERICACEAE Jan.-Apr.
Global Rank None State Rank None

DISTRIBUTION: Transmontane San Diego County, Riverside County; Baja California, Mexico

HABITAT: Adams' Manzanita is concentrated east of the crest of the Peninsular Range; but can be found at sporadic locations on the western slopes of the mountains. Its chaparral habitat tends to be

of a relatively uniform canopy height with dense shrub spacing. The understory is usually quite limited due primarily to poorly developed soils in the chaparral at these higher elevations, in concert with a rain shadow effect at the eastern end of the Peninsular Range. Soils on Mount Laguna are mapped as Sheephead rocky sandy loams. Possible Associates: *Adenostoma fasciculatum*, *Ceanothus greggii*, *Garrya flavescens*.

KNOWN SITES: This manzanita is common to abundant at various locations in the Laguna Mountains and ranges well southeastward such as the arid chaparral between Potrero and Campo. Herbarium specimens examined were from Pinon Point, near Laguna Lake, Lookout Point, El Cajon Mountain, Boulevard, Rattlesnake Peak near Hipass, Hot Springs Mountain, Tecate Mountain summit, Lawson Peak, Cottonwood Creek near Laguna Junction, Desert View Lookout, Corte Madera Ranch, Julian, Inaja Memorial, Guatay, Cuyamaca Peak, Eagle's nest on Hot Springs Mountain, Monument Peak, Hot Springs Mountain peak, Fred Canyon, and Lyons Peak. One unconfirmed report from outside its expected range is from Jamul Valley. It is also reported from Deep Canyon in Riverside County. Boyd in unpublished notes mentions this subspecies is uncommon in the San Gabriel, San Bernardino, and Santa Rosa mountains.

Twelve herbarium specimens (annotated by Wells) from Baja California are found at the San Diego Natural History Museum; south to 32° 3' North where collected by Moran (SD 75785) on the upper north slope of Cerro Blanco.

STATUS: This substantial shrub is locally abundant and is not declining in San Diego County. Its transmontane habitat on the upper desert flanks of the Laguna Mountains has been only lightly impacted by rural development. This subspecies is differentiated from other closely related subspecies of *A. glandulosa* by an absence of long white hairs on the leaves and twigs, inflorescence bracts which are deltate to awl-like rather than leaf-like, white-glaucous leaves, and pedicels in fruit which are 5-10mm long. Adams' Manzanita may warrant full species status; additional taxonomic work is needed on the entire *A. glandulosa* complex.

DEL MAR MANZANITA [*Arctostaphylos glandulosa* Eastw. ssp. *crassifolia* (Jeps.)Wells]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- /FE ERICACEAE Dec.-Apr.
Global Rank GST1 State Rank S1.1

DISTRIBUTION: Coastal San Diego County; Baja California, Mexico

HABITAT: Del Mar Manzanita typically occurs in relatively open, coastal chaparral; the substrate is eroding sandstone, and the chaparral vegetation is relatively low-growing. At occasional inland sites it grows in denser mixed chaparral vegetation. Soils include Terrace Escarpments and Loamy alluvial land of the Huerhuero complex. Possible Associates: *Ceanothus verrucosus*, *Adenostoma fasciculatum*, *Corethogyne filaginifolia* var. *linifolia*.

KNOWN SITES: This manzanita grows in both northern and southern extensions of the Torrey Pines State Reserve. It is occasional in Lomas Santa Fe such as in San Dieguito County Park, near I-5 on the southern border of the San Elijo Lagoon Reserve, in the canyon south of Paseo del Lago in Carlsbad, north of High Bluff Drive near Grandvia in Del Mar Heights, near Del Mar Heights Road and east of Dunham Way, north of Carmel Mountain Road near I-5, in Encinitas near Whisper Wind Lane, east of El Nido Road in Rancho Santa Fe, wll distributed in the ridges east of Landquist Drive in Encinitas, at Oak Crest Park in Encinitas, on the northern slopes of La Zanja Canyon near Strawberry Road, west of Ivy Glen Drive in Encinitas, southeast of Las Mananas near Rancho Santa Fe Farms, on the Ecke Ranch at the northwest end of Green Valley in Encinitas, west and north of Via Del Mar in the Sorrento Hills, on the bluffs south of the San Dieguito River and west of El Camino Real, as well as south of Encinitas Creek and east of El Camino Real near the Home Depot store. Over two hundred shrubs growing south of Del Mar Heights Road and east of El Camino Real in a vestigial stand

of chaparral were graded for Carmel Valley Community Park. A number of small colonies grow in the finger canyons west of the terminus of Park Village Road in the Peñasquitos Canyon Preserve. A handful of shrubs occur on a sandstone bluff downslope and northwest of the runways for Palomar Airport near an area proposed for a community golf course. Herbarium specimens at the San Diego Museum of Natural History are for the bluffs south of Del Mar Heights School, on the west side of Lux Canyon in Encinitas, 0.8 km west southwest of Alga Road southeast of Carlsbad, and south of Encinitas Boulevard and west of Manchester Avenue in Encinitas. A report is from east of Rancho Santa Fe Road near Avenida La Posta. Old biological survey reports note sites north of Willow Spring Drive in Olivenhain, between La Glorieta and Rambla de las Flores in Rancho Santa Fe, west of the Olivenhain Cemetery, by Mountain View Road and El Camino Real in Encinitas, near Circo Diegueno Road east of Del Mar, the Crest Canyon drainage in Del Mar, El Apajo Road just south and beyond the Rancho San Dieguito boundary, and 1 mile north of Batiquitos Lagoon and 0.5 mile west of El Camino Real. CNDDDB reports are from scattered sites along both sides of El Camino Real near Batiquitos Lagoon, 1 km north of Batiquitos Lagoon and 1.5 km west of El Camino Real, 0.5 km south of Encinitas Creek and 0.7 km east of Manchester Avenue, at Eden Gardens in Solana Beach 0.8 km northwest of Interstate 5 near the Via de la Valle intersection, south of the San Dieguito River and 1 km south of Via De la Valle on the southeast side of El Camino Real, 0.3 km southwest of the mouth of Shaw Valley in Carmel Valley, 0.5 km south of Encinitas Creek and 0.7 km east of Manchester Avenue, south of the San Dieguito River and east of the mouth of Gonzales Canyon near the toe of several slopes, and south of Border Avenue and between the I-5 Freeway and the Del Mar Race Track. A single shrub was found on a slope east of the northern terminus of Bonita Road in Encinitas. One unconfirmed report is well to the north of concentrated populations at Fire Mountain in Oceanside; this may represent *A. g. zacaensis*. All reports from near Mount Whitney and the Del Dios Highway region are dubious and likely represent the more common *A. g. var. zacaensis*; including one km north of Mt. Whitney at the west end of Wahingtonia Drive, and between San Marcos and Escondido approximately 2.5 km south of Richland School.

Five herbarium specimens (annotated by Wells) from Baja California are found at the San Diego Natural History Museum; south to 32° 10 1/2' North where collected by Moran on the western edge of Mesa de Descanso, east of Medio Camino (SD 110476). It is also recorded on the north slope of the southern peak of Cerro Jesus Maria, on a ridge 4 miles east of Cerro Coronel, and on Cerro del Coronel. Shrubs seen about 10 miles south of Tecate may key here.

STATUS: This shrub is declining substantially in recent years in San Diego County as infilling occurs in residential areas from Torrey Pines and Del Mar north to Encinitas and Carlsbad. All of the larger, relatively intact populations (*i.e.*, not fragmented by piecemeal development) are recommended for protection. Isolated, individual shrubs or small clusters of manzanitas should be placed into biological open space whenever possible. *A. glandulosa* subspecies *crassifolia* is differentiated from *A. glandulosa* ssp. *zacaensis* by its leaf color which is deep to grayish green not glaucous and dull gray; leaf base obtuse or wedge-shaped not truncate or lobed to obtuse; as well as leaf generally ovate not round-ovate. *A. g. ssp. zacaensis* is common as far north as the Santa Ynez, Santa Lucia, and San Rafael mountains and does not warrant listing. Subspecies *zacaensis* in San Diego County occurs at more inland locales than *A. g. crassifolia*, in an arcing range from Otay Mountain northward through the hills south of San Marcos and then westward to Carlsbad where approaching the eastern periphery of the predominantly more coastal Del Mar Manzanita populations. Specimens from relatively near the coast which likely represent subspecies *zacaensis*, yet occur near concentrated populations of the Del Mar Manzanita, are from 0.1 km east of El Camino Real and 0.6 km south of Palomar Airport, northeast of Palomar Airport Road near the El Camino Real Intersection, west of Letterbox Canyon and north of Palomar Airport, 0.35 miles west of Palomar Airport and one mile south of Evans Point, and a nearby site 0.2 to 0.5 miles southeast of "Agua 357" on USGS topo map. Several reports may represent ssp. *crassifolia* in the western Poway area including 1-2.5 km south of Poway Road and 0.5 km east of Interstate 15; one shrub examined in June 2001 near

the trail above the treatment plant, just east of the freeway and near this location, does appear close to ssp. *crassifolia*. It may represent the easternmost site Del Mar Manzanita has been observed. Shrubs examined on Evans Point in Carlsbad near the northern summit, apparently included specimens of both subspecies; each shrub seemed to retain the appropriate leaf traits associated with one subspecies or the other. Typically mature ssp. *zacaensis* is a denser foliated and more robust plant; while ssp. *crassifolia* sometimes has a more decumbent habit and sprawls on exposed sandstone outcrops. The range of the Del Mar Manzanita is strongly correlated with a distinctive geologic sandstone strata, and it appears to be restricted to areas where this sandstone is exposed along the coast. Rarity is attributed to the limited exposure of this sandstone unit, and urban expansion into this area over the last fifty years.

OTAY MANZANITA [*Arctostaphylos otayensis* Wies. & Schreib.]

- LISTING:** CNPS List 1B R-E-D Code 3-2-3
State/Fed. Status -- /Species of Concern ERICACEAE Jan.-Mar.
Global Rank G2 State Rank S2.1
- DISTRIBUTION:** San Diego County
- HABITAT:** Otay Manzanita grows in chaparral on metavolcanic peaks. On San Miguel and Otay Mountain the soil is mapped as San Miguel-Exchequer rocky silt loam. Typically, the xeric chaparral is a dense tangle of shrubs with a height of perhaps five to six feet. Soils may be quite shallow amid exposed rock. Possible Associates: *Ceanothus tomentosus* ssp. *olivaceus*, *Adenostoma fasciculatum*, *Ceanothus otayensis*.
- KNOWN SITES:** Scattered populations for this shrub occur on San Miguel Mountain and in the Jamul Mountains; excellent stands occur in chaparral at upper elevations of Otay Mountain including west of Hubbard Spring near Woodwardia Canyon, and on the first saddle-ridge near the Marron Valley Road entrance. An old herbarium collection on gabbroic soil at Guatay Peak is misidentified according to Wells; a CNDDDB report from southwest of Julian is also presumed to be erroneous.
- Several peaks immediately south of Otay Mountain in Mexico have the potential to harbor this southern San Diego County endemic. Shrubs observed growing during the winter on Cerro Dieciseis south of Tecate showed some affinities with the Otay Manzanita; this population should be investigated during the flowering season.
- STATUS:** Populations of Otay Manzanita are presently stable. It is potentially imperiled from residential development in Proctor Valley on the flanks of San Miguel Mountain, and from blocks of proposed ranch-style housing south of Duizura in the foothills near Otay Mountain. All populations are recommended for protection. Rarity of this species is attributed to fidelity to distinctive soils on metavolcanic intrusions which are only sporadically exposed in San Diego County. Otay Manzanita does not have the rounder, more oval, and slicker glaucous leaves of *Arctostaphylos glauca*, nor does it have the comparatively gigantic and sticky fruit of this manzanita. It also may grow with hairy and soft-leaved *Arctostaphylos glandulosa* ssp. *zacaensis*; whose leaves do not have the subtly rougher texture of Otay Manzanita.

RAINBOW MANZANITA [*Arctostaphylos rainbowensis*] J. Keeley & Massihi

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- None ERICACEAE Jan.-Feb.
Global Rank G2 State Rank S2.1
- DISTRIBUTION:** San Diego County, Riverside County
- HABITAT:** Southern Mixed Chaparral is the preferred habitat with a relatively dense canopy from six to eight feet being common. Rocky Cieneba and Las Posas soils are found in areas of heavy

concentrations of Rainbow Manzanita where it occurs north of Pala. Possible Associates: *Adenostoma fasciculatum*, *Xylococcus bicolor*, *Tetracoccus dioicus*.

KNOWN SITES: This shrub is the dominant manzanita on the Pala/Temecula Road. During a 1990 survey, more than 5000 shrubs were estimated to be present in the hills flanking Pala Creek. Rainbow Manzanita is common on Magee Road near the Riverside County border and extends eastward into the Agua Tibia Wilderness. These are the only areas where it can presently be considered abundant. It is scattered throughout the rugged terrain from Pala westward to the Santa Margarita Mountain's eastern slopes. This shrub is uncommon north of Fallbrook in chaparral along Sandia Creek, and southward near the intersection with De Luz Road where a sizeable population was found on a bench overlooking the Santa Margarita River. It is uncommon on Camp Pendleton in heavy chaparral near upper Roblar Creek. In Riverside County it is rare in the Santa Rosa Plateau region such as Walker Basin, near Calle Jardín, and in chaparral adjacent to La Ventana Road; also to the north near Mountain Avenue west of Alberhill. A handful of shrubs were seen on a chaparral slope of the Merriam Mountains, west of Interstate 15 and Windsong Lane; this is south of all other reported sites. Old biological survey reports note sites northwest of the Garnsey Ranch and north of the Tenaja Truck Trail, at several locales on Monserate Mountain, near Rainbow Glen Road west of Rainbow Creek, west of Trujillo Creek and southwest of Magee Truck Trail, east of Keys Creek and west of Mountain View Lane northwest of Valley Center, near Sudale Ranch Road north of Fallbrook, near Gomez Creek and Rainbow Crest Road south of Rainbow, west of Rainbow Heights Road due east of Rainbow, north of Chief Mountain in the vicinity of Magee Creek, and 0.5 mile west of Daily Road on the San Diego side of the San Diego/Riverside County line; as well as east of Slaughterhouse Canyon near the Santa Rosa Plateau in western Riverside County. A newer CNDDDB record is from Rancho Heights Road 1.2 miles east of Pala/Temecula Road.

STATUS: Rainbow Manzanita's populations are presently stable. It is imperiled by continued orchard expansion into the Pala and De Luz regions. All larger stands of this shrub in areas of steep slope should be protected. Taxonomic similarities exist with *Arctostaphylos peninsularis* ssp. *peninsularis* from Riverside County and Baja California. An unconfirmed report is of a lone U.S. site for *A. p.* ssp. *peninsularis* from the vicinity of Canebrake Road and Bow Willow Creek four miles NNE of McCain Ranch near Cottonwood Campground on the high desert. This is well outside the range of the Rainbow Manzanita. Sixty species of manzanita are listed as sensitive in the CNDDDB database for the State of California. This underscores the extraordinary plasticity of the genus. Geographically isolated populations of manzanita on distinctive soil types have a tendency to evolve into new species or subspecies. Rainbow Manzanita appears to be one of these species evolving locally and maintaining its limited range; inhibited in a possible expansion (at least under current climatic conditions) by unsuitable peripheral soils/substrates. Unlike *Arctostaphylos glauca*, near which it may grow, Rainbow Manzanita does not have the comparatively gigantic and sticky fruit of this related manzanita.

SAN DIEGO SAGEWORT [*Artemisia palmeri* Gray]

LISTING: CNPS List 4 R-E-D Code 1-1-3
State/Fed. Status -- None ASTERACEAE Jul.-Sep.
Global Rank G3 State Rank S3.2

DISTRIBUTION: Coastal San Diego County; Baja California, Mexico

HABITAT: San Diego Sagewort is primarily found along creeks and drainages near the coast; inland it may occur in mesic chaparral conditions. Well inland near Sequan Peak this suffrutescent shrub was found in some abundance in Cieneba very rocky coarse sandy loam on a steep, moist, north-facing chaparral slope. *Ceanothus leucodermis* and *Quercus berberidifolia* were the primary constituents at this locale. In its more usual context, San Diego Sagewort grows within a shaded understory beneath riparian woodland. Occasionally it also is seen beneath *Quercus*

agrifolia, but in decidedly mesic circumstances. Possible Associates: *Platanus racemosa*, *Artemisia douglasiana*, *Salix lasiolepis*.

KNOWN SITES: San Diego Sagewort is most often seen along perennial watercourses. Peñasquitos Creek is typical of such habitat and has an extensive sagewort population from Poway to Interstate 5. A significant population is found scattered along Escondido Creek and its tributaries from Olivenhain northeastward to the Questhaven Retreat. It is occasional beneath oaks in the drainages north of Mt. Israel Road and on the north-facing slopes of Rose Canyon near Interstate 805. The southeasternmost locale is in a creek just east of Glen Lonely near 2000 feet in elevation. It also grows abundantly on a north-facing slope in chaparral south of Sequan Road near the Tavern Road turnoff to Alpine. Another peripheral population is within Santa Maria Creek in Daney Canyon upstream of Kimball Valley. San Diego Sagewort is occasional within the Tijuana River Valley west of Interstate 5; scattered on the shores of San Vicente Reservoir; as well as in shaded chaparral southwest of the Barona Indian casino. This plant is also occasional in Rose Canyon near the Interstate 805 bridge, in Lopez Canyon near Camino Santa Fe, on the flanks of Escondido Creek southeast of Paint Mountain Road, by the Montiel Truck Trail near Lawson Valley, alongside the creek in Poway's Blue Sky Reserve, east of Interstate 15 near the Mercy Road extension, and in Dulzura Creek near the Daley Rock Quarry. Also, old reports are from east to Mount Woodson, Alpine, near Japatul Valley School, and north of Deerhorn Valley Road; as well as northeast into the Valley Center/Lilac area and south of the Questhaven Retreat. It is rare on the south shore of Lake Wohlford. It was reported from upper Proctor Valley, and Green Valley in Poway. Old reports are from near Old Town, Euclid Avenue, and Tecolote Canyon in the City of San Diego. Old biological survey reports note numerous locales including south of Poway Road between Espola Road and Highway 67, by Old Coach Road south of Highland Valley Road in Poway, 0.7 mile northwest of the junction of Archie Moore Road and Highway 67, northwest of Skyline Truck Trail near Lyons Peak, east of Starvation Mountain, west of Barber Mountain, near Mountain View Road northwest of the community of Harbison Canyon, near Polk Road in Alpine, in Peutz Valley north of Alpine, northwest of Victoria Drive in Alpine, north of Lilac Road and west of Anthony Road in Valley Center, near Red Mountain Road not far from Old Castle Road, on Gaskill Peak in Lawson Valley, in Deerhorn Valley, close to Jamul Highlands Road, by the Montiel Truck Trail south of Loveland Reservoir, south of Highway 94 near the Steele Canyon Road, near the intersection of Fairmont Road and Montezuma Road close to San Diego State University, in Steele Canyon, near Highway 94 just west of Jamul, Mina de Oro Road in eastern Poway, Honey Springs Truck Trail, near Western Victoria Drive in Alpine, west of Anthony Road near Lilac, near La Cresta Boulevard and Forrester Creek in Alpine, southwest of Harmony Grove in San Elijo Canyon, near Wisecarver Truck Trail and Skyline Truck Trail, Wisecarver Road near the intersection of Skyline Truck Trail and Lyons Valley Road, on Poway Grade, close to Fortuna Ranch Road in Elfin Forest, the north slope of Lawson Peak near Carveacre Road, Green Valley Truck Trail near Espola Road in Poway, near Red Mountain Road and south of Old Castle Road, the slopes immediately south of Hidden Glen, Carroll Canyon east of El Camino Memorial Park, across the road from the Old Padre Dam parking lot, and a drainage flowing into Forrester Creek in Crest. CNDDDB reports are from San Pasqual Valley east of Lake Hodges, 2.75 miles northeast of Rancho Bernardo, Lopez Canyon, north of San Dieguito Reservoir in Escondido Creek, near the confluence of Lusardi Creek and the San Dieguito River, in the Otay River Valley near Beyer Way, north of Beeler Canyon and south of Poway Road, south of Twin Peaks Road near Rattlesnake Creek in Poway, north of Sequan Peak, south of Sequan Peak east of Beaver Hollow, and east of El Camino Real approximately 1.8 miles north of its intersection with La Costa Avenue. Recent CNDDDB reports are from Warren Canyon .25 mile NE of Rock Haven Spring, .5 mile north of Twin Peaks Road and .7 mile west of Espola Road in Poway, .5 mile east of Dearborn Memorial Park in Poway, south of Highland Valley Road 3.4 miles northeast of Rancho Bernardo Road and Pomerado Road, and at Forester Creek south of La Cresta Road. A limited population is found beneath the freeway bridge near the ocean at San Onofre along San Mateo

Creek. This may be the northwestern limit for the species, only yards south of the Orange County border.

This shrub grows south into Baja to 31° 38' North where collected by Moran (SD 101788), 1 km east of El Paraiso. Thirteen collections for northern Baja are deposited in the San Diego Natural History Museum's herbarium.

STATUS: San Diego Sagewort is declining in the U.S. and being impacted by numerous local projects that channelize or disrupt minor drainages, or via massive flood control efforts, such as the San Diego River/Mission Valley FSDRP project. This herbaceous shrub should be considered for introduction to native plantings in riparian habitats; it seems to grow well if started with temporary irrigation measures. Substantial portions of all larger populations are recommended for protection. San Diego Sagewort appears to have been well distributed throughout appropriate habitats prior to urban expansion. Cumulative human impacts to its wetland's and mesic chaparral habitat are dictating its decline. The bicolored and deeply and coarsely 3-7 lobed leaves of *Artemisia palmeri* are relatively distinctive. The lobes are substantially broader than with *Artemisia californica* - with which it often grows sympatrically.

WESTERN SPLEENWORT [*Asplenium vespertinum* Maxon]

LISTING: CNPS List 4 R-E-D Code 1-2-2
State/Fed. Status -- None ASPLENIACEAE
Global Rank G3G4 State Rank S3.2

DISTRIBUTION: San Diego County, Riverside County, Orange County, Los Angeles County; San Bernardino County; Baja California, Mexico

HABITAT: This cryptic fern is sometimes found at the shaded base of overhanging boulders. A microhabitat utilized by Western Spleenwort on Cowles Mountain was semi-shaded but seasonally arid. Conditions here were moist for only brief periods following good rainfall. It was seen in a more mesic circumstance in canyonlands on Otay Mountain, growing under substantial, overhanging tree and shrub cover near a creek. Soils at this site are mapped as San Miguel-Exchequer rocky silt loams. Possible Associates: *Adiantum jordanii*, *Pentagramma triangularis*, *Aspidotis californica*.

KNOWN SITES: This fern is uncommon in rocks in Mission Gorge, east of the highway and Old Padre Dam, on the flanks of Cowles Mountain. It was also observed in Sycamore Canyon on Otay Mountain. Herbarium specimens were examined from three miles below Barrett, Tecate Junction, the north slope of Lyons Peak, a canyon north of Jamul Mountain, Woodwardia Canyon on Otay Mountain, San Miguel Mountain (the type specimen for this species), the eastern slope of Mission Gorge, Sweetwater, Alpine, Poway Valley, near the Poway Grade, Featherstone Creek, Foster, El Cajon Mountain, below Morena Dam, the north slope of Tecate Mountain, and at Hidden Glen. A report is from near Chocolate Summit south of El Capitan Reservoir. It is also reported from the Santa Ana Mountains above Lake Elsinore in Riverside County; the Loma Linda Hills; near a seep in the San Mateo Wilderness Area; the southern face of the San Gabriel Mountains of San Bernardino County; as well as near Santa Monica and Pasadena in Los Angeles County. Sanders in unpublished notes mentions there are collections from only 13 sites from the herbariums at Rancho Santa Ana and U.C. Riverside, of which only four are in the last fifty years.

A collection from Baja California found at the herbarium of the San Diego Natural History Museum is from San Rafael and was collected prior to the turn of the last century by C.R. Orcutt. Two other collections are reported from Baja California.

STATUS: Herbarium specimens for this fern in San Diego County were collected primarily from rugged, hilly terrain which is still little impacted by urban development. The few recent observations

and reports are of quite limited numbers of plants per site, indicating that larger populations in any given area may be quite uncommon. Populations of this species are considered stable. Given the latest information from around southern California in the Year 2000, all populations are recommended for protection. The paucity of collections from Baja California, and the few recent collections may indicate this species is much more uncommon than previously assumed. Given its southern California distribution, Western Spleenwort may be a relictual element from a wetter climatic period; its decline natural and as yet only partly influenced by human impacts. The pinnate leaves of this spleenwort are relatively small, giving the long, relatively narrow fronds a delicate appearance not found with other ferns that grow in its habitat. More focused field work is necessary to more accurately assess the true sensitivity status of this fern.

SALTON SEA MILK VETCH [*Astragalus crotalariae* (Benth.) Gray]

- LISTING:** CNPS List 4 R-E-D Code 1-1-2
State/Fed. Status -- None FABACEAE Jan.-Apr.
Global Rank G4G5 State Rank S3.3
- DISTRIBUTION:** San Diego County, Imperial County, and Riverside County; Arizona; Baja California, Mexico
- HABITAT:** Barren, sandy locales in Sonoran Desert Scrub are the preferred habitat of Salton Sea Milk Vetch. Mild soil disturbance appears to enhance opportunities for this conspicuous annual/biennial. Possible Associates: *Larrea divaricata* ssp. *tridentata*, *Ambrosia dumosa*, *Coldenia plicata*.
- KNOWN SITES:** Rare along the Borrego Salton Seaway, this species is easily identified by its vile odor. Because of its desolate habitat, it is difficult to assess the abundance of this milk vetch. An old report is from near Palm Spring. Herbarium collections include Fish Creek Wash at Split Mountain, Palo Verde Wash, Font's Point Wash, Carrizo Station, the Carrizo Badlands and South Mesa washes, and the historical Borrego Oil Well site. From Imperial County are herbarium collections at the entrance to the Salton Sea Naval Base, at S-22 near its junction with Highway 86, at Dixieland, and by Montgomery Road 1.1 miles west of Haley Road. Biological survey reports note sites northeast of the Fish Creek Mountains, as well as a number of locales north and southeast and south of the Superstition Hills, and southeast of the Superstition Mountains. Reported by Barneby from the head of the Salton Sea south to Carrizo Valley, southeast through Imperial County to the Yuma Desert in extreme southwestern Arizona, and south into Baja California (no collections are found for Baja at the herbarium of the San Diego Natural History Museum).
- STATUS:** The Salton Sea Milk Vetch is apparently stable in the southern deserts. Off-road vehicle use can impact this species when it is sometimes situated adjacent to existing trails or on broad road shoulders such as at the previously noted Salton Seaway site. Reasons for the rarity of this species are difficult to assess, and more specific information is needed about microhabitat preferences. The occupied locations in San Diego County do not superficially appear to be distinctive, but rather habitat which is well distributed in the region. San Diego County's deserts do lie on the western edge of the species' known range, indicating that climate may be a key factor in its local distribution. Summer rainfall is greater on the more easterly deserts in Arizona and northern Mexico -- where this species occurs in greater numbers. This tall and robust species has a very distinctive unpleasant odor that could actually make one nauseous. On one occasion, I had to tightly seal it in an airtight plastic bag because the odor in the car's cab was unbearable.

DEAN'S MILK VETCH [*Astragalus deanei* (Rydb.) Barneby]

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- /Species of Concern FABACEAE Mar.-May

Global Rank G2 State Rank S2.1

DISTRIBUTION:

San Diego County

HABITAT:

Diegan Coastal Sage Scrub, chaparral, and sandy washes are all reported habitats for this very rare, herbaceous perennial. The few extant locales examined indicate this species utilizes the partial shade of low-growing shrubs where it is not always readily detectable. Cienega-Fallbrook rocky sandy loam is the soil type mapped for the Tecate population. Possible Associates: *Eriogonum fasciculatum*, *Gnaphalium* species, *Machaeranthera juncea*. The sensitive Southwestern Arroyo Toad [*Bufo (microscaphus) californicus*] is known from broad sandy washes occupied by this vetch.

KNOWN SITES:

The current status of historical sites in Sloane Canyon and at the Singing Hills Country Club are unknown; much of the habitat is developed or degraded. A few plants grow above a cut-slope just west of a sharp northeastward turn on Willow Glen Drive 1 mile south of the Singing Hills Golf Course. A few plants grow downslope here alongside the paved road. It was noted northeast of Hillsdale Road near the intersection with Donohue Drive. A second locale is nearby to the southeast, north of Hillsdale Road near Elan Lane, with plants inconspicuously located beneath the shrub understory. It is also reported north of Highway 94 just west of the Tecate Road turnoff at a site difficult to access. Old biological survey reports note sites on steep slopes at the Hester Granite Pit on Willow Glen Road north of Oak Drive, as well as on the eastern slopes at the mouth of Sloane Canyon. Most of the historical habitat probably utilized by this species has been extirpated by sand mining and grading for golf courses. Herbarium collections examined were for Whispering Oaks near the Sloane Ranch, and a first year burn at Cottonwood, 3 miles below Barrett. The creeks and tributaries of the upper Otay River and Sweetwater River seem to define the range of this species. A CNDDDB record is from the confluence of an unnamed creek and Potrero Creek approximately 0.75 mile west of Grapevine Creek northeast of Tecate Peak.

No specimens for Dean's Milk Vetch are found in the San Diego Natural History Museum's herbarium from Baja California. This species should be looked for in northern Baja California in suitable habitat near Tecate.

STATUS:

This very rare San Diego County endemic is declining and is now imperiled at most of the known sites; it should be given immediate listing as Federally Endangered. No extensive extant populations are known for Dean's Milk Vetch. This species has the potential for extinction within the next few decades. All populations should be protected with substantial habitat buffers included. Horticultural requirements for growing this species need to be investigated. Dean's Milk Vetch is apparently restricted to a few contiguous watersheds over a relatively small range. It has probably been extremely uncommon within its U.S. range over the last two hundred years; but it is now threatened at the few locations where it once was well established. *Astragalus trichopodus* and/or *Astragalus pomonensis* may have contributed to its origins. Rarity may be attributed to either relatively recent isolation/speciation; or conversely, to a relictual and localized population representing a once wider ranging species. In either case, this is one of the rarest plant species in San Diego County. Dean's Milk Vetch has the midrib of the leaflet prominently raised on the lower side unlike *Astragalus pomonensis*. *Astragalus trichopodus* var. *lonchus*, which also grows in the same region, has a very distinctive long-stalked base to each pod, and is not glabrous.

JACUMBA MILK VETCH [*Astragalus douglasii* (T. & G.) var. *perstrictus* (Rydb.) Munz & McBurn. ex Munz]

LISTING:

CNPS List 1B

R-E-D Code 2-2-2

State/Fed. Status -- / Species of Concern

FABACEAE Apr.-Jun.

Global Rank G5T2 State Rank S2.2

DISTRIBUTION:

San Diego County, Imperial County; Baja California, Mexico

HABITAT: Open chaparral, often a transmontane desert phase, is the preferred U.S. habitat of this herbaceous perennial. Mild soil disturbance may encourage growth of this species in relatively exposed, xeric locales. La Posta loams are the soil type found with the Live Oak Springs populations near Miller Valley. Possible Associates: *Adenostoma fasciculatum*, *Geraea viscida*, *Cercocarpus betuloides*.

KNOWN SITES: Jacumba Milk Vetch can be found along Highway 94 east of Cameron Corners. Scattered individual plants were seen south of Miller Creek and west of Miller Valley on mildly disturbed road shoulders where there was little competition from other species. Jacumba Milk Vetch's habitat is primarily transmontane, high desert chaparral. This plant is little known owing to its occurrence in a very lightly populated area of San Diego County; nevertheless, a number of scattered reports from Buckman Springs to Bankhead Springs indicate Jacumba Milk Vetch occurs at a substantial number of locales. Old reports include Lark Canyon, Eckener Pass, Campo, Tierra del Sol, and Jacumba. Old biological survey reports note sites just south of Boulevard, near Starship Road and the community of Manzanita south of Highway 94, 2 miles south of Tierra Del Sol along Tierra Del Sol Road, 1.2 miles south of Bankhead Springs, south of the Calexico Lodge and southeast of Manzanita, along McCain Valley Road, between Interstate 8 and Highway 94 south of Boulevard, and 0.5 mile north of Manzanita and east of Jewell Road. This species likely extends into Imperial County south of In-Koh-Pah Park. CNDDDB reports are for scattered locales in the vicinity of the McCain Valley including near the Cottonwood Campground, south of the McCain Valley Road's terminus, on Canebrake Road, south of the intersection of McCain Valley Road and Lost Valley Road, in Lark Canyon Campground, near Mount Tule, in Pepperwood Canyon, near the Manzanita/Cottonwood Road, near a road intersection to Table Mountain, 0.25 mile south of McCain Valley Road and north of Lost Valley Road, and south of Table Mountain paralleling Interstate 8. Another CNDDDB entry is for the Manzanita Indian Reservation adjacent to the reservoir along Tule Creek. Plants growing near Temecula Creek south of Aguanga in Riverside County show strong tendencies towards variety *perstrictus* and grow in a similar semi-desert microhabitat; these could represent a northern, disjunct population of Jacumba Milk-vetch.

This plant grows south in Baja California to 31° 44' North where collected 2 miles west of Cerro Colorado by Moran (SD 83919). Only 7 collections from Baja are deposited at the San Diego Natural History Museum's herbarium; pinyon and juniper woodland is its preferred habitat south of the border.

STATUS: Populations of Jacumba Milk Vetch are presently stable in the United States, owing to limited development of its transmontane, desert habitat. Some local ranching groups reportedly send out work crews to destroy locoweeds in the mistaken belief that all species in this genus are toxic to horses and cattle. *A. d. var. perstrictus* has a distinctive erect habit and growth aspect quite dissimilar to *A. douglasii* var. *parishii* which grows at higher elevations in the mountains of southeastern San Diego County. When the latter is in fruit, the plant lies open and the inflorescences are semi-prostrate -- as if the plants were stressed by a lack of water. *A. d. var. parishii* is according to unpublished notes by A. Sanders widespread but uncommon in the San Bernardino and San Jacinto Mountains at mid elevations; and is poorly differentiated from more northerly ranging *A. d. var. douglasii*. *A. d. var. parishii* can be locally common in the dry understory of pine forest in San Diego County and does not warrant sensitivity listing status. Substantial portions of large populations of *A. d. var. perstrictus* are recommended for protection. *Astragalus* is a genus which is well-known for speciating following geographic isolation and/or adaptations to unique soil requirements. Present populations of Jacumba Milk Vetch are probably similar to those a hundred years ago, but the introduction of piped water into the area could lead to substantial changes in the rural nature of its arid border habitat.

HARWOOD'S MILK VETCH [*Astragalus insularis* Kell. var. *harwoodii* Munz & McBurn.]

- LISTING:** CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status -- None FABACEAE Jan.-May
Global Rank G5T3 State Rank S2.2?
- DISTRIBUTION:** San Diego County, Imperial County, and Riverside County; Arizona; Sonora, Mexico
- HABITAT:** Sonoran Desert Scrub with gravelly, sandy washes or dunes is the preferred habitat of this annual. Possible Associates: *Psoralea spinosa*, *Hyptis emoryi*, *Justicia californica*.
- KNOWN SITES:** Harwood's Milk Vetch has been reported in sandy washes near Elephant Tree Nature Trail south of Ocotillo Wells. A report is also from a wash near Vallecito. No other recent sites are known for this species in San Diego County. An old report by Gander for 2 miles southwest of Carrizo Station has not been relocated. Herbarium collections were examined for Imperial County at Ogilby Road; as well as locales 3 miles west of Blythe, the Pinto Basin, and Chuckwalla Valley in Riverside County. Barneby reports it in Yuma County, Arizona south to the Colorado Delta in northeastern Baja California; also, to the head of the Gulf of California, northern Sonora, the San Lorenzo Islands, Angel de la Guardia, and the Desierto de San Julian. It is reported by Felger in the Gran Desierto of Sonora, Mexico.

Eight herbarium specimens from Baja California are deposited at the San Diego Natural History Museum, south to 15 miles west of Los Angeles Bay where collected by Harbison (SD 41763). Also collected on Angel De la Guardia Island in the Gulf of California. Subspecies *insularis* is more widely collected in the Baja deserts.

- STATUS:** The Harwood's Milk Vetch populations on the southern deserts, while apparently quite uncommon, are presumed stable or slowly declining based on the limited impacts to their potential desert habitat. However, ORV impacts in washes and dune habitat need to be investigated. More information is needed on the desert range and cumulative population size of this species, and its tolerance for various mildly disturbed microhabitats. Until such information is gathered, all known sites should be protected. *Astragalus lentiginosus* var. *borreganus* generally has considerably more flowers on the inflorescence (10-35 versus 2-10) than Harwood's Milk Vetch and larger flowers (keel 10-13 mm versus 4.8-6 mm). *Astragalus magdalenae* var. *peirsonii* has a terminal leaflet which is not or only obscurely jointed to the midrib (see line drawing in Jepson), while Harwood's Milk Vetch has the terminal leaflet clearly jointed. *A. m.* var. *peirsonii* also has larger flowers (keel 8.5-10 mm versus 4.8-6mm).

BORREGO MILK VETCH [*Astragalus lentiginosus* Dougl. var. *borreganus* Jones]

- LISTING:** CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None FABACEAE Feb.-May
Global Rank G5T4T5 State Rank S3.3
- DISTRIBUTION:** San Diego County, Riverside County, San Bernardino County, Imperial County; Arizona; Baja California and Sonora, Mexico
- HABITAT:** Very open desert scrub in sandy locales and semi-stabilized dunes is favored by this herbaceous perennial. Blowing sands (Carrizo soils) may create some instability of habitat which enables the Borrego Milk Vetch to out-compete normally hardier desert species. Possible Associates: *Helianthus niveus* ssp. *canescen*, *Palafoxia arida*, *Croton californicus*.
- KNOWN SITES:** The Borrego Milk Vetch grows on sand dunes near Font's Point in the Anza-Borrego Desert. The population probably fluctuates dramatically depending upon precipitation. It is occasional near Borrego north of Henderson Canyon Road in very sandy locales. It is reported from a wash near Thimble Trail and east of Palo Verde wash in Anza-Borrego State Park. Herbarium specimens are from the south end of Clark Valley, in Coyote Creek, on the east side of Ogilby Road in Imperial County, and on the Kelso Sand Dunes in San Bernardino County. Old

biological survey reports note sites near Palo Verde Boulevard and the Riverside/Imperial County line, as well as north of the New Coachella Canal and north of Highway 78. Plants in a sandy wash near Elephant Trees Nature Trail at Ocotillo Wells may also key here. Reported by Barneby from extreme southwestern Arizona and adjoining northwestern Sonora, Mexico. No Baja specimens are found at the San Diego Natural History Museum's herbarium.

STATUS: County populations of Borrego Milk Vetch are apparently stable given the limited impacts to its desert habitat. This species is potentially impacted by ORV use in Borrego Valley, as well as by people gathering colorful wildflowers during the occasionally high seasonal influx of tourists to the Valley. Until more range and cumulative population size information is available, all populations should be protected. Specimens of *Astragalus lentiginosus* are annotated by Barneby as variety *coulteri* from Font's Point Wash, and are deposited at the San Diego Natural History Museum. A second annotated specimen for this entity is recorded from between Holtville and Yuma in Imperial County. In the Jepson Manual this is treated as a synonym, but its presence implies there may be some variability in the local San Diego County/Imperial County form. *Astragalus lentiginosus* is a notoriously variable taxon. *A. l.* variety *borreganus* is an annual (sometimes perennial) that has conspicuous purple flowers with a keel at least 8.5 mm, loose racemes, a not strongly inflated pod that is silky strigulose, as well as silky herbage. Rarity appears to be a result of microhabitat dune requirements for this species, and the geographic isolation of such habitat on the present day Colorado Desert.

BEAR VALLEY WOOLLYPOD [*Astragalus leucolobus* Jones]

- LISTING:** CNPS List 1B R-E-D Code 2-2-3
State/Fed. Status -- /Species of Concern FABACEAE May-Jul.
Global Rank G2 State Rank S2.2
- DISTRIBUTION:** San Bernardino County, Los Angeles County, Riverside County
- HABITAT:** Montane Coniferous Forest and Pebble Pavement Plain are the reported habitat for this herbaceous perennial; particularly dry pine woods, gravelly knolls among sagebrush, and stony lake shores. In the Santa Rosa Mountains this small locoweed grows in relatively dry, semi-shaded locales beneath conifers. Possible Associates: *Pinus jeffreyi*, *Pedicularis semibarbata*, *Galium andrewsii*.
- KNOWN SITES:** Bear Valley Woollypod is locally well distributed on Santa Rosa Peak north of the San Diego County line in Riverside County. One old report by Moran (SD 67902) is from nearby, on the bare north slope of a ridge, 1 mile northwest of Toro Peak, southeast of the Stump Spring Campground in Riverside County. The Santa Rosa Mountains have not been examined with much scrutiny by prior botanists working in the region. A herbarium specimen at SD is recorded from the road to Table Mountain northwest of Big Pines near the summit at 7,400 feet in Los Angeles County. Reported by Barneby from the San Antonio Mountains of Los Angeles County to the east end of the San Bernardino Mountains and the Santa Rosa Mountains; including the Bear Valley and Baldwin Lake region. CNDDDB entries for San Bernardino County include the north shore of Baldwin Lake, the Mohave View Unit of the Bear Valley Reserve, Eagle Point in Bear Valley, 0.4 airmile southeast of the well at Cienaga Seca on Onyx Peak, Castle Glen area near Big Bear Lake, Sugarloaf near the northern terminus of Dixie Lee Road, Arrastre Flat, Lower Holcomb Valley, by the roadside between Hanna Flat and Fawnskin, east of Arrastre Creek near Road 2N02, on dry benches at Coon Creek, at Cactus Flat in Cushenbury Canyon, at Hanna Flat between Holcomb Creek and Fawnskin Valley, at Caribou Creek near Belleville between Holcomb Valley and Arrastre Flat, west of Big Bear City on the north side of Highway 38 approximately 0.6 mile east of the Stanfield Cutoff, at Sugarloaf between the edge of town and Highway 38; for Los Angeles County at Table Mountain above Wrightwood; for Kern County a questionable identification in Cuddy Canyon at Cuddys Valley; for Ventura County a questionable identification at the summit of Mount Pinos.

STATUS: This species is presumed stable in its montane habitat; development near Big Bear Lake could be impacting potential habitat. The status of Bear Valley Woollypod is unknown in San Diego County. This species is possibly present in the southern portions of the Santa Rosa Mountains that extend into San Diego County; however, no collections or specific sites could be located. Rarity may be a factor of population isolation within a narrowing montane habitat following warmer and drier weather patterns that followed the Pleistocene. The distinctive woolliness of the plant, the long ascending purple keel (14.3-16.8 mm), and the species' higher elevation habitat separate this from other locoweeds found in San Diego County.

PEIRSON'S MILK VETCH (*Astragalus magdalenae* Greene var. *peirsonii* (Munz & McBurn) Barneby]

LISTING: CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- CE/FT FABACEAE Dec.-Apr.
Global Rank G3G4T2 State Rank S2.2

DISTRIBUTION: San Diego County, Imperial County; Arizona; Baja California and Sonora, Mexico

HABITAT: Well developed desert dunes are the preferred habitat of this short-lived perennial. Much better habitat is found on the Algodones dune system east of El Centro in Imperial County. Possible Associates: *Helianthus niveus*, *Croton californicus*, *Palafoxia arida*. The Fringe-toed Lizard (*Uma notata*) may occupy similar habitat as Harwood's Milk Vetch.

KNOWN SITES: No recent sightings in San Diego County are known. A single unconfirmed collection is reported from dunes near Borrego Spring; it is to be searched for during years of good desert rains. The nearest known extant locale is the Algodones Dunes in Imperial County (e.g., 4 miles west of Glamis; 9.6 miles east of the Highland Canal; 22 miles east of Brawley; east of Holtville) where this species is locally well distributed following years of good rainfall. Biological survey reports note a site approximately 8 miles north of the Superstition Hills, as well as north of the New Coachella Canal and north of Highway 78. Shreve and Wiggins report this species in Arizona from the vicinity of Yuma.

Growing southeast to Puerto Penasco in Sonora; the variety *peirsonii* has a primarily eastern range from San Diego County. *Astragalus magdalenae* var. *magdalenae* has 15 collections from Baja California in the San Diego Natural History Museum's herbarium; south to Santa Maria Bay at 24° 46' North where collected by Moran (SD 50266); it also has been collected on Natividad Island.

STATUS: This species is presumed stable in the southern deserts. The status of Peirson's Milk Vetch in San Diego County is unknown. Until more cumulative population and range information is available, all populations should be protected. The dearth of dune habitat on the local deserts probably accounts in some large part for the rarity of the species in San Diego County. The terminal leaflet on Peirson's Milk Vetch is not jointed to the midrib (see Jepson Manual line drawing), unlike other species found in the southern California deserts.

DESCANSO MILK VETCH [*Astragalus oocarpus* Gray]

LISTING: CNPS List 1B R-E-D Code 3-2-3
State/Fed. Status -- /Species of Concern FABACEAE May-Aug.
Global Rank G2 State Rank S2.2

DISTRIBUTION: San Diego County

HABITAT: Cismontane chaparral edges at the periphery of meadows is a typical habitat for the Descanso Milk Vetch. Most locales observed have species of *Arctostaphylos* and other woody shrubs well interspersed with Chamise. Crouch coarse sandy loams are utilized at Jeff Valley. As with many other *Astragalus*, mild soil disturbance may be a factor in facilitating the spread of

populations. Possible Associates: *Adenostoma fasciculatum*, *Eriogonum wrightii*, *Pteridium aquilinum*.

KNOWN SITES: This species is easily confused when not in fruit with *Astragalus douglasii*. Descanso Milk Vetch has very distinctive, short pods. Scattered locales from Palomar to Cuyamaca Mountains include herbarium collections from 1.5 miles east of Santa Ysabel, Black Canyon 1 mile south of Mesa Grande, and at the San Diego River Falls. This plant may be either under or over-reported due to confusion with *A. douglasii*. It is definitely not common as is sometimes suggested; it grows along the road near the approach to Volcan Mountain, along trails east of Green Valley Campground, and is locally plentiful alongside trails in Jeff Valley on Palomar Mountain. Reports are from Echo Valley, Ballena, the Lake Henshaw area, and in the eastern San Pasqual Valley. Herbarium specimens examined are from Descanso near Central Avenue, Boulder Creek Road, Julian, the Cedar Creek Falls on the San Diego River, Witch Creek, Black Canyon 1 mile south of Mesa Grande, Pine Hills, Carrizo Creek near Lake Henshaw, and on the Wyss Ranch in the Palomar Mountains. Old biological survey reports are from the Hosking Ranch near Wynola, as well as 0.25 mile east southeast of Aguanga near Highway 79. CNDDDB reports are along Oak Grove Drive in Descanso, 1.5 miles east of Santa Ysabel near Highway 78, 5 miles north of Santa Ysabel, and on the south side of Airplane Ridge just north of Arroyo Seco in the Cuyamaca Mountains. Recent CNDDDB reports are from .3 miles from Loveland Reservoir along a truck trail, between Dyche Valley and Will Valley on Palomar Mountain, and along the Lusardi Truck Trail .3 and .6 mile from Highway 76.

No collections from Baja were found in the San Diego Natural History Museum's herbarium.

STATUS: Montane populations of the Descanso Milk Vetch, a San Diego County endemic, are presumed stable. Continued heavy recreational use of the Cuyamaca Mountains, including activities such as horse riding and mountain biking, could negatively impact some populations of this species which are presumed protected within state parks lands. While this *Astragalus* may actually increase in numbers where soils are mildly disturbed (*e.g.*, along secondary hiking trails), heavy horse or bike traffic could reverse such a trend and may lead to expanded and heavily degraded trails. All substantial populations should be protected. Given the variety of historical reports, Descanso Milk Vetch is relatively widely ranging in County mountains; including at both lower montane and mid-elevation locations. Nevertheless, it seldom occurs in any substantial numbers. Circumstances promoting good population vigor may be marginal under current climactic conditions. Horticultural studies are warranted to determine optimal growing conditions for this distinctive species; and could provide some clues in explaining its sporadic distribution. The egg-shaped inflated pod of this species (hence the name *oocarpus*) is distinctive and separates this from *Astragalus douglasii* which can grow in similar habitat and can have similar leaves.

JAEGER'S LOCOWEED [*Astragalus pachypus* Greene var. *jaegeri* Munz & McBurn.]

LISTING: CNPS List 1B R-E-D Code 3-3-3
State-Fed. Status -- /Species of Concern FABACEAE Dec.-Jun.
Global Rank G?T1 State Rank S1.1

DISTRIBUTION: Riverside County and San Diego County

HABITAT: Jaeger's Locoweed occurs in chaparral understory with a coastal/desert ecotonal mix of shrubs. At Vail Lake the soils are mapped as Gullied Lands. Possible Associates: *Eriogonum fasciculatum*, *Mahonia nevinii*, *Adenostoma fasciculatum*.

KNOWN SITES: This subshrub is growing near the tip of the peninsula that juts into Vail Lake (Riverside County) from the south. A herbarium specimen at the San Diego Natural History Museum was examined from the hills east of Banning along Potrero Creek; it is also reported in Riverside

County at locales south and east of Vail Lake towards Aguanga. One old report is from a chaparral hillside west of Warner Hot Springs.

STATUS: The status of this species in San Diego County is presumed stable given the very limited development in the Warner Springs to Aguanga region. Proposed development near Potrero Creek and Vail Lake indicate this species is imperiled within its known Riverside County range. This species has some potential as a candidate for listing as Federally Endangered; more information is needed on potential habitat in the foothills of the San Jacinto Mountains. At present, all populations should be protected. It is difficult to know if rarity for this species is a product of relictual distribution, or of geologically recent speciation and slow expansion. Open chaparral habitat south of Vail Lake (that includes a vigorous population of the sensitive shrub *Mahonia nevinii*) is quite unusual for the region, and has the appearance of a relictual environment surviving from an era prior to the widespread local expansion of dense mixed chaparral. *Astragalus pachypus* var. *pachypus* which is uncommon in the southern California deserts has white petals (not yellow when fresh), and generally a slightly larger calyx tube (4-5.2 mm versus 3.7-4.3mm) than Jaeger's Locoweed. The pods are not three sided such as occurs with the closely related *Astragalus tricarinatus* that is found in Big Morongo Wash in the northeastern Coachella Valley. The forms of *Astragalus lentiginosus* have smaller flowers (keel 6-9.4mm versus 10.7-15.3mm).

COASTAL DUNE MILK VETCH [*Astragalus tener* Gray var. *titi* (Eastw.) Barneby]

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- CE/FE FABACEAE Mar.-May
Global Rank G1T1 State Rank S1.1
- DISTRIBUTION:** San Diego County, Los Angeles County, Monterey County
- HABITAT:** Coastal dunes are the preferred habitat based on historical records. The high degree of vegetation disturbance to virtually the entire southern California coastal strand accounts for the likely local extirpation of this species. In Monterey County the population is subject to repeated, dense fogs. Presumed Associates: *Abronia maritima*, *Nemacladus denudata*, *Camissonia cheiranthifolia*.
- KNOWN SITES:** This annual was probably extirpated by Naval Amphibious Base exercises on the Silver Strand in the distant past, or by recreational beach use. This is another beach dune species whose habitat is extremely degraded in San Diego County. No other confirmed reports are known from San Diego County; several historical reports were based on misidentifications. Elsewhere, one population for this species is known to be extant on a bluff on the coast in Monterey County, 0.25 mile north of Bird Rock Road along 17 mile Drive where it is imperiled by foot/horse/auto traffic. Historical reports are from Moss Beach, Pacific Grove, and Monterey on Monterey Bay; as well as a site on the coast of San Luis Obispo County. It is presumed extirpated in Los Angeles County where it was collected at Santa Monica in 1891 by Hasse, as well as at Hyde Park.
- STATUS:** The Coastal Dune Milk Vetch is presumed extirpated in the southern California and close to extinction on the coast in central California. All populations should be protected with adequate buffers included. Horticultural requirements should be investigated, and seeds from plants at the few existing locations should be considered for propagation and establishment at historical locales where the species is no longer present. Taxonomic links between the Monterey population and the lone San Diego County site (based on Purer's 1930's collection) should be re-examined, given the considerable distance between these locales and the few intervening, historical populations. Rarity of this species in southern California is probably due to several factors including extraordinary habitat destruction along the beaches due to recreational uses; as well as to natural rarity of the species indicating it may be relictual in nature and poorly adapted to the present climate regime. During the Pleistocene the beaches, due to lower

oceanic elevations/water tied up with glaciation, extended well into what is now the Pacific Ocean at a number of locations. Ancestral beach plants that could not adapt to long-term changes in weather conditions were less likely to colonize the newer beaches being created farther inland as the oceans rose and the glaciers retreated releasing additional available water. Such a hypotheses, while very speculative, might explain the odd Monterey/San Diego counties range of a naturally rare plant species once found near the beaches at intervening locations. Alternative possibilities might include erratic avian seed dispersal during north/south migrations.

COULTER'S SALTBUSH [*Atriplex coulteri* (Moq.) D. Dietr.]

- LISTING:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- None CHENOPODIACEAE Mar.-Oct.
Global Rank G2 State Rank S2.2
- DISTRIBUTION:** San Diego County, Orange County, Riverside County, Los Angeles County, Santa Barbara County, San Bernardino County, San Clemente Island, Santa Catalina Island, San Miguel Island, Santa Rosa Island, Santa Cruz Island, Anacapa Island, San Nicolas Island; Baja California and San Benito Island, Mexico
- HABITAT:** Historical records indicate sea-bluff habitat is preferred. Presumed Associates: *Atriplex pacifica*, *Eriogonum parvifolium*, *Amblyopappus pusillus*.
- KNOWN SITES:** Coulter's Saltbush has historically been quite rare in San Diego County. Herbarium specimens examined were for Otay Mesa, Silver Strand, Balboa Park, the historical Santa Margarita Ranch House, and on the San Onofre Bluffs. Some specimens need to be carefully differentiated from *Atriplex pacifica*; further taxonomic work is necessary to clearly delineate these two species. Outside of San Diego County, herbarium specimens examined from SD include Santa Catalina Island (where reported locally common by Thorne) above Cottonwood Dam, at Little Harbor, and in Bulrush Canyon; on Seal Beach at San Nicolas Island, on Santa Cruz Island, and on San Benito Island in Mexico. It is apparently quite rare in Orange County where reported by Roberts, and on coastal bluffs near Point Dume in Los Angeles County where reported by Raven. A recent report is from Newport Beach in Orange County where growing north of a public library near the Fashion Island Shopping Center. A second Orange County report is from near the Prima Deshecha Landfill.
- STATUS:** This species may be extirpated from San Diego County, as well as nearing extirpation elsewhere in mainland California. All mainland populations should be protected with adequate buffers included. Coulter's Saltbush is similar in appearance to the Pacific Saltbush, but has a much more pronounced, serrated fruiting bract on the free margin; identification should be carefully checked. A current review is needed of historical collections to include site re-visits, in conjunction with a focused investigation of additional potential sites, to more accurately assess the status of this species. In northern Baja California where development along the immediate coastline has not yet been so catastrophic to native plant life, there is often a thin microhabitat veneer at the edge of the sea bluffs. Within this area of erosive steep slopes to the west, and typical coastal sage scrub/chaparral to the east, an unusual and distinctive bluff floral association still persists. This zone may be only a few yards wide in some areas; nevertheless, a micro-flora including species of saltbushes such as *Atriplex pacifica* thrive under the influence of salt spray and a lack of competition for light from taller shielding shrubs. Salt marsh subshrubs may also occupy this corridor. This narrow zone has been almost completely lost in San Diego County; often due to the construction of viewshed homes almost to the edge of the sea bluffs, and the subsequent planting of horticultural vegetation in the intervening areas. Coulter's Saltbush has sharply dentate bracts (entire bract 2-3 mm) unlike the minutely toothed bracts of *Atriplex pacifica* (entire bract 1-1.5mm) with which it is sometimes confused. The bract shapes of the two species are quite different.

SOUTH COAST SALTSCALE [*Atriplex pacifica* Nels.]

- LISTING:** CNPS List 1B R-E-D Code 3-2-2
State/Fed. Status -- /Species of Concern CHENOPODIACEAE Mar.-Oct.
Global Rank G3G4 State Rank S2.2
- DISTRIBUTION:** San Diego County, Orange County, Los Angeles County, Ventura County, Riverside County, San Clemente Island, Anacapa Island, Santa Catalina Island, Santa Cruz Island, San Nicolas Island, and Santa Rosa Island; Baja California and Sonora, Mexico
- HABITAT:** This wiry little herb grows in xeric, often mildly disturbed locales. Soils are mapped as Linne clay loam at the Rice Canyon site and Huerhuero-urban land complex in Imperial Beach. Usually the surrounding vegetation is an open Diegan Coastal Sage Scrub; although, near the Bernasconi Hills it was found on alkaline flats in an area devoid of taller shrubs. Possible Associates: *Filago californica*, *Ferocactus viridescens*, *Stylocline gnaphalioides*.
- KNOWN SITES:** The type specimen for this little saltbush is from San Diego; presumably within several miles of the ocean. A few plants were observed on an eroded hillside west of the intersection of McNeil and Dubuque in Oceanside and east of I-5 during spring 2001. Occupied habitat includes small populations seen just east of Fairbanks Ranch near Lusardi Canyon along a pipeline easement, in Chula Vista's Rice Canyon near an expanding new housing development, west of Carmel Mountain on an undeveloped portion of the ridgeline south of Arroyo Sorrento Road, in Salt Creek near the aquaduct crossing north of Otay Mesa, on the periphery of the salt marsh near the mouth of the Tijuana River in Imperial Beach, in a SDGE easement north of the terminus of River Ash Drive in Chula Vista, along the dirt roads immediately south of Rock Mountain in Otay Valley, near the northern terminus of Dillon Road on Otay Mesa, south of the terminus of The Hill Road in Bonita, and in western Riverside County south of the Bernasconi Hills and the Ramona Expressway growing with *Atriplex coronata* var. *notatior*. These small populations are all imperiled by foot traffic or development. A sizeable population is scattered in the grasslands and around the salt pannes southwest of Florida and Warren Roads in Hemet in Riverside County. Roberts reports this species from Orange County where possibly no longer extant. A herbarium specimen was examined from the San Pedro Hills of Los Angeles County. It is reported from San Clemente Island, Santa Catalina Island, and Santa Rosa Island. South Coast Saltscale is now growing robustly at the California Terraces Mitigation Project on northern Otay Mesa indicating its potential for re-introduction at a number of other sites in the region.
- Twenty-four herbarium specimens from Baja California were examined at the San Diego Natural History Museum. A small population was found close to the U.S. border in Baja California, near the highway west of Tecate and the new prison. A second site was examined east of Valle de las Palmas on a flat mesa among numerous vernal pools. It is locally common on the seabuffs between La Fonda and Punta Mesquite; typically growing within twenty yards of the cliffs. Also found at SD is a herbarium specimen from the Pinacate region of Sonora.
- STATUS:** South Coast Saltscale is apparently severely declining throughout its coastal range on the mainland. Most sites observed had relatively small populations of this saltscale, and vigorous larger populations may now be limited to northern Baja California and the offshore islands. Although detailed horticultural requirements are poorly known, this species can apparently be grown from seed, and an effort should be made to establish new populations in appropriate native habitat. This saltbush has been ignored until quite recently as a species warranting protection. Its rarity is strongly correlated with the human-derived losses of native vegetation at the edge of beaches, coastal salt marsh, and sea bluff. Interestingly, South Coast Saltscale sometimes persists on ridgelines in areas of open sandy habitat a few miles inland, and in alkaline lowlands such as occur in western Riverside County. These areas generally mimic beach bluff or salt marsh edge habitat. All remaining defensible sites for this species in San Diego County should be protected. *Atriplex coulteri* has sharply dentate bracts (entire bract 2-3

mm) unlike the minutely toothed bracts of South Coast Saltscale (entire bract 1-1.5mm) with which it is sometimes confused. The bract shapes of the two species are quite different.

PARISH'S BRITTLESCALE [*Atriplex parishii* Wats.]

- LISTING:** CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- / Species of Concern CHENOPODIACEAE Jun.-Oct.
Global Rank G2? State Rank S1.1
- DISTRIBUTION:** Riverside County, San Diego County, Los Angeles County, Orange County, San Bernardino County; Baja California
- HABITAT:** This species grows in alkaline flats on the periphery of salt pannes. The few extant locales where recently observed occur in flat terrain which has been historically grazed, and which can be quite marshy in the spring following heavy rainfall. Possible Associates: *Atriplex coronata* var. *notatior*, *Frankenia salina*, *Lasihenia glabrata* ssp. *coulteri*.
- KNOWN SITES:** This saltbush is very rare in fields near California Street on the western outskirts of Hemet, Riverside County; it is also reported along the nearby San Jacinto River floodplain south of the Bernasconi Hills. Several large sub-populations found by C. Reiser on May 9, 1996 (vouchers taken) and numbering in the thousands, were observed in the agricultural field situated north of Winchester Park, south of Simpson Road, and west of Farnsworth. Deep, agricultural discing has by the Year 2000 extirpated most of this population. The type locality of Parish's Brittscale is from Costa Station in Orange County. Herbarium collections cited in CNDDB information are from the Cahuilla Indian Reservation west of Anza, Vandeventer Flat, and Palm Springs in Riverside County; from Santa Monica, Redondo Beach, Cahuenga, and near Bixby Ranch in Long Beach, in Los Angeles County; near Laguna Beach in Orange County, and Cushenbury Springs in San Bernardino County. Most of these historical sites are probably no longer extant. No definite records for San Diego County can be located. A very old report from S. B. Parish for "Coahuila Hot Springs" in San Diego County; reflects a site now in Riverside County.
- STATUS:** Parish's Brittscale is likely extirpated from most of its historical locales. All populations should be protected; and this species should be listed as Federally Endangered. No San Diego County herbarium specimens have been located, and a report of this species locally may be inaccurate. Parish's Brittscale, a distinctive full species, was presumed extinct until re-found near Hemet in the 1990s. A second site, the only known sizeable population located near Simpson Road in Winchester, was reported to the appropriate federal wildlife agency soon after its discovery in spring 1996. No protection measures were undertaken by this agency as the site occurred on private property utilized for active agriculture. Due to its prior "extinct" status, the species lacked any true legal protection. Agency staff appeared to be tentative about how to proceed; and were uncertain about informing the landowner despite the extraordinary rarity of this species and the sensitivity of the site. Their concern was that if informed, nothing might deter the farmer from eradicating the population prior to legal action being taken to upgrade the federal sensitivity status of this species, and the site being protected. Subsequently, the population there was aggressively disced and most of the Brittscale was absent by summer 2000. It is not known if the farmer was ever informed of the rare plant population on his property. Rarity of Parish's Brittscale is presumed to be strongly correlated with the geographic isolation of alkaline wetlands in the Hemet/Winchester valleys (including the tendency of floodwaters to perch during high rainfall years in nearby and oftentimes dry Lake Mystic creating a large inland alkali meadow), and the conversion of much of the low-lying habitat in the region for agricultural pursuits. The tiny, white-scaly ovate to cordate leaves (4-8mm) of Parish's Brittscale are distinctive insofar as they are typically closely imbricated (overlapping like wooden roofing tiles) along the stem, and the plant itself remains relatively compact and diminutive.

DAVIDSON'S SALTSCALE [*Atriplex serenana* A. Nels. var *davidsonii* (Standl.) Munz]

- LISTING:** CNPS List 1B R-E-D Code 3-2-2
State/Fed. Status -- None CHENOPODIACEAE Apr.-Oct.
Global Rank G5T2? State Rank S2?
- DISTRIBUTION:** Riverside County, San Diego County, Los Angeles County, Orange County, Santa Barbara County, Ventura County, Santa Rosa Island; Baja California, Mexico
- HABITAT:** Davidson's Saltscale may have historically been associated with the isolated alkaline flats of southern California valleys; areas which have primarily been drained and converted to residential housing or agriculture. Possible Associates: *Atriplex* species, *Frankenia salina*, *Suaeda moquinii*.
- KNOWN SITES:** Taxonomic problems surround this described variety of the wide-ranging *Atriplex serenana*. Plants roughly keying to either variety *A. s.* var. *davidsonii* or *A. s.* var. *serenana* are found along a disturbed swale adjacent to Menlo Avenue and the southeastern corner of Tres Cerritos near Lakeview, Riverside County. These plants have a longer inflorescence than is supposedly associated with *A. s.* var. *davidsonii*, but have much smaller leaves than are typical for *A. s.* var. *serenana*. Plants resembling this entity occur elsewhere in western Riverside County, such as at Winchester Park in the community of Winchester. The slightly different and stunted Winchester Park plants grow near a population of the extremely rare *Atriplex parishii*, and may also represent natural hybrids. Davidson's Saltbush is reported by Munz for coastal areas from Los Angeles to Balboa and Laguna Beach. It may no longer be extant at historic locales where once collected, in this now heavily urbanized region. Herbarium specimens from the San Diego Natural History Museum include vouchers from the San Pasqual Valley and the Sweetwater River near San Miguel Mountain which roughly conform to the short-leaved western Riverside plants noted above. Recently a large population of the short-leaved plant form was found at Trolley Square in Santee growing in alkaline playas with a disjunct population of *Centromadia pungens* ssp. *laevis*. However, this population appears to be closer to variants of *A. s.* *serenana*. Another specimen labeled *A. s.* var. *davidsonii* from San Diego County collected in the lower Tijuana River has longer leaves and may also represent the more common variety *serenana*.
- STATUS:** Valid specimens of Davidson's Saltscale may never have been collected in San Diego County. True Davidson's Saltscale is/was apparently extremely rare in the Los Angeles basin based on the few known historical collections. It is presumed to be severely declining throughout its range, and may be extinct or close to extinction. All populations should be fully protected in situ. Careful taxonomic work is necessary to more clearly delineate it from the related and relatively widespread and polymorphic *Atriplex serenana* var. *serenana*. *A. s.* var. *serenana* forms generally have an elongated inflorescence while *A. s.* var. *davidsonii* has a spheric terminal cluster. The published description of variety *davidsonii* is poor and the original collections should be re-examined and compared to newer herbarium specimens which have been subsequently identified as this saltbush. The small-leaved plants identified as variety *davidsonii* and collected historically a few times near the Orange County and Los Angeles beaches may represent a natural hybrid between other species of coastal saltbushes and *Atriplex serenana* variety *serenana*. These coastal plants may best conform to the type description for variety *davidsonii*. Taxonomically confusing populations of plants near Tres Cerritos in western Riverside County and in Santee in San Diego County grow in semi-alkaline swales and seem to be able to tolerate limited disturbance. These plants may represent a short-leaved form of *A. serenana* var. *serenana* and not *A. s.* var. *davidsonii*. It is still difficult to account for the rarity of this short-leaved form; the related variety *serenana* is an aggressive weed with markedly longer basal leaves. To summarize this confusing scenario, it is possible that variety *davidsonii* as originally described may be a natural coastal hybrid with no true range; while a still to be described variety of *Atriplex serenana* with small leaves is rare in western Riverside County and San Diego County. Additional hybrids may be found in western Riverside County. Genetic work is necessary to sort out this confusion of forms.

AYENIA [*Ayenia compacta* Rose]

LISTING: CNPS List 2 R-E-D Code 2-1-1
State/Fed. Status -- None STERCULIACEAE Mar.-Apr.
Global Rank G4 State Rank S3.3

DISTRIBUTION: San Diego County, Riverside County, San Bernardino County; Baja California, Mexico

HABITAT: Rocky canyons and desert arroyos are the preferred habitat of this subshrub. The rocky periphery of sandy washes are utilized at Box Canyon. Possible Associates: *Pleurocoronis pluriseta*, *Sarcostemma cynanchoides*, *Matelea parvifolia*.

KNOWN SITES: *Ayenia* is a very inconspicuous subshrub growing at Box Canyon in a sandy wash, and it is scattered in hills south of Hellhole Canyon. Another population was observed growing near the saddle of a hill overlooking Little Blair Valley. A vigorous population occurs in Flat Cat Canyon north of Hellhole Canyon in Anza Borrego, growing at the edges of the braided drainage. It is difficult to ascertain how rare this desert species is owing to its cryptic nature. Old reports are from Pinyon Wash, Corral Canyon, Snail Canyon, Indian Canyon, and Chuckwalla Wash--Anza Borrego State Park. Herbarium specimens at the San Diego Natural History Museum are from Vallecito Station one kilometer east of the County Park, the southeast slope of Pinyon Mountain, southeast of Mine Wash, the banks of Vallecito Wash, Just east of Scissors Crossing, at Yaqui Pass, the west end of Sentenac Canyon, the extreme northeastern corner of the county, at Borrego Palm Canyon at the first palms before the fork, in Borrego Valley, west of the Narrows on a steep canyon wall, and at Agua Caliente. A recent CNDDDB report is from Flat Cat Canyon north of Hellhole Canyon near Borrego. One herbarium collection is from Andreas Canyon in Riverside County. Reports from near Palm Springs in Riverside County include northeast of Big Horn Drive near Highway 74, near Tahquitz Creek, west of Canyon Drive, and west of Murray Hill. Reported by Felger on Tiburon and San Esteban Islands in the Gulf of California; also reported in Riverside County's Deep Canyon in the Coachella Valley. Reported by Daniel and Butterwick from the South Mountains near Phoenix.

Ayenia is reported from the length of Baja California including some islands. Eighteen collections from Baja California are deposited in the herbarium of the San Diego Natural History Museum; south to the Cape Region at 24° 11' North where collected by Moran (SD 50555) at Arroyo de los Pozos.

STATUS: *Ayenia* is apparently rare but stable in the southern deserts, given the limited historical disturbance to its potential habitat. A number of sensitive plants from the Anza-Borrego area appear to coincide in their northwestern ranges with the northwestern boundaries of the Colorado Desert and the southern-most Mohave Desert. As such, they do not range extensively onto the higher elevations of the Mohave Desert where conditions can be markedly cooler in the winter. Rarity for species like *Ayenia* may be partially a product of climatic requirements and geographic barriers to further northward expansion. Their presence may also be relictual in nature, and these species in slow decline and general retrenchment southeastward responding to changing long-term rainfall conditions. The fruits on *Ayenia* are very distinctive, and if present, should immediately identify the species. The spheric fruits have many purplish protuberances, and the general impression is like that of an immature tiny strawberry.

MEXICAN MOSQUITO FERN [*Azolla mexicana* Presl.]

LISTING: CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- None SALVINIACEAE August
Global Rank G5 State Rank S3.2?

- DISTRIBUTION:** San Diego County, Butte County, Kern County, Modoc County, Lake County, Nevada County, Plumas County, Tulare County, Santa Clara County; Arizona; Idaho; New Mexico; Nevada; Oregon; Texas; Utah; Washington; Wyoming; Baja California, Mexico; and Guatemala
- HABITAT:** This is an aquatic species which floats on the surface of ponds. Possible Associates: *Lemna* species, *Potamogeton* species, *Najas guadalupensis*. This plant species may be associated with high quality waterfowl habitat; providing significant forage for species such as Northern Pintail (*Anas acuta*).
- KNOWN SITES:** No specific locales are known for San Diego County; although a non-specific report from the CNDDDB files mentions this county.
- STATUS:** The present status of this species in San Diego County as well as elsewhere in southern California is unknown; no verified herbarium specimens are found at the San Diego Natural History Museum. The related and regionally common *Azolla filiculoides* is difficult to differentiate in the field from Mexican Duckweed. In Mexican Mosquito Fern the megaspore (*i.e.*, a primitive seed) is pitted on the basal portion, and the glochidia are septate (*i.e.*, divided into portions); both traits require a microscope to determine. Dense rufous-colored concentrations of mosquito fern are readily identified floating on ponds. Given the widespread availability of its potential pond habitat, Mexican Mosquito Fern's dearth of collection information in the region may be strongly correlated with the difficulty of its being identified properly in the field, rather than in its true rarity. Moreover, the diverse North American collections for this species underscore it is only locally sensitive, and not necessarily endangered or threatened throughout its range. Nevertheless, significant native populations of this species are recommended for protection in San Diego County to preserve possibly unique regional genetic traits. Given the absence of contemporary collections, any initial collection locations would be considered significant populations.

SHORT-LEAVED BACCHARIS [*Baccharis brachyphylla* A. Gray]

- LISTING:** CNPS Unlisted R-E-D Code None
 State/Fed. Status – None ASTERACEAE Jul.-Nov
 Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, San Bernardino County, Imperial County, Riverside County; Arizona; Nevada; New Mexico; Texas; Utah; Sonora and Baja California, Mexico
- HABITAT:** This inconspicuous shrub occupies broad alluvial fans and the periphery of rocky drainages in Sonoran Desert Scrub. It typically occurs in the Anza-Borrego region as sub-population clusters rather than occasional isolated shrubs. Possible Associates: *Ambrosia dumosa*, *Acacia greggii*, *Lyrocarpa coulteri*.
- KNOWN SITES:** Short-leaved Baccharis is occasional at Scissor's Crossing and within the greater San Felipe Valley, extending southward into the hills around Little Blair Valley and onto Pinyon Mountain. It is reported from Jacumba and Mountain Springs. Herbarium specimens were examined from the Anza-Borrego Desert at Sentenac Canyon, a tributary of Fish Creek, Bisnaga Wash, and a drainage east of Mine Wash. Also seen were specimens from Coyote Wells in Imperial County; the Chocolate Mountains Aerial Gunnery Range in Riverside County, and the Lava Artillery Range at the 29 Palms Marine Corps Base in Riverside County; 19 miles west of Wilcox in Cochise County, Arizona; and south of Llano and opposite Querobabi in Sonora, Mexico. Knight reports it as rare in washes in eastern Imperial County. Dedecker reports this shrub at China Lake in San Bernardino County. Another report is from Deep Canyon in Riverside County. Thorne, Prigge, & Hendrickson report this baccharis as rare in Willow Springs Canyon in the Granite Mountains, as well as in the lower Providence Mountains of San Bernardino County.

Two Collections from Baja California are found at the herbarium of the San Diego Natural History Museum with records as far south as Lazaro Cardenas where collected by Moran (SD 98261) near 31°23' North.

STATUS: This glandular stemmed baccharis is quite nondescript due to its small leaves, tiny ray-less flowers, and non-distinctive growth habit. As a result, it is probably often overlooked. Its microhabitat requirements do not superficially appear to be uncommon in the desert regions; and its wide southwestern United States range underscores this assessment. Despite the limited historical collections in San Diego County, a number of other sites are expected within the rocky, western desert foothills of the Laguna Mountains and the Vallecito Mountains; as well as eastward into the sporadic ranges distributed over the Colorado Desert. The limited number of Baja California collections may reflect limited collecting on the desert flanks of the Sierra Juarez Mountains. Availability of suitable habitat does not appear to be the critical factor in rarity, based on the collection information for Short-leaved Baccharis. Given the information available on the wide range of this species and the limited impacts to its habitat, no recommendations are made for protection of specific populations.

ENCINITAS BACCHARIS [*Baccharis vanessae* Beauchamp]

LISTING: CNPS List 1B R-E-D Code 2-3-3
State/Fed. Status -- CE/FT ASTERACEAE Aug.-Nov.
Global Rank G1 State Rank S1.1

DISTRIBUTION: San Diego County, Riverside County

HABITAT: A mature but relatively low-growing chaparral is the primary habitat of this rare shrub. In the Encinitas region *Arctostaphylos glandulosa* ssp. *crassifolia* grows nearby along with *Yucca schidigera*. Given the limited range of this species, edaphic requirements may significantly restrict dispersal. Soil at Encinitas is Corralitos loamy sand while the soil type on Mount Israel is mapped as the quite different Cienega rocky coarse sandy loam (the Ralphs Ranch and Crest reports are also in Cienega soils). At inland locales Encinitas Baccharis may be associated with large granitic boulders. Possible Associates: *Adenostoma fasciculatum*, *Yucca schidigera*, *Bebbia juncea*.

Open chaparral utilized by this species is also regularly occupied by several avian species including the Rufous-crowned Sparrow (*Aimophila ruficeps*).

KNOWN SITES: Several shrubs are clustered in the northeastern corner of Oak Crest Park in Encinitas. Populations to the immediate north were destroyed during grading for shopping and light industrial use. Further to the north, an illegal alien encampment utilized another small population for firewood. The only surviving shrub here was found on a steep east-facing slope following a diligent search. An old biological survey report from near Mountain View Drive and El Camino Real in Encinitas may no longer be extant; a single shrub is reported from east of Chicarita Creek. Reports indicate a population is still present on the Ecke Ranch at Encinitas' Green Valley about 0.9 mile south of Batiquitos Lagoon and 0.5 mile due north of the eastern terminus of Woodley Road; as well as 1.4 miles south of Batiquitos Lagoon and 0.5 mile due west of intersection of El Camino Real and Olivenhain Road. One sizeable population on a rocky knoll was reported at Ralphs (*i.e.*, 4S) Ranch south of Lake Hodges with another nearby colony closer to the lake and southwest of Bernardo Mountain. There is a report of a substantial population from the rocky Montana Serena area of Crest growing with the endemic Lakeside Lilac (*Ceanothus cyaneus*). The few reports of occasional shrubs near Mount Israel (south of the road by that name) are in an area burned by a massive fire in 1990. Populations reported north of the Lake Hodges spillway are probably still extant. A healthy population of perhaps 30 shrubs was seen in spring 1991 resprouting from a fire on a ridgeline (north of Mount Israel Road) overlooking Lake Hodges to the west. A conspicuous hikers belvedere is nearby. Several hundred shrubs were also observed in 1999 due north in the

chaparral and are concentrated where the ridgeline drops suddenly downslope. Other shrubs are found a half mile to the west on the parallel ridge overlooking a valley that will soon be inundated by the Olivenhain Water District's Mt. Israel Reservoir. Additional isolated shrubs occur throughout the uplands which will surround this reservoir. A large nearby population was observed on the north-facing slopes of a canyon northwest of the intersection of Del Dios Highway and Mt. Israel Road. A report from Mount Woodson 0.4 km southeast of the lookout station and nearby on the flank of Iron Mountain pushes the known range of this species well to the east. A lone shrub near Black Mountain Road south of Horseman's Park is reportedly no longer extant. CNDDDB reports are of sites in the hills west of Poway approximately 0.5 mile west of Meadowbrook Intermediate School, just east of San Dieguito County Park, .9 mile south of Harmony Grove northwest of Del Dios, the east side of Quail Botanical Gardens where questionably native, .6 mile south of OakCrest Junior High, and .9 mile WNW of Carmel Mountain summit at a location which needs confirmation as this is outside the known range. Another report is considerably north of known populations near Devil's Creek .6 mile from its confluence with San Mateo Canyon in the San Mateo Wilderness Area near the Riverside/San Diego county line.

STATUS: Encinitas *Baccharis* is nearing local extirpation on sandstone slopes in Encinitas and is imperiled by urban development elsewhere in San Diego County. All known sites should be fully protected with viable buffers included. Attempts to transplant this species locally have not been particularly successful; nursery grown stock should be pro-actively transplanted to biological open space preserves within its historical range. Poor seed viability may be a factor limiting the vigor of this species. Encinitas *Baccharis* is one of the rarest shrubs in southern California. Given its peculiar extant range and its apparent edaphic limitations, the overall population may be retreating naturally under less than optimal growing conditions. Loss of steep slope habitat near known population sites, due to fuel modification zones and the introduction of orchards, could both be future concerns. The mature leaves of Encinitas *Baccharis* are generally much longer than the related and regionally common *Baccharis sarothroides*, the shrub is considerably shorter and more compact, the phyllaries are narrowly tapered and not ovate, the pistillate involucre are funnel-shaped and not cylindrical to bell-shaped, and the base of the involucre glandular-puberulent not glabrous.

SALTWORT [*Batis maritima* L.]

LISTING: CNPS Unlisted R-E-D Code None
 State/Fed. Status -- None BATACEAE Jul.-Oct.
 Global Rank None State Rank None

DISTRIBUTION: San Diego County, Orange County, Santa Barbara Co., Los Angeles County, Ventura County, San Clemente Island; Texas; Louisiana; Hawaii; South America; Baja California, Mexico

HABITAT: This perennial herb occupies mid and upper elevations of Coastal Salt Marsh and occasionally grows at higher elevations into mesic, low-lying areas of Coastal Dunes. Possible Associates: *Jaumea carnosa*, *Salicornia virginica*, *Suaeda esteroa*. This herbaceous plant may be associated with sensitive Tiger Beetle habitat (*Cincindela* species).

KNOWN SITES: Saltwort is locally common in the remaining coastal salt marshes within the southern portion of San Diego County. However, it does not occur uniformly in superficially suitable habitat. It is found at the Northern Wildlife Preserve in northeast Mission Bay, at the mouth of the San Diego River west of the freeway, near Gunpowder Point in San Diego Bay, on the southeast side of the Silver Strand on San Diego Bay, at Famosa Slough, in the Tijuana River sloughs of Imperial Beach, at the mouth of Penasquitos Canyon, and at San Elijo Lagoon; as well as in Newport Bay in Orange County. Herbarium specimens examined were from the foot of G Street as well as the Salt Works site on San Diego Bay. Additional specimens were examined from Bolsa Chica Bay in Orange County; Mazatlan on the mainland Mexican coast, and a number of islands in the Gulf of California; as well as from Jefferson Parish in Louisiana.

Reported by Wallace from San Clemente Island. Unpublished reports by Roberts note this species collected 21 times in Orange County; D. Wilken reports only one location in Santa Barbara County. Recently reported from the Goleta Slough in Santa Barbara County.

Seventeen collections from Baja California are found at the herbarium of the San Diego Natural History Museum with records as far south as Pichilingue where collected by Mudie (SD 93935) near 24° 14' North.

STATUS: This distinctive herb is well distributed within the southern-coastal salt marshes of the County. Almost all of this habitat is within dedicated biological open space; Saltwort populations are relatively stable in this region, and no additional recommendations are made for protection. If possible, it should be included as a component in coastal salt marsh habitat creation in the region. Superficial confusion with rotund seasonal forms of *Jaumea carnosa* are readily avoided, the opposite leaves on Saltwort do not meet at their bases. Factors for establishment of Saltwort in coastal salt marshes may include marsh elevation and frequency of exposure to tidal flushing.

FREMONT BARBERRY [*Berberis fremontii* Torrey var. *fremontii* = *Mahonia higginsae* Ahrendt]

LISTING: CNPS List 3 R-E-D Code ??-1
State/Fed. Status --/3C BERBERIDACEAE Apr.-Jun.
Global Rank G5 State Rank S2?

DISTRIBUTION: San Diego County, San Bernardino County; Arizona; Nevada; Baja California; Sonora, Mexico
HABITAT: High Desert Chaparral is the southern California habitat for this large shrub. The site near Bankhead Springs consists of xeric, relatively uniform chaparral of moderate density growing on fairly level terrain. Granitic boulder fields lie nearby. The soil is mapped as La Posta rocky loamy coarse sand. Possible Associates: *Adenostoma fasciculatum*, *Zizyphus parryi*, *Adenostoma sparsifolium*.

KNOWN SITES: Several shrubs were seen growing on the freeway center divide north of Bankhead Springs. Although the very rugged hills in the region are poorly explored, *M. fremontii* may be quite rare in these rocky, high desert badlands. An old report is from near Boulevard. There is another report of a lone shrub south of Lost Valley Road in McCain Valley, 0.25 mile southwest of the airway beacon. CNDDB reports are for southern McCain Valley in the Tule Lake Area north of Interstate 8, near Dubber 0.3-0.4 mile northeast of the northeastern corner of the trailer park, Walker Canyon south of Interstate 8 and 1.1 miles east of McCain Valley, and a rocky point across from the old Boulevard Post Office (where possibly no longer extant). In San Bernardino this shrub is reportedly extirpated at sites in Cushenbury Springs, as well as near Barnwell in the New York Mountains. It may be extant at nearby locales.

Twenty-four collections from Baja California are gathered in the San Diego Natural History Museum's herbarium. It is found as far south as 28° 24' North where collected by Moran (SD 64983) at Tenajas de la Chona in the Sierra San Borja.

STATUS: The southern California populations of Fremont's Barberrry appear stable. These populations were formerly referred to *Mahonia higginsiae*. Under the Michael P. Williams treatment in the Jepson Manual (1993), they are considered a synonym for the wider ranging, desert shrub *Mahonia fremontii* var. *fremontii*. Additional taxonomic investigation may be warranted. San Diego County appears to be on the northwestern periphery of this shrub's range, and this species may not be particularly rare in Mexico. Environmental and subsequent floristic changes in the region since the Pleistocene (e.g., the natural decline of pinyon-juniper woodland), may account for the current dearth of Fremont's Barberrry in San Diego County. The fruits of Fremont's Barberrry are yellowish or purplish red to dark purple, while forms of *Berberis aquifolium* and *Berberis pinnata* growing to the west have dark blue to blue-purple fruits.

NEVIN'S BARBERRY [*Berberis nevinii* Gray = *Mahonia nevinii* (Gray) Fedde]

LISTING: CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- CE/PE BERBERIDACEAE Mar.-Apr.
Global Rank G2 State Rank S2.2

DISTRIBUTION: San Diego County, Riverside County, Los Angeles County, San Bernardino County

HABITAT: Chaparral with strong desert affinities is the primary habitat for this shrub at the southern end of Vail Lake (soils here are mapped as Gullied lands) in western Riverside County. Shrub cover is relatively low growing and Nevin's Barberry may tower above the surrounding subshrubs. Possible Associates: *Yucca schidigera*, *Rhamnus ilicifolia*, *Adenostoma fasciculatum*.

KNOWN SITES: Nevin's Barberry is planted at Torrey Pines State Park near the ranger's cabin. A reported site in the desert foothills of Anza-Borrego near Ranchita has never been relocated. A vigorous population occurs near the peninsula on the south side of Vail Lake in Riverside County; also on the slopes immediately downstream of the dam. A few shrubs are still extant at the old Vail Ranch approximately 3 miles southeast of Temecula in Riverside County. It may occur in nearby San Diego County in the little explored foothills of the Agua Tibia Wilderness Area close to the Dripping Springs Trail. CNDDB records include in San Bernardino County a few plants in a side canyon of San Timoteo Canyon, a single shrub near the mouth of Scott Canyon southwest of Redlands; for Los Angeles County in San Francisquito Canyon north of Saugus on both sides of the highway before Powerhouse #2, nearby in San Francisquito Canyon one plant 0.5 mile north of the San Francisquito Powerhouse, just west of Padua Avenue in the vicinity of San Antonio Wash a few miles west of Upland and just north of Claremont, on the east bank of Arroyo Seco 0.5 mile north of the Rose Bowl near the corner of Arroyo and Washington Streets where possibly not native, near Vista Del Valle Road in Griffith Park where likely introduced; in Riverside County on the west side of Arroyo Seco Creek approximately 0.3 mile northwest of the Dripping Springs Guard Station and north of Highway 71, also scattered nearby about Butterfield Valley, as well as on south-facing slopes of Big Oak Mountain west of Vail Lake; in San Diego County on County Road S-6 approximately 1.6 miles north of its Junction with Highway 76 southwest of Palomar Mountain (where likely not native).

STATUS: After an earlier period in the Los Angeles basin in which Nevin's Barberry was substantially declining, remaining populations are now relatively stable, although few in number. The status of Nevin's Barberry in San Diego County is unknown; no extant native populations have been located; more information is needed. All native populations should be protected. Given the wide southern California range-- but paucity of reported sites -- this barberry is presumed to be a relictual species already severely declining prior to the Mission Period. The catastrophic clearing of most sage scrub in lowlands throughout the Los Angeles basin from 1870-1970, as well as the channelizing of most remaining major drainages in this region, may have removed many unreported and now extirpated populations. The narrow and relatively long bluish-green leaves of Nevin's Barberry are readily separated from other *Berberis* growing in the region.

POWAY MAHONIA [*Berberis pinnata* (Lag.) Fedde. ssp. *pinnata* affinity]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None BERBERIDACEAE March-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County

HABITAT: A seemingly unusual form of Shinyleaf Mahonia (*Berberis pinnata*) grows in coastal San Diego County, generally on steep north-facing slopes within mixed chaparral. It appears dissimilar to the broader, glossier leaved form found in the mid-mountain ranges of San Diego County.

San Miguel Exchequer loam and Olivenhain cobbly loam are mapped for the Poway population of this conspicuous shrub. Possible Associates: *Comarostaphylis diversifolia*, *Xylococcus bicolor*, *Quercus berberidifolia*.

Dense chaparral utilized by Poway Mahonia is also regularly occupied by several avian species including the Spotted Towhee (*Pipilo maculata*) and Scrub Jay (*Aphelocoma coerulescens*).

KNOWN SITES: A small fenced population remains within a designated biological open space near a population of *Acanthomintha ilicifolia* south of Creekbridge Place and Los Penasquitos Canyon Creek in Poway; as well as along the chaparral/sage scrub trail to the west. Additional shrubs occur on steep slopes in chaparral to the west facing the freeway interchange. In La Zanja Canyon in Fairbanks Ranch some shrubs are lightly distributed on a north-facing slope east of Clubhouse Drive and west of Lago Court. Old reports, presumably this form, are from Mission Valley and Chollas Valley, Olivenhain, Black Mountain, and Penasquitos Canyon.

STATUS: The coastal form of the wide-ranging Shinyleaf Mahonia found in San Diego County appears quite distinctive from the low-montane form found elsewhere in the County such as at Japatul Valley. The coastal form generally has much duller and narrower leaves. These traits apparently occur elsewhere within the broad range of Shinyleaf Mahonia such as in the mid-Sierra Nevada. Nevertheless, given the strong geographic correlation of the two forms within the County, additional taxonomic studies seem warranted. Genetic studies rather than superficial analysis of a suite of leaf traits might be most appropriate for clarifying this problem. The coastal form is now only known from a handful of sites, and given this remnant distribution, it is recommended that all shrubs be protected until this taxonomic issue can be resolved. From ten feet away plants are sometimes difficult to quickly differentiate from juvenile scrub oak; however, the spines on the leaves are much more pronounced, and when in flower the showy racemes of yellow flowers are very distinctive and diagnostic.

GOLDENSPINED CEREUS [*Bergerocactus emoryi* (Engelm.) Britt. & Rose]

- LISTING:** CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status -- None CACTACEAE May-Jun
Global Rank G3 State Rank S2.1
- DISTRIBUTION:** San Clemente Island, Santa Catalina Island, southern San Diego County; Baja California, Mexico
- HABITAT:** Maritime Succulent Scrub is the primary habitat of this cactus. Moist ocean breezes may be a key to its habitat requirements. In Baja California the Goldenspined Cactus is sometimes a dominant shrub of ocean-facing slopes overlooking the coastal strand. Possible Associates: *Euphorbia misera*, *Agave shawii*, *Mammillaria dioica*. This cacti may provide significant nesting habitat for species of rodents such as Desert Wood Rat (*Neotoma lepida*); as well as cover for a variety of snakes .
- KNOWN SITES:** A stand of this cactus grows on steep hillsides at Cabrillo National Monument; as well on Naval property to the north. A sizeable shrub grows alongside H Street in Rice Canyon east of Paseo Del Rey. Several small populations were noted in the hills just east of Border Field State Park. A colony occurs in O'Neil Canyon, where the canyon narrows, south of the County jail; several isolated cacti are also reported on north-facing slopes of Otay Mesa. One small colony is reported east of Beyer Way in San Ysidro; another in Goat Canyon in the Tijuana Hills; a northernmost population is reported from west of La Jolla Farms south of Torrey Pines State Park. CNDDDB information records sites in San Diego County on the south rim of Otay Mesa 1.4 miles north of Tijuana, at the northeast edge of Otay Mesa east of Dennery Canyon and 0.1 mile west of Chester Grade on Otay Valley Road, Spooners Mesa west of Border Field State Park, on Point Loma at the Naval Oceans System Center along the southwestern end of Fort Rosecrans National Cemetery, and near the Guy Fleming Trail at Torrey Pines State

Reserve where introduced; also on Santa Catalina Island near China Point, near the coast east/southeast of Ballast Point, Indian Head Point south of Little Harbor; on San Clemente Island in Bryce Canyon, the north fork of Eagle Canyon, an unnamed canyon due west of "Boulder," Vista Canyon, Thirst Canyon, Cave (i.e., Red Rock) Canyon, Middle Ranch Canyon, Norton Canyon, Box Canyon, Horse Canyon, and just south of Wilson Cove below the lighthouse.

Twenty collections from Baja are found at the San Diego Herbarium with records as far south as Arroyo de Venado where collected by Moran (SD 54375) near 29° 48' North. Healthy populations occur along the coast south of Tijuana in northern Baja California where it can be locally common. In the volcanic hills south of the Guadalupe Valley to Punta San Miguel it is often a dominant shrub; it is locally common further north from San Antonio del Mar to Baja del Mar. Populations often range well inland from the coast in Baja California.

STATUS: The limited U.S. populations of Goldenspined Cactus are slowly declining. All mainland populations should be protected. Selected cuttings or seedlings established from the Point Loma populations should be considered for transplantation to appropriate coastal habitat elsewhere in the region. It is recommended the Cabrillo population be "expanded" to protected coastal habitat as far north as Torrey Pines. Goldenspined Cactus is near its northernmost range in San Diego County, and its rarity is not necessarily a result of habitat loss. The absence of distinctive soils to which it is well adapted, in concert with wetter and colder environmental conditions, may be important factors in limiting its spread northward. Propagated plants are being installed at the California Terraces Mitigation Project on Otay Mesa. Opportunities exist to establish this cacti at a number of protected nearby locations.

BERGIA [*Bergia texana* (Hook.) Seub.]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None ELATINACEAE Mar.-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County, Central Valley of California; north to eastern Washington; central and southern United States; northeastern Mexico

HABITAT: This is a wetland associated species which may occur on sandbars along river margins, near standing pools of water, and on the periphery of various other aquatic locales. In San Diego County it occupies just a very few vernal basins in somewhat alkaline locales. Possible Associates: *Lythrum hyssopifolium*, *Juncus bufonius*, *Polypogon monspeliensis*.

KNOWN SITES: This small biennial grows on Otay Mesa both north and south of the highway, in disturbed vernal basins southwest of Brown Field and east of Dillon Road. Recently this area was fenced and a vernal pool mitigation project was installed. The plant is being propagated and seeded within this California Terraces Vernal Pool Mitigation Project; early results are reported to be successful. It is also reported near Hemet in Riverside County along the San Jacinto floodplain.

STATUS: Although apparently well distributed elsewhere in North America, this species is quite uncommon in southern California. Based on the paucity of known extant or historical sites, it was probably not well distributed in the region during the last few hundred years. Given its local rarity, and to preserve possibly unique genetic traits, all naturally occurring populations of this species are recommended for protection. *Bergia* is a diminutive annual that has elliptic, glandular-serrate to hairy leaves and nondescript tiny, white, axillary flowers. While it does not mimic other wetland species in the region, it can pose a difficulty trying to key it to family and genus.

COULTER'S SPIDERLING [*Boerhavia coulteri* (Hook.) S. Watson]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None NYCTAGINACEAE Aug.-Nov.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County; Arizona; Sonora and Baja California, Mexico

HABITAT: In San Diego County this annual occurs on sandy floodplains on the western periphery of the Anza-Borrogo Desert. Elsewhere to the east into Arizona it may be found as a weedy, desert species of disturbed roadsides and agricultural lands. Possible Associates: *Juniperus californica*, other *Boerhavia* species, *Linarthus lemmonii*.

KNOWN SITES: The Coulter Ringstem was observed near the Banner Queen Ranch east of Banner. It is also reported from the San Felipe Valley, as well as nearby in Earthquake Valley four miles south of Scissors Crossing. Herbarium specimens were examined from Little Blair Valley between Section 20 and Section 21 six hundred meters south of the section corner, as well as north Pinyon Mountain Road in San Diego County; from between Gila Bena and Casa Grande in Maricopa County, Sulphur Springs Valley, the Sacaton Mountains, and in Pinal County near I-8 and Highway 84 in Arizona; also six specimens from Sonora, Mexico. Stone and Sumida report it from the east-facing slope above Crystal Spring in the Kingston Range in San Bernardino County. Sanders (pers. com.) reports herbarium specimens from twenty miles northwest of Blythe on Midland Road, and near Highway 95 5.6 miles south of Vidal in Riverside County; as well as a site in an alfalfa field in Moreno Valley where likely introduced. Thorne, Prigge, & Hendrickson report it near Valley Wells in the Clark Mountains. Daniel & Butterwick report it as locally common in the South Mountain area near Phoenix, Arizona. Felger & Lowe report this species on Tiburon Island and San Esteban Island in the Gulf of California.

Six collections from Baja California are found at the herbarium of the San Diego Museum of Natural History with records as far south as behind a broad dune barrier on the beach at El Palmar where collected by Mudie (SD 93981) near 23°16' North.

STATUS: Although apparently locally common outside of California in the American Southwest, this annual species may be relatively uncommon in San Diego County. The westernmost populations of Coulter's Spiderling rely on sporadic summer thunderstorms to sprout, and can only be readily censused in the mid to late summer months following substantial rainfall. Sizeable numbers of Coulter's Spiderling may only be evident during years of unusually heavy desert rains, and this species may be more common than previously thought. Unlike the Slender Spiderling (*Boerhavia triquetra*), this species has flowers in a raceme-like inflorescence and a shorter peduncle. More local collection information is needed. Provisionally, substantial proportions of all populations in San Diego County are recommended for protection until good collection data is available. Rarity locally may be correlated with a decline in summer rainfall over the last few centuries on the western deserts.

SLENDER SPIDERLING [*Boerhavia triquetra* S. Watson]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None NYCTAGINACEAE Sep.-Dec.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, San Bernardino County, Riverside County, Imperial County; western Arizona; Baja California and Sonora, Mexico

HABITAT: In San Diego County this annual may occur in sandy or rocky areas of the Anza-Borrogo Desert. Possible Associates: Other *Boerhavia* species.

COULTER'S SPIDERLING [*Boerhavia coulteri* (Hook.) S. Watson]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None NYCTAGINACEAE Aug.-Nov.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County; Arizona; Sonora and Baja California, Mexico

HABITAT: In San Diego County this annual occurs on sandy floodplains on the western periphery of the Anza-Borrego Desert. Elsewhere to the east into Arizona it may be found as a weedy, desert species of disturbed roadsides and agricultural lands. Possible Associates: *Juniperus californica*, other *Boerhavia* species, *Linanthus lemmonii*.

KNOWN SITES: The Coulter Ringstem was observed near the Banner Queen Ranch east of Banner. It is also reported from the San Felipe Valley, as well as nearby in Earthquake Valley four miles south of Scissors Crossing. Herbarium specimens were examined from Little Blair Valley between Section 20 and Section 21 six hundred meters south of the section corner, as well as north Pinyon Mountain Road in San Diego County; from between Gila Bena and Casa Grande in Maricopa County, Sulphur Springs Valley, the Sacaton Mountains, and in Pinal County near I-8 and Highway 84 in Arizona; also six specimens from Sonora, Mexico. Stone and Sumida report it from the east-facing slope above Crystal Spring in the Kingston Range in San Bernardino County. Sanders (pers. com.) reports herbarium specimens from twenty miles northwest of Blythe on Midland Road, and near Highway 95 5.6 miles south of Vidal in Riverside County; as well as a site in an alfalfa field in Moreno Valley where likely introduced. Thorne, Prigge, & Hendrickson report it near Valley Wells in the Clark Mountains. Daniel & Butterwick report it as locally common in the South Mountain area near Phoenix, Arizona. Felger & Lowe report this species on Tiburon Island and San Esteban Island in the Gulf of California.

Six collections from Baja California are found at the herbarium of the San Diego Museum of Natural History with records as far south as behind a broad dune barrier on the beach at El Palmar where collected by Mudie (SD 93981) near 23°16' North.

STATUS: Although apparently locally common outside of California in the American Southwest, this annual species may be relatively uncommon in San Diego County. The westernmost populations of Coulter's Spiderling rely on sporadic summer thunderstorms to sprout, and can only be readily censused in the mid to late summer months following substantial rainfall. Sizeable numbers of Coulter's Spiderling may only be evident during years of unusually heavy desert rains, and this species may be more common than previously thought. Unlike the Slender Spiderling (*Boerhavia triquetra*), this species has flowers in a raceme-like inflorescence and a shorter peduncle. More local collection information is needed. Provisionally, substantial proportions of all populations in San Diego County are recommended for protection until good collection data is available. Rarity locally may be correlated with a decline in summer rainfall over the last few centuries on the western deserts.

SLENDER SPIDERLING [*Boerhavia triquetra* S. Watson]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None NYCTAGINACEAE Sep.-Dec.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, San Bernardino County, Riverside County, Imperial County; western Arizona; Baja California and Sonora, Mexico

HABITAT: In San Diego County this annual may occur in sandy or rocky areas of the Anza-Borrego Desert. Possible Associates: Other *Boerhavia* species.

KNOWN SITES: An unconfirmed report for the Watson Ringstem is from Scissors Crossing; another from nearby Earthquake Valley four miles south of Scissors Crossing. Herbarium specimens were examined from Little Blair Valley, Smuggler Canyon, McCain Valley, and the Banner Grade in San Diego County; from Painted Gorge, Indian Pass in the Chocolate Mountains, and Palm Canyon in Imperial County; the Bonanza King Mine area of the Mohave Desert, and in the Old Woman Mountains of San Bernardino County. Sanders (pers. com.) reports this species as relatively common in Morongo Valley and Yucca Valley; as well as a variety of other locales on the southern Mohave Desert. Stone & Sumida report it from Bobcat Trough as well as the west-facing slope of Crystal Spring in the eastern Mohave Desert of San Bernardino County. Dedecker reports it in the Kingston Range. Reported by Thorne, Prigge, & Hendrickson as frequent in Gold Valley in the Mid Hills, as well as the Kelso Dunes. McLaughlin, Bowers, & Hall report it as infrequent in washes in eastern Imperial County. Additional reports are from the northern base of the Santa Rosa Mountains and the Little San Bernardino Mountains. One herbarium specimen was seen from Guaymas, Mexico.

Fifteen collections from Baja California are found at the herbarium of the San Diego Museum of Natural History with records as far south as 3.7 miles north of Migrino where collected by Moran (SD 80278) near 23°6' North.

STATUS: This annual spiderling is apparently sporadically distributed, but not uncommon on the California deserts. Slender Spiderling relies on infrequent summer thunderstorms to sprout, and can only be readily censused in the mid to late summer months following substantial rainfall. Unlike Coulter's Spiderling, this species has an umbel-like inflorescence rather than a raceme-like spike; as well as a long peduncle. Given the apparently regular distribution of this species on the southern Mohave Desert, no recommendations for protection are given. Numerous unreported populations are expected as more summer surveys are conducted on the deserts; however, it may be quite uncommon in San Diego County. Rarity locally may be correlated with a decline in summer rainfall on the western deserts over the last few centuries.

ROUND-LEAVED BOYKINIA [*Boykinia rotundifolia* Parry]

LISTING: CNPS recently delisted R-E-D Code none
State/Fed. Status -- None SAXIFRAGACEAE Jun.-Jul.
Global Rank formerly G3G4 State Rank formerly S?

DISTRIBUTION: San Diego County, Orange County, Los Angeles County, Riverside County, Santa Barbara County, San Bernardino County, and Ventura County

HABITAT: Alongside streamcourses in Lower montane coniferous forest is a preferred habitat for Round-leaved Boykinia. In the Palomar Mountains this perennial herb with large conspicuous leaves was found growing in deep shade (mapped as Tollhouse rocky coarse sandy loam) near a spring. Possible Associates: *Symphoricarpos mollis*, *Rosa californica*, *Aquilegia formosa*.

KNOWN SITES: This boykinia grows along Palomar Mountain's Highway to the Stars below Nellie. This area was burned during a major Palomar mountain fire in the late 1980's; however, the plant was still present two years later. Herbarium specimens were examined from a stream flowing north from the Agua Tibia Wilderness Area, in Daisy Mae Meadow on Volcan Mountain, and a canyon near the crest of Volcan Mountain. Reported by Roberts in the Santa Ana Mountains of Orange County at Lost Woman Canyon, Holy Jim Canyon, Central Santiago Canyon, and Upper McVicker Canyon. Reported by Smith in the Santa Barbara region at Ozena Campground in upper Cuyuma Valley; also by Raven in Los Angeles County at lower Malibu Canyon. Additional herbarium specimens seen were from Vista Grande Road 1 mile east of the Banning/Idyllwild Road in Riverside County; both Snow Creek and Grapevine Spring in the San Gabriel Mountains of San Bernardino County; and on Mount Baldy and in Santa Ana Canyon in the mountains of Los Angeles County. Round-leaf Boykinia is reportedly fairly

regular along drainages and in shaded locales on the southern flanks of the San Bernardino Mountains, and is also reported in Day Canyon in the San Gabriel Mountains.

The Round-leaf Boykinia is sometimes an indicator species of seeps and montane springs which can provide important functions as late-season sources of water for wildlife.

STATUS: This species is presumed stable in southern California, given its lightly impacted montane range. Round-leaved Boykinia was recently deleted from CNPS listing status. Evidence cited included unpublished notes from A. Sanders noting this species occurs in moderate to high numbers in most canyons on the coastal slope of the San Bernardino Mountains; remarks by S. Boyd that it is a frequent element in shaded riparian situations in the San Gabriel Mountains; and R. Burgess noting it ranges as far north as Ventura County where at least two populations are recorded. The leaves of Round-leaf Boykinia can get quite large and conspicuous (10-30 cm), making it difficult to miss in the densely vegetated understory of mesic, montane slopes.

COLORADO DESERT BRICKELLBUSH [*Brickellia arguta* Rob. var. *odontolepis* Rob.]

LISTING: CNPS Unlisted R-E-D Code -- None
State/Fed. Status -- None ASTERACEAE Apr.-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County; Arizona; Sonora and Baja California, Mexico

HABITAT: In San Diego County this subshrub is typically found wedged into granitic cracks and crevices in the desert foothills of the Anza-Borrego Desert. Generally a small colony of shrubs will be found scattered about an area of rocks rather than isolated plants. Possible Associates: *Pleurocoronis pluriseta*, *Mirabilis tenuiloba*, *Perityle emoryi*.

KNOWN SITES: The Colorado Desert Brickellbush has been reported from the Oriflamme Mountains, Vallecito Valley, Mountain Springs, Mortero Palms, San Felipe, and on the higher desert at Dubber. Herbarium collections were examined from Jacumba Jim Canyon and Sentenac Canyon. Plants best referred to *B. a. arguta* were seen at such locations as Box Canyon near the old Mormon Trail, along canyon trails on Pinyon Mountain, as well as in Myers Creek near the border with Mexico.

Eleven collections from Baja California are found at the herbarium of the San Diego Museum of Natural History with records as far south as a canyon close to Rancho el Picacho where collected by Moran (SD 104359) near 31°12' North.

STATUS: This brickellbush is separated from the related *B. arguta* var. *arguta* by its distinctively dentate phyllaries; however, intermediate forms may blur this distinction and more taxonomic work is warranted. Very little of its rocky, desert foothill habitat has been impacted over the last one hundred years, and this canyonlands habitat is not uncommon in Anza-Borrego State Park. It probably occurs within its limited California range at more locales than suggested by historical collections. Nevertheless, substantial populations are recommended for protection.

THREAD-LEAF BRODIAEA [*Brodiaea filifolia* Wats.]

LISTING: CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- CE/FT THEMIDACEAE Mar.-Jun.
Global Rank G2 State Rank S2.1

DISTRIBUTION: San Diego County, Orange County, Los Angeles County, and Riverside County

HABITAT: Vernal moist grasslands and the periphery of vernal pools are typical locales where this species has been found. The Darwin Drive (Diablo Clay) and El Camino Real (Altamont Clay) sites were largely devoid of shrubs and were situated in annual grasslands which may have been

heavily grazed in the distant past. Aside from some soil indications that these areas were seasonally moist in the spring, there were few obvious indicators that any rare plants occurred at these locales. Possible Associates: *Sisyrinchium bellum*, *Nassella pulchra*, *Microseris* species.

KNOWN SITES: A very large population is still extant in the fields near Linda Vista Drive and Las Posas Road in San Marcos. It is very rare on a hillside west of Darwin Drive north of Crestmont Place near Guajome Regional Park. A small colony is still extant on a grassy knoll north of Palomar Airport Road and west of El Camino Real, despite partial grading of the site and nearby residential construction. Reports from the 1990s are for scattered populations in the grasslands of the bombing ranges on Camp Pendleton from near Roblar Road, in nine scattered locales, to near the infantry school. CNDDDB reports include a San Marcos population between San Marcos Boulevard, Pacific Street, and MacMahr Drive; a large population from approximately 0.7 mile north/northwest of Palomar College in the southeastern quarter of Section 4; southwest of the intersection of Linda Vista and Bent Street south of Palomar College; also another nearby locale approximately 0.6 mile south/southeast of Buena near Mission Road and the railroad tracks; approx. 2.5 miles north of the Carlsbad Raceway in the southwestern quarter of Section 31; just north of the Carlsbad Raceway in the northwestern quarter of Section 18; approximately 0.5 mile east, northeast of Landes Park near Vista; the claypits just north of Palomar Airport; near the southeastern corner of the junction of La Costa Avenue and Rancho Santa Fe Road; the southeast corner of the junction between La Costa Avenue and Rancho Santa Fe Road; on the Carillo Ranch 2 km west of Lake San Marcos and south of the Carlsbad Raceway; on an east-facing slope adjacent to Elm Avenue and opposite the Wilshire Grammar School in Carlsbad; in grasslands southeast of the intersection of Rancho Santa Fe Road and Olivenhain Road, and east of El Camino Real and north of Alga Road in the hills north of San Marcos Creek. Recent CNDDDB reports are from near Elm Avenue opposite the Hope Elementary School in Carlsbad, southeast of Rancho Santa Fe Road and Olivenhain Road, near a drainage east of El Camino Real and .1-1.5 km north of Alga Road, three km north of La Costa Country Club and .5 km from El Camino Real, southwest of Linda Vista Road and Bent in San Marcos, near Los Vallecitos along Santa Fe Road .5 miles east of Rancho de los Quiotes, .1 mile east of San Mateo Canyon Access Road and 1.2 miles north of Basilone Road on Camp Pendleton, west of San Mateo Canyon on Camp Pendleton, .6 km east of San Onofre Canyon and .1 km north of Basilone Road, 9.1 and 8.7 and 8.1 miles east of San Clemente along Basilone Road and .5 mile southeast of Horno Summit, .25 mile north of Basilone Road and Junction with Roblar Road, in Oceanside south of Mission Avenue and east of Old Grove Avenue, southwest of Lone Jack Road and the Double LL Ranch Road. A 1936 herbarium specimen at SD is vaguely labeled as 4.5 miles south of Vista on [old] Highway 395, which might place it near North County Town Center and Bernardo Mountain. A sizeable population is still extant at the Nature Conservancy's Santa Rosa Plateau Preserve on Mesa de Colorado and Mesa de Burro in western Riverside County. This corm is reported from southern Riverside County at an unconfirmed site near Vail Ranch, as well as verified reports near Mud Springs on the Margarita Peak Quadrangle along USFS Road 8S01 between 8S03 and Sky Ranch, in Miller Canyon and Devil Canyon near Miller Mountain within the San Mateo Wilderness Area, on Miller Mountain, on the eastern flanks of Squaw Mountain, north of the Santa Fe Railroad tracks near California Avenue east of Winchester, 2 miles south of Perris near Goetz Road, just upstream of Railroad Canyon Reservoir north of Kaban County Park on the western flanks of the San Jacinto River floodplain, in the fields north of Lakeview and south of the San Jacinto River, and east of Perris in the San Jacinto Riverbed. It also is reported in San Bernardino County in the hills around Arrowhead Hot Springs at the mouth of Waterman Canyon. Confirmed reports are from near Glendora in Los Angeles County near the mouth of Englewild Canyon at the end of Loraine Avenue; as well as near the mouth of Wildwood Canyon. In Orange County a population occurs on the west flanks of Bell Canyon in the foothills of the Santa Ana Mountains; another report is from near El Toro Road.

STATUS: Thread-leaf Brodiaea (with its distinctive tiny and narrowly triangular staminodes that cling to the perianth lobes) is still substantially declining throughout its southern California range. This species is systematically being eliminated by numerous, unrelated construction projects around the Palomar Airport and San Marcos areas. Populations near the City of Hemet may be similarly imperiled. This corm-sprouting brodiaea can grow in disturbed open grasslands, and is difficult to census except during its short flowering season: typically around May. As a result, surveys out of season may not discover its presence. All populations should be fully protected. Vast areas of vernal pool habitat in northern coastal San Diego County are now converted to residential and urban uses. Aerial photographs from the 1928 San Diego County photo series clearly show extensive tracts of mima mound and vernal pool habitat (including the low rolling terrain where the regional USFWS building now resides) that don't seem to be represented in contemporary herbarium collections by any plant specimens. Given this brodiaea's current distribution on Camp Pendleton, and sporadic presence near Palomar Airport and Car Country Carlsbad where many hundreds of now disturbed or urbanized acres once supported vernal wet grasslands and mima mounds, it is presumed the County population of Thread-leaf Brodiaea was probably once much larger than heretofore supposed. The large and botanically important San Marcos population near Pacific Street is continually under siege by proposed development projects. This site supports three species of brodiaea (including *B. orcuttii* and *B. jolonensis*; as well as occasional hybrids) in very large and significant numbers; and retains extraordinarily high quality habitat for this species not duplicated elsewhere in San Diego County. Currently the site needs fencing protection to deter secondary impacts such as illegal dumping and foot traffic; as well as long-term preserve status.

ORCUTT'S BRODIAEA [*Brodiaea orcuttii* (Greene) Hoover]

- LISTING:** CNPS List 1B R-E-D Code 1-3-2
State/Fed. Status -- /Species of Concern THEMIDACEAE Apr.-Jul.
Global Rank G3 State Rank S3.1
- DISTRIBUTION:** Riverside County, San Bernardino County, Orange County, San Diego County; Baja California, Mexico
- HABITAT:** Vernal moist grasslands, mima mound topography, and the periphery of vernal pools are all preferred habitat for this corm sprouting species. Occupied soils include Stockpen gravelly loam on Otay Mesa and Redding gravelly loam on Mira Mesa. Orcutt's Brodiaea will occasionally grow on streamside embankments. In vernal pool locales Orcutt's Brodiaea will typically grow in the swales leading into the more developed pools, and on the lower flanks of small mima mounds. Possible Associates: *Deschampsia danthonioides*, *Bloomeria crocea*, *Dichelostemma capitatum*. Two-striped Aquatic Garter Snakes (*Thamnophis hammondi*) may congregate in the spring in areas which support this bulb species.
- KNOWN SITES:** This corm is regularly seen around the vernal pools at Otay Mesa, near Miramar Mounds Reserve, and growing in the pool areas just north of Miramar Road and west of Eastgate Mall. It is occasional within the primary drainage in Proctor Valley growing among *Iva hayesiana*. A few montane locations include scattered vernal meadows near Cuyamaca Lake and along a fast-flowing creek on Otay Mountain. Widespread destruction of vernal pools has dramatically reduced historical populations on Otay Mesa; it is still found north of the state prison and east of Brown Field. A very large population consisting of at least several thousand corms occurs west of the entrance to the San Marcos landfill in mesic grasslands. A number of scattered colonies occur in grassy meadows and mesic openings within the chaparral in the hills west of Mussey Grade Road and northwest of San Vicente Reservoir. A small colony grows near isolated vernal pools in the hills northwest of the Barona Indian Reservation Casino. A substantial population occurs in San Marcos near the intersection of Linda Vista Drive and Las Posas Road where it occurs sympatrically with *B. filifolia*. Old reports indicate a scattered "back country" distribution from the Santa Margarita Mountains to Santa Ysabel; also on the Hosking Ranch in Pine Hills. A number of these old collections sites are likely to be extirpated

as *Brodiaea orcuttii* is typically found in flat terrain near spring ponds where cattle frequently wallow and human associated impacts may be severe. Herbarium collections at the San Diego Natural History Museum include Henshaw Dam, Rainbow Valley, both 1 mile north and 4 miles west of San Marcos, Murphy Canyon, Barona, Japatul School, Corte Madera, north of Azalea Spring in the Cuyamaca Mountains, Palomar Mountain Observatory, and El Cajon. Old biological survey reports are from the Hosking Ranch near Wynola, as well as Vista Ramona Road in the San Vicente Valley. CNDDDB reports are 0.6 mile east of junction of Santa Fe Road and Questhaven road on the south side of Questhaven Road, on the southwestern slope of Cuyamaca Peak near King Creek, in Woodwardia Canyon on Otay Mountain, numerous locales around Miramar Air Station, Tierra Santa just north of Shepherd Canyon and west of Mission Trails Park, in Tierra Santa at the south end of Santo Road, Oak Canyon below the second falls and 0.5 mile north of Old Mission Dam, in Carroll Canyon by Pomerado Road east of Highway 395, north of the junction of Carroll Canyon and Miramar Roads as well as on both the south and north rims of Carroll Canyon, north and south of Mira Mesa Boulevard in central Mira Mesa, west of the junction of New Salem Street and Barbados Way in Mira Mesa, Montgomery Airfield north of Serra Mesa, Lopez Ridge on the south side of Peñasquitos Canyon, a mesa between Peñasquitos Canyon and Deer Canyon, approximately 1 mile south southwest of Black Mountain Lusardi Lookout in Organ Valley, south of Palomar College just across Mission Road, 0.4 mile west of Palomar College, Cuyamaca Rancho State Park 100 meters north of Azalea Spring, along the west side of Highway 79 at the south end of Cuyamaca Lake, approximately 1800 feet south of Discovery Street just west of the junction with Grand Avenue, Escondido Creek Floodplain north of the San Dieguito Reservoir, Valley Center Grade, the southeastern corner of the junction of La Costa Avenue and Rancho Santa Fe Road, several locales north of Spangler Peak summit west of San Vicente Valley, Rose Canyon approximately 0.5 mile southeast of junction of interstate 15 and Miramar Way, San Clemente Canyon, north of Miramar Road and from 0.5-1 mile east of Interstate 805, Lopez Mesa adjacent to Carl Sandberg School, Mira Mesa at the north end of Camino Ruiz, Kearny Villa South northeast of Highway 163/Clairemont Mesa Boulevard, and 0.5 mile south of Julian. A recent report is from the newly constructed Carlsbad Poinsettia Train Station. Recent CNDDDB reports are from the southwest slope of Japacha Peak, the south slope of Cuyamaca Peak, south of Fern Flat on Cuyamaca Peak, La Puerta Spring on Middle Peak, Boulder Creek west of Lake Cuyamaca, Azalea Creek on North Peak, west of Grand Avenue in San Marcos, west of Rancho Santa Fe Road and Olivenhain Road, east of Rancho Santa Fe Road and north of La Costa Meadows Drive, 1.5 mile west of Highway 395 on Mira Mesa Boulevard, El Cajon Truck Trail 1.1 miles ENE of Rock Mountain summit, west slope of Viejas Valley 1.2 miles southeast of the summit of Viejas Mountain, at the east end of Bushcalough Cove on Lower Otay Reservoir, west of Johnson Canyon on Otay Mesa, southwest of the intersection of Linda Vista and Bent Street in San Marcos, northeast of Highway 167 and the Clairmont Mesa Boulevard cloverleaf, vernal pools near Camino Ruiz in San Diego, .7 km east of Highway 805 at the Miramar interchange, near Miramar Airfield runways, San Clemente Canyon, on the Valley Center Grade, and the southeastern corner of La Mirada drive and Pacific Street in San Marcos. A site was observed north of San Dieguito Reservoir near Escondido Creek. Reported by Roberts in Orange County at Casper's Regional Park. CNDDDB reports for Riverside County are from the Santa Rosa Plateau near San Mateo Creek on southwestern Redonda Mesa, four pools on Mesa de Colorado, a pool on Mesa de la Punta, three pools on Mesa de Burro, 4 miles west of Tenaja Guard Station, between Mesa de Colorado and Mesa de Burro 1.5 miles northeast of Santa Rosa Ranch, and on Miller Mountain near Willow Spring..

No specimens for Baja California could be found at the herbarium of the San Diego Natural History Museum.

STATUS: Orcutt's *Brodiaea* (which unlike other related *brodiaea* species in the region lacks staminodes) is substantially declining throughout its southern California range. Generally, only a spring census during its blooming period, or immediately following, can determine the presence of this

species. Given its relatively wide range of potential sites in vernal moist montane and coastal locales, it is probable a number of sites are being developed without the realization this form was present. Substantial portions of all sizeable populations should be fully protected. This brodiaea shows some affinity for wetland swales where herbaceous ruderal plants predominate in the foothills of San Diego County. Such areas have been heavily degraded by cattle grazing (e.g., near Ramona) that may have eliminated numerous historical populations. The considerable cismontane County range of this species indicates its current rarity is probably correlated with human-induced habitat destruction.

ELEPHANT TREE [*Bursera microphylla* Gray]

LISTING: CNPS List 2 R-E-D Code 3-1-1
State/Fed. Status -- None BURSERACEAE Jun.-Jul.
Global Rank G4 State Rank S2.3

DISTRIBUTION: San Diego County, Imperial County; Arizona; Baja California, Mexico

HABITAT: Sonoran Desert Scrub is the preferred habitat of the distinctive Elephant Tree. At Fish Creek the habitat of this shrub is largely desert alluvial fan scrub, while in Indian Gorge (Acid Igneous Rock Land) this *Bursera* was seen growing on a rocky, talus slope. Possible Associates: *Psoralea spinosa*, *Hyptis emoryi*, *Ambrosia dumosa*. The Gray Vireo, a bird species quite uncommon in San Diego County and more typically found breeding in montane chaparral, is known to associate with the Fish Creek Elephant Trees during the winter season following migration.

KNOWN SITES: A protected site near Fish Creek is available to the public for viewing this unusual "Elephant Tree." Rare individuals, such as at Indian Gorge, are sparsely scattered in the desert foothills. Herbarium specimens examined were from Fish Creek across from the Gypsum Mine, 0.5 mile southwest of the mouth of Canebrake Canyon, at Mountain Palm Springs, Bow Willow Canyon, and between Fish Creek and Carrizo Gorge. It is also reported from In-Koh-Pah Gorge. CNDDDB reports for San Diego County are at Torote Canyon in the Tierra Blanca Mountains, between Canebrake and Torote Canyons about 1 mile east/southeast of Crawford Ranch, at Alta Bisnaga Wash about 2.5 miles northwest of Agua Caliente Springs, Alma Wash on the east side of the Vallecito Mountains, Bow Willow Canyon about 0.5 mile north of the Ranger Station, Canebrake about 0.5 mile west of Sweeney Pass Road, approximately 3.5 miles southwest of the "Elephant Tree" visitor area in Fish Creek Wash, 1.5 miles west of Villager Peak in the Santa Rosa Mountains; also, along the east-bound lane of Interstate 8 and 0.5 mile west of the Myers Creek Bridge Crossing. It is also reported by Shreve and Wiggins in western Sonora to east of Guaymas, and localized in southern Arizona and south to Zacatecas. It is reported by Butterwick for the South Mountains of Arizona.

Fifty-three herbarium specimens from Baja California are deposited at the San Diego Natural History Museum. The range stretches southward to Cabo San Lucas.

STATUS: The Elephant Tree populations in the southern deserts are presumed stable. All U.S. populations should be protected. This species is state-listed as Highly Safeguarded in Arizona. Due to its curious growth form, illegal collections by horticulturalists of young seedling shrubs could be an occasional problem. The genus *Bursera* is associated with thorn forest habitats in northern Mexico and Baja California. Presence as far north as San Diego County indicates a certain hardiness of this species, and hints at periods of a more tropical climate in the region that allowed this species to migrate northward.

TUFTED PINE-GRASS [*Calamagrostis koelerioides* Vasey]

LISTING: CNPS Unlisted R-E-D Code - None

State/Fed. Status - None

POACEAE Jun.-Jul.

Global Rank None State Rank None

DISTRIBUTION: Orange County, San Diego County; Baja California, Mexico

HABITAT: Rugged terrain in chaparral, primarily on gabbroic or metavolcanic derived soils, is the primary habitat of this perennial rhizomatous grass. The peaks and upper ridgelines of mountains appear to be a preferred microhabitat. Las Posas fine sandy loams are found at the summit of Sequan Peak and Black Mountain-Lusardi Peak; Acid Igneous rock lands are mapped for Lyons Peak, Lawson Peak, as well as a number of the other reported sites. Tufted Pine-grass typically occurs in openings in Chamise with exposed rock common in the area, and soils noticeably shallow. Possible Associates: *Achnatherum coronatum*, *Scrophularia californica*, *Senecio ganderi*.

KNOWN SITES: This species is rare in the Jamul Mountains. A report comes from near Montana Serena Road northwest of Crest. Herbarium specimens at the San Diego Natural History Museum are from Lawson Peak, Potrero Peak, Poser Mountain, Dos Picos County Park, Otay Mountain, Descanso, the south fork of Featherstone Creek, and Inspiration Point overlooking the Anza-Borrego Desert. Old reports are from Guatay Mountain, San Miguel Mountain, Viejas Mountain, Lyons Peak, Kings Creek, Four Corners below Los Pinos Mountain, Corte Madera Valley, Los Terranitos, and Skye Valley. A number of reports are from lot splits near Engineers Road on North Peak; also at Hoskings Ranch in Pine Valley, and west of Cuyamaca Peak on Boulder Creek Road. Dense Reed Grass is locally common on the crest near the summit of Sequan Peak. When not in flower, this species is easily overlooked. It is locally common at the upper elevations of Black Mountain-Lusardi and rare in gabbroic soils north of Magee Road near the Riverside County line. It is occasional in the rugged hills south of Japatul Valley. Old biological survey reports note sites at the intersection of Farmer and Wynola Road in Julian, near the Montiel Truck Trail south of Loveland Reservoir, near Penstemon Road and Engineers Road in Pine Hills, west of Cosmit Peak near Engineers Road, 1 mile west of Cuyamaca Peak, 1 mile northeast of Harrison Park, and west of Inspiration Point. CNDDDB reports are from a southwest facing slope of North Peak along Engineers Road, the southeast side of Arrowmakers Ridge, the southeast end of Airplane Ridge, the top of the western slope of Pine Ridge in the Cuyamaca Mountains, the west side of Japacha Peak, 0.9 mile east southeast of Oakzanita Peak, 1 mile southeast of Oakzanita Peak, the south side of the Sweetwater River 0.33 mile west of Los Terranitos, Guatay Mountain along the summit ridge, northwest of Guatay Campground, 3 miles southwest of Guatay Mountain, at Four Corners approximately 1.25 miles southeast of Los Pinos Mountain, near Potrero Valley, at King Creek 1 mile southwest of Japacha Peak, 1 mile northeast of Corte Madera Mountain, on Boulder Creek Road from the Burney Ranch to just north of Wildcat Spring, on Tule Springs Road 1 mile south of Mineral Hill, near Conejos Creek 1 mile west southwest of Wildcat Spring, Dubois Road 1 mile east southeast of Burney Ranch in Echo Valley, on the east and north sides of Barber Mountain, and on the north flank of Elena Mountain. Reported by Roberts from Coal Canyon in the Santa Ana Mountains of Orange County. Also reported in Orange County from Black Star Canyon near Hidden Ranch, as well as at the Claymont Clay Mine in the Santa Ana Mountains. This species also occurs elsewhere in the state, according to the Jepson Manual, in the Northwestern and Central Western regions, and into Idaho and Wyoming.

The range of this grass probably extends southward into the mountains of Northern Baja California; however, no voucher specimens are deposited in the San Diego Natural History Museum's herbarium.

STATUS: Populations of Tufted Pine-grass in southern California are presumed stable, this encompasses plants formerly referred to *Calamagrostis densa*. Interestingly, both the type specimens for *Calamagrostis koelerioides* and *Calamagrostis densa* were collected near Julian by Orcutt in 1891. This provides additional support for merging the two taxa. Given the inconspicuous nature of this bunchgrass, a number of as yet undiscovered populations are expected to be found in montane and foothill locales during the next decade. The flowering period of this grass is

June and July. Late in the year this species may be overlooked due to its superficial similarity to other common bunchgrasses and the absence of its conspicuous flowering panicle. It may be limited in its local range by a requirement for gabbroic soils that are sparsely distributed in the County's foothills and mountains.

BREWER'S CALANDRINIA [*Calandrinia breweri* Wats.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-2
State/Fed. Status -- None PORTULACACEAE Mar.-Jun.
Global Rank G4 State Rank G3.2?
- DISTRIBUTION:** San Diego County, Los Angeles County, San Bernardino County, Contra Costa County, Mendocino County, Monterey County, Mariposa County, Marin County, Napa County, Santa Barbara County, Santa Clara County, Santa Cruz County, Santa Rosa Island, San Luis Obispo County, San Mateo County, Sonoma County, Ventura County; Baja California, Mexico
- HABITAT:** This species is typically reported from burns in chaparral and coastal sage scrub. Possible Associates: *Papaver californicum*, *Stylomecon heterophylla*, *Camissonia* species.
- KNOWN SITES:** A large population was observed on a burn on the northwestern lower slopes of Tecate Mountain. A few plants were found on a burn on the summit of a hill near Honey Springs Road and the Daley Truck Trail. A limited population was observed in burned chaparral in the City of San Diego on the south flanks of Penasquitos Canyon just northwest of Calle Cristobal and Camino Ruiz. An extensive population was found north of the Barona Reservation on a burned chaparral slope south of Longs Gulch Creek and Daley Creek. A lone plant was observed near Arroyo Sorrento Road in the Sorrento Hills. San Diego County herbarium collections have been examined from burns on the crest of Poway Grade, the north slope of San Miguel Mountain, Point Loma; as well as from Morro Bay in San Luis Obispo County. Thomas reports this species from the Santa Cruz Mountains from Stevens Creek Reservoir, near Loma Prieta, and China Grade. Raven reports this species in the Santa Monica Mountains of Los Angeles County at unspecified burned or disturbed chaparral areas. Smith reports this plant in the Santa Barbara region as scattered on burns and in disturbed places in the Santa Ynez Mountains and on Burton Mesa north to Lompoc. Wallace reports this annual from Santa Rosa Island and Santa Cruz Island. Bowerman reports this species in the Mount Diablo region from Eagle Ridge south of Twin Peaks, and from Oyster Ridge west of Riggs Canyon. Hoover reports this annual in the San Luis Obispo region as common in burned chaparral areas, usually in sandy soil, eastward to the La Panza Range; he mentions it is seldom seen except following a fire.
- One specimen was found in the herbarium of the San Diego Natural History Museum from Baja California. It was collected at 31° 59' North at Rancho de la Cruz by Moran (SD 110744).
- STATUS:** This fire-following annual is apparently rare in southern California; its populations are presumed to be declining due to loss of habitat along the coast. It may be mistaken for the superficially similar Red Maids (*Calandrinia ciliata*) which is locally abundant in the area. Brewer's Calandrinia has a distinctive triangular seed capsule which extends well beyond the calyx., and easily differentiates it from the common Red Maids (although the flowers are similar). Given its rarity in the southern portion of its range, it is recommended that substantial portions of all populations south of the Santa Monica Mountains be protected. Disruption of the typical chaparral fire cycle in southern California over the last one hundred years may trigger seed senescence for this species in some areas where fires are precluded. It is not known how long the seeds of this species can retain their vigor in areas where fires are suppressed and the seed lies dormant.

SEASIDE CALANDRINIA [*Calandrinia maritima* Nutt.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- None PORTULACACEAE Mar.-May
Global Rank G3G4 State Rank S3.2
- DISTRIBUTION:** Santa Barbara County, Ventura County, Los Angeles County, Orange County, San Diego County, Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Catalina Island, Santa Cruz Island, Santa Rosa Island; Baja California, Mexico
- HABITAT:** Sandy bluffs near the beach and sandy openings in Diego Sage Scrub are preferred habitat of this distinctive annual. This species may be subject to extensive herbivory owing to its succulent nature, and may also be susceptible to eradication by hikers who might crush it underfoot. All populations noted appear to occur at locales with moist sea breezes. Flat-top Buckwheat and California Sagebrush are the dominant shrubs at most of these sites; however, steep slopes with open chaparral may also include potential populations. Gaviota fine sandy loams are utilized on Point Loma, while the soils are mapped as Terrace Escarpments at the Torrey Pines and Swallowtail Road sites. Possible Associates: *Amblyopappus pusillus*, *Coreopsis maritima*, the greenish-flowered form of *Chorizanthe procumbens*.

KNOWN SITES: A small population of Seaside Calandrinia, east of Palm Ave and Interstate 805 was removed in 1988 by grading. Another small population still extant grows on bluffs at Torrey Pines State Park. This species is much rarer now than 50 years ago (when probably still uncommon), and is in danger of extirpation in San Diego County. Its beach bluff habitat in southern San Diego County is now almost nonexistent. A sizeable population occurs on the Subsea sea bluffs, on the east side of Point Loma; as well as below western Fort Rosecrans. A small colony grows on a steep hillside in Military Sector Oscar One north of the Santa Margarita River on Camp Pendleton. Similar small colonies are found on a sandy ridge north of the terminus of Swallowtail Road in Encinitas, north of El Nido Road in Rancho Santa Fe, and over 100 plants were clustered in a small area on a south-facing slope of Carmel Mountain. A few plants were observed on an eroded hillside west of the intersection of McNeil and Dubuque in Oceanside and east of I-5 during spring 2001. One old report comes from the hillsides of southern La Jolla where it may no longer be extant; another is from north of Via de la Valle and west of El Camino Real in Encinitas. Reported growing at the California Terraces Mitigation Project on northern Otay Mesa. Reported by Thorne from one locale on Santa Catalina Island. It is reported by Smith on Anacapa Island on the trail above Frenchman's Cove, on Santa Cruz Island on the sea cliffs at Coches Prietos and Frys Harbor, and on bluffs west of Ventura. Raven reports an historic population from Santa Monica that is probably no longer extant.

Thirty-four collections from Baja California are found in the San Diego Natural History Museum's herbarium; south to 28° 5' North where collected by Moran (SD 64961) east of La Vuelta. In northern Baja California this species is locally common near the coast at Punta Banda, La Fonda, Baja Del Mar, and Jatay. Much of its seabluff habitat in northern Baja is being developed for vacation homes.

STATUS: Seaside Calandrinia is severely declining in mainland southern California, and is approaching extirpation in San Diego County and Orange County; only a limited number of small sites are now known from the former. All mainland U.S. sites should be protected. Horticultural requirements for this showy succulent plant should be investigated to determine if it can be viably re-introduced into appropriate native, beach bluff habitat. The decline of this species is attributed primarily to loss of habitat via residential coastal development.

FAIRYDUSTER [*Calliandra eriophylla* Benth.]

- LISTING:** CNPS List 2 R-E-D Code 2-1-1
State/Fed. Status -- None FABACEAE Jan.-Mar.

Global Rank G5 State Rank S2.3

DISTRIBUTION: San Diego County, Imperial County, Riverside County; Arizona; New Mexico; Baja California, eastward and south into mainland Mexico

HABITAT: Sonoran Desert Scrub, primarily rocky hillsides and bajadas, is the preferred habitat of the showy Fairy Duster. Possible Associates: *Acacia greggii*, *Ferocactus cylindraceus*, *Prunus fremontii*.

KNOWN SITES: Fairy Duster is readily seen planted at Anza-Borrego Park Headquarters in Borrego. San Diego County herbarium collections are from the south base of Pinyon Mountain, in Blair Valley, in the Vallecitos Mountains, and in the extreme northeastern corner of the County. Herbarium specimens from Imperial County include the Chocolate Mountains at Indian Pass Road 7 miles northeast of Ogilby Road, near Tumco in the Cargo Muchacho Mountains, 5 miles south of the Mickway Well on the Blythe/Glamis Road, in Mammoth Wash north of Calipatria, 13 miles from Glamis on the road to Blythe, 3.5 miles north of Ogilby on the road to Blythe, and in the In-Koh-Pah area near the San Diego County line. A Riverside County herbarium specimen from Mesquite Canyon was seen. Shreve and Wiggins report this shrub from Arizona, New Mexico, south into Jalisco and Puebla in Mexico. Herbarium collections examined include Oaxaca and Sonora. Felger reports Fairy Duster on Tiburon Island in the Gulf of California; McLaughlin reports it from the Cargo Muchacho Mountains of eastern Imperial County in washes and flats.

Seven specimens from Baja California are found in the herbarium at the San Diego Natural History Museum; south to 31° 20' North where collected on the north slopes of Arroyo Teraizo by Moran (SD 89785) in the Sierra Juarez.

STATUS: Fairy Duster is quite rare in San Diego County and appears to be relatively uncommon elsewhere in the southern deserts of California. Since its potential desert habitat is rarely developed; populations are presumed stable. This species may be relictual in nature, and better adapted to moister-desert conditions than have generally occurred over the last several hundred years in San Diego County. Fairy Duster has a very showy spray of reddish-purple flowers with long-exserted stamens (18-22mm) that cannot be mistaken for other native plants in the region.

CATALINA MARIPOSA LILY [*Calochortus catalinae* Wats.]

LISTING: CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- None LILIACEAE Feb.-May
Global Rank G3 State Rank S3.2

DISTRIBUTION: Los Angeles County, Orange County, Ventura County, Catalina Island, Santa Cruz Island, San Luis Obispo County, Santa Barbara County, Santa Rosa Island

HABITAT: Open chaparral, cismontane woodland, and valley and foothill grasslands are all recorded habitats for this bulbous perennial. Raven reports this species as locally common in grasslands in the Santa Monica Mountains of Los Angeles County; it is particularly conspicuous after fires. In foothills near Malibu it was observed within an area of native bunchgrasses and introduced Eurasian annual grasses, on an open ridgeline not far from the ocean. Possible Associates: *Nasella pulchra*, *Dichelostemma capitatum*, *Bloomeria crocea*.

KNOWN SITES: No valid collections of Catalina Mariposa Lily can be located from San Diego County. An historical, unverified report is from Ramona; the report from Lake Hodges is based on a misidentification. This species was found in limited numbers in the Santa Monica Mountains of Los Angeles County on a hillside overlooking Escondido Canyon. Reported by Thorne as common on Santa Catalina Island. Reported by Roberts from Orange County in Santa Ana Canyon, at Upper Shady Canyon in the San Joaquin Hills, in Upper Wood Canyon at Aliso-Wood Canyon Regional Park, in Rancho Mission Viejo, on a ridge between Limestone and

Santiago Canyons, at Casper's Regional Park, and in both Black Star and Trabuco Canyons in the Santa Ana Mountains. Reports are from Tonner Canyon near Brea, as well as the grasslands north of the Ramakrishna Monastery and east of Los Alisos Road in the foothills of the Santa Ana Mountains. Smith reports this mariposa lily from grassy woodland openings on the south side of the Santa Ynez Mountains, from the upper Santa Ynez River to Figueroa Mountain, and on Santa Cruz Island. It is not mentioned by Hoover in his flora of San Luis Obispo County, but apparently at least one record for this region is known. Herbarium specimens examined were for the Santa Ynez Mountains near Highway 154, 5 miles below San Marcos Pass in Santa Barbara County; from the Palos Verdes Hills, Las Flores Canyon near Santa Monica, near Mulholland Highway and its intersection with Pacific Coast Highway, close to Malibu Road in Los Angeles County; near Avalon on Santa Catalina Island; and at Beecher's Bay on Santa Rosa Island.

STATUS: This bulb is slowly declining in southern California due to urban residential expansion into the foothills surrounding the Los Angeles basin. The status of Catalina Mariposa Lily in San Diego County is unknown; it may not be native to this area. Suitable habitat may exist in the San Mateo Wilderness Area and in the Santa Margarita Mountains. Opportunities for re-introducing this showy species into appropriate native habitat from seed-grown nursery material should be investigated. A substantial portion of all sizeable southern California populations should be protected. Rarity of the species may be correlated with geography. The Santa Ana Mountains have desert-like basins to the north and east, the ocean not far westward, and mesas to the south which do not provide good contiguous linkages with other similar mountainous habitat. The large bowl-shaped white petals of Catalina Mariposa Lily have a purple spot near the base and lack the conspicuous red-brown spot above the nectary and long yellowish hairs associated with *Calochortus dunnii*.

DUNN'S MARIPOSA LILY [*Calochortus dunnii* Purdy]

- LISTING:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- CR/ Species of Concern LILIACEAE May-Jun.
Global Rank G2 State Rank S2.1
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Rocky openings in chaparral or grassland/chaparral ecotone are the preferred habitat of this species. San Miguel-Exchequer rocky silt loams are utilized on San Miguel Mountain in an arid chaparral. Dunn's Mariposa Lily seems restricted to metavolcanic and gabbroic derived soils. At San Miguel Mountain it did not flower well during a year with poor rainfall. Possible Associates: *Ceanothus tomentosus*, *Chlorogalum parviflorum*, *Satureja chandleri*.
- KNOWN SITES:** This bulb is uncommon on San Miguel Mountain and on the western face of the Jamul Mountains. Old reports are from the Minnewawa Truck Trail on Otay Mountain extending to higher elevations such as at Doghouse Junction and near the transmitting station at the summit, on East Mesa in the Cuyamaca Mountains, on a southern slope of Cuyamaca Peak, near the south fork of Featherstone Creek, and on Guatay Peak. A very old report by K. Brandegee reports this bulb 2 miles from Descanso on the west side of the road on a rocky, brushy hillside. This locale may correlate with Guatay Mountain which has appropriate geology and soils for the species. CNDDDB reports are from Japacha Peak, 0.9 mile southeast of Oakzanita Peak, and the southern summit of Tecate Peak; a report from Lower Doane Valley is questionable. A number of CNDDDB reports reflect a population site in the Cuyamaca Mountains near Inspiration Point; however, on close inspection the flowers of these plants appear to display a spectrum of traits; with some close to forms of *Calochortus venustus*, a wide-ranging species very uncommon in San Diego County.

No specimens of Dunn's Mariposa Lily from Baja California are located in the San Diego Natural History Museum's herbarium. Unconfirmed reports are from near Guadalupe Mountain, as well as near Laguna Hansen.

STATUS: Existing populations of Dunn's Mariposa Lily are presently stable in San Diego County. All sites should be protected. A fringe population near the desert lookout west of Julian may show some introgressive traits with *Calochortus venustus*, a wide ranging and variable species. Dunn's Mariposa Lily is limited in range by its metavolcanic/gabbro soil preferences, and has not been heavily impacted, as yet, by urban development. Proposals to intensively develop for houses along Proctor Valley Road, and the adjacent metavolcanic hillsides, could result in significant future impacts. Initial designs do not provide good contiguous linkages with other similar mountainous habitat. The large bowl-shaped white petals of Catalina Mariposa Lily, a species with a more northerly coastal range, have a purple spot near the base and lack the conspicuous red-brown spot above the nectary and long yellowish hairs associated with *Calochortus dunnii*.

BEACH EVENING PRIMROSE [*Camissonia cheiranthifolia* (Spreng.) Raim ssp. *suffruticosa* (Wats.) Raven]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None ONAGRACEAE Jan.-Sept.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Orange County, Los Angeles County; Santa Barbara County, Ventura County, Baja California, Mexico

HABITAT: This perennial herb grows in very sandy substrates near the beach; typically on back dunes. While it generally occurs in soils almost devoid of clays and loams, occasionally it is found along coastal riverine systems such as the lower San Diego River, where it grows in a more heterogeneous silty and sandy alluvium intermixed with organics. Possible Associates: *Nemacaulis denudata*, *Lotus nuttallianus*, *Ambrosia chamissonis*.

KNOWN SITES: This species is now uncommon along the coastal strand, primarily due to heavy use by beachgoers and the overly aggressive use of sand cleaning equipment. Until a decade ago it covered acres of sand on the north side of Ocean Beach, south of the freeway and the mouth of the San Diego River. It still is scattered near the athletic fields which have displaced it. Beach Evening Primrose also grows at Border Field, the back dunes on both beach and bay side of the Silver Strand, in the northeastern corner of Mission Bay near the salt marsh preserve; as well as in scattered and generally small pockets of back dunes from Torrey Pines State Beach northward to Solana Beach, Carlsbad, and Oceanside. On Camp Pendleton it was observed at Military sectors Victor, Uniform, and Margarita along the immediate beaches; however, it is sparsely distributed; presumably due to Marine military activities and historical impacts dating back to the rancho era. A population was observed on the back dunes north of the mouth of San Onofre Creek on property now controlled by the state parks. Plants extend well inland along the San Diego River, and include scattered locations where hybrids with *Camissonia bistorta* are present. It also occurs along the lower Sweetwater River and is scattered in sandier locations in the Tijuana River Valley. In unpublished comments A. Sanders reports it as rapidly re-colonizing disturbed portions of the El Segundo Dunes; and D. Wilken reports it as intergrading with the northern subspecies near Pt. Conception, and now uncommon along the beaches of Santa Barbara and Ventura counties. Several decades earlier Smith in his flora of the region had reported the species still common along the beaches. Reported by Wallace from San Nicolas Island growing with ssp. *cheiranthifolia*.

Twenty-five specimens from Baja California are found at the herbarium of the San Diego Natural History Museum.

STATUS: *Camissonia cheiranthifolia* is quite distinctive, and when mature, easily differentiated from *Camissonia bistorta*, with which it sometimes hybridizes in riverine situations. The former is a much more robust and almost shrubby plant; as well as a perennial. The latter is typically an annual growing from a more conspicuously basal rosette. *C. cheiranthifolia* usually has substantially larger flowers, often without red dots at the bases of the petals, and much broader and stubbier cauline leaves. Hybrids can have an intermediate growth habit between these two species; as well as displaying the more narrowly shaped leaves of *C. bistorta*. These intermediate plants usually exhibit large flowers with conspicuous red dots at the base of the petals. Lee Wedberg, the late botany professor from San Diego State, did extensive field studies and published his results on hybridization of these two species, including some mapping efforts along the San Diego River. Beach Evening Primrose usually does extremely well when re-introduced into beach dunes, and should be considered for all native plantings in this habitat. Human disturbances are apparently severely reducing the populations of this species throughout its range, despite the fact it was once a dominant member of the back dune plant association. Without conservation efforts, the Beach Evening Primrose may remain locally uncommon on the beaches despite its historical abundance and ability to quickly colonize dunes. Given its weedy nature, the extraordinarily severe impacts from beach-cleaning operations are considered the primary instigator in its decline.

YUMA BROWN-EYED EVENING PRIMROSE [*Camissonia claviformis* (Torr. & Frem.)ssp. *yumae*
(Raven)Raven]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None ONAGRACEAE March
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Imperial County; Arizona; Sonora and Baja California, Mexico

HABITAT: This small annual grows on sandy dunes and within desert washes. Possible Associates: *Larrea tridentata*, *Palafoxia arida*, *Hesperocallis undulata*.

KNOWN SITES: The Yuma Brown-eyed Evening Primrose belongs to a taxonomically confusing group; the annual may be of natural hybrid origin. Plants with leaves more typical of *C. c.* ssp. *yumae* than *C. c.* *perisonii*, but with the fused sepal tips in bud of the latter, occur north of Ocotillo near Highway S-2. Reported from Yaqui Well in San Diego County. Yuma Brown-eyed Evening Primrose is locally common on the Algodones Dunes in southeastern Imperial County.

STATUS: *C. c.* ssp. *yumae* has yellow petals not white, unlike four related California subspecies; is not spreading-hairy below like *C. c.* ssp. *perisonii*, but rather strigulose or glabrous; and is strigose above not glabrous or glandular hairy like *C. c.* ssp. *cruciformis* and *C. c.* ssp. *lancifolia*. A. Sanders in unpublished notes theorizes this may be a natural hybrid between *Camissonia brevipes* and typical *Camissonia claviformis*. He finds that yellow flower color in *C. c.* ssp. *claviformis* probably indicates *C. brevipes* ancestry; and that leaf morphology, pubescence, and fruit shape vary between *C. c.* *claviformis* and *C. brevipes* backcross forms. This seems possible based on the hodgepodge of traits among the various subspecies that do not strongly correlate with distinctive desert microhabitats. The Jepson Manual notes this subspecies may be derived from *C. c.* ssp. *aurantiaca* crossed with *C. c.* ssp. *peeblesii* which occurs in Arizona.

LEWIS' EVENING PRIMROSE [*Camissonia lewisii* Raven]

LISTING: CNPS List 3 R-E-D Code ??-2
State/Fed. Status -- None ONAGRACEAE Mar.-Jun.
Global Rank G? State Rank S?

DISTRIBUTION: San Diego County, Orange County, Los Angeles County; Baja California, Mexico

HABITAT: This small annual grows in very sandy substrates near the beach, typically on beach bluffs. In the Tijuana Hills it was observed on soils mapped as Chino fine sandy loams. Possible Associates: *Nemacaulis denudata*, *Lotus nuttallianus*, *Camissonia cheiranthifolia*.

KNOWN SITES: This species is rare near the coastal strand at Border Field, the back dunes on the southern Silver Strand, Spooner's Mesa in the Tijuana Hills, and at the western edge of Otay Mesa. A population numbering in the thousands occurs on the north side of San Dieguito Lagoon in open sage scrub terrain near the intersection of McGonigle Road and Carmel Valley Road. This may be the only large remaining population in the County. A few plants were found on a sandstone outcrop in Carlsbad a half mile west of the terminus of the Palomar Airport's runway; this location is unlikely to survive. Several plants were observed on an isolated hillside abutting the Penasquitos Lagoon adjacent to the freeway. Approximately fifty plants were observed on a very sandy hummock north of Dairy Mart Road and southwest of the largest pond near a cat-tail marsh. A small population occurs on Navy property near the intersection of Woodward Road and Gatchell Road on Point Loma, with some plants in sandy soils interdigitated with exotic plantings. Herbarium specimens examined were from Balboa Park, Otay Lakes Road, San Luis Rey, Crown Point, the south end of San Diego Bay, and near Old Town. Some of the reported locales for San Diego County are now within the boundaries of the urbanized coastal cities where it is probably extirpated. Other reported sites include Bonita, Agua Hedionda, San Pasqual, Fallbrook, and Jamul. The last three inland locations are questionable. Roberts reports this species as quite rare and possibly extirpated in Orange County. Raven notes this species is rare at Point Dume in the Santa Monica Mountains. A herbarium specimen was examined from the El Segundo Dunes.

Nineteen specimens are found at the herbarium of the San Diego Natural History Museum, south to 28° 10' North where collected by Moran (SD 92335) at Arroyo de la Purificacion.

STATUS: Lewis' Evening Primrose is severely declining in San Diego County, and probably throughout its U.S. range. Some of the reported inland locales, particularly in western Riverside County, may represent misidentifications; this genus is notoriously difficult to identify taxonomically, and individual plants can superficially mimic the relatively common *Camissonia bistorta* or *Camissonia micrantha*. The small stature of the plant, thick quadrangular seed capsule, small yellow flowers without the stigma held well above the anthers, and a preference for a sandy microhabitat near the beach are typical of this species. Lewis' Evening Primrose is now extremely rare in the U.S. All populations over a few dozen plants should be protected. The heavy recreational use of the beaches and the severe impacts associated with sand-cleaning machines may be responsible for the current rarity of this species. Two hundred years ago it may have been well distributed on back dunes along the coast. This is an excellent plant for re-introduction at beach dune restoration sites along with regionally depleted species such as *Convolvulus soldanella* and *Atriplex leucophylla*.

ARIZONA CARLOWRIGHTIA [*Carlowrightia arizonica* Gray]

LISTING: CNPS List 2 R-E-D Code 3-2-1
State/Fed. Status -- None ACANTHACEAE flowers spring-fall rains
Global Rank G4 State Rank S1.3

DISTRIBUTION: San Diego County, southern Arizona; northern Mexico

HABITAT: This suffrutescent bush grows on the periphery of desert washes; sometimes at the base of sizeable granitic boulders. Soils are mapped as Acid Igneous rock land at the Hellhole Canyon site. Possible Associates: *Justicia californica*, *Ayenia compacta*, *Hyptis emoryi*.

KNOWN SITES: Arizona Carlowrightia is now known from several locations in San Diego County. A first is reported at the mouth of Borrego Palm Canyon near the headquarters for Anza Borrego State Park and the canyon trailhead. A second site is reported at Hellhole Canyon, not far to the

south of the first site on a side drainage near Montezuma Grade Road, 0.8 mile south of Palm Canyon Drive and 0.1 mile west of Highway S-22. A CNDDDB report is from Hellhole Canyon 0.9-1.1 mile west of County Highway S-22 and 2 miles west of Borrego Springs. A small colony was observed just going into flower in late March 2001 -- growing at the edges of a braided channel in Flat Cat Canyon north of Hellhole Canyon. An October Borrego report is 0.2 mile south of a borrow pit and 0.3 mile south of a locked gate along a County Road, at the base of slope in a flood zone where seven plants were observed growing with *Justicia* and *Larrea*. Reported by Daniel & Butterwick as occasional in washes in the South Mountains near Phoenix, Arizona.

STATUS: This shrub and its peripheral habitat is potentially imperiled at the Borrego Palm Canyon site by high recreational use (*i.e.*, foot traffic) near the park headquarters. This small shrub is exceedingly inconspicuous, and when not in flower is readily overlooked. The small, opposite, and well-spaced lanceolate leaves have an angular droop and the repeated bifurcations of the many densely packed stems give the plant a distinctive broomy appearance; however, from a distance it superficially resembles several other almost-leafless desert shrubs. All southern California populations should be protected. Arizona *Carlowrightia* may be a relictual element that has figuratively taken a moving-van eastward due to the declining summer rainfall in the Borrego region.

SAN BERNARDINO OWL'S CLOVER [*Castilleja lasiorhyncha* (Gray) Chuang & Heckard]

- LISTING:** CNPS List 1B R-E-D Code 2-2-3
State/Fed. Status -- / Species of Concern SCROPHULARIACEAE Jun.-Aug.
Global Rank G2 State Rank S2.2
- DISTRIBUTION:** San Diego County, Riverside County, San Bernardino County
- HABITAT:** Montane Meadows and Pebble Pavement Plain are the typical abode of this small, showy annual. Krantz reports this owl's clover at the moist edges of springs and seeps on clay soil in the San Bernardino Mountains. Also utilized are wet meadows and openings in coniferous forest. The soil types at Cuyamaca Lake for the reported historic population are Holland stony fine sandy loam or Loamy alluvial land. Possible Associates: *Ranunculus californicus*, *Blennosperma nanum*, *Sidalcea malvaeflora*.
- KNOWN SITES:** Botanists have been unable to relocate a reported historic population near the Stonewall Jackson mine at Cuyamaca Lake. It may be extirpated by cattle grazing. One CNDDDB report where possibly still extant is from the east face of North Peak 1 mile east of the summit and 0.5 mile west of the junction of Sunrise Highway and Highway 79. This lone San Diego County collection needs to be confirmed with examination of the original collection material. Reported by T. Krantz at up to a dozen small populations in Big Bear Valley in the San Bernardino Mountains. CNDDDB reports from Riverside County are from between Tahquitz and Little Tahquitz Valleys in the San Jacinto Mountains; from San Bernardino County near the edge of a spring and water tank 0.5 mile south of Sugarloaf, at Saragosa Spring in upper Holcomb Valley, at Fawnskin Park, along Highway 38 0.3 mile east of the Junction of Highway 18 near the east end of Big Bear Lake, in Bear Valley in the flats near Bear Tavern, between Arrastre Flat and Union Flat, south of Baldwin Lake about 0.5 mile east of Big Bear Boulevard and 0.3 mile south of Shay Road, at Metcalf in Bear Valley in a meadow at the bay's margin, north of Highway 18 across from the Snow Valley Ski Area, Ash Meadows at Lake Arrowhead, Squints Ranch 4 miles north of Lake Arrowhead, in the meadow at the toll road and public Camp below Lake Arrowhead, in Big Bear City just north of Highway 18 and east of Pioneer Lane, at Deer Lick Station on the east side of Running Springs, at the Northshore Campground at the east end of Lake Arrowhead, 0.3 mile northwest of Woodlands, 0.5 mile east of Bluff Lake, in Maloney Canyon at the east end of USFS Road 3N20, at Harry Spring in Hanna Flat, on the hill slope north of the golf course at Lake Arrowhead, near Eagle Point on the south shore of Big Bear Lake, in the Castle Glen area of Big Bear Lake, in Fawnskin Valley, at

Upper Holcomb Valley, the old ski beach at Kidd Cove on the southwestern end of Big Bear Lake, and near Green Valley Lake.

STATUS: The reported County sites are dubious, and need to be confirmed with an herbarium specimen. If it was formerly native to the Cuyamaca region, San Bernardino Owl's Clover is close to or may already be extirpated in San Diego County, and is slowly declining elsewhere within its range. Few, if any, additional sites are expected to be located in the Cuyamaca area in the southern portion of its potential range. Significant portions of all substantial populations should be protected. Pebble Plain habitat is very poorly developed in the mountains of San Diego County, and the end of the colder and wetter Pleistocene has apparently exacerbated growing conditions suitable for montane habitat niche specialists like this owl's clover. Historical grazing around Cuyamaca Lake has also degraded potentially suitable habitat.

BUCK'S JEWELFLOWER [*Caulanthus heterophyllus* (Nutt.) Pays. var. *pseudosimulans* R. Buck]

LISTING: CNPS Listed but awaiting code R-E-D Code Awaiting code
State/Fed. Status -- None BRASSICACEAE Mar.-May
Global Rank G4T2T3 State Rank S2S3

DISTRIBUTION: San Diego County, Riverside County, San Bernardino County, Orange County

HABITAT: Chaparral and sage scrub are both utilized by Buck's Jewel Flower. This annual is a fire follower which may lie dormant as seed in areas of mature chaparral or sage scrub. Hambright gravelly clay loams are utilized in Piedre de Lumbre Canyon, and the Roblar site is mapped as Cienega very rocky coarse sandy loam. In the Vail Lake region of western Riverside County, the habitat is a rugged Chamise Chaparral with sandy openings; on the Gavilan Plateau similar vegetation is interspersed with Juniper Woodland. Possible Associates: *Phacelia minor*, *Phacelia distans*, *Adenostoma fasciculatum*.

KNOWN SITES: This annual jewel flower was observed growing abundantly on a burned slope near Roblar Creek at Camp Pendleton, in the sage scrub one mile south of Bonsall and south of the San Luis Rey River, and on a burned north slope of Piedra de Lumbre Canyon on Camp Pendleton. It is occasional in the Vail Lake region of western Riverside County (e.g., along Highway 79 on burns) in arid sage scrub and sparse chaparral habitats; as well as on the Gavilan Plateau near Harford County Park. A few plants were seen east of Polly Butte near the City of Hemet, several colonies near Murrieta east of Antelope Road in sage scrub, as well as near Calle Azur and south of Glen Oak Valley in Riverside County. Herbarium specimens from the San Diego Natural History Museum include sites from Lilac, Monserate, Pala, and Twin Oaks Valley. CNDDDB entries for San Diego County show coastal sites 2 miles north of Fallbrook and north of the Santa Margarita River near Willow Glen Road, near the confluence of Sandia Creek and the Santa Margarita River; foothill and mountain sites for a knoll south of High Point Truck Trail east of the Junction with the Cutca Trail, and near Aguanga 1 mile north of Highway 79 and 1 mile west of Highway 71. A small population was observed in sage scrub upstream of the Bonsall Bridge and south of the San Luis Rey River. Riverside County reports include the Lakeview Mountains southwest of Mount Rudolph; south of Durasno Valley, from Dawson Canyon, Arroyo del Toro, and Estelle Mountain in the Gavilan Hills; the Menifee Valley; at Potrero Basin, north of the Domenighani Valley, scattered in the hills east of Massacre Canyon near Potrero, at the Motte Reserve east of Old Elsinore Road, on the west side of Crown Valley, south of Cactus Valley and Polly Butte near Hemet, north of Cactus Flat Road and east of Hemet, southeast of Lakeview, and north of Brown Canyon near Bedford Road. A small population was observed near Baxter Road and Meadowlark Road east of Murrieta Hot Springs. Reported from Orange County southeast of the Mission Viejo site and San Juan Creek; by the CNDDDB from the Bedford Truck Trail in the Santa Ana Mountains, and from 4.5 miles east of San Juan Capistrano in the first unnamed canyon west of Trampas Canyon on the south side of Highway 74. CNDDDB records from Riverside County are for the Lakeview Mountains at Mount Rudolph, 0.5 mile northwest of the Bar V Ranch, west/northwest of Juniper Flat,

0.4 mile northeast of the junction of Gunther Road and Briggs Road; as well as the Motte Reserve 2.5 miles northwest of Perris, between Elsinore and Menifee, 5 miles northeast of Murrieta, the vicinity of Winchester, Bautista Canyon 7 miles east of Fairview Avenue on Highway 74, Reche Canyon 5 miles from Barton Road Turnoff on Reche Canyon Road, Aguanga approximately 1 mile north of Highway 79 and 1 mile west of Highway 71, 2.8 miles from Banning up the Idyllwild Road on the south side, and Road S-3 five miles south of Sage.

No specimens from Baja California of this jewel flower are deposited in the San Diego Natural History Museum's herbarium.

STATUS: The status of Buck's Jewel Flower in San Diego County and Riverside County is presumed slowly declining, primarily due to ranchette style residential development and clearance of lands for orchards. This species has substantially longer basal and cauline leaves than the related *Caulanthus simulans*. It is difficult to account for the relatively limited range of this species, given similar unoccupied habitat lying to the north and south. It may have originated with an ancestral species on the desert, and evolved within the last few millennia after invading through desert passes onto the coastal plains.

PAYSON'S JEWEL FLOWER [*Caulanthus simulans* Pays.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- /Species of Concern BRASSICACEAE Mar.-Jun.
Global Rank G3 State Rank S3.2
- DISTRIBUTION:** San Diego County, Riverside County
- HABITAT:** Sheephed rocky fine sandy loam is mapped for the site east of Banner; a Juniper Woodland with isolated Pinyon Pines occurs at this locale. Possible Associates: *Juniperus californica*, *Prunus fremontii*, *Lotus strigosus* (hairy-leaved form).
- KNOWN SITES:** This annual is locally common in Juniper Woodland on the desert east of Banner Queen Ranch following good rains, and is locally well distributed in Culp Valley and eastern San Felipe Valley. Herbarium specimens from the San Diego Natural History Museum note sites at Bankhead Springs, San Felipe Creek, Harper's Ranch, west of Jacumba, Warner's Hot Springs, Grapevine Canyon, southeast flanks of the Oriflamme Mountains, Montezuma Viewpoint, and in Thing Valley. CNDDB reports are for montane locales at Cuyamaca State Park near the South Boundary Fire Road just west of the junction with Highway 79, Cuyamaca State Park south of Fern Flat, Cuyamaca State Park on Little Stonewall Peak; and for desert sites at McCain Valley, sand flats 4.3 miles east of Banner along Highway 78 in Earthquake Valley, southeastern flanks of Oriflamme Mountains along the Butterfield Stage Route south of Scissors Crossing, the eastern base of Granite Mountain, San Felipe Wash 2 miles east of Banner, and at Yaqui Well. Old reports are from between Jacumba and Campo. CNDDB reports for Riverside County are from 9.5 miles southeast of Anza in White Wash (a tributary of Coyote Canyon), along the road to the landfill in Pinyon Flat in the Santa Rosa Mountains, Toro Peak, and along Bonita Vista Road and west of Cedar Crest and the Bonita Vista Ranch turn-off in the San Jacinto Mountains. Another report is from the Domenigoni Valley near a massive new reservoir named Diamond Valley Lake.
- STATUS:** Populations in the desert foothills of San Diego County and Riverside County are presumed stable. The limited number of known sites for this species may in part be attributed to limited collection activity in the desert foothills. Substantial portions of sizeable populations are recommended for protection. This species occupies upper desert elevations associated with woody species like juniper that have been in decline in the region for hundreds of years. Juniper Woodland and its associated floristic companions, once occupied much of the lower desert now largely devoid of any surficial traces of its former presence. Ancient woodrat nests

found in arid desert caves supplies considerable evidence for this now departed flora. The basal leaves of this annual are conspicuously pustulate bristly unlike *Caulanthus cooperi*.

SLENDER-POD JEWELFLOWER [*Caulanthus stenocarpus* Payson; possibly = form of *Caulanthus heterophyllus* (Nutt.) Payson var *heterophyllus*]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status Rare/Species of Concern BRASSICACEAE Mar.-Jun.
Global Rank G?Q State Rank S?
- DISTRIBUTION:** San Diego County
- HABITAT:** Friant rocky fine sandy loam is mapped for the Dulzura site. Plants roughly conforming to the description of this species are sometimes found in the first year following a fire growing on chaparral hillsides in rugged terrain near exposed rock. Possible Associates: *Papaver californicum*, *Stylomecon heterophylla*, *Camissonia ignota*.
- KNOWN SITES:** Plants roughly conforming to the description in Munz were observed on a burned ridgeline approximately a half mile east of Dulzura on the Clark Ranch. Other similar plants were seen following a massive fire in the hills near Honey Springs Road where nearby plants seemed to also grade into descriptions of *Caulanthus heterophyllus* var. *heterophyllus*. The same phenomena was observed on a burn south of San Pasqual Valley on the hillside east of the mouth of Bandy Canyon. CNDDDB reports of plants found near these locations include Harbison Canyon, a hillside .75 mile west of Dehesa School, north slope near the summit of Kimball Grade, San Pasqual Grade about two miles east of San Pasqual on Highway 78, along Potrero Creek and Highway 94 and about 1.5 miles west of Tecate Road, the north slope of Tecate Mountain near Highway 94, the west side of Poway Lake north of the parking lot on south and west-facing slopes. All of these specimens may actually refer to *C. h.* var. *heterophyllus*.

Reported from Ensenada, Baja California.

- STATUS:** Slender-pod Jewelflower is questionably distinct from *Caulanthus heterophyllus* var. *heterophyllus*. This putative species is considered a synonym of *C. h.* var. *heterophyllus* by Roy E. Buck in his Jepson treatment of *Caulanthus*. One would expect that two such similar plants as *C. h.* var. *heterophyllus* and *Caulanthus stenocarpus* would have distinct geographic ranges or microhabitats, but that does not appear to be the case. Moreover, the former was once placed in the genus *Streptanthus*, and this may have caused considerable confusion over silique shapes used as a primary means to separate these two genera. The primary difference in older keys was siliques subterete and 2-4.5 cm long in *C. stenocarpus*, and siliques subcompressed and 5-8 cm long in *S. h.* var. *heterophyllus*. However, this may be primarily a difference between immature and more mature fruits, as well as natural variability between individual plants. The separation of the two genera is itself questionable. Other traits which appear variable depending upon where one finds these fire following annuals include the intensity of lobing, the level of hairy-ness, and the narrowness of the basal leaves. Some plants are unusually large with robust basal leaves and are often closer to descriptions of *C. h.* var. *heterophyllus*, while others are more stunted and have narrower leaves and mimic *C. stenocarpus*. Regardless of the status of the latter, these fire followers are not very common in the foothills of San Diego County. *S. h.* var. *heterophyllus* ranges northward to the La Panza Range of central California.

LAKESIDE CEANOOTHUS [*Ceanothus cyaneus* Eastw.]

- LISTING:** CNPS List 1B R-E-D Code 3-2-2
State/Fed. Status -- /Species of Concern RHAMNACEAE Apr.-Jun.

Global Rank G2 State Rank S2.2

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Inland Mixed Chaparral, specifically in the region from Crest to the Lakeside foothills, includes the known habitat and range for the Lakeside Lilac. Hybrid shrubs seem to occur regularly in the latter area. Typically, this *Ceanothus* occurs in a dense, almost impenetrable chaparral with a mix of Chamise and other shrubs such as species of manzanita. This chaparral is taller growing than other woody scrub areas in the region. At Crest the soil types are mapped as Acid Igneous rock land and Cieneba very rocky coarse sandy loam. Possible Associates: *Adenostoma fasciculatum*, *Ceanothus leucodermis*, *Rhamnus pilosa*.

KNOWN SITES: This large, showy shrub grows on slopes south of Interstate 8 near Chocolate Summit Road. It is common near Montana Serena Drive northwest of Crest, occurring over several hundred acres; this site and nearby outlying colonies (e.g., near Farrell Lane) may include a sizeable proportion of the total extant population for the species. Old herbarium specimens at the San Diego Natural History Museum include a regional cluster of sites at Oak Ridge Ranch on the east slope of El Cajon Mountain, as well as the southeast base and northeastern slope of this same mountain; also from a bluff between San Vicente Creek and the San Diego River, in the Barona Valley, on the Eckstein Ranch near Silverwood Wildlife Sanctuary, above the Philbrook Ranch in Lakeside, and 3 miles east of Poway on the road to Ramona. Several shrubs were observed on the ridgeline east of Mussey Grade near the gated entrance to San Vicente Reservoir; as well as at scattered locales in hills to the west. A single shrub in flower was observed a half mile east of Mussey Grade Road and south of Oak Valley Road. Old biological survey reports are from Section 33 along Wildcat Canyon Road near Lakeside, near Bullard Lane in Alpine, 0.25 mile northeast of the intersection of Wildcat Canyon Road and Muth Valley Road, south of Interstate 8 and adjacent to Flinn Springs Park, and near Mountain View Road northwest of the community of Harbison Canyon. CNDDDB reports are from the same region including the south face of El Cajon Mountain northwest of Road 13510 through Section 29, along Cornelius Ranch Truck Trail northwest of Harbison Canyon, 0.75 mile west of Dehesa School, and on a north slope near the summit of Kimball Grade. Reports from Otay Mountain and McGinty Mountain need to be verified. Shrubs of hybrid origin from east of San Vicente Reservoir have been examined which are closer to *Ceanothus tomentosus* and include occasional black glands on the serrated leaf tips. An old report by McMinn from north of Pala mentions on the herbarium card the specimen's probable hybrid origin; intermediate towards *Ceanothus leucodermis*. A report by Raven 5 miles east of Torrey Pines may represent another hybrid occurrence. A shrub noted east of I-15 and south of Poway Road had hybrid traits.

One herbarium specimen at the San Diego Natural History Museum from Baja California was collected on the summit of a ridge 2 miles east of Cerro Coronel at 32° 17½' North. More material from this locale is needed to ascertain whether this represents more than a lone hybrid specimen.

STATUS: The primary population of Lakeside *Ceanothus* in the Crest region is relatively stable, but is imperiled by a number of encroaching residential projects. This distinct shrub should be considered for planting at regional county parks or other areas with suitable habitat near/within its historical range. Any reports from outside of the Crest or El Cajon Mountain region should be considered questionable due to possible intergeneric hybrids of other species which sometimes superficially resemble *Ceanothus cyaneus*. Lakeside *Ceanothus* may be a relatively newly evolving species that has stabilized following hybridization of *Ceanothus tomentosus* and *Ceanothus leucodermis*. Both reputed parents are common in the region, and this could account for the limited distribution of Lakeside *Ceanothus* in chaparral covered foothills that otherwise extend well beyond the current range of this species. Strong edaphic ties to specific soil requirements may also be a primary factor. Lakeside *Ceanothus* has larger leaves and does not have conspicuous black glands on the serrated edges of the leaf margin like *Ceanothus tomentosus*, and the flat leaves are almost glabrous unlike both *C. tomentosus* and *Ceanothus oliganthus*. Twigs are not rigid like *Ceanothus leucodermis*; the flowers are a very distinctive

brilliant deep blue unlike the other species mentioned. Occasional shrubs in the Mussey Grade area have broad flat glabrous leaves similar to Lakeside Lilac, but with occasional conspicuous black glands on the serrated leaf margins and somewhat reddish young stems. These are best considered hybrids. All substantial populations where this shrub is a dominant element should be protected. It is recommended that significant portions of smaller colonies also be placed into dedicated biological open space.

VAIL LAKE CEANOTHUS [*Ceanothus ophiochilus* Boyd, Ross, & Arnseth]

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- CE/FT RHAMNACEAE Feb.-Mar.
Global Rank G1 State Rank S1.1
- DISTRIBUTION:** Riverside County
- HABITAT:** This shrub grows on a reddish-hued, pyroxenite outcrop in Chamise Chaparral at Oak Mountain; it utilizes gabbroic soils near Woodchuck Campground. Shrub diversity is relatively limited and the Vail Lake Ceanothus is a very localized but common component of this chaparral. Possible Associates: *Adenostoma fasciculatum*, *Ceanothus crassifolius*, *Rhamnus ilicifolia*.
- KNOWN SITES:** This unique, small-leaved species occupies a very limited range. A sizeable colony is found on the eastern slopes of Oak Mountain, approximately 1 mile west of Vail Lake in Riverside County. From a distance this shrub bears a superficial similarity to Chamise, with which it grows sympatrically, which may in part account for its recent discovery. A second site where this shrub is found in several dense concentrations is south of Highway 79 and south of Woodchuck Campground within the Agua Tibia Wilderness near the San Diego County line. Additional sites may occur nearby in the rugged and little explored Agua Tibia Wilderness Area of San Diego County.
- STATUS:** Currently the populations of this shrub are stable. This species has been imperiled by repeated attempts to propose development around the Vail Lake area. The tiny (2-7mm), opposite, and entire leaves almost resemble Chamise from a distance. The lower leaf surface is glabrous and the flowers are pale blue or sometimes pinkish. Given its rarity, all populations should be protected. It is allied with ancestral *Ceanothus greggii* var. *perplexans* and *Ceanothus crassifolius*, but perhaps not as directly as *Ceanothus otayensis* found in southern San Diego County. Vail Lake Ceanothus may be of botanically-recent origin given its limited distribution within an area of similar chaparral extending well beyond the known range of the species. Conversely, strong edaphic ties to specific soil requirements may also be the primary factor in its rarity, and the species may be relictual in nature.

OTAY MOUNTAIN CEANOTHUS [*Ceanothus otayensis* McMinn]

- LISTING:** CNPS 1B R-E-D Code 3-2-2
State/Fed. Status -- None RHAMNACEAE Feb.-Apr.
Global Rank G1 State Rank S1.2
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** This shrub grows in a xeric Chamise Chaparral; the soil type for Otay Mountain sites are mapped as San Miguel-Exchequer rocky silt loam. Otay Mountain Ceanothus may be restricted to metavolcanic and gabbroic peaks. Possible Associates: *Arctostaphylos otayensis*, *Adenostoma fasciculatum*, *Pickeringia montana*.
- KNOWN SITES:** This distinctive shrub is found on San Miguel and Otay Mountains where it can occur in dense colonies. Near the summit on Tecate Mountain are found plants with relatively small leaves that appear more closely related to *Ceanothus greggii*.

A shrub quite similar (maybe =) to Otay Mountain Ceanothus is common on Cerro Bolla in northern Baja California. It is also reported from Cerro Jesus Maria.

STATUS: This ceanothus would be well protected on Otay Mountain were there not repeated fires associated with illegal immigration through the area. All substantial U.S. populations are recommended for protection. This species may have ancestral *Ceanothus greggii* var. *perplexans* and *Ceanothus crassifolius* (both in Section *Cerastes*) as possible parental species. Rarity of this shrub may be associated with isolation of the metovolcanic soils on which it grows, that are surrounded by geologic formations with granitic origins and different soils. The small leaves with a hairy upper surface look somewhat like miniature versions of *C. crassifolius* (which has an upper leaf surface that is glabrous). Nevertheless, they are quite distinctive and the leaf shape is uniformly small within the population.

WART-STEMMED CEANOTHUS [*Ceanothus verrucosus* Nutt. in T. & G.]

LISTING: CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status -- /Species of Concern RHAMNACEAE Jan.-Apr.
Global Rank G3 State Rank S2.2

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Coastal Chaparral intermixed with Chamise and Mission Manzanita is the preferred habitat for this sizeable shrub. Typically, the Wart-stemmed Ceanothus is a dominant shrub within the vegetation community where it occurs. It may be particularly vigorous on north-facing slopes, but can accommodate more xeric aspects. Exchequer rocky silt loams and San Miguel-Exchequer rocky silt loams are utilized by the dense populations of this ceanothus in the Mount Whitney (*i.e.* northern coastal San Diego County) area. Terrace Escarpments are the soil type mapped for this shrub at Torrey Pines, while Gaviota fine sand loams are found at the Point Loma populations. Possible Associates: *Arctostaphylos glandulosa* ssp. *crassifolia*, *Adenostoma fasciculatum*, *Comarostaphylis diversifolia* ssp. *diversifolia*.

KNOWN SITES: Sizeable populations are found on the Point Loma Subbase, at Carmel Mountain, on north-facing slopes near the Miramar Landfill in San Clemente Canyon, and on the north-facing slopes of Escondido Creek 1 mile east of Lake Val Sereno. Another substantial population grows at Torrey Pines. A small population is still extant on an urban hillside in East San Diego, as well as in Swartz Canyon in Balboa Park indicating that sizeable tracts of urban City of San Diego lands may once have been cloaked in Wart-stemmed (synonym White Coast) Ceanothus. This shrub is the dominant plant in rugged terrain south of Mount Whitney. Here and surrounding the nearby Questhaven Retreat it occurs in the tens of thousands. It is also common at the crest of the road to Mount Israel on Rancho Cielo, in the hills to the north of this area, on the northeastern flanks of Bernardo Mountain, and on the northern flanks of Escondido Creek southeast of Paint Mountain Road. A vigorous population occurs in the San Marcos Mountains east of Richland Road and downslope and west of Woodlawn Heights. Once regionally abundant within the coastal canyons of the county, *Ceanothus verrucosus* has been substantially reduced in numbers because of urban sprawl. Other locales where this shrub is found include near Rossini Drive in Cardiff east of the terminus of Chesterfield Drive, north of the terminus of Swallowtail Road in Encinitas, on the slopes near the Cabrillo National Monument, near Del Mar Heights Road and Dunham Road, south of Del Mar Heights Road and east of El Camino Real, in La Zanja Canyon, in the open space drainages south of Rancho Santa Fe Farms Drive, north of Woodwind Drive in Olivenhain, north of Sky Loft Road in Encinitas, east of Bonita Road in Encinitas, on Carmel Mountain, in Del Mar Heights northeast of Trento Place and west of El Camino Real, in the canyon west of 30th Street and south of Nutmeg near Balboa Park in San Diego, in the chaparral near La Jolla Village Drive and the 805 Freeway, and well distributed in the canyons between the Miramar landfill and the Interstate 805. Numerous other small populations between La Jolla and Carlsbad could be identified. Old biological survey reports are from between La Glorietta and Rambla de las Flores in Rancho Santa Fe, southwest

of Sienna Canyon Drive in Encinitas, south of Avenida del Diablo in western Escondido, near the intersection of Fairmont and Montezuma Road in the vicinity of San Diego State University, in San Elijo Canyon southwest of Harmony Grove, in the Crest Canyon drainage in Del Mar, near El Apajo Road just south and beyond the Rancho San Dieguito boundary, 0.5 mile northeast of Lake Hodges, at Fairbanks Ranch 0.5 mile north of La Zanja Canyon and 1 mile east of San Dieguito Valley, near Quail Gardens in Encinitas, and east of Interstate 5 and south of Palomar Airport Road. Recent CNDDDB reports are for east of the El Camino Memorial Park in Carroll Canyon, in San Clemente Canyon south of Miramar Air Station, the canyon slopes adjacent to Ward Road in Normal Heights, the Tijuana Hills, northeast of Miramar Road and Eastgate Mall, south of Soledad Canyon between Genessee Avenue and I-805, and at San Dieguito County Park.

Twenty-seven collections from Baja California are found at the San Diego Herbarium; south to 28° 21¼' North where collected by Moran (SD 78000) on Cedros Island. It is locally common in coastal chaparral north of Ensenada, Mexico; occasional on Punta Banda Peak.

STATUS: Several very vigorous populations of Wart-stemmed *Ceanothus* are extant; however, it is declining locally on the periphery of the coastal cities in San Diego County. It is recommended that protection focus on several massive populations in the Mount Whitney and Mount Israel areas. A population of *Ceanothus megacarpus* on the hills behind Laguna Beach in Orange County shows some intermediate leaf traits with *C. verrucosus* despite the large fruit (8-12 mm versus 5mm). In addition, shrubs on Bernardo Mountain north of Lake Hodges sometimes show leaf traits resembling *Ceanothus greggii* with some indentations along the margin -- rather than the typical entire margin. S. Boyd notes this species is an obligate seeder and may retrench in numbers and area covered when subject to repeated burns. This shrub seems to have been relatively common on suitable soils prior to aggressive urban sprawl, and loss of habitat on the coast appears to be the primary factor in its current "reduced" status.

SOUTHERN TARPLANT [*Centromadia parryi* (Greene)Greene ssp. *australis* (Keck)B.G. Baldwin = *Hemizonia parryi* Greene ssp. *australis* Keck]

- LISTING:** CNPS List 1B R-E-D Code 3-3-2
 State/Fed. Status -- / Species of Concern ASTERACEAE Jun.-Nov.
 Global Rank G5T2 State Rank S2.1
- DISTRIBUTION:** San Diego County, Orange County, Ventura County, Los Angeles County, and Santa Barbara County
- HABITAT:** Mesic areas in valley and foothill grasslands, alkaline locales, and peripheral Salt Marsh are all utilized by the Southern Tarplant. At the Del Mar locale the soils are mapped as Chino silt loam and the salt marsh vegetation is found only yards away. At Newport Back Bay this tarplant grows in mesic grasslands with an ocean influence; most of the surrounding vegetation here consists of invasive non-native weeds. Possible Associates: *Salicornia virginica*, *Cressa truxillensis*, *Isocoma menziesii*.
- KNOWN SITES:** A small colony is immediately east of Interstate 5 and south of Via de La Valle on the periphery of the Salt Marsh. Agricultural fields are extending into the Salt Marsh to the south of this site. It is reported around the large vernal pool near the Ramona Airport. A robust colony occurs in grassy terrain westward and close to Rangeland Road in Ramona near the creek. Much of this species' probable habitat no longer exists; it is largely farmed or developed. A recent Year 2000 report is from downtown San Marcos in low-lying grasslands adjacent to San Marcos Creek. A 1916 report is from Escondido. A number of scattered colonies occur at Newport's Back Bay in Orange County centered near the bike bridge which crosses Delhi Channel; one site was seen across the bay along the shoulder of Back Bay Drive. Other reports in Orange County are from Bonita Canyon on the Irvine Campus, near the Peters Canyon Channel by the intersection of Walnut Avenue and Harvard Avenue east of the Tustin

Marine Helicopter Station, at the mouth of the Santa Ana River, Near Kalmus in Costa Mesa, and along a graded slope at the Wintersburg Flood Control Channel near Bolsa Chica. Also to the north of San Diego County are reports where possibly no longer extant from the Bryant Ranch in Long Beach, below Long Beach State near Pacific Coast Highway, in low bottom ground on the San Gabriel River in Long Beach, east of Isla Vista School at Goleta in Santa Barbara County, on Santa Catalina Island in an open field above a golf course, and in Del Ray in Los Angeles County at Lower Ballona Creek. Historical locations in Orange County noted by Roberts at Santa Ana, Rossmoor, Cypress, Westminster, and Garden Grove are all possibly extirpated. Reported by Smith for the Santa Barbara area between Goleta and Ellwood in sandy fields near the ocean, and along the railroad tracks near Pitas Point.

Herbarium specimens from four locales in Baja California are found at the San Diego Natural History Museum; south to 30° 29' North where collected by Moran (SD 68050) 3 miles east of San Quentin in a vernal pool. Two other Baja locations are at Las Juntas, Ejido Papalote, and 1.4 miles southwest of Redondo Station. An additional Baja station where reported is 17.5 miles east of Tijuana on the road to Tecate.

STATUS: The Southern Tarplant is almost extirpated in San Diego County and severely declining throughout its U.S. range. The few remaining San Diego County sites are imperiled by development; extensive recreational use of Newport Back Bay in Orange County threatens various scattered colonies. This tarplant should be given status as Federally Endangered; all sites should be protected. The species was formerly included in the genus *Hemizonia*, with the spiny-leaved section now segregated into *Centromadia*. Rampant coastal development and historical alterations to most coastal drainages in southern California appear to be the primary culprit in the severe decline of this species. Southern Tarplant has disk pappus present unlike *Centromadia pungens* ssp. *laevis*; and has brown or black anthers rather than yellow.

SMOOTH TARPLANT [*Centromadia pungens* (Hook. & Arn.)Greene ssp. *laevis* (Keck)B.G. Baldwin = *Hemizonia pungens* (Hook. & Arn.)Torrey & Gray ssp. *laevis* Keck]

LISTING: CNPS List 1B R-E-D Code 2-3-3
State/Fed. Status -- /Species of Concern ASTERACEAE Apr.-Sep.
Global Rank G5T2 State Rank S2.1

DISTRIBUTION: San Diego County, Los Angeles County, Orange County, Riverside County, San Bernardino County, and Kern County

HABITAT: Valley and foothill grasslands, particularly near alkaline locales, are the preferred habitat. Hanford coarse sandy loams are found at both the Hemet and the Sycamore Canyon Park locale. Smooth Tarplant generally grows at sites with minimal shrub cover. Plants south of Lake Hemet occur in a habitat which is quite alkaline and marshy in the spring following good winter rains. Studies indicate this species germinates best following cold stratification and particularly -some sort of physical breaking of the seed coat. Possible Associates: *Atriplex coronata* var. *notatior*, *Distichlis spicata*, *Brodiaea filifolia*.

SITES: A large population was observed in Santee growing in the fields around the Santee Square trolley station west of Civic Center Drive. Dense colonies numbering in the thousands are found nearby in the swales north of Town Center Parkway. This extended population is the only known extant Smooth Tarplant site in San Diego County. One historical report is from the San Luis Rey area. An 1897 report from Oceanside could represent *Centromadia parryi* ssp. *australis*. An inexplicable 1906 report is from the Borrego Sink in Anza-Borrego Desert. It is still found along Temecula Creek within the city environs north of Rancho California Road in western Riverside County, north of Cajalco Road and west of Alexander Street, and in the Sycamore Canyon Park drainage west of Eucalyptus Street and the City of Moreno Valley. A vigorous population occurs 0.5 mile southwest of Lakeview Hot Springs near Lake Perris in Riverside County. It is also reported at other nearby locales along the San Jacinto River, 1160

meters east of the Lake Skinner Dam just north of Tualota Creek, at Clinton Keith Road just east of the Deer Creek development in a low drainage, north of the intersection of Washington Road and Auld Road; at Potrero Creek near Beaumont, east of Reinhardt Canyon and north of Domenighani (*i.e.*, Diamond Valley Lake) Reservoir, both southeast of the San Jacinto Reservoir and immediately to the north, east of the duck ponds at the San Jacinto Wildlife Reserve, and in Moreno Valley 1 mile south of Highway 60 on the west side of Nason Street south of Dracaea Avenue. The type specimen is from the San Bernardino Valley; one report is from nearby Lytle Creek. Reported by Roberts for Orange County, and by Raven from wet sands along the Los Angeles River.

Seven collections of *Centromadia pungens* are found in the herbarium at the San Diego Natural History Museum for Baja California; south to 31° 51' North where collected by Moran (SD 63637) 3 miles northwest of Ojos Negros. Some/most/all of these specimens may be *ssp. laevis*; both small and large flowered, more robust plants are grouped together.

STATUS: Smooth Tarplant is close to extirpation in San Diego County, where an upscale shopping center and public library in Santee have been previously proposed for development. It is apparently severely declining in western Riverside County where it is being heavily impacted by flood control measures and residential development along major and minor drainages. It is a strong candidate for Federally Threatened status. Significant portions of all populations of Smooth Tarplant should be protected. Aggressive agricultural discing throughout western Riverside County's farmlands, particularly within drainages, has resulted in the loss of many of the historical populations of this species. *Centromadia parryi ssp. australis* has disk pappus present unlike Smooth Tarplant; and has brown or black anthers rather than yellow.

PEIRSON'S PINCUSHION [*Chaenactis carphoclinia* Gray var. *peirsonii* (Jeps.) Munz]

LISTING: CNPS List 1B R-E-D Code 2-1-3
State/Fed. Status -- None ASTERACEAE Mar.-Apr.
Global Rank G5T1 State Rank S1.3

DISTRIBUTION: San Diego County, Riverside County, Imperial County

HABITAT: This annual grows in open Sonoran Desert Scrub with very limited competition from perennial shrubs. Along the Salton Seaway, a population was observed on a broken, rocky substrate in relatively flat terrain; soils here were shallow and very poorly developed. Possible Associates: *Opuntia basilaris*, *Fouquieria splendens*, *Larrea tridentata*.

KNOWN SITES: Reported sites include Benson Dry Lake, Silent Canyon, and Palm Wash.

STATUS: Peirson's Pincushion is presumed stable, with its reported range concentrated in an historically little developed desert region. Much of its potential range is within protected federal lands, on rugged, undeveloped terrain. Additional taxonomic analysis is recommended to demonstrate this entity merits varietal status. Its tripinnatifid leaves are primarily restricted to a basal cluster, differentiating it from common varieties of this white-flowered annual. Its restricted range may be due to subtle soil preferences. Variation within the desert species of *Chaenactis* have been previously noted by a researcher named Stockwell who described a number of additional species that are not listed in the Jepson Manual.

ORCUTT'S PINCUSHION [*Chaenactis glabriuscula* DC. var. *orcuttiana* (Greene)H.M. Hall]

LISTING: CNPS List 1B R-E-D Code 2-3-2
State/Fed. Status -- None ASTERACEAE Mar.-Jul.
Global Rank G5T3 State Rank S2.1

Mountain Truck Trail, east of Table Mountain in the Santa Rosa Mountains, at several locales between Forbes Ranch Road and Lake Hemet east of Highway 74, in the vicinity of Mountain Center, near Tahquitz Peak, and near Idyllwild. Parish's *Chaenactis* is locally well distributed in the chaparral along Santa Rosa Peak Road, west of the peak, in Riverside County.

Five Baja specimens are deposited in the herbarium of the San Diego Natural History Museum south to 30° 54' North where collected by Moran (SD 79644) near La Grulla. Ten collections are reported by Boyd for Baja California in the herbarium at Rancho Santa Ana.

STATUS: Parish's *Chaenactis* populations are presumed stable in areas of transmontane habitat which generally have been subject to limited historical impacts. Recreational activities such as mountain biking pose minor threats to specific populations. Significant portions of all large populations should be protected. This perennial species with white to pinkish flowers appears to be relictual in nature, and in natural decline over at least the last few centuries due to changes in both seasonality and duration of rainfall. Summer rainfall, so typical still of Arizona, may have once been much more regular over the eastern escarpment of the Laguna Mountains. The only closely related shrubby species -- the Shasta *Chaenactis* (*Chaenactis suffrutescens*) from northern California -- is also rare.

SOUTHERN MOUNTAIN MISERY [*Chamaebatia australis* (Bdg.) Abrams]

LISTING: CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- None ROSACEAE Nov.-May
Global Rank G4 State Rank S3.2

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: This sprawling shrub, which often forms impenetrable thickets, is apparently restricted to gabbroic or metavolcanic derived soils. San Miguel-Exchequer rocky silt loams are a preferred soil type on Otay Mountain and San Miguel Mountain. Possible Associates: *Pickeringia montana*, *Pedicularis densiflora*, *Salvia clevelandii*.

KNOWN SITES: This shrub grows in thickets at various location on Otay Mountain (e.g., the upper slopes of Cedar Canyon), San Miguel Mountain, and in the Jamul Mountains. A concentrated population occurs on a north-facing slope of the San Marcos Mountains, west of the large quarry operations on Twin Oaks Valley Road. A very large population grows at the upper elevations on Tecate Mountain. A small population is found near the saddle in the hills south of Iron Mountain Peak. An unverified report is from a very steep southeast-facing slope of San Onofre Mountain; this area burned in 1990. Most sites are currently well protected, growing on steep slopes near the summits of undeveloped mountains. Also known are old reports from Barber Mountain, McGinty Mountain, Potrero Peak, and Elena Mountain near Lyon's Peak.

Twenty specimens from Baja are found at the San Diego Herbarium; south to 30° 23½' North where collected on the main ridge of Cerro San Miguel by Moran (SD 84476).

STATUS: Populations of Southern Mountain Misery are stable in San Diego County. This plant typically only occurs as extensive thickets, and not as isolated shrubs. This extremely glandular and odoriferous shrub is unlikely to be mistaken for other native species. All such populations should be protected. The limited distribution of this shrub appears to be related to the limited availability of its preferred gabbroic/metavolcanic derived soils found on steep rocky slopes.

ARIZONA SPURGE [*Chamaesyce arizonica* (Engelm.) Arthur]

LISTING: CNPS List 2 R-E-D Code 2-1-1
State/Fed. Status -- None EUPHORBIACEAE Mar.-Apr.

- Global Rank G5 State Rank S1.3
- DISTRIBUTION:** San Diego County, Imperial County, and Riverside County; Arizona; Texas; Baja California and mainland Mexico
- HABITAT:** Sonoran Desert Creosote Bush Scrub is the reported habitat for this tiny perennial spurge. Possible Associates: *Croton californicus*, *Chamaesyce* species, *Tiquilia plicata*.
- KNOWN SITES:** A small population of this inconspicuous prostrate species was observed in a minor wash east of S-2 and about a mile north of Ocotillo. Herbarium specimens deposited in the San Diego Natural History Museum are from Borrego Palm Canyon and Butler Canyon on the Anza-Borrego Desert. Reports for Riverside County are from west of Murray Hill near Palm Springs, as well as north of Sierra del Sol Road and Thousand Palms. Shreve and Wiggins report this species eastward through Arizona to Texas, and south to Chihuahua and northern Durango.

Three specimens from Baja California are found in the herbarium at the San Diego Natural History Museum; south to 28° 30' North where collected by Moran (SD 65366) in a dry bed of Arroyo San Pedro.

- STATUS:** The present status of Arizona Spurge in San Diego County and Riverside County is poorly known; it is presumed stable. More collection information is needed. Given the extensive available habitat, one might expect it to occur at a number of additional sites in the southern deserts; superficial similarities with other common *Chamaesyce* species could account for the few collections in this region. The cyathia (*i.e.*, involucre) on this perennial species is distinctly urn-shaped and contracted at the mouth with a hairy ovary and capsules; not bell-shaped like superficially similar desert spurges. In addition, the seeds are distinctively transversely ridged, unlike *Chamaesyce polycarpa*. Given the dearth of extant sites for the region, all populations should be protected. San Diego County is at the extreme northwestern edge of the range of this species, perhaps partly accounting for the dearth of collections.

FLAT-SEEDED SPURGE [*Chamaesyce platysperma* (S. Watson.) Shinnery]

- LISTING:** CNPS List 1B R-E-D Code 3-2-2
State/Fed. Status -- /Species of Concern EUPHORBIACEAE Feb.-Sep.
Global Rank G3 State Rank S1.2?
- DISTRIBUTION:** Imperial County, San Diego County, Riverside County; Arizona
- HABITAT:** This small prostrate annual is found associated with desert dune systems. Possible Associates: *Croton californicus*, *Helianthus niveus*, *Palafoxia arida*.
- KNOWN SITES:** A single report for San Diego County is for September 26, 1901 from Little Blair Valley. Flat-seeded Spurge is reported from near Thousand Palms in the Coachella Valley (not seen since 1914) and from the vicinity of Yuma, Arizona. A report from Imperial County is in the Superstition Mountains.
- STATUS:** This present status of this spurge species on the deserts of southern California is poorly known; it is presumed stable. However, little collection information is available, and the dune systems in the Coachella Valley have been heavily impacted in recent years. The current status of this inconspicuous annual in San Diego County is unknown. Potential habitat is found near Clark Dry Lake and several other similar, but smaller dune systems in the Anza-Borrego Desert. This annual has a glabrous ovary and capsules with "whitish," radially elongate glands that are unappendaged. It may be under-reported due to superficial similarities with several other common spurges found on the southern deserts. Given the dearth of extant sites known from the region, all native populations should be protected. Limited California collections are likely partly the result of a dearth of suitable habitat; and the relative isolation of the dune areas remaining in the Colorado Desert that may limit ready expansion of this species.

THREAD-STEMMED SPURGE [*Chamaesyce revoluta* (Engelm.) Small]

- LISTING:** CNPS proposed List 4
State/Fed. Status None
Global Rank G5 State Rank S3.3
- DISTRIBUTION:** Imperial County, Riverside County; San Diego County; Arizona; New Mexico; Nevada; Texas
- HABITAT:** This annual is found on rocky desert slopes. Possible Associates: *Ditaxis lanceolata*, *Encelia farinosa*, *Agave desertii*.
- KNOWN SITES:** Thread-stemmed Spurge is reported from a single location in San Diego County in the Pinyon Mountains. An unpublished note by S. Boyd reports it from the New York Mountains, Providence Mountains, and the eastern Mohave Desert.
- STATUS:** This present status of this rare annual species of the deserts of southern California is poorly known; it is presumed stable. The long linear leaves (*i.e.*, 3-26 mm) should readily differentiate this species from other desert spurges in the County. It should have been more frequently collected if it were more common in the region. Nevertheless, rocky desert slopes are perhaps the least thoroughly examined habitat in San Diego County. San Diego County lies on the extreme western edge of Thread-stemmed Spurge's known range; in part; this may account for its limited presence.

STICKY LIPFERN [*Cheilanthes viscida* Davenp.]

- LISTING:** CNPS Unlisted
State/Fed. Status -- None
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Riverside County, Los Angeles County, San Bernardino County, Inyo County, Kern County; Baja California, Mexico
- HABITAT:** This small fern grows in shaded, rocky crevices in the desert mountains. Acid igneous rock lands are found at the Mountain Springs site. Observed sites were typically in partially shaded locales with the ferns wedged between granitic fissures. The Jepson Manual reports this species on Limestone. Possible Associates: *Selaginella asprella*, *Notholeana californica*, *Cheilanthes parryi*.
- KNOWN SITES:** Sticky Lipfern grows near Mountain Springs in the shade of boulders near Myers Creek Bridge, and in Sentenac Canyon near the old bridge site. Herbarium specimens for San Diego County were examined from Upper Blair Valley, La Puerta, and Borrego Palm Canyon; from In-Koh-Pah Gorge in Imperial County; from Whitewater in San Bernardino County, on the north side of the San Jacinto Mountains in Riverside County; and from Surprise Canyon in the Panamint Mountains of Inyo County. It is reported by Munz from Twentynine Palms, the Granite Mountains near Victorville, and Darwin. Reported by Dedecker from the Argus, Black, and Kingston ranges. Reported by Twisselmann from Kern County on the east side of the mouth of Last Chance Canyon in the El Paso Range.
- This fern is reported by Wiggins for the northern Sierra Juarez; however, no voucher specimens were found deposited at the herbarium of the San Diego Natural History Museum.
- STATUS:** Given the rugged, rocky desert foothills where this fern typically grows, it is presumed stable. The wide range north to Inyo and Kern County indicates this species may not be particularly rare, but rather undercollected at many rocky desert locations that are rarely investigated botanically. Both the upper and lower surface of the leaves of Sticky Lipfern are quite glandular, and this species is not likely to be confused with other desert ferns.

PENINSULAR SPINEFLOWER [*Chorizanthe leptotheca* Goodm.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-2
State/Fed. Status -- None POLYGONACEAE May-Aug.
Global Rank G4 State Rank S3.2
- DISTRIBUTION:** San Diego County, Riverside County, San Bernardino County; Baja California, Mexico
- HABITAT:** This tiny annual is typically found in xeric openings in Chamise Chaparral. Possible Associates: *Filago californica*, *Navarretia hamata*, *Eriastrum sapphirinum*.
- KNOWN SITES:** Limited numbers of this spineflower were seen in the chaparral along Highway 94, west of Jamul; as well as southwest of the intersection of Japatul Valley Road and Interstate 8. Herbarium specimens for San Diego County were examined from Campo, near Canyon City, Corte Madera, Doane Valley, Mount Woodson, Echo Dell; as well as Doane Valley in the Palomar Mountains. Old biological survey reports noting *Chorizanthe staticoides* in the foothills and mountains of San Diego County may represent misidentified *Chorizanthe leptotheca*. An additional voucher specimen was seen from near Idyllwild in the San Jacinto Mountains of Riverside County. Peninsular Spineflower has also been reported from Santa Ysabel, Mesa Grande, Pala, Ramona, and Otay Mountain. Reported by Reveal near the southern base of the San Bernardino Mountains, along the eastern edge of the Santa Ana Mountains, and through the San Jacinto and Santa Rosa Mountains of Riverside County. A population south of Vail Lake in Riverside County appears somewhat intermediate to *C. staticoides* with pink flowers.

Two voucher specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 32° 33½' North where collected by Moran (SD 107442) eleven kilometers east of Tecate. It was occasional in chamise chaparral on volcanic soils on the Tecate/Ensenada Highway, near the crest of the road north of Valle de Las Palmas, in Baja California.

- STATUS:** Peninsular Spineflower is presumed stable but uncommon in the region given its typical inland chaparral habitat, where steep slopes predominate. The relationship between this species and *Chorizanthe staticoides* is not always clear. Live plants typically have a pale blue to white calyx as opposed to the pink calyx of *C. staticoides*. In San Diego County well defined *C. staticoides* is apparently restricted to near the coast, while historical inland and montane forms may be referable to *C. leptotheca*. More taxonomic work is needed to elucidate the range and diagnostic traits of this species. Given the limited information available on the Peninsular Spineflower, significant portions of all substantial populations should be protected. It is difficult to account for the rarity of this species given the widespread chaparral habitat in which it is reported. The Baja location on volcanics might indicate a preference for this substrate which is uncommon in the County foothills.

ORCUTT'S SPINEFLOWER [*Chorizanthe orcuttiana* Parry]

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- CE/FE POLYGONACEAE Mar.-Apr.
Global Rank G1 State Rank S1.1
- DISTRIBUTION:** San Diego County
- HABITAT:** Coastal Chamise Chaparral openings with a distinctive loose sandy substrate are a microhabitat favored by Orcutt's Spineflower. The Oak Crest Park site is mapped with a division of soil types: Corralitos loamy sand, and loamy alluvial land in the Huerhuero complex. Carlsbad gravelly loamy sand or Gaviota fine sandy loam are presumed to be the soil type for the historical Point Loma population. A factor in the rarity of this species may be the dearth of undisturbed, loose sandy areas in appropriate coastal chaparral. Most of the historical coastal chaparral is either developed for residential or military uses, or it has been heavily disturbed

by foot traffic in the open sandy areas where this tiny annual might grow. Possible Associates: *Lastarriaea coriacea*, *Chorizanthe polygonoides*, *Chorizanthe fimbriata*.

KNOWN SITES: After a decade of intermittent searching in the spring near known historical locations, this minuscule annual was found (not far from an historical site now destroyed) by C. Reiser and K. Ince at Oak Crest Park in Encinitas. Approximately 20 plants were seen on April 17, 1991, in flower and inhabiting a very limited area of five by five feet. Two specimens were collected and deposited in the herbarium at the San Diego Natural History Museum; macrophotographs of the plants in flower were taken. The microhabitat is a chaparral clearing in loose sand, downslope from eroded sandstone bluffs, south of a bike path, north of a grassy lawn, and west of a parking lot. This species had been considered extinct. In spring 1992 and 1995 the site was revisited and similar conditions and population sizes were noted. A reported occurrence at Torrey Pines east of the main road and above the salt marsh was not confirmed; both *Chorizanthe procumbens* and *Chorizanthe staticoides* were seen at this locale. Two recent reports are from military lands on Point Loma. One .5 miles NNW of the Bennington Memorial at Fort Rosecrans National Cemetery and west of Cabrillo Memorial Drive; the second .35 mile NNE of the Bennington Memorial and east of Cabrillo Memorial Drive. Database reports where possibly no longer extant are from south of the Del Mar Racetrack just south of where the bridge crosses the mouth of the slough (examined again in Year 2000 with no positive results), 2.5 miles east of Encinitas on the road to Olivenhain, east of Highway 101 under the Torrey Pines in presumably the North Grove of Torrey Pines State Park, and low hills on the north side of 6060 Clairemont Mesa Boulevard 1.5 miles west of Interstate 395. Most potential habitat is currently being considered for urban development within the cities of San Diego, Del Mar, Solana Beach, and Encinitas.

STATUS: Only three small sites are known to be extant; Orcutt's Spineflower is very close to extinction. The Encinitas site is imperiled by illegal aliens who regularly sleep in the chaparral, and by park visitors who walk randomly through openings in the shrub cover. Fencing is finally being seriously entertained in Year 2001 at the Oak Crest site by the City of Encinitas, after almost a decade at risk. An enclosure should be immediately installed to protect this population from random foot traffic. All sites should be fully protected. Potential habitat for this species has largely been removed by residential coastal development. However, the few early collections, in a region fairly well botanized, indicates it was not common prior to urban sprawl. Strong affinities to well-weathered sandstone may be the limiting factor in its niche habitat preferences and subsequent rarity. Orcutt's Spineflower can remain amazingly tiny; it has only three involucre bracts with awns, and a narrowly flaring involucre tube. *Chorizanthe polygonoides* var. *longispina* sometimes also has only three hooked awns, but it has a broader bell-shaped involucre and a white to rose perianth (versus yellow).

SAN FERNANDO VALLEY SPINEFLOWER [*Chorizanthe parryi* Wats. var. *fernandina* (Wats.) Jeps.]

LISTING: CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- /Candidate Endangered POLYGONACEAE Apr.-Jun.
Global Rank G2T1 State Rank S1.1

DISTRIBUTION: Ventura County; Formerly found in Los Angeles County and Orange County.

HABITAT: Coastal Scrub is the reported habitat for this small annual. The closely related variety *parryi* grows in alluvial fan scrub and in open sandy locales in low-growing sage scrub. Possible Associates: More information needed.

KNOWN SITES: One historical collection from Del Mar has been re-identified as *Chorizanthe procumbens* by Reveal in his treatment of this genus (Phytologia, May 1989). Examples of variety *parryi* seen in Riverside and San Bernardino counties occasionally have straight hooks on the involucre bracts, as in variety *fernandina*. CNDDB reports note a 1929 herbarium collection from Elizabeth Lake in Los Angeles County, a 1901 report from Chatsworth Park, a herbarium

specimen from near the summit of Mount Lowe, in Little Tujunga Wash, Newhall, and the hills near Santa Ana in Orange County. Several of these may be misidentifications; Reveal mentions only the Mount Lowe and Santa Ana sites. A recent confirmed report is of a large population of 5,000-10,000+ annuals from the Ahmanson site at Laskey Mesa in Ventura County where threatened by the construction of a large residential community. At present, this is the only known extant location.

STATUS: The San Fernando Valley Spineflower was until recently presumed extinct. The single large population found north of the Los Angeles metropolitan area is threatened by residential housing development. The sprawling Los Angeles megalopolis may have removed most primary habitat for this spineflower. It is not considered native to San Diego County. All populations should be protected. Rarity of this spineflower may be due in part to geographic isolation in the foothills of northern Los Angeles County, from more southerly *C. p. parryi* located on the plains. Perianth lobes are sometimes jagged at the tips and most involucral awns are straight to separate this variety from the related *C. p. parryi*. As often occurs, subtle evolutionary strategies to occupy different, newly confronted microhabitats can lead to various phenotypes.

LONG-SPINED SPINEFLOWER [*Chorizanthe polygonoides* T. & G. var. *longispina* (Goodman) Munz]

LISTING: CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- /Species of Concern POLYGONACEAE Apr.-Jul.
Global Rank G5T3 State Rank S2.2

DISTRIBUTION: San Diego County, Riverside County, Santa Barbara County; Baja California, Mexico

HABITAT: This small annual is typically found on clay lenses which are largely devoid of shrubs. It can be occasionally seen on the periphery of vernal pool habitat and even on the periphery of montane meadows near vernal seeps. At Cuyamaca Lake it grows on Boomer stony loams, while on Kearney Mesa it occurs on Redding gravelly loams. Possible Associates: *Chorizanthe fimbriata*, *Navarettia atractyloides*, *Chorizanthe procumbens*.

KNOWN SITES: Long-spined Spineflower is well distributed around the vernal pool complex on Kearney Mesa. A substantial population grows east of the northern terminus of Mercury Street south of Freeway 52. It is found in somewhat similar habitat, at a much higher elevation, on the western periphery of Cuyamaca Lake; and near the northern terminus of Pine Creek Road. A small population was noted near mima mounds on Carmel Mountain. Another small colony was seen on Point Loma near the road to the tidepools and the active lighthouse. It grows with the miniscule population of *Chorizanthe orcuttiana* at Oak Crest Park in Encinitas. Herbarium specimens examined for San Diego County include sites at Barber Mountain .5 mile from the summit, Oak Grove Valley, Corte Madera, and east of Kearney Villa Road near the old water tank. Two recent CNDDDB reports are from Cutca Valley along the road, and 1.9 miles northeast of the junction of Carroll Road and Fenton Road. In western Riverside County it was found on the southern flanks of Alberhill in clay soils. A large population occurs on open flats near Idaleona Road on the Gavilan Plateau. Thousands were observed on an unusual volcanic bald of approximately two acres in size east of Meadowlark Lane near Murrieta where this species was a dominant species. Another site is reported in the CNDDDB from the south slope of Miller Mountain, west of the confluence of Devil Canyon and San Mateo Creek.

Six voucher specimens from Baja California are found at the herbarium of the San Diego Natural History Museum; south to 31° 56½' North where collected by Moran (SD 105213) six kilometers northwest of Ojos Negros.

STATUS: Long-spined Spineflower is substantially declining in San Diego County and Riverside County as much of its habitat -- level, vernal mesic terrain devoid of much vegetation -- is developed for housing tracts and light industrial uses. Substantial portions of all sizeable populations should be protected. The distribution of this species indicates it may have been much more

common in San Diego County prior to the agricultural uses and cattle grazing, and subsequent residential construction on the area's mesas. 1928 aerial photographs of the coastal County indicate vernal pools once were found over very extensive areas that were subsequently altered. This spineflower could have been well distributed on the upland mima mound periphery of many of these pools. Long-spined Spineflower's involucre may have only three ribs with hooked awns like Orcutt's Spineflower, but it has a broader bell-shaped involucre and a white to rose perianth (versus yellow).

PROSTRATE SPINEFLOWER [*Chorizanthe procumbens* Nutt.]

- LISTING:** CNPS Delisted R-E-D Code None
 State/Fed. Status -- None POLYGONACEAE Apr.-Jun.
 Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Riverside County, Orange County, Los Angeles County, San Bernardino County, Ventura County; Baja California, Mexico
- HABITAT:** Sandy openings in Chamise Chaparral are typical locales for the Prostrate Spineflower; however, it may also occur in sage scrub. It regularly occupies recently disturbed microhabitats such as the shoulders of dirt roads or areas of lightly brushed chaparral. At Rancho Cuca the soils utilized are Crouch rocky coarse sandy loam; Fallbrook sandy loams are mapped for the Riverview Road site; Cieneba-Fallbrook rocky sandy loams for the Gregory Canyon site. Possible Associates: *Filago californica*, *Sylocline gnaphaloides*, *Chorizanthe fimbriata*.
- KNOWN SITES:** The Prostrate Spineflower grows in chaparral openings at Poway near the proposed Midland Road extension (i.e., close to Ehman Road). It is locally common at Rancho Cuca near the eastern boundaries of this old Mexican land grant and on a chaparral hillside east of Sandia Creek. It is scattered in chaparral openings north of the freeway at Alpine and on a disturbed trail in chaparral near Riverview Road in Fallbrook. It was also noted on a sage scrub ridgeline west of Gregory Canyon near Pala. Other small populations examined include near Rocky Mountain Road well north of Jamul Butte, on Whale Peak near Ballena, near Via Cuesta in northern Ramona, on the peaks west of Vista Viejas Road in Peutz Valley, within La Zanja Canyon, in Pamo Valley near Orosco Ridge, near Jamul Butte, both west and east of Olive Hill Road near Bonsall, on a coastal peak east of Interstate 15 and south of Poway Road, close to the Miramar Landfill in open Chamise Chaparral, south of Del Mar Heights Road and east of El Camino Real, in the chaparral south of Deerhorn Valley Road, near the peak north of Forester Creek and La Cresta Road, east of Fiore Terrace near Miramar, and near Chocolate Summit Road west of Alpine. A massive specimen about two feet across was found on a ridgeline south of Jans Oak Way near the Barona Ranch Indian Reservation. This spineflower is found as far north as a barren, rocky butte near Winchester in western Riverside County, but is apparently quite uncommon in this region. A second locale in Riverside County was noted near Colt Road and De Portola Road. This annual sometimes invades newly disturbed soils in habitats with no prior historical degradation. J. R. Reveal merges subspecies *albiflora* into synonymy with typical *C. procumbens* var. *procumbens*. The latter form is seen primarily along the immediate coast on sandy beach bluffs where it is now quite rare due to urbanization. It is still found at both the northern and southern extensions of Torrey Pines State Park; the coast forms have greenish white (Torrey Pines) or deep yellow tepals (Dana Point, Orange County), as opposed to white or cream tepals. Herbarium specimens for *C. procumbens* were examined from the east slope of El Cajon Mountain, Pauma Valley, Pacific Beach, Point Loma, northeast of San Vicente Creek, Carlsbad, 2.5 miles east of Encinitas on the road to Olivenhain, Hidden Glen, an old 1862 specimen from the National Ranch, Balboa Park, the Silver Strand, Harbison Canyon, Twin Oaks Valley and Gopher Canyon Road, east of Otay Lake, just north of Highline Road on Barber Mountain, northeast of Loveland Reservoir, in Del Mar, and by the U.S. Boundary Monument 238. The specimens mentioned near the beach are

probably closer to the greenish-white flowered form. The Prostrate Spineflower is reported by Roberts from one site along the San Joaquin Corridor alignment in Orange County.

Thirteen specimens from Baja California are found at the San Diego Natural History Museum, south to a locale near 30° 23' North where collected by Moran (SD 88855). The coastal form with a greenish coloration to the flowers is locally common on the beach bluffs south of Punta Mesquite near Plaza Santa Maria.

STATUS: Prostrate Spineflower is stable and apparently wide ranging in the "back country." It was recently de-listed by the CNPS; with good collection evidence/reports to support the de-listing. However, additional taxonomic work should be conducted focusing on a correlation between tepal color and geographic range; as well as genetic tests to more conclusively demonstrate that unique subspecies or varieties are not present. Field experience with live, flowering material indicates that small populations growing near the beach may be distinctive and substantially rarer than the wide-ranging interior form. Subtle differences may not be so readily apparent in pressed herbarium material. If distinctive, these beach forms should be protected. This annual may be a pioneering species which historically did not have to compete with Eurasian grasses on recently disturbed sites. If this is true, higher disturbance factors coupled with the cumulative addition of aggressive non-native weeds might eventually bring about a reduction in available habitat on the urban periphery of coastal San Diego County. At present, this species is not recommended for sensitivity listing, merely that variation within the species be adequately examined for anomalies that might warrant subspecific status. If the beach form is distinctive, it is now extremely rare, and all sites for this form should be protected.

COAST TURKISH RUGGING [*Chorizanthe staticoides* Benth. ssp. *chrysacantha* (Goodman) Munz]

LISTING: CNPS Unlisted R-E-D Code -- None
State/Fed. Status -- None POLYGONACEAE Apr.-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County and Orange County

HABITAT: Diegan Coastal Sage Scrub and open locales in Chaparral are the preferred habitat for this small annual. Mild disturbance of topsoils, away from large seedbanks of ubiquitous weeds, may facilitate the spread of this species. Heavily disturbed soils may not act as such a catalyst to population growth. Las Flores loamy fine sand is the soil type at the Windmill Canyon site; Gaviota fine sandy loam occurs at the Bravo Two locale. Possible Associates: *Navarretia hamata*, *Dudleya multicaulis*, *Salvia apiana*.

KNOWN SITES: Turkish Rugging was found near Windmill Lake on Camp Pendleton. A second, more substantial population was observed on the Base growing in open, White Sage dominated sage scrub habitat in military sector Bravo Two. These are the first known sightings for San Diego county. J. R. Reveal merges this subspecies into synonymy with typical *C. staticoides*, a notoriously variable taxon. The north County coastal form known as *chrysacantha* has noticeably larger involucre than plants seen elsewhere. One massive herbarium specimen examined from a burn on Otay Mountain may represent an atypical fire response. Plants at Torrey Pines State Park (both northern and southern extensions) represent typical *Chorizanthe staticoides* with smaller involucre. Herbarium specimens from Olivenhain are also annotated by Reveal as this smaller form. Reported by Roberts for Orange County in the San Joaquin Hills at Shady Canyon, Sycamore Hills, Pelican Hill, and Pelican Point; Aliso Viejo in Sheep Hills; from Temple Hill in Laguna Beach; Niguel Hill in Laguna Niguel; in Cañada Chiquita in Mission Viejo; above San Juan Creek; in Cristianitos Canyon; and in Lower Gabino Canyon. A small population was seen near Badlands Park in Laguna Beach.

STATUS: Coast Turkish Rugging populations in San Diego County and Orange County are slowly declining. The Windmill Lake site is imperiled by future golf course alteration or expansion.

The Bravo Two locale may be degraded by military maneuvers. Populations in coastal Orange County are being impacted by expanding urban development. Montane forms of *Chorizanthe staticoides* reported in San Diego County are all questionable, and may represent *Chorizanthe leptotheca*. Reveal's determinations for merging subspecies *chrysacantha* are compelling. Unless further taxonomic studies can provide a more convincing determination that Coast Turkish Rugging is a distinct entity, no recommendations for protection are given.

DELICATE CLARKIA [*Clarkia delicata* (Abrams) Nels. & MacBr.]

- LISTING:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- None ONAGRACEAE May-Jun.
Global Rank G2G3 State Rank S2.2
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** The periphery of oak woodlands and cismontane Chaparral haunts are the favored habitats for this annual. Soils at the Black Mountain-Lusardi site are mapped as Bancas stony loam; the population here was situated primarily on very old roadcuts in partial shade. Locales where observed were partially shaded by tree canopy or large shrubs, and typically were vernal mesic situations with substantial peripheral annual and herbaceous spring growth. Possible Associates: *Quercus agrifolia*, *Symphoricarpos mollis*, *Toxicodendron diversilobum*.
- KNOWN SITES:** Delicate Clarkia was seen growing in a canyon north of Highway 94 just east of Dulzura. This is a striking little Clarkia that is best identified during a narrow flowering period from approximately April 23 to June 13 (dates based on herbarium collections). Old collections at the San Diego Natural History Museum are from the following locales: Mother Grundy Truck Trail, Black Canyon Road 5 miles south of Mesa Grande, a south slope near Honey Springs Road west of Bratton Valley, the east end of Lyons Valley, the south fork of Featherstone Creek, at Foster (now submerged by San Vicente Reservoir), Corte Madera, a burn in Harbison Canyon, the south side of Moreno Reservoir, the east side of Highland Valley Road southeast of Highway 67, 6 miles east of Lake Hodges Bridge, and a slope near the southern arm of El Capitan Reservoir. It is reported from near Orinoco Creek. An unconfirmed report of a large population comes from eastern slopes of the Jamul Mountains. A small population was found on roadcuts near the intersection of Black Mountain Road/Lusardi and the connecting truck trail to Lake Sutherland. Another small population was found south of Deerhorn Valley Road in an Engelmann Oak Woodland. Delicate Clarkia is scattered alongside the drainage in oak woodland east of Viejas View Place in Alpine. It is uncommon in oak woodland understory at the Blue Sky Ecological Reserve in Poway. Several sub-populations are found near Longs Gulch Creek well east of Kimball Valley growing on the periphery of oak woodlands; a nearby colony was observed near the junction of San Vicente Creek and Dancy Canyon. Several small populations are found in the oak woodland periphery a mile west of the confluence of Cottonwood Creek and Tecate Creek in Marron Valley. Old biological survey reports, possibly misidentified and referable to other species of *Clarkia*, note this species near Vista Romero Road near San Vicente Valley, near the community of Palomar Mountain, 1 mile west of Potrero Road near Highway 94, near the Sequan Truck Trail, and in the vicinity of Eagle Rock Road and Pine Hills near Orinoco Gorge and Paine Bottom Gorge. A recent report is from the periphery of the floodplain below San Vicente Dam.
- Only six Baja specimens are found at the San Diego Herbarium; south to 32° 5' North where collected by Moran (SD 127478) 2 km east of La Mision de San Miguel, Valle Ojos Negros.
- STATUS:** Delicate Clarkia populations are slowly declining in San Diego County, as development of the back-country proceeds. A number of residential projects in cismontane oak savannahs and open mixed chaparral habitats are now threatening some populations of this inconspicuous annual. A plant census out of season could easily miss this species: late fall, winter, and early spring censusing for this clarkia is of dubious value. *Clarkia delicata* is quite distinct while alive and

in flower; its diagnostic traits include spatulate rose petals and bicolored anthers which are bright orange-red on the tips. Despite its apparent potential habitat along many oak drainages at the mid elevations, much of this habitat has been heavily overgrazed. Historical grazing pressures may be a significant reason for its current rarity. Significant portions of sizeable populations of Delicate Clarkia should be protected.

DOWNY-LEAF CHINESE HOUSES [*Collinsia heterophylla* Buist var. *austromontana* (Newsom)Munz]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None SCROPHULARIACEAE Apr.-Jul.
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Los Angeles County, Orange County, San Bernardino County
- HABITAT:** Moist to relatively dry, semi-shaded slopes at foothill and mountain elevations are utilized by this showy annual. Possible Associates: *Quercus chrysolepis*, *Galiumandrewsii*, *Claytonia parviflora*.
- KNOWN SITES:** A small population with short corolla lips and very glandular stems was observed along Boulder Creek Road north of Descanso. Herbarium specimens examined with numerous glandular hairs which may represent Downy-leaf Chinese Houses were from El Capitan, Mussey Grade, Vulcan Mountain, Black Canyon Road, Foster, Barona, Castro Canyon, Green Valley near Descanso, Cuyamaca Lake, Descanso Junction, Campo, Tijuana Valley, Balboa Park, Monument School, Hot Springs Mountain, Miramar, northeast of Escondido, and on Palomar Mountain. *C. h. austromontana* is reported from Escondido, Julian, and Pine Hills. It is also reported from the San Gabriel Mountains and the San Bernardino Mountains. Unpublished report by Boyd of specimens in the herbarium at Rancho Santa Ana from the San Gabriel Mountains and the San Bernardino Mountains.
- STATUS:** Downy-leaf Chinese Houses has strongly pubescent stems to differentiate it from the common Purple Chinese Houses, *C. h. heterophylla*, found throughout the lower montane areas of San Diego County. Perhaps more importantly, it has a noticeably short, upper corolla lip. A cursory look at all San Diego County specimens of *Collinsia heterophylla* at the herbarium of the San Diego Natural History Museum revealed that plants at higher elevations had strongly glandular stems below the inflorescence, while most of the numerous collections from coastal locations did not. However, there were a few exceptions from near the coast. Additional collection information and taxonomic study is needed to determine if a unique suite of traits separates this entity from variety *heterophylla*. *Collinsia heterophylla* has a curved basal spur projecting at the base of the filament into the bottom of the pouch of the floral tube; unlike *Collinsia concolor*. This trait can be observed without a hand lens. Provisionally it is recommended that substantial portions of all sizeable populations of Downy-leaf Chinese Houses should be protected -- pending additional taxonomic information. No recommendations are made for protection of small populations.

LAS ANIMAS COLUBRINA [*Colubrina californica* Jtn.]

- LISTING:** CNPS List 2 R-E-D Code 2-1-1
State/Fed. Status -- None RHAMNACEAE Apr.-May
Global Rank G5 State Rank S2S3.3
- DISTRIBUTION:** San Diego County, Imperial County, Riverside County; Arizona; Baja California and Sonora, Mexico
- HABITAT:** The Las Animas Colubrina is reported to be localized around springs and in mesic rocky canyon bottoms in Mojavean Desert Scrub. Possible Associates: More information needed.

KNOWN SITES: This species is reported from isolated desert locales including Joshua Tree National Monument, the Eagle Mountains, and the Chuckwalla Mountains. No historical records for San Diego County have been verified.

Five specimens from Baja California are found at the herbarium of the San Diego Museum of Natural History; south to 28° 1' North where collected by Hastings & Turner (SD 92248) 4.6 miles northeast of Pozo Aleman.

STATUS: This shrub is presumed rare but stable in its isolated desert habitat. Given the dearth of sightings, substantial portions of all sizeable populations should be protected. Mesic desert habitat is now poorly distributed in California. This species may be relictual in this region; a remnant species from a prior time during the Pleistocene when conditions for desert springs and vernal seeps were more amenable to population expansion of the Las Animas Colubrina. This shrub has a spheric fruit and hairy dull-gay-green entire leaves (12-30mm), as well as rather inconspicuous flowers.

SUMMER-HOLLY (*Comarostaphylis diversifolia* (Parry) Greene ssp. *diversifolia*)

LISTING: CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- /Species of Concern ERICACEAE Apr.-Jun.
Global Rank G3T2 State S2.2

DISTRIBUTION: San Diego County, Riverside County, and Orange County; Baja California, Mexico

HABITAT: Mesic north-facing slopes in Southern Mixed Chaparral is the preferred habitat of this large, showy shrub. Rugged steep drainages seem to be a preferred location for isolated shrubs. Most of the population of Summer-Holly occurs west of Interstate 15. In the larger populations, the surrounding mature chaparral is typically tall, dense, and luxuriant. Possible Associates: *Ceanothus verrucosus*, *Xylococcus bicolor*, *Heteromeles arbutifolia*.

KNOWN SITES: A large population with hundreds of mature shrubs was found south of Encinitas Road and just northwest of Montura Road in San Marcos; most of the population was lost to residential grading. At least 1000 shrubs grow on the north slopes of Double Peak in San Marcos. A scattered, healthy population of shrubs occurs on the north-facing slope of Mount Whitney. A few were seen near Seal Rock in the Merriam Mountains and others occur nearby west of Interstate 15 flanking Lawrence Welk Estates (one shrub was seen east of the freeway near Champagne Boulevard). It is occasional on the steep north-facing slopes south of Questhaven Road. Limited populations are found in La Zanja Canyon, northeast of Cicada Court in the finger canyon west of Park Village Road in the Penasquitos Canyon Preserve, in Lopez Canyon, west of Darkwood Road in Rancho Penasquitos, on the north-facing slopes of Escondido Creek near Buman Road, west of Mountain Meadow Road and south of Meadow Lane in Hidden Meadows, near the crest of the hill with water tank east of Engineers Springs and north of Highway 94, on the upper northern flanks of Mount Soledad, north of Lomas Santa Fe Drive in eastern portions of San Dieguito County Park, north of Faraday Avenue at the entrance to the proposed Carlsbad Golf Course, north of High Bluff Road in Del Mar Heights east of I-5, south of Paseo del Lago in Carlsbad, northwest of Dove Lane in Carlsbad, south of Shepherd Canyon in Mission Trails Regional Park, in the drainage east of Las Mananas near Rancho Santa Fe Farms, northeast of the junction of Palomar Airport Road and El Camino Real, and on north-facing slopes near Del Mar Heights Road well east of Torrey Pines High School. Isolated shrubs were seen near Minnewawa Campground on the lower slopes of Otay Mountain. The shrub is scattered lightly at several locales in the San Marcos Mountains east of Richland Road, and in Rancho Santa Fe east of El Nido Road on eroded east-facing slopes. More substantial populations are reported to the northeast of this valley. Other locales where Summer-Holly was seen in low numbers are a hillside near the upper reaches of Woodwardia Canyon on Otay Mountain, on the upper slopes south of Batiquitos Lagoon, and west of the Miramar Dump near Interstate 805. A report is from the north-facing slopes south

of Turner Reservoir near Moosa Canyon. Old biological survey reports note this species 0.5 mile northeast of Lake Hodges, in Carroll Canyon east of El Camino Memorial Park, near Fairbanks Ranch 0.5 mile north of La Zanja Canyon and 1 mile east of San Dieguito Valley, the Crest Canyon drainage near Del Mar, 1 mile north of Batiquitos Lagoon and 0.5 mile west of El Camino Real, west of Fairmont Avenue and Montezuma Road near San Diego State University, San Elijo Canyon southwest of Harmony Grove, east of Kaywood Drive in Escondido, southeast of the eastern terminus of Clairemont Mesa Boulevard, on the Sofa Ranch west of Twin Oak Valley, and in Hidden Meadows. CNDDDB reports show sites west of Rancho Bernardo and south of Lake Hodges, near Aldine Drive between Fairmont Avenue and El Cajon Boulevard, near Osuna Valley, on the north slope of San Miguel Mountain, between Miramar Road and Soledad Canyon northeast of the intersection with Eastgate Mall, near El Camino Real and Camino Vida Roble, near El Camino Real and Alga Road, a slope above Green Valley .2 mile WNW of El Camino Real and Olivenhain Road, and the Escondido Creek Floodplain north of the San Dieguito Reservoir. It is reported by Roberts from Orange County near Seaview Park north of Niguel Hill, as well as in the Santa Ana Mountains on a single canyon slope above Highway 74 and west of the Lower San Juan Picnic Area. One shrub was seen on a hillside near Pacific Island Drive in Laguna Niguel; several others were observed near the head of Hobo Canyon just north of the ridge overlooking Aliso Canyon. A CNDDDB report is from nearby at the Seaview Park area of Monarch Summit.

Ten specimens from Baja California are found at the herbarium of the San Diego Museum of Natural History; south to 31° 14' North where collected by Moran (SD 127485) southeast of Erendira.

STATUS: Summer-Holly is declining throughout its U.S. range. A few large populations occur within or near the City of San Marcos where they are imperiled by residential development and warrant dedicated biological open space protection. Elsewhere the species is slowly but steadily declining. Plants observed in the Santa Margarita Mountains on Camp Pendleton appear closer to subspecies *planifolia* than ssp. *diversifolia*; with some of the northernmost keying directly to *C. d.* ssp. *planifolia*. Similarly, two adjacent shrubs examined near the head of Hobo Canyon east of Laguna Beach in Orange County displayed dissimilar traits; one the ovate flattened leaves of subspecies *planifolia*, the other the distinctive and more elongated curled leaves of subspecies *diversifolia* -- indicating some intergradation may be occurring here near the extreme range boundaries of each subspecies. Substantial stands of Summer Holly should be protected; significant portions of isolated smaller stands should be protected within biological open space. The decline of this species is strongly tied to habitat loss; it was once much more common in chaparral along the immediate coast prior to extensive development.

SMALL-FLOWERED MORNING GLORY [*Convolvulus simulans* Perry]

LISTING: CNPS List 4 R-E-D Code 1-2-2
 State/Fed. Status -- None CONVOLVULACEAE Mar.-Jun.
 Global Rank G3 State Rank S3.2

DISTRIBUTION: San Diego County, Orange County, Riverside County, Los Angeles County, Santa Cruz Island, Kern County, Contra Costa County, Santa Barbara County, San Clemente Island, Santa Catalina Island, San Benito County, San Joaquin County, San Luis Obispo County, Stanislaus County; Baja California, Mexico

HABITAT: This small annual grows on friable clay soils which are typically devoid of shrubs, in openings in chaparral, sage scrub, and grasslands. It is also reported from ultramafic ridgelines. Possible Associates: *Acanthomintha ilicifolia*, *Microseris* species, *Plantago rhodosperma*.

KNOWN SITES: This morning glory is found in San Diego County on a small mesa on the north slopes of Otay Valley east of Rock Mountain. It also occurs north of Palomar Airport Road east of the Carlsbad Raceway. A small population occurs about a half mile northeast of the intersection

of Palomar Airport Road and El Camino Real in typical cracked clay soils, in a small meadow among dense chaparral woodland. Herbarium specimens were examined from the Sweetwater Valley, Vista, Black Canyon on Otay Ranch, and Casa de Oro near Spring Valley. North of Country Hills Lane and immediately north of Proctor Valley Road a population of exceptionally robust plants was observed in heavy clay soils which had been disced within the previous six months. A few plants were found on a clay trail west of the Otay Landfill and east of Jeremy Point Court in Otay Valley; another small population was observed in the grasslands near the corner of Pacific Street and Linda Vista Drive in San Marcos. A recent report is from near the intersection of Roblar Road and Basilone Road on Camp Pendleton. Historical reports are from Rancho Santa Fe, Lemon Grove, Vista, and La Costa. Small-flowered Morning Glory is present within the California Terraces Mitigation Project on Otay Mesa. Roberts reports this species from Orange County; Boyd reports it from the northwestern base of the Gavilan Hills and on the Gavilan Plateau. Smith reports this plant from the Santa Barbara region in Birabent Canyon south of Zaca Peak. Reported by Wallace for Santa Cruz Island. Twisselmann reports it from Kern County in ultra-fine clay at Dry Bog Knoll at the head of Adobe Canyon in the Greenhorn foothills, and in San Luis Obispo County in the Pinole Hills in the Temblor Range near the Kern County line. Hoover reports this annual from a few locales in San Luis Obispo County from Cottonwood Pass to Estrella.

Twelve specimens are found at the herbarium of the San Diego Natural History Museum from Baja California, south to 30° 42' North at Arroyo de la Escopeta where collected by Moran (SD 91602). Small-flowered Morning Glory grows adjacent to the vernal pools at Valle de las Palmas in an unusual mix of sealed pools and cracked clays.

STATUS: Small-flowered Morning Glory is substantially declining in southern California due to loss of habitat. The distinctive friable and very crumbly clay soils where this species is usually found are now quite uncommon in southern California in an undisturbed state. Such areas are generally very small, often less than 1000 square feet in size, and have sometimes been graded. All substantial populations in the southern portion of the State should be protected. The wide range and limited collections of this species suggest it was once much more common, and is naturally declining as climatic conditions have changed. This circumstance mimics that of *Erodium macrophyllum* -- another species with similar clay soil preferences and a relatively wide range. Historic heavy grazing could be a factor in the decline of both species, as the clay lenses they occupy seem to occur most often in non-native grasslands where cattle are/were grazing. Observations in Otay Valley over several decades at a grazed site noted the eventual disappearance of both rare species from an area of mima mounds and clay lenses. Numerous native plants here were slowly overwhelmed by *Avena barbata* and species of bromes, despite only moderate grazing pressures. The oblanceolate leaves of this small annual are not particularly conspicuous, and this species is easily overlooked. The small pinkish or bluish bell-shaped flowers give way to small spheric fruits that do not resemble those of other species found in its clay microhabitat.

SALT MARSH BIRD'S BEAK [*Cordylanthus maritimus* Nutt. ssp. *maritimus*]

LISTING: CNPS List 1B R-E-D Code 2-2-2
 State/Fed. Status -- CE/FE SCROPHULARIACEAE
 Global Rank G3T2 State Rank S2.1

DISTRIBUTION: San Luis Obispo County, Santa Barbara County, Ventura County, Los Angeles County, Orange County, San Diego County; Baja California, Mexico

HABITAT: Salt Marsh habitat, particularly slightly raised hummocks, is the preferred habitat of this small annual. In Imperial Beach the colony grows at the edge of a salt pan. Tidal inundation of this area is occasional. In Newport Beach, a portion of the habitat is apparently shell and sand dredgings. Possible Associates: *Salicornia virginica*, *Cressa truxillensis*, *Suaeda esteroa*.

KNOWN SITES: Only two native sites are definitely extant in San Diego County: a sizeable population of perhaps 100 individuals was seen in the salt marsh at Imperial Beach and a small group of perhaps a dozen plants were found growing in Chula Vista's E Street Marsh near the Gunpowder Point museum. A subpopulation in the Imperial Beach marsh but substantially further south has been reported. An old herbarium collection from near Boundary Monument #258 at Border Field State Park may no longer be extant. Large initial populations of this bird's beak growing in the thousands occurred in an experimental planting along the slough southward of the mouth of the Sweetwater River in San Diego Bay. Reportedly this planted population continues to shrink substantially. Curiously, during the Audubon Christmas Bird Count several plants from this introduced population were noticed in flower in mid-December growing near the railroad tracks. An estimated 2000 plants were flowering along Back Bay Road in Newport, Orange County during early summer 1989. Elsewhere in California populations are reported by restricted to salt marsh habitat at Ormund Beach and Mugu Lagoon in Ventura County, Carpenteria Marsh in Santa Barbara County, at Bolsa Chica Bay south of Huntington Harbor, and Morro Bay in San Luis Obispo County. An old site report from Anaheim Bay has not been rediscovered. CNDDDB records for Orange County show a site at Anaheim Landing 1 mile south of Landing Hill which is 3 miles northwest of Bolsa Chica, at Bolsa Marsh 3.5 miles south of Seal Beach where possibly extirpated; for Ventura County at Silver Stand Beach 1 mile west of Port Hueneme where possibly extirpated, near the Santa Clara River 1.3 miles north of McGrath Lake where possibly extirpated, west of Mugu Lagoon from about 750 feet west of Arnold Road eastward to the runway, at the end of McWane Road near the Oxnard Drain; for Santa Barbara County in the Carpenteria Salt Marsh at the west end of the estuary; for Orange County in Upper Newport Bay near Back Bay Drive and the bridge over Big Canyon Drive; for San Luis Obispo County at the north end of Mitchell Drive and Cuesta-by-the-Sea at the south end of Morro Bay, at the north end of Morro Spit west of Morro Bay, and at the north end of Morro Spit due west of Fairbank Point and southwest of Morro Bay.

This species extends its range south into Baja California. Only five herbarium specimens are found in the San Diego Natural History Museum's herbarium: at Laguna Mormona in the coastal dunes; east of the English cemetery at Bahia San Quentin; a flat near the mouth of San Quentin Bay; Pond B in an arroyo south of Cabo Colnett; and 2 km west of Santa Maria where collected by Moran (SD 105565) at 30° 24' North.

STATUS: Salt Marsh Bird's Beak is approaching extirpation in San Diego County and is imperiled throughout the remainder of its restricted coastal range. All populations should be protected. The rarity of this species may be associated with severe reduction of salt marsh habitat in southern California, particularly in upper marshlands where this species may have once flourished. 19th century photographs of Mission Bay and northern San Diego Bay show vast tracts of salt panne and salt marsh covering an area from downtown San Diego/eastern Point Loma miles northward to the southern base of Soledad Mountain. Native salt marsh habitat here is now restricted to the relatively small Kendall-Frost Preserve at the northeastern end of Mission Bay, the channeled mouth of the San Diego River, and to Famosa Slough near Sports Arena Boulevard. Salt Marsh Bird's Beak is unlikely to be mistaken for other species within its salt marsh habitat; the native flora here is relatively restricted.

ORCUTT'S BIRD'S BEAK [*Cordylanthus orcuttianus* Gray]

LISTING: CNPS List 2 R-E-D Code 3-3-1
 State/Fed. Status -- /Species of Concern SCROPHULARIACEAE Mar.-Jul.
 Global Rank G2? State Rank S1.1

DISTRIBUTION: Southern San Diego County; Baja California, Mexico

HABITAT: Seasonally dry drainages and upland adjacent to riparian habitat is the preferred habitat of Orcutt's Bird's Beak. In the Tijuana River Valley it grows in a cobbly ecotone with sage scrub

upslope and disturbed Broom Baccharis and Southern Willow Scrub near the watercourse. Reiff fine sandy loam is mapped at the Rogers Park site; Holocene alluviums and riverwash are found in occupied habitat on the embankments of the Otay River. Possible Associates: *Baccharis salicifolia*, *Salix exigua*, *Gnaphalium palustre*.

KNOWN SITES: This species is near extirpation and possibly no longer extant at Greg Rogers Park and Rice Canyon owing to residential development. There is a limited occurrence in Poggi Canyon. The major U.S. population is found in the Otay River drainage west of Interstate 805 to Beyer Boulevard where it is locally abundant. Scattered occurrences are found downstream. An old biological survey report notes this species near the large borrow pit at the extreme eastern end of the Tijuana Hills south of Monument Road. Isolated populations are found on slopes between Dillon Road and Heritage Road in the northernmost canyonlands south of Otay Mesa Road. Reported volunteering on manufactured slopes adjacent to a wetland restoration project in Poggi Canyon approximately a half mile east of Brandywine Avenue in eastern Chula Vista. CNDDDB reports are from 0.75 mile due east of Wruck Canyon on Otay Mesa, and south of the Borderland Air Sports Center 1.5 miles east of Lower Otay Reservoir. The Otay River colonies should be considered the only vigorous extant U.S. population and should be rigidly protected.

Substantial collections are from Baja California with 30 specimens at the San Diego Natural History Museum's herbarium. It grows south to 28° 39' North where collected by Moran (SD 87246) near Rosarito.

STATUS: Orcutt's Bird's Beak is substantially declining within its limited U.S. range. Aside from the Otay River population, all known U.S. sites are presently imperiled by direct development or significant secondary impacts. All U.S. populations should be protected. The rarity of this species appears to be related to its natural distribution; Chula Vista lies at the extreme northern end of a primarily Mexican range for this species. Unlike other California members of its genus, Orcutt's Bird's Beak has a leaf with 8-10 lateral leaf lobes that are paired; while other species have entire leaves, or 3-7 palmately lobed leaves.

SEA DAHLIA [*Coreopsis maritima* (Nutt.) Hook. f.]

LISTING: CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status -- None ASTERACEAE Mar.-May
Global Rank G3 State Rank S2.2

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Sandstone cliffs near the ocean are the preferred microhabitat of Sea Dahlia. The moist sea breezes are presumably a significant factor in providing optimal habitat for this perennial with semi-succulent leaves and fistulous stems. Gaviota fine sandy loams are utilized at the Point Loma Subbase while the Torrey Pines population grows on Terrace Escarpment sandstones. Typically Sea Dahlia chooses highly eroding slopes where competition from other shrubs is limited. Possible Associates: *Chaenactis glabriuscula*, *Dudleya lanceolata*, *Encelia californica*.

KNOWN SITES: A stable, relatively large population occurs at Torrey Pines State Reserve. A smaller population is situated on steep east and west facing cliffs at the Subbase on Point Loma. A very small relictual population is found on a sandy ridge north of the terminus of Swallowtail Drive in Encinitas. Approximately 150 shrubs grow in a highly eroded drainage on sea bluffs south of Shingle Bluff on Camp Pendleton. Sea Dahlia is uncommon in the Tijuana Hills near the ocean. This species occurs on Carmel Mountain on north-facing slopes near the quarry. Approximately fifty shrubs were observed on a steep west-facing slope immediately west of I-5 and north of Manchester Road in Encinitas; approximately 100 plants occur in the hills north of El Nido road in Rancho Santa Fe. Most historical sites in the County have been extirpated

by construction of "ocean view" lots. Several plants still grow on the sea bluffs west of La Jolla Farms Road and Idle Hour Lane in Torrey Pines. A report occurs inland on a peak just east of the San Diego Aqueduct and north of Escondido Creek approximately 1 mile west of the southernmost dogleg of Harmony Grove Road. A small population grows nearby in rocks on the northern flanks of Escondido Creek south of Paint Mountain Road; in an area not directly under the influence of coastal sea breezes. Other old reports are from Spooner's Mesa near the Mexican border, Oceanside, and at Cardiff. Old biological survey reports note sites at the seabluff at the western terminus of Border Avenue northwest of the Del Mar Racetrack, in the Crest Canyon drainage in Del Mar, in Goat Canyon near the Tijuana border, and west of Fourth Street in Del Mar. Recent CNDDDB reports are from the north side of Via de la Valle west of El Camino Real, and the west side of La Jolla Scenic Drive .5 mile from Ardath Road.

Thirty-six specimens from Baja are found in the San Diego Herbarium; south to 30° 31' North where collected by Moran (SD 84492) west of San Quentin. Numerous scattered, but vigorous populations are seen on rocky headlands along the immediate coast of northern Baja California from Rosarito Beach south to Punta Banda. Several plants grow on a rocky knoll well inland, near Rodriguez Dam east of Tijuana. This shrub occasionally occurs several miles inland, such as in canyon tributaries of Guadalupe Valley, in locales which experience occasionally moist onshore winds.

STATUS: Sea Dahlia is substantially declining in San Diego County. Natural herbivory may play a role in the precarious cliffside locales often utilized by this species. Natural erosion on sea-bluffs -- and homes built yards to the east of these bluffs -- is not conducive to long term survival of this species. Erosion of sea-bluffs is often followed by pioneering weedy non-native species which have displaced the native scrub (including Sea Dahlia) once found at the tops of the bluffs. This species may benefit from seeding or direct planting on sandstone bluffs overlooking the ocean within its historical range, and is available from several plant nurseries. It grows well at a number of coastal locations where planted from nursery stock. Significant portions of all populations should be protected. Rarity of this species is also directly tied to loss of habitat from residential housing construction within a mile of the beaches (e.g., the hills around La Jolla's Mount Soledad). Sea Dahlia is a robust and hollow-stemmed perennial with distinctly succulent leaves; it is not likely to be mistaken for other species in the coastal flora.

SAN DIEGO SAND ASTER [*Corethrogyne filaginifolia* (H. & A.) Nutt. var. *incana* (Nutt.) Canby = *Lessingia filaginifolia* (Hook. & Arn.) Lane var. *filaginifolia*]

LISTING: CNPS List 1B R-E-D Code 3-3-2
 State/Fed. Status -- None ASTERACEAE Jun.-Aug.
 Global Rank G4T1 State Rank S1.1

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Coastal chaparral, primarily in sandy openings between Chamise, is a typical microhabitat utilized at Point Loma. Point Loma has an insular weather pattern with regular fogs, which is underscored by its possible island status in the geologic past. The trend towards gigantism, in this case the larger involucre of the San Diego Sand Aster, is a floristic trend sometimes associated with the Channel Islands. Carlsbad gravelly loamy sand is the soil type mapped for the ridgeline at Point Loma, with Gaviota fine sandy loam downslope. Possible Associates: *Ceanothus verrucosus*, *Adenostoma fasciculatum*, *Cneoridium dumosum*.

KNOWN SITES: This entity has distinctive, large involucre heads when compared with other forms. It grows on federal property near Fort Rosecrans on Point Loma. Much of this population is imperiled by expansion of Naval facilities on Point Loma. One vigorous population is found throughout the chaparral northwest of the intersection of Woodward Road and Cabrillo Memorial Drive. It also extends southward into the Cabrillo National Monument. Herbarium specimens

annotated by Dr. Meredith Lane are from Spooner's Mesa near the Tijuana River Valley; as well as from Pacific Beach and Ocean Beach where it is possibly extirpated. Two of her other annotated specimens, from well inland near Potrero and Oak Grove, are probably examples of the common, wide ranging form of Cudweed Aster with unusually large involucre heads. Coastal specimens from Santa Rosa Island, and beach locales well to the north at Morro Bay, Santa Maria, and Guadalupe have similar large flowering heads.

Two specimens from Baja California are found at the San Diego Natural History Museum, south to 32° 5¼' North where collected by Moran (SD 105274) near La Mision.

STATUS: The San Diego Sand Aster is substantially declining on Point Loma, primarily due to expansion of naval facilities. Little of its original habitat on the immediate coast is still available. Recent taxonomic review (Dr. Meredith Lane, Kansas) has referred this entity to the very common and wide ranging Cudweed Aster (*Lessingia filaginifolia* var. *filaginifolia*). However, little of Ms. Lane's work on this species complex was done locally in the field. Opinion in the botanical community is divided and the CNPS notes additional genetic, taxonomic study is merited. Provisionally all populations should be protected. Further study is expected to correlate significantly larger involucre heads with the population on Point Loma. Point Loma is very gradually being uplifted (according to plate tectonics theory) due to a collision of the Pacific and North American Plates occurring well beneath the surface of San Diego County; with the gradual submergence of the former beneath the latter. One result (along with prior periods of volcanism) is a rising of the coastal plain. Point Loma may have formerly been, on occasion, an island located a short distance off-shore. Gigantism of parts (*e.g.*, larger involucre heads) is associated with other endemic species of plants in the Channel Islands (*e.g.*, *Eriogonum giganteum*), and with insular speciation of plants in general. The San Diego Sand Aster appears to have been rare within historical times, even prior to substantial development on Point Loma. It may have evolved in comparative isolation within a relatively limited area.

DEL MAR MESA SAND-ASTER [*Corethrogyne filaginifolia* (H. & A.) Nutt. var. *linifolia* Hall = *Lessingia filaginifolia* (Hook. & Arn.) Lane var. *filaginifolia*]

LISTING: CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- /Species of Concern ASTERACEAE Jul.-Sep.
Global Rank G4T1 State Rank S1.1

DISTRIBUTION: San Diego County

HABITAT: Coastal Mixed Chaparral in sandy, open locales is the preferred habitat of the Del Mar Sand Aster. This form of the widely ranging Cudweed Aster seems to thrive on partially disturbed sandy soils indicating that habitat can be created given the proper geology and soils. Terrace Escarpments are mapped in La Zanja Canyon and at a number of locales where this aster grows. Possible Associates: *Arctostaphylos glandulosa* ssp. *crassifolia*, *Ceanothus verrucosus*, *Cardionema ramosissimum*.

KNOWN SITES: This herbaceous perennial is common throughout the Torrey Pines State Reserve. It grows east of Del Mar and in a number of areas of Encinitas not yet developed for residential uses. It is localized on the north-facing slopes of Carmel Valley near Interstate 5 and on Carmel Mountain, at the foot of eroded bluffs north of Woodwind Drive in Olivenhain, west of the terminus of Arroyo Sorrento Road and east of the freeway near Penasquitos Lagoon, northwest of Trento Drive and west of El Camino Real, north of Sky Loft Road in Encinitas, in the canyon bottom east of Landquist Drive in Encinitas, near Desert Rose Way in Encinitas, south of Del Mar Heights Road and east of El Camino Real in vestigial stands of chaparral, south of Townsgate Road in proposed Carmel Valley Park, north of Manchester Road and west of I-5 in Encinitas, and is sometimes found farther inland such as at La Zanja Canyon. This sand-aster also grows at Oak Crest Park in Encinitas and in chaparral to the south. Small colonies occur along the ranger's access road within the Penasquitos Canyon Preserve, northeast of the

small waterfall. Old biological survey reports note this plant on the Interstate 5 embankments in Del Mar Heights, as well as near the Fairbanks Ranch Golf Course. CNDDDB records note the Del Mar Sand-aster on the south side of San Elijo Lagoon just west of Interstate 5, north of Del Mar Heights Road and 0.5 mile west of Interstate 5, at Los Encinitos approximately 0.5 mile northwest of Olivenhain, east of Del Mar Heights 0.25 mile east of El Camino Real and 1 mile north of Carmel Valley, north of Encinitas Boulevard and west of Vulcan Avenue, west of Acama Street on Lopez Mesa in Mira Mesa, and on both sides of El Camino Real 1.8 miles north of its intersection with La Costa Road. Recent CNDDDB reports are from near the corner of John Jay Hopkins and Tower Roads near UCSD, .15 mile southwest of Ecke Park west of I-5, and behind Mira Costa College in Lux Canyon.

STATUS: Del Mar Sand Aster is declining substantially but is still locally common in the Del Mar/Encinitas region. Long term prognosis, however, is questionable owing to extensive habitat reduction. It is potentially easily grown in appropriate sandy substrate. The Del Mar Sand Aster has a preference for mildly disturbed soils and will pioneer on recently cleared chaparral sites with sandstone substrates. Recent taxonomic review (*i.e.*, Dr. Meredith Lane, Kansas) has referred this entity to the very common and wide ranging Cudweed Aster (*Lessingia filaginifolia* var. *filaginifolia*), merging a number of additional varieties in the process. Plants with tomentose involucres occur in diverse locales and habitats elsewhere in California. A form once referred to variety *latifolia*, with a similar involucre but more broadly oblong leaves occurs in the Los Angeles to Santa Barbara area along the coast; a form once referred to variety *sessilis* with a tomentose involucre and ovate leaves grows in the San Bernardino and San Diego County mountains. Typical variety *filaginifolia* has a glandular involucre. In addition, leaf shape (typically linear in the Del Mar Sand Aster) is notoriously variable within the common form of sand aster. Merging these entities owing to the irregular patterns of trait distributions may be warranted. However, it should be noted that in the Del Mar region strong edaphic correlations exist with the form that has linear leaves and tomentose involucres. In general, the common form of Cudweed Aster and the Del Mar Sand Aster do no co-occur under natural conditions. At one location in Penasquitos Canyon the two were found growing near each other, but the Del Mar Sand Aster maintained its preference for sandstone on the slopes, while the Cudweed Aster grew yards away in disturbed, more loamy flatland substrate. Given these strongly differing habitat preferences, the former does appear to be a distinctive subspecies/variety. The CNPS notes additional taxonomic study is merited; it is provisionally recommended that substantial portions of sizeable populations be protection. Del Mar Sand Aster was once locally common within the limits of its exposed sandstone substrate; the decline of this species is strongly correlated with urban expansion along the coastal plain.

CROSSOSOMA [*Crossosoma bigelovii* S. Watson]

LISTING: CNPS Unlisted R-E-D Code None
 State/Fed. Status -- None CROSSOSOMATACEAE Feb.-Apr.
 Global Rank None State Rank None

DISTRIBUTION: San Diego County, Imperial County, Riverside County, Los Angeles County, and San Bernardino County; Arizona; Nevada; Baja California, Mexico.

HABITAT: Sonoran Desert Scrub -- typically growing in rocky crevices on canyon walls -- is the general habitat utilized by this small shrub. Soils are mapped as Acid Igneous rock land at the Borrego Palm Canyon site. Possible Associates: *Brickellia arguta*, *Salvia vaseyi*, *Galium stellatum*.

KNOWN SITES: Crossosoma is uncommon in Borrego Palm Canyon on Anza-Borrego State Park lands growing on a partially shaded, steep rocky slope. In Dry Morongo Wash in Riverside County east of the Coachella Valley and west of Morongo it is more widely dispersed, growing in more open locales, but still on relatively steep, rocky slopes.

STATUS: Crossosoma populations are probably stable on the southern deserts based on limited historical impacts to its canyonlands habitat. Although apparently more common elsewhere to the east, populations on the western periphery of the Colorado Desert are uncommon and should be protected. Uneven distribution at the western edge of its desert range implies this species is relictual in nature, newly invading the region, or stabilized but barely sustaining itself under less than optimal conditions. Retrenchment of a number of primarily Arizona species eastward, following long-term climatic changes, argues for the first circumstance. This is underscored by the general rarity of the Crossosomataceae throughout the southwestern United States. Crossosoma has white fading to purplish flowers (9-12 mm per petal) that are distinctly clawed, and small leaves 9-15 mm in length. When not in flower, this shrub may be easily overlooked.

RIBBED CRYPTANTHA [*Cryptantha costata* Bdg.]

- LISTING:** CNPS List 4
State/Fed. Status -- None
Global Rank G4G5 State Rank S3.3
- DISTRIBUTION:** San Diego County, Imperial County, San Bernardino County, Riverside County, and Inyo County; Arizona
- HABITAT:** Desert sand dunes are utilized by Ribbed Cryptantha near Clark Dry Lake; a site with Carrizo very gravelly loams. At this locale plants were growing on relatively unstable slopes where winds limit competition among plants to only those best adapted to moving sands. Possible Associates: *Helianthus niveus*, *Eriogonum deserticola*, *Palafoxia arida*.
- KNOWN SITES:** Ribbed Cryptantha grows on fairly well established dunes north of the Salton Seaway near Clark Dry Lake. This site is near to but not sympatric with *Cryptantha ganderi* sightings. The latter has been observed on more stabilized dunes. Several plants were seen in the *Geraea canescens* dominated fields north of Henderson Road in very sandy soils. It is also reported from north of Palm Canyon Drive off Borrego Springs Road on private property. Old herbarium collections are from the Oil Well 5 miles north of Bensons, in Pinto Wash, and from sand dunes at an unidentified locale in Imperial County. A curious report where identification needs to be confirmed is southeast of Hemet Lake in the San Jacinto Mountains of Riverside County. Reported by Dedecker as infrequent in Saline Valley, Inyo County. Shreve and Wiggins report this coarse annual eastward into Yuma County, Arizona. Reported by Norris in Death Valley; also reported at low elevations in Deep Canyon of the Coachella Valley. Localized populations are found in the dune fields of eastern Imperial County, generally outside of the concentrated ORV activity.
- STATUS:** The southern desert populations of Ribbed Cryptantha are presumed stable. Apparently it is quite rare and may only typically occur in small, isolated populations. As such, these populations may be vulnerable to a single stochastic event (*e.g.*, a severe storm) or a destructive ORV sortie. Given the limited collections of this species on the western edge of the Colorado Desert, all populations in this region are recommended for protection. Rarity of this species is attributed in part to the dearth of suitable well-developed dune habitat across the southwestern California deserts. Many of the Cryptanthas are best identified by nutlet characters. Ribbed Cryptantha has 4 similar lanceolate nutlets with backs that are smooth to minutely rippled (not papillate or bristly), and a flat inner surface with a sharp angled margin (not rounded). *Cryptantha holoptera* has a weakly tuberculed inner surface, and *Cryptantha racemosa* has nutlets of two kinds.

GANDER'S CRYPTANTHA [*Cryptantha ganderi* Jtn.]

- LISTING:** CNPS List 1B
State/Fed. Status -- /Species of Concern
- R-E-D Code 3-3-2
BORAGINACEAE

Global Rank G2 State Rank S1.1

DISTRIBUTION: San Diego County; Sonora, Mexico

HABITAT: Desert sand dunes are utilized by this small annual with a golden yellow hue. Rositas fine sand is mapped for the soil type at the Borrego Airport, while Carrizo very gravelly loams occur towards Clark's Dry Lake. More soil stabilizing grasses and shrubs were seen on the dunes at the Gander's *Cryptantha* sites than at the one nearby dune locale where *Cryptantha costata* was observed. A report from Mexico indicates this species may range more widely than the very narrow range previously known. Possible Associates: *Geraea canescens*, *Astragalus lentiginosus* var. *borreanus*, *Croton californicus*.

KNOWN SITES: Gander's *Cryptantha* is a very distinctive yellow-hued species. One plant was found growing in dunes east of the Borrego Airport and several in similar habitat near Clark Dry Lake just north of the Salton Seaway. *C. ganderi* is apparently extremely rare with very few known sightings. A revisit the following year to the Borrego Airport site revealed several dozen plants following a period of good rainfall. Old County herbarium collections are for Coyote Creek 1 mile north of Henderson Canyon Road, and east of the Anza Desert Country Club. An old biological survey report notes this species east of Catarina Drive and west of Santa Rosa Drive in Borrego. A CNDDDB record notes a site 0.25 mile southeast of Borrego School in Borrego Valley. This species was collected in 1988 by Felger (SD 127221) in the Pinacate region of Sonora, Mexico, four kilometers south of Mexico Highway 2 on the Pozo Nuevo Road at 32° 1' North.

STATUS: This annual is presumed stable but may grow at only a very few locales in the United States. Disturbance at these few sites could severely impact the total population. Expansion of the airport at Borrego is one such potentially significant impact. All populations should be fully protected. Rarity of this species is attributed in part to the dearth of suitable true dune habitat across the southern California deserts (*i.e.*, except the Algodones Dunes). Many *Cryptanthas* are best identified by nutlet characteristics. Gander's *Cryptantha* has 1-2 lanceolate nutlets with a shiny smooth back and a faint longitudinal ridge, generally mottled gray-brown; as well as the distinctive yellow hue previously mentioned.

WINGED CRYPTANTHA [*Cryptantha holoptera* (Gray) MacBr.]

LISTING: CNPS List 4

State/Fed. Status -- None

Global Rank G3G4 State Rank S?

R-E-D Code 1-1-2

BORAGINACEAE Mar.-Apr.

DISTRIBUTION: San Diego County, Imperial County, Riverside County, San Bernardino County, and Inyo County, Arizona, Nevada; Baja California and Sonora, Mexico

HABITAT: Washes, plains, and slopes in Sonoran and Mojavean Desert Scrub are the reported habitats for this infrequently observed species. Possible Associates: *Prunus fremontii*, *Ephedra* species, *Horsfordia newberryi*.

KNOWN SITES: Winged *Cryptantha* has few recent sightings on the western periphery of the Colorado Desert. Vast areas of unexplored desert terrain may yet yield significant populations. An unconfirmed site near Split Mountain is reported. Dedecker reports this species from the Black Mountains of the northern Mojave Desert. Herbarium collections include the east side of Jefferson Road across from the entrance to Cahuilla Lake County Park south of Indio in Riverside County, at the Laguna Dam in Imperial County north of the bridge over the canal, in the Gila Mountains of Arizona, at Carnegie Peak in the Sierra Pinacate in Sonora, Mexico where abundant, and at Hourglass Canyon in Sonora. Reported by Knight on rocky slopes at low elevation in the Muddy Mountains of Clark County; by Norris in Death Valley; by McLaughlin on north-facing slopes in arid eastern Imperial county; also reported at low elevations in Deep Canyon of the Coachella Valley.

Two collections from Baja California were found at the herbarium for the San Diego Natural History Museum; where collected by Clemons at 32° 30' North (SD 122261) in Cañada Cantu de las Palmas; also collected in the Sierra de las Pintas. A small population was observed alongside the steep highway grade east of La Rumarosa and midway down the flanks of the eastern Sierra Juarez.

STATUS: The status of Winged Cryptantha on the western periphery of the Colorado Desert is poorly understood; it is presumed stable. While the four subequal nutlets are broadly winged and distinctive, the numerous superficially similar *Cryptantha* species on the deserts make ready visual identification in the field difficult. The ovate to triangular nutlets are sparsely tubercled and shiny. This species is primarily reported from very arid and little visited areas on the eastern Colorado and Mohave Deserts. Only intensive field studies of this species are likely to reveal whether or not it has a distinctive niche which can be correlated with an identifiable microhabitat. Provisionally, significant portions of all populations should be protected.

TECATE CYPRESS [*Cupressus forbesii* Jeps.]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- /Species of Concern CUPRESSACEAE cones Jan-Dec.
Global Rank G2 State Rank S1.1

DISTRIBUTION: Orange County, San Diego County; Baja California, Mexico

HABITAT: Closed Cone Coniferous Forest and Southern Mixed Chaparral are utilized by this distinctive tree. San Miguel-Exchequer soils are mapped for the cypress forests on Otay Mountain. The Tecate Cypress prefers well drained, north-facing slope aspects and can grow to ten meters in height. Seed typically requires bare mineral soil to germinate such as occurs after a fire. One tree at the Sierra Peak site is over 200 years old. However, this fire-adapted species generally grows amid chaparral habitat with a high fuel load; most populations are relatively young and of a similar age class. Possible Associates: *Pickeringia montana*, *Adenostoma fasciculatum*, *Arctostaphylos otayensis*. This cypress is the only known host plant for the sensitive Thorne's Hairstreak butterfly (*Mitoura thornei*).

KNOWN SITES: A widespread forest is developing on Otay Mountain but is imperiled by recurrent fires started by illegal immigrants heading north from the nearby Mexican border. Outlying trees on Otay Mountain occur well downslope into O'Neal Canyon. A small population is doing well on the north slope of Guatay Mountain. The Tecate Mountain population was dramatically reduced by the last major fire, and unlike Otay Mountain has not responded well. Outlying populations are reported by the CNDDB on the north slope of a canyon 2 miles west southwest of Tecate Peak along a creek, as well as in Potrero Creek near Barrett School. Reported by Roberts for Orange County in the Santa Ana Mountains at Santa Ana Canyon, Gypsum Canyon, and Coal Canyon. CNDDB records note populations on the south face of Sierra Peak along the main divide road between Sierra Peak and Skyline Drive, along Bedford Truck Tail, and west of Sierra Peak between Gypsum, Coal, and Fremont Canyons.

Twelve specimens from Baja California are found at the San Diego Natural History Museum's herbarium; south to Rancho el Cipres at 30° 23' North where collected by Moran (SD 54829). An easily reached population grows on south-facing slopes of Cerro Dieciseis near the highway to Tecate.

STATUS: The Tecate Cypress is relatively stable in San Diego County and Orange County. Illegal alien campfires and off-road vehicles pose a fire danger in its primary habitat on peaks in southernmost San Diego County. This tree is dependent upon fire; the cones often require a fire to open the resinous seals to release seed, and may persist unopened on the tree for years. Natural fire intervals of 50-100 years are reported for Tecate Cypress based on reproductive rate data; however, more frequent human-triggered fires could result in substantially reduced

populations. All populations should be protected. Given the quirky distribution of this cypress, at only a few southern California and northern Baja California locations where it grows on metavolcanic soils, Tecate Cypress is presumably a relictual species that was more widely dispersed in the Pleistocene period or earlier. This circumstance is also mirrored in the limited ranges of several other related species (*Cupressus abramsiana*, *C. bakeri*, *C. goveniana*, *C. lawsoniana*, *C. macrocarpa*) in California. Tecate Cypress lacks the conspicuous gland or pit found on the outer leaf surface of *Cupressus stephensonii*.

CUYAMACA CYPRESS [*Cupressus stephensonii* Wolf]

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
 State/Fed. Status -- /Species of Concern CUPRESSACEAE cones Jan-Dec.
 Global Rank G1 State Rank S1.2
- DISTRIBUTION:** San Diego County; Arizona; Baja California, Mexico
- HABITAT:** Closed Cone Coniferous Forest and Montane Chaparral are the preferred habitat for this substantial tree. On Cuyamaca Peak this species grows on relatively xeric, west-facing slopes, on Las Posas stony fine sandy loam. Possible Associates: *Adenostoma fasciculatum*, *Cercocarpus betuloides*, *Arctostaphylos pungens*.
- KNOWN SITES:** The Cuyamaca and Japacha Peak area is now heavily utilized by "novice" hikers and fire is an omnipresent threat. Although the cypress stand is isolated near King Creek, its portion of the mountain has never recovered from the last major fire approximately four decades ago. Historically reduced rainfalls may be a factor, with the stand imperiled by a natural ecological change to its habitat. An early 1990s visit to the primary site showed much of the population restricted to drainages with limited recruitment within the intervening chaparral. Most of the trees appeared to be robust "adolescents" with few mature specimens. Thick chaparral makes movement difficult within the primary groves. A single tree is twenty yards upstream of Boulder Creek Road at Wildcat Spring.

Thirteen specimens from Baja California are found in the San Diego Natural History Museum's herbarium; south to 31° 39' North at the edge of an arroyo at El Agua Colorado in the Sierra Juarez where collected by Moran (SD 98620).

- STATUS:** Populations of Cuyamaca Cypress are stable in San Diego County. All southern California populations should be protected. This localized population is well isolated and at the extreme peripheral range of the closely related Arizona Cypress. Although the 1993 Jepson manual lists the Cuyamaca Cypress in synonymy with *Cupressus arizonica* ssp. *arizonica*, the CNPS reports that genetic evidence does not support this interpretation. The Arizona Cypress is concentrated in four southeastern counties of Arizona, one county in New Mexico, and two northern states of Mexico. Cuyamaca Cypress is a relictual species which may continue to decline naturally if climatic conditions remain similar to the present time. This tree has a conspicuous gland or pit on the outer leaf, unlike *Cupressus forbesii*. Both species are sometimes planted in the foothills adjacent to homes or in parks.

UTAH CYNANCHUM [*Cynanchum utahense* (Engelm.) Woods.]

- LISTING:** CNPS List 4 R-E-D Code 1-1-1
 State/Fed. Status -- None ASCLEPIADACEAE Apr.-Jun.
 Global Rank G4 State Rank S3.3
- DISTRIBUTION:** San Diego County, Imperial County, Riverside County, and San Bernardino County; Arizona; Nevada; and Utah.
- HABITAT:** Sonoran Desert Scrub and Mojavean Desert Scrub are general habitats utilized by this vine-like shrub. It usually scrambles through woodier shrubs for support. Soils are mapped as Acid

Igneous rock land at Sentenac Canyon, a locale with arid sandy slopes and relatively low-growing desert shrub cover. Possible Associates: *Ambrosia dumosa*, *Prunus fasciculata*, *Sphaeralcea ambigua*.

KNOWN SITES: Utah *Cynanchum* is a very inconspicuous milkweed growing at the western entrance to Sentenac Canyon and winding through shrubbery near the ranger station in Blair Valley. It is reported on the eastern side of Little Blair Valley. It is difficult to assess the rarity of this species: it is easy to overlook even when in flower. Herbarium specimens examined are from Sweeny Pass, Dolomite Mine, and Earthquake Valley in San Diego County; as well as at Coyote Wells in Imperial County. Shreve and Wiggins report this vine from southern Nevada, southwestern Utah, and northwestern Arizona. Reported by Thorne from the southeastern base of the Ivanpah Mountains in the eastern Mohave Desert, utilizing dry stony washes.

STATUS: Utah *Cynanchum* populations are probably stable on the southern deserts based on limited historical impacts to suitable habitat. Although apparently more common elsewhere to the east, populations on the western periphery of the Colorado Desert are uncommon and should be protected. San Diego County lies on the western periphery of its much broader range, and its rarity may be attributable to less than optimal growing conditions under the current climatic regime. This inconspicuous perennial has long linear leaves (1.5-4 cm) and umbel-like tiny yellow flowers (1.5-3mm) that become orange in age. It is easily overlooked when not in flower, and may be significantly under-reported in rocky desert terrain.

OTAY TARPLANT [*Deinandra conjugens* (Keck)B.G. Baldwin = *Hemizonia conjugens* Keck]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- CE/PT ASTERACEAE May-Jun.
Global Rank G1 State Rank S1.1

DISTRIBUTION: Southern San Diego County; Baja California, Mexico

HABITAT: Fractured clay soils in grasslands or lightly vegetated Diegan Coastal Sage Scrub are the preferred habitat of the Otay Tarplant. Most of the sites near Sweetwater Reservoir are mapped as Diablo clay; Olivenhain cobbly loams of the Otay Formation are found at sites in Otay Valley. Cryptogamic crusts well covered with soil stabilizing lichens and liverworts are sometimes host to this species. A URS study (April 2000) indicates that parent material at tarplant sites was most frequently metavolcanic colluvium; as well as caliche, sandstone, rhyolites, andesites, quartzites, and granites. They further note that the "B" horizon usually consists of well-sorted argillic clays that may be associated with Miocene volcanic ash deposits; the argillic clays may be necessary to support the root zones of Otay Tarplant and to provide prolonged moisture-release into the summer growing season. Usually there is little competition from woody shrubs where this annual grows. Possible Associates: *Isocoma menziesii* var. *decumbens*, *Lessingia filaginifolia* ssp. *filaginifolia*, *Astragalus trichopodus* var. *lonchus*.

KNOWN SITES: All U.S. sites for this State Endangered and Federally Threatened plant occur in the Chula Vista/ Spring Valley/Otay Mesa region. The population along the west side of Otay Lake Road, south of Bonita Road, and a second fragmented population in Poggi Canyon are both substantial sites. More than ten thousand plants occurred at each location in the late 1980s. The Otay Lakes Road site was heavily impacted by a "tract home" entrance road in 1989, bisecting the population despite a Supplemental EIR during which the builders were "required" to move the entrance southward. The builders were ultimately fined for subsequently constructing at their original location; however, the entrance road remained at the unapproved site. Despite limited peripheral restoration efforts, the site now supports a much smaller population of tarplant. In Poggi Canyon the population will be difficult to protect from nearby development owing to its open grassland habitat and the proximity of Olympic Parkway a short distance northward which is under construction in Year 2000. A small population just north of Otay Valley Road and west of Rock Mountain is potentially imperiled by a planned road

widening; another small population occurs on the lower north-facing slopes of Otay Valley, south of the river and Maxwell Road near the waterpark. Extensive populations numbering in the hundreds of thousands was seen scattered on slopes in the vicinity of Horseshoe Bend near Proctor Valley Road. A number of other small but dense outlying colonies were noted along Proctor Valley Road. These included a site around an isolated utilities structure at Gobbler's Knob, as well as a second location west of Upper Otay Reservoir in the northeastern quarter of Section 26. A large residential development and freeway is planned to surround this large concentrated population and heavily impact or eliminate many of the outlying colonies under a compromise agreement with the USFWS. A somewhat disjunct population occurs south of U.S. Elevator Road in Spring Valley. About 150 plants were observed in native grasslands east of West Point Drive on the northern flanks of Otay Valley. Dozens of colonies of Otay Tarplant were observed throughout the hillsides east of the 805 Freeway on the south flanks of Otay Valley; most were recently impacted by the Dennery Ranch project in 1998-1999 that included state and federal approvals. Recent reports are from the southeastern flank of San Miguel Mountain. An older biological survey report where possibly no longer extant is from the southern terminus of El Rancho Grande Road in Bonita. CNDDDB reports are all from locales near the above sites, including from between Otay Lakes Road and Corral Canyon Road in the Long Canyon drainage, east of Otay Mesa on the western edge of Otay Mountain about 5 miles east southeast of Brown Field, east of Dennery Canyon on Otay Mesa, west of the junction of Siempre Vista Road and La Media Road on Otay Mesa, just east of the Chester Grade on northern Otay Mesa, near Rock Mountain near Otay Valley, 0.7 mile south of the Lower Otay Reservoir, the southern end of Salt Creek 0.5 mile west of Lower Otay Reservoir, 0.5 mile north and slightly west of Upper Otay Reservoir, Wildman's Canyon near Mother Miguel Mountain, 1.9 miles due south of the Keebler Ranch, 1/2 mile WSW of I-805 and Palm Avenue, east of Hueneme Court off Barren Drive, west of the north tip of Upper Otay Reservoir, .05 mile north and slightly west of the tip of Upper Otay Reservoir, at the north end of Salt Creek 0.8 mile due south of the Fenton Ranch and 1/2 mile west of Lower Otay Reservoir, and east of Otay Mesa at base of San Ysidro Mountains and 5 miles ESE of Brown Field. It is still locally abundant at various locations in Wolf Canyon.

Two collections for Baja California are found at the herbarium for the San Diego Natural History Museum; south to 32° 26' North where collected by Moran (SD 97795) on a barren north slope 3 km south of La Presa. It has also been collected on the south side of Guadalupe Valley.

STATUS: Otay Tarplant is substantially declining; most sites are imperiled by residential development and secondary impacts. Federal/State protection of this species during the last few years has been inadequate. All large populations have been directly impacted during the last dozen years, or are proposed to be impacted. Sympatric presence of the closely related *Deinandra paniculata* within the very limited range of *Deinandra conjugens* (formerly *Hemizonia conjugens*) is considered doubtful despite old reports that place the latter at nearby locales (e.g., Paradise Valley, Spring Valley, and Telegraph Canyon). Specimens examined from these locales at the herbarium of the San Diego Natural History Museum were misidentified and properly belonged to *D. conjugens*. A number of these specimens were originally collected and identified (under the plant keys of that era) prior to the taxonomic description of *D. conjugens*, but had not been re-assessed. *D. conjugens* has pappus scales that are linear/narrowly lanceolate and relatively short (see line drawings in Jepson Manual); they are not longer and fringed as with *D. paniculata*. Herbarium specimens of *D. paniculata* were seen from Baja California; one specimen from southernmost Otay Mesa near the border fence may also belong here. More taxonomic work is needed. *D. paniculata* is locally abundant in western Riverside County where it grows in various soil types in xeric open sage scrub; it is not restricted to clays. It is uncommon in northern San Diego County south to near Barham Road in San Marcos. *D. conjugens* is typically restricted to cracking clay soils generally devoid of woody shrubs. It often grows interdigitated but not sympatrically with *Deinandra fasciculata* (5 ray flowers not 8-10), the common tarweed of the region, at locales where "fingers" of clay intrude into

loams. Taking into account that population numbers at single sites may be very high even within relatively confined areas, it is recommended that substantial portions of all remaining populations of Otay Tarplant be well protected and placed into dedicated biological open space. The present rarity of this species has resulted from a combination of urban development impacts and the natural restriction of the species to a specific isolated soil type. Historically, Otay Tarplant was probably heavily impacted by grazing pressures due to its occurrence in sizeable open grasslands underlain by heavy clays. Prior to the Mission Period it is presumed to have been relatively common within its very limited range.

TECATE TARPLANT [*Deinandra floribunda* (Gray)B.G. Baldwin = *Hemizonia floribunda* Gray]

- LISTING:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- /Species of Concern ASTERACEAE Aug.-Oct.
Global Rank G3 State Rank S2.2
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Sandy washes in the high desert are a typical locale for the Tecate Tarplant. Carrizo very gravelly loam is found in the broad wash west of Jacumba. This floodplain has deep sandy alluvium and limited shrub cover, allowing for a few, well adapted species to grow unencumbered by substantial vegetative competition. Possible Associates: *Asclepias erosa*, *Acer negundo* var. *californicum*, *Salvia carduacea*.
- KNOWN SITES:** Tecate Tarplant grows in a broad, sandy floodplain west of Jacumba. Old reports are from Tecate Junction, Boundary Creek, Potrero, Canyon City, Jewell Valley, Bankhead Springs, McCain Valley, 0.5 mile southeast of Tierra del Sol, and Hipass. Old biological survey reports note sites east of Tierra del Sol Road near the railroad right-of-way, at Bankhead Springs, 1 mile west of Potrero Valley Road near Highway 94, 0.25 mile north of the Mexican border east of Bankhead Springs and north of the San Diego Arizona Eastern railway line, near the junction of Highway 94 and Highway 188 at the Tecate Road turnoff, and between Interstate 8 and Highway 94 east of Boulevard. CNDDB reports are from 1.25 miles north northeast of Potrero Peak and 0.3 mile southeast of Round Potrero Road, 1 mile northwest of Potrero Peak east of the south end of Coyote Holler Road, 0.1 mile north of Interstate 8 and 1.1 mile southeast of the junction of Highway 1 and State Route 94, 0.75 mile southeast on Interstate 8 from its junction with State Route 94, the top of the grade between Dulzura and Cottonwood, near Live Oak Springs, in McCain Valley 0.2 mile south of the southern cattleguard for Lark Canyon Campground, both 0.1 mile south and 0.8 mile north of the northern cattleguard for Lark Canyon Campground, and 0.5 mile south of the junction of Lost Valley Road and McCain Valley Road.
- Only six specimens are found from Baja California at the San Diego Natural History Museum's herbarium. It has been collected as far south as 31° 5½' North by Moran (SD 106365) at Rancho San Jose. All six collections occurred in sandy washes.
- STATUS:** Populations of Tecate Tarplant are stable in San Diego County, with little historical development within its sandy wash habitat. Principal impacts are from grazing and general degradation of wash habitat by meandering cattle. Apparent rarity in Baja California should be factored into any assessment of this species. All populations should be protected. Quite a few species of tarplants have very restricted ranges. Rarity of this species may be a product of niche habitat specialization combined with physical barriers to expansion. Tecate Tarplant seems to be restricted to a few of the wider and better established, high desert washes. The Laguna Mountains to the north are a natural impediment to expansion, while less xeric drainages with competition from many more species occur to the west. Much warmer and seasonally different conditions prevail at lower elevations on the deserts to the east. This species has 13-20 ray flowers to separate it from other members of the genus found in the region.

MOJAVE TARPLANT [*Deinandra mohavensis* (Keck)B.G. Baldwin = *Hemizonia mohavensis* Keck]

- LISTING:** CNPS List 1B R-E-D Code 2-1-3
Stat/Fed. Status CE / Species of Concern ASTERACEAE July-Sept.
Global Rank G2 State Rank S2.3
- DISTRIBUTION:** San Diego County, Riverside County
- HABITAT:** This small herb grows along drainages at mid-elevations in relatively arid locations. Reported by the Jepson Manual as occupying habitat at 900-1300 feet in elevation. The Munz flora reports habitat utilized near Joshua Tree Woodland and the Mohave River. In San Diego County this species occurs on minor drainages in montane chaparral habitat that has few other sensitive components. Sheephead rocky fine sandy loam is the soil type at the Puerta La Cruz site. Possible Associates: *Adenostoma fasciculatum*, *Mimulus pilosus*, *Juncus mexicanus*.
- KNOWN SITES:** Mojave Tarplant is reported along drainages near Cutca Valley on Mount Palomar 3.6-4.4 miles east northeast of Eagle Crag Summit; as well as 2.25 miles east. It grows along a minor drainage surrounded by chaparral near the entrance to a small County park on Puerta La Cruz Road south of Chihuahua Valley. Another report is 0.3 km and 4.2 km south of Chihuahua Valley Road on Forest Service Road 9S05. Munz' *Flora of Southern California* reports this species near the Mohave River on Deep Creek; as well as on Mount San Jacinto.
- STATUS:** This species is only known from a few isolated foothill locations which are beyond the areas typically imperiled by development. A decade ago this species was considered possibly extinct. In San Diego County it is possibly threatened by crew landscaping activities at the Puerta La Cruz park/campground site. The curious range of this species indicates it may be a relictual survivor from a now much modified landscape. It is difficult to ascertain what its preferred habitat may have once been. Mojave Tarplant has yellow anthers; as well as a dense inflorescence, pappus scales lanceolate to rectangular (not linear), and subentire basal leaves (not clearly toothed leaves) to separate it from *Deinandra kelloggii*.

PANICULATE TARPLANT [*Deinandra paniculata* (Gray)B.G. Baldwin = *Hemizonia paniculata* Gray]

- LISTING:** CNPS List 4 R-E-D Code 1-2-2
Stat/Fed. Status -- None ASTERACEAE May-Nov.
Global Rank G4T3 State Rank S3.2
- DISTRIBUTION:** San Diego County, Orange County, Riverside County; Baja California, Mexico
- HABITAT:** The Paniculate Tarplant occurs on Cajalco fine sandy loams in the northern Gavilan Hills. Typically it occupies open sparsely vegetated grasslands or open sage scrub in arid cismontane regions. It grows on hard packed soils unlike the friable, cracked clay soils favored by the related *Deinandra conjugens*. Possible Associates: *Lessingia filaginifolia*, *Ericameria palmeri* var. *pachylepis*, *Phacelia distans*.
- KNOWN SITES:** This annual is localized and quite uncommon in northern cismontane San Diego County. A small population was observed in disturbed sage scrub north of Santa Fe Avenue and south of Guajome Lake Road and west of Osborne Street in northwestern Vista. A second small population was seen near Barham Road in San Marcos. One herbarium specimen was examined from near the Tijuana Airport just north of the U.S. boundary that had unusual larger and slightly fringed pappus scales which keyed to *D. paniculata*. Paniculate Tarplant is locally common in mildly disturbed grasslands and arid open terrain in a region of western Riverside County roughly south of Corona/Riverside, east of Lake Elsinore/Temecula, north of Pechanga, and west of Hemet/Sage. It was observed growing near the eastern terminus of Patton Street in Winchester; at various locations in the Menifee Hills south of Patton; in the hills near La Sierra Drive on an eastern slope of Arlington Mountain in the extreme northern portion of the Gavilan Hills; in Temescal Canyon near Alberhill, in grasslands northeast of Iodine Springs,

south of Pauba Road and west of Margarita in Temecula, and near Sycamore Park north of Alessandro Road and west of the Escondido Freeway. Roberts reports this species has been collected six times in Orange County.

Approximately a dozen herbarium sheets at SDMNH with specimens collected in northern Baja California (30 degrees North) key to Paniculate Tarplant.

STATUS: This species is beginning to severely decline with the residential development of western Riverside County -- that has been triggered by relatively low regional land costs. While Paniculate Tarplant was once locally common in flat grazing lands which had not been subjected to discing, much of this habitat is highly valued for its construction potential, and is expected to be graded and developed in the next twenty years. Specimens from northern Baja California which are disjunct from the primary populations in Riverside County/northern San Diego County, should be closely examined taxonomically to see if they represent a distinct subspecies of *Deinandra paniculata*. The lack of intervening specimens in central and southern San Diego County, in apparently suitable habitat, is difficult to account for if these two populations were at one time contiguous. Most historical reports of *D. paniculata* in the Chula Vista region are in fact *Deinandra conjugens*; a species with smaller, narrowly lanceolate and unfringed pappus scales. All specimens at the herbarium of the San Diego Natural History Museum examined from this area (except one anomalous specimen from near the Tijuana Airport) -- and labeled as *Hemizonia paniculata* (i.e., *Deinandra paniculata*)-- keyed to *D. conjugens*. Some of these specimens were collected and originally labeled prior to the taxonomic description of *D. conjugens*.

CUYAMACA LARKSPUR (*Delphinium hesperium* Gray ssp. *cuyamaca* (Abrams) Lewis & Epling]

- LISTING:** CNPS List 1B R-E-D Code 2-2-3
State/Fed. Status CR/ Species of Concern RANUNCULACEAE Jun.-Jul.
Global Rank G4T2 State Rank S2.1
- DISTRIBUTION:** San Diego County, Riverside County
- HABITAT:** Relatively densely vegetated Montane Meadow is the habitat utilized by the Cuyamaca Larkspur south of Cuyamaca Lake. This locale is considerably more mesic than the habitat typically occupied by any other larkspurs in the region. The soils here are mapped as Holland stony fine sandy loam. Possible Associates: *Muhlenbergia rigens*, *Carex* species, *Juncus* species.
- KNOWN SITES:** This delphinium grows in broad meadows near Stonewall Jackson Mine at Cuyamaca Lake. The site is imperiled by excessive recreational use of meadows south of this lake (e.g., horsemen and hikers). Plants growing in the hundreds occur on a minor knoll in the grasslands near the east end of Cuyamaca Lake; a smaller population occurs on Middle Peak above Milk Ranch. This species is extremely rare in the mountains of San Diego County with old reports from Pine Hills, northeast of Cuyamaca Dam, the Garnet Kiosk locale in the Laguna Mountain Recreation Area, and upper French Valley in the Palomar Mountains. Some small reported sites such as 0.5 mile east of Julian High School or near Woodland Drive and Sunset Drive at Kentwood-in-the-Pines may not retain habitat values due to residential encroachment, and these sites may already be extirpated. CNDDDB reports are from a relatively restricted area including Cuyamaca Dam on the northwestern shore of the reservoir, on the western slope of Cuyamaca Peak at the headwaters of King Creek, northwest of Cuyamaca Reservoir 0.5 mile west northwest of the gaging station and south of Engineers Road, southwest of Cuyamaca Reservoir at La Puerta Springs, 0.5 mile north of Paso Picacho Campground and west of Highway 79, north of Little Stonewall Peak, Arroyo Seco north of Pine Ridge in Cuyamaca Rancho State Park, about 0.5 mile south of the primitive camp north of Pine Ridge, on the south and north side of this primitive camp, in Green Valley south of Cuyamaca Reservoir, south of East Mesa and south of the Cuyamaca Reservoir, on the west side of East Mesa near the Dyar Spring Fire

Road, along the East Mesa Fire Road, the upper drainage channel of Pine Valley Creek east of East Mesa, 0.25 mile west southwest of Granite Spring in Cuyamaca Rancho State Park, 800 feet east of Sunrise Highway opposite the Garnet Peak Information Center, and in Filaree Flat Meadow north of Lucas Creek and west of the Sunrise Highway. This species is also reported from the San Jacinto Mountains of Riverside County.

STATUS: Cuyamaca Larkspur is at relatively low population numbers throughout its range. The hopefully permanent removal of cattle grazing at Cuyamaca Lake has expanded potential habitat for this species. Status in Riverside County is poorly known. All San Diego County populations should be protected. This larkspur's rarity may be associated with isolation of an ancestral delphinium in the San Diego County and San Jacinto mountains following the wetter Pleistocene period. As conditions changed, the intervening populations at lower and drier elevations could have been eliminated by natural selection pressures. Cuyamaca Larkspur has a striate lower stem and inner lobes of lower petals hairier than outer lobes unlike *Delphinium parishii* and *Delphinium parryi*, and does not have an attenuated stem base with an easily detached tuberous root like *Delphinium patens*.

COLORADO DESERT LARKSPUR (*Delphinium parishii* Gray ssp. *subglobosum* (Wiggins) Lewis & Epling]

LISTING: CNPS List 4 R-E-D Code 1-1-2
State/Fed. Status -- None RANUNCULACEAE Mar.-May
Global Rank G4T3 State Rank S3.2

DISTRIBUTION: San Diego County, Riverside County, Imperial County; Baja California, Mexico

HABITAT: Open Sonoran Desert Scrub is the general habitat of this larkspur. At Mountain Springs this herbaceous perennial grows with a mix of high and low desert elements; while at Canyon Sin Nombre it was observed on a partially shaded talus slope in sparsely vegetated desert terrain. Possible Associates: *Pectocarya* species, *Lupinus arizonicus*, *Ferocactus cylindraceus*.

KNOWN SITES: This showy larkspur was flowering well after a season of good rains at Mountain Springs near the Imperial County line. It was also found in limited numbers near Canyon Sin Nombre. Numerous historical collections in the Anza Borrego Desert indicate a considerable range for this entity; however, the species is seldom encountered in dry years. Several plants were observed in shaded nooks under rocks in Flat Cat Canyon north of Hellhole Canyon in Anza Borrego State Park, in similar shaded boulder habitat in Culp Valley, as well as in the western San Felipe Hills. Old reports are from Montezuma Valley, San Felipe Valley, Yaqui Well, Box Canyon, Pinyon Mountain, The Potrero, Agua Caliente Hot Springs, McCain Valley, and Mortero Palms. Herbarium specimens include sites 0.4 mile west of the Banner Queen Ranch, 0.5 mile south of Scissor's Crossing, near the foot of Sentenac Canyon, a stony fan at the head of Borrego Valley, at Warner's Hot Springs, the Campbell Ranch, near Cuyamaca Lake, and at the base of Mountain Springs Grade. Old biological reports note sites on the southern high desert such as 1.2 miles south of Bankhead Springs, east of Old George Mountain, in McCain Valley south of Lost Valley Road, 0.25 mile southwest of Boulevard, south of the Calexico Lodge and southeast of Manzanita, near Starship road south of Highway 94 near Manzanita, east of Bankhead Springs and north of the San Diego Arizona Eastern Railway line. These sites indicate Colorado Desert Larkspur may be well represented in this high desert region. One herbarium specimen examined is from Aguanga just north across the Riverside County line, and another from Ribbonwood on the north side of the Santa Rosa Mountains. It is reported from Deep Canyon in the Coachella Valley. A small population was observed in Nance Canyon close to Coyote Canyon Road southwest of Santa Rosa Mountain.

Eight herbarium specimens from Baja California are found at the San Diego Natural History Museum south to 30° 8' North where collected by Moran (SD 88785) on the north slope of Cerro San Juan Del Dios.

STATUS: Colorado Desert Larkspur populations are presumed stable, given the limited development within its historic range. During springs following good rainfall, one can usually find this larkspur readily at known locations; however, during drought years, it may be quite difficult to locate. Rarity of the species may be associated with long-term drought cycles and periods of less than optimal growing conditions on the desert for this species -- with populations fluctuating from decade to decade or century to century. Herbarium specimens collected from higher transmontane elevations above the hotter Colorado Desert lowlands, -- previously identified as Colorado Desert Larkspur -- sometimes have leaves similar to *Delphinium parishii* ssp. *parishii* from the Mohave Desert. Considering the higher general elevation of the Mohave, this may indicate ssp. *parishii* extends along the eastern crest of the desert mountains southward into Baja California. Some specimens from similar elevations in Baja California also bear these leaf similarities to ssp. *parishii*. Additional taxonomic work is necessary; however, two distinctly leaved plants seem to be involved. Lewis & Epling (Brittonia, May 10, 1954) note two different forms which may have arisen as hybrid derivatives with *Delphinium parryi* which comprise *Delphinium parishii* ssp. *subglobosum*. The first which they identify with *Delphinium subglobosum* Wiggins is noted in Banner Canyon in an ecotone between chaparral and desert scrub. It has "conspicuously pubescent leaves and petioles, and the leaf lobes are narrow." These traits are maintained when transplanted to controlled nursery conditions. The second and much more widespread and desert-dwelling form they identify with *Delphinium collinum* Ewan. It has glabrous leaves and "leaf lobes are broader and fleshier." Given the different habitats and traits of both forms, these two may warrant separate taxonomic recognition. Colorado Desert Larkspur does not have the inner lobes of its lower petals hairier than the outer lobes, or the stems striate like *Delphinium hesperium*. It also has shorter fruits than *Delphinium parryi* (less than or equal to 3x longer than wide versus greater than 3x). Colorado Desert Larkspur can have a decidedly purplish color, unlike the more blue-ish flowered *Delphinium parryi* growing to the west

WESTERN DICHONDRA [*Dichondra occidentalis* House]

- LISTING:** CNPS List 4
 State/Fed. Status -- None
 Global Rank G4? State Rank S3.2
 R-E-D Code 1-2-1
 CONVULVACEAE Mar.-May
- DISTRIBUTION:** San Barbara County, Ventura County, Los Angeles County, Orange County, San Diego County, Santa Catalina Island, Santa Cruz Island, San Miguel Island, Santa Rosa Island; Marin County (questionable); Baja California, Mexico.
- HABITAT:** Southern Mixed Chaparral, Chamise Chaparral, Diegan Coastal Sage Scrub, rocky outcrops in grasslands, and especially recently exposed areas of post-burn habitat are all sometimes occupied by this small, cryptic perennial herb. It often grows almost completely hidden at the base of leafy shrubs. Soil tolerances for *Dichondra* appear variable with Loamy alluvial land of the Huerhuero complex utilized at Torrey Pines, Hambright gravelly clayloam in the San Onofre Mountains, and a variety of other types elsewhere. Possible Associates: *Ceanothus verrucosus*, *Cneoridium dumosum*, *Arctostaphylos glandulosa* ssp. *crassifolia*.
- KNOWN SITES:** Western Dichondra is occasionally common following burns in coastal San Diego County, as near Black Mountain Road south of Peñasquitos Canyon. It is potentially present at many county sites in coastal Chaparral or Diegan Coastal Sage Scrub. It is abundant on the slopes above the ocean at the Torrey Pines State Reserve as a dominant understory element. Dichondra is a widely dispersed understory plant in Military Sector Alfa Two on Camp Pendleton with sightings extending throughout the San Onofre Mountains. Among other sites are the Jamul Mountains north of the glider port and Lower Otay Lake, immediately east of the Upper Reservoir on the western flanks of Otay Mountain, further south near the first major ridgeline on western Otay Mountain, on the peak east of Interstate 15 and south of Poway Road, the hills east of Massachusetts Avenue and north of Freeway 94, south of Del Mar Heights Road and east of El Camino Real, on a knoll west of the cul-de-sac of La Bella in

Olivenhain, near Windmill Lake Golf Course on Camp Pendleton, near the northern terminus of Kearney Villa Road in the City of San Diego, near the crest of Evans Point in Carlsbad, on the upper southern flanks of Penasquitos Canyon near Camino Santa Fe and Calle Cristobal, and north of Poggi Canyon in Chula Vista. Three inland reports are from Fortuna Mountain, south of Poway Road on a slope at the end of Cobblestone Creek Road, and the top of Poway Grade; however, most historical sites are clustered near the immediate coast. Limited populations were seen at the head of Wruck Canyon near the Mexican border, east of Ruffin Road and just south of Highway 52, north of Swallowtail Lane in Encinitas, near Canyon Drive in Oceanside, near the upper elevations of the hillside east of Evans Point and El Camino Real in Carlsbad, close to the intersection of Questhaven and Elfin Forest Road, on the ridgeline west of the Sycamore Landfill in Santee, and near the Wire Mountain housing on Camp Pendleton. Some representative herbarium specimens include the summit of Mother Miguel Mountain, north of the Del Mar Racetrack, south of Gonzales Canyon and east of El Camino Real, the southeast side of Osuna Valley, San Marcos Creek, the bluffs north of Jefferson High School in Oceanside, and on Spooner's Mesa in the Tijuana Hills. Among the numerous reported sites are 0.25 mile north of the San Ysidro Border Station, on Soledad Mountain near the radio towers, near Inspiration Drive and Terryhill Drive in La Jolla, near La Jolla Rancho and Ravenswood Road and La Jolla Corona Drive, near Kearney Villa Road by the checkered water tank, near Mesa College west of Linda Vista Road, on a ridge on the southwest side of Fortuna Mountain, near the glider port and Salk Institute at Torrey Pines, east of Pine Needles Drive and Hidden Pines Road in Del Mar, east of Via Torina off Carmel Valley Road, in a tributary of Gonzales Canyon west of Black Mountain Road in North City West, north of Via de la Valle near Nardo Avenue in Del Mar, west of the El Camino Memorial Park along the side of Carroll Canyon Road, northwest of Camino Ruiz in North Mira Mesa, 1 mile east of Scripps Ranch, at the end of Santa Fe Drive between J and K Streets in Encinitas, scattered about Lux Canyon in Encinitas, in Solana Beach on the south side of San Elijo Lagoon, north of Agua Hedionda Creek and west of Dawson-Los Manos Reserve in Carlsbad, on the south side of Agua Hedionda Lagoon between the railroad tracks and Interstate 5, 1 mile south of San Francisco Peak, 1.5 miles northwest of Loma Alta Mountain, north of Ramblas de las Flores Road in Rancho Santa Fe, east of Whispering Palms Golf Course in Fairbanks Ranch, and north of San Marcos Gorge and 1 mile south of Rancho de los Quiotes. Old biological survey reports note sites in the Calavera Hills near Lake Calavera, near Pomerado Road between Carroll Canyon and San Clemente Canyon, between La Glorietta Road and Rambla de las Flores Road, south of Carlsbad and north of Agua Hedionda Creek, Sundance Avenue near Carmel Mountain Road, Dictionary Hill, in Carroll Canyon east of El Camino Memorial Park, as well as south of San Dieguito Road and the Fairbanks Golf Course. This species is rare at Dana Point in Orange County on bluffs near the ocean, on the bluffs near Monarch Point, and is reported from Aliso Canyon. It is reported in La Jolla Valley and Deer Canyon in Ventura County; the ridge between Tuna and Topanga Canyon in Los Angeles County; as well as by Raven from Point Mugu State Park and Leo Carillo State Park.

Thirteen specimens from the herbarium at the San Diego Natural History Museum are recorded; south to 31° 1¼' North where collected by Moran (SD 105343) three and a half kilometers east of El Rodeo. It can be seen on the eastern slope of Banda Peak at Punta Banda in Baja California and is locally common in sage scrub openings in Guadalupe Valley.

STATUS: Western *Dichondra* is slowly declining in coastal southern California and is a borderline species for inclusion on the CNPS list. Sites with very high densities are noteworthy; in such circumstances substantial portions of these populations should be protected. Increasing rarity of this once well-distributed coastal species is strongly correlated with urban expansion and loss of habitat. Flowers are rarely observed with Western *Dichondra*; the reniform leaves are distinctive and difficult to confuse with other species except very young leaves of *Cardamine californica*.

CALIFORNIA DITAXIS [*Ditaxis serrata* (Torr.)A.A. Heller var. *californica* Steinmann]

- LISTING:** CNPS List 3 R-E-D Code ?-2-3
State/Fed. Status -- None/Species of Concern EUPHORBIACEAE Oct.-Dec.
Global Rank G5T2? State Rank S2.2
- DISTRIBUTION:** San Diego County; Riverside County; Sonora, Mexico
- HABITAT:** Rocky desert chaparral. Possible Associates: More information needed.
- KNOWN SITES:** This entity is dubiously distinct from *D. serrata*. An almost glabrous *Ditaxis* plant with broad leaves was photographed on a hillside at The Narrows, north of the creekbed and Highway 78 and west of Ocotillo Wells in San Diego County. The herbarium specimen reported from San Diego County should be re-examined.
- STATUS:** Steinmann reports (unpublished) this could be merely a glabrous morph of *D. serrata* that may not warrant taxonomic distinction.

CUYAMACA LAKE DOWNINGIA [*Downingia concolor* Greene var. *brevior* McVaugh]

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- CE/Species of Concern CAMPANULACEAE May-Jul.
Global Rank G4T1 State Rank S1.1
- DISTRIBUTION:** San Diego County
- HABITAT:** Montane meadows on the periphery of Cuyamaca Lake are the preferred habitat of this small but colorful annual. Shrubs are generally not present and plant associates include low growing, facultative wetland elements. This lakeside habitat is a montane variation on the coastal vernal pool, with very moist spring soils drying out in the late summer. Soils are mapped in the vicinity of the lake as loamy alluvial land. Possible Associates: *Limosella acaulis*, *Juncus* species, *Polygonum amphibium* (nearby).
- KNOWN SITES:** Following removal of cattle from vast meadows on the north side of Cuyamaca Lake, several thousand or more individuals flowered in 1988 along the retreating borders of the wetlands near the causeway, over a distance of at least 300 yards. This occurred in a drought year; during spring 1991 this area was under a substantial body of water following concentrated spring rainfall. During spring 1996 isolated pockets of downingia were growing near the intersection of the Cuyamaca Highway and Sunrise Highway. It also grows near Stonewall Jackson Mine in sandy depressions adjacent to tall grasses. CNDDDB reports are from the eastern face of North Peak 1 mile east of the summit at the 4800 foot contour, both south and east of Camp Tapawingo at the southern end of Cuyamaca Reservoir.
- STATUS:** Following several decades with extremely limited populations, the Cuyamaca Downingia is now expanding around the lake. Continued protection from cattle grazing and excessive recreational hiking is needed. This annual was considered close to extinction prior to the removal of cattle from its primary habitat around Cuyamaca Lake. Allowing the lake waters to remain at a high level for consecutive years could affect a robust population noted in 1988, by maintaining the primary habitat under water. Horse corrals and trails are uncomfortably near the Stonewall Jackson Mine population. Cattle should be restricted from the area of population resurgence for the Cuyamaca Lake Downingia. In addition, shore fishermen have been regularly observed trampling the area containing the primary population near the levee, and should be restricted from this area. All populations should be fully protected. The Cuyamaca Downingia is probably a relictual species that may have been more widespread during the wetter Pleistocene period. This colorful blue/white/purple spotted flowering annual is unlikely to be confused with any other native species.

PENINSULAR MOUNTAINS DRABA [*Draba corrugata* S. Watson var. *saxosa* (Davids.) Munz & I. M. Johnston]

- LISTING:** CNPS List 1B R-E-D Code 2-1-3
State/Fed. Status -- None BRASSICACEAE Jun.-Sept.
Global Rank G4T2 State Rank S2.3
- DISTRIBUTION:** Riverside County
- HABITAT:** Dry Montane Coniferous Forest in rocky openings is the habitat usually favored by this tiny biennial or perennial. In the Santa Rosa Mountains it was observed in semi-shaded, forest openings. Possible Associates: *Astragalus leucolobus*, *Pedicularis semibarbata*, *Sedum niveum*.
- KNOWN SITES:** Peninsular Mountains Draba was observed near the saddle between Santa Rosa Peak and Toro Peak in the Santa Rosa Mountains of Riverside County. This site is not far from the San Diego County line, and this species may grow there in similar, arid, montane locales. An herbarium specimen was examined from the summit of San Jacinto Peak.
- STATUS:** *Draba corrugata* ssp. *saxosa* has 0-3 cauline leaves and fruits sparsely clustered, unlike the more northern subspecies, *D. c. corrugata*. Fruits of the biennial or perennial Peninsular Mountains Draba are generally twisted, unlike fruits of the annual *Draba cuneifolia*. More information is needed from sparsely collected, high montane locales to accurately assess the rarity of this species. Present rarity is probably correlated with distinctive and uncommon microhabitat requirements, rather than human associated impacts.

BANNER DUDLEYA [*Dudleya alainae* Reiser]

- LISTING:** CNPS List 3 R-E-D Code 3-2-3
State/Fed. Status -- None CRASSULACEAE Jun.-Jul.
Global Rank G1Q State Rank S1?
- DISTRIBUTION:** San Diego County
- HABITAT:** Lower Montane Coniferous Forest and Chaparral ecotone are the preferred habitat of the Banner Dudleya. This succulent perennial favors exposed rocky outcrops where it utilizes cracks and crevices with only limited soils, and where it has only minimal competition from other plant species. Soils are mapped as Crouch coarse sandy loam near Harrison Park, Sheephead rocky fine sandy loam in Banner, and Holland stony fine sandy loam near both Jim Green Creek and at Pine Hills. The Banner Dudleya appears more closely correlated with metamorphic, exposed rock and with sufficient winter rainfall, than with specific soil type. Possible Associates: *Opuntia phaeacantha*, *Selaginella bigelovii*, *Dudleya pulverulenta* ssp. *arizonica*.
- KNOWN SITES:** This *Dudleya* is uncommon in Banner and Chariot Canyon. A large population occurs adjacent to Jim Green Creek at the foot of the Volcan Mountains in open rocky terrain. It is scattered in rocks south of the American Adventure Campground near Harrison Park. Banner Dudleya is localized in rocks at Pine Hills near the intersection of Eagle Peak Road and Blue Jay Drive; as well as south of the intersection of Engineer's Road and Boulder Creek Road in coniferous understory. Small populations that may key here are found in coniferous forest near French Creek on Palomar Mountain not far from the weir, in Delta Area on Camp Pendleton in the Santa Margarita Mountains near upper Roblar Grade Road, and in the Temecula Gorge.
- STATUS:** Banner Dudleya populations in the mountains of San Diego County are presently stable. It is potentially impacted by construction of mountain cabins, recreational campgrounds, and by the overgrazing of horses and cattle. CNPS List 1B is recommended for this species. Substantial portions of all populations should be protected. This succulent perennial is sometimes referred to *Dudleya saxosa* ssp. *aloides*. However, *Dudleya saxosa* ssp. *aloides* typically occurs in desert mountains (e.g., Sentenac Canyon, Dry Morongo Wash, the foothills of the Santa Rosa Mountains just west of Palm Desert, Aguanga) which share almost no floristic species with the

coniferous forest and montane chaparral habitat of the Banner Dudleya. Most dudleya species in California have very restrictive habitat requirements; even the wide-ranging *Dudleya pulverulenta* has a desert form, (subspecies *arizonica*) to separate it from the more coastal subspecies *pulverulenta*. The greenish-yellow flowers, generally taller and typically reddish peduncle with a substantially more open inflorescence, as well as the quite different, barren, rocky, desert terrain habitat with few shrubs and much higher seasonal temperatures, separate *D. saxosa* from the diminutive *D. alainae* with sulphur yellow flowers found within or near montane, Jeffrey Pine habitat. A complex of dudleya forms in the foothills of the eastern Transverse Range and northern Peninsular Range needs further study. Plants at different sites here show differing mixes of characteristics of *Dudleya lanceolata*, *Dudleya cymosa*, *Dudleya saxosa* and possibly *Dudleya alainae*; some of these were formerly referred to *Dudleya cymosa* ssp. *minor*. Uncommon caespitose plants in the Vulcan, Cuyamaca, Laguna, and Jacumba Mountains with pale yellow-green or whitish-green flowers with a red-striped keel and very short peduncles are *Dudleya abramsii* ssp. *abramsii* (= *Dudleya delicata*). Rarity of this species may be associated with herbivory; low population numbers at individual sites are subject to stochastic events and possible localized extirpations.

ORCUTT'S DUDLEYA [*Dudleya attenuata* (Wats.) Moran ssp. *orcuttii* (Rose) Moran]

- LISTING:** CNPS List 2 R-E-D Code 3-3-1
 State/Fed. Status -- /Species of Concern CRASSULACEAE May-Jul.
 Global Rank G4T2 State Rank S1.1
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Openings in Diegan Coastal Sage Scrub near the coast are preferred by Orcutt's Dudleya. Marina loamy coarse sand is mapped for the Border Field site. In Baja California, the proximity to moist ocean breezes seems to be a significant factor in the abundance of this succulent perennial (e.g., near Punta Banda). Possible Associates: *Agave shawii*, *Bergerocactus emoryi*, *Amblyopappus pusillus*.
- KNOWN SITES:** A small population of perhaps two hundred plants grows on a bluff at Border Field State Park. This is the only known population in the U.S.

Seventeen specimens are recorded from Baja California at the San Diego Natural History Museum's herbarium; south to 31° 7' North where collected by Moran (SD 96841) on the south wall of a canyon at Rio San Rafael. It is locally common on the northern coast of Baja California such as on Banda Peak, the hills around Baja Del Mar, and south of Punta Mesquite.

- STATUS:** Orcutt's Dudleya is close to extirpation in the United States. All populations should be fully protected. An appropriate buffer against human intrusion needs to be established for the population at the Border Field site where nearby habitat enhancement is proposed for Year 2001. Picnic areas and recreational activities occur near this lone U.S. site. The existing small population is also subject to herbivory problems. It is recommended that seed be taken from this small population at Border Field State Park and grown horticulturally for establishment on similar park lands near this northern-most site. Rarity of this species is probably associated with its coastal range. Volcanic substrates and substantial rocky habitat utilized by this species in coastal Baja California, ends abruptly at the Tijuana Hills. The broad Tijuana River floodplain -- with only limited habitat for this species -- occurs to the north and provides a natural physical barrier for further expansion into the United States. The smaller and thinner, fleshy, finger-like leaves of Orcutt's Dudleya (2-10 cm versus 8-20) are also differentiated from the regionally common *Dudleya edulis* by their mealy white powder.

BLOCHMAN'S DUDLEYA [*Dudleya blochmaniae* (Eastw.) Moran ssp. *blochmaniae*]

- LISTING:** CNPS List 1B R-E-D Code 2-3-2
State/Fed. Status -- /Species of Concern CRASSULACEAE Apr.-Jun.
Global Rank G3T2 State Rank S2.1
- DISTRIBUTION:** San Diego County, Orange County, Los Angeles County, Ventura County, Santa Barbara County, and San Luis Obispo County; Baja California, Mexico
- HABITAT:** This tiny corm-like sprouting perennial grows in sandy openings in low-growing Diegan Coastal Sage Scrub or chaparral near the coast. Las Flores loamy fine sand and Terrace Escarpments are the soil types mapped at Camp Pendleton. Proximity to the coast, or to areas with a strong coastal influence, seem to be a requirement for this species. Possible Associates: *Sisyrrinchium bellum*, *Amblyopappus pusillus*, *Chaenactis glabriuscula* ssp. *orcuttiana*.
- KNOWN SITES:** A large population of over 1000 individuals was discovered west of the helicopter landing strip, near the beach on Shingle Bluff at Camp Pendleton. It is also found in small colonies just south of Cocklebur Creek on an ocean bluff, and in Military Sector Oscar One west of Mass 3 Road and north of the large power lines. Other populations are reported north of Basilone Road west of Military Sector Bravo Three, and 0.2 km northeast of the Santa Margarita School on Wire Mountain. An historical report from Imperial Beach may be referable to *Dudleya variegata*, but should be investigated. A small population was observed downslope from the northwestern corner of the fenced runway for Palomar Airport Road in Carlsbad. A report is from near 8th street in Oceanside east of the freeway. Several hundred are scattered along the ridge north of Dana Point Harbor in Orange County. Reported by Roberts elsewhere in Orange County at San Clemente north of Pico Avenue and in San Clemente State Park. Raven reports this species from Dos Vientos in the Santa Monica Mountains of Los Angeles County. Another report is from near the Chatsworth Reservoir. Historical collections to the north include Point Sal Ridge in Santa Barbara County, on a serpentine outcrop near Morro Beach in San Luis Obispo County, and in Long Grade Canyon 1 mile east of Camarillo State Hospital in the northern Santa Monica Mountains. CNDDDB reports for Los Angeles County are from Point Dume, the mouth of Winter Canyon near Malibu Beach; for Orange County from San Clemente 0.3 km west of Avenue Pico; for Ventura County on the Conejo Grade 3 miles west of Newbury Park, Dos Vientos Ranch southeast of Conejo Mountain in an east/west trending valley, in western Thousand Oaks; in San Luis Obispo County approximately 2 miles north of Cayucos on a seabluff, east of Point Estero northwest of Highway 1 about 4 miles north of Cayucos, west of the intersection of Los Osos Valley Road and Highway 101 just outside city limits of San Luis Obispo, 8 miles west of San Luis Obispo near Morro Bay, and the west base of Bishop Peak.
- Two sites from Baja California have recorded specimens at the San Diego Natural History Museum's herbarium: 2 km south of Descanso at the K51 highway marker, and on a volcanic mesa at Los Hornos 9 km southeast of La Mision where collected by Moran (SD 105144).
- STATUS:** Blochman's Dudleya is substantially declining throughout its coastal southern California range. Protected populations on Camp Pendleton improve the prognosis for survival of the species in the San Diego region. Plants may be quite difficult to relocate except in late spring and early summer; censusing outside of this period is not recommended for this species. All southern California populations should be protected. Recent work on this species indicates that the populations in central California may be genetically distinct, despite superficial similarities. Rarity of the species in San Diego County is probably related to the presence of the closely allied Short-leaved Dudleya (*Dudleya blochmaniae* var. *brevifolia*) which is restricted to areas around Torrey Pines/Del Mar. It is doubtful Short-leaved Dudleya would have evolved into a distinct entity without isolation over an extended period of time from the similar and much wider ranging Blochman's Dudleya. Given the extended coastal range of Blochman's Dudleya, soil and climatic conditions in mid San Diego County may have been different enough to trigger speciation. Blochman's Dudleya appears to be relictual based on its widespread distribution and

limited number of known sites. Blochman's Dudleya has oblanceolate leaves 10-60mm, while *D. b. ssp. brevifolia* has spoon-shaped leaves 7-15mm. In addition, Blochman's Dudleya has white flowers not yellow flowers like *Dudleya variegata*.

SHORT-LEAVED DUDLEYA [*Dudleya blochmaniae* (Eastw.) Moran ssp. *brevifolia* Moran = *Dudleya brevifolia* (Moran)Moran]]

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
State/Fed. Status -- CE/Species of Concern CRASSULACEAE April
Global Rank G1Q State Rank S1.1
- DISTRIBUTION:** San Diego County
- HABITAT:** Open areas of Chamise Chaparral or Torrey Pine Forest -- on Torrey sandstone with soils mapped as Carlsbad gravelly loamy sand -- are the preferred habitat. Small marble-sized, iron-bearing concretions have been observed at all known sites for this cryptic, corm-like sprouting perennial. Competition from other plants is very limited and usually only a few other species such as *Selaginella cinerascens* are present. Possible Associates (nearby): *Ceanothus verrucosus*, *Pinus torreyana*, *Arctostaphylos glandulosa* ssp. *crassifolia*.
- KNOWN SITES:** A healthy population occurs at the southern extension of Torrey Pines State Reserve; a much smaller colony is found at three colonies in Crest Canyon Reserve near the northern extension of this state park. A localized and dense population is situated on the west-facing slope of Carmel Mountain above the old quarry; a substantial population also occurs nearby on the east side of the Carmel Mountain mesa in a broad open area. CNDDDB reports a site at the northern extension of Torrey Pines State Reserve south of Del Mar Heights School; also a site where possibly extirpated at the junction of Del Mar Coast Boulevard and 13th Street; south of UCSD on the eastern rim of Skeleton Canyon (0.3 km east of benchmark 342) just west of the freeway, and an historical collection from near Mount Soledad. Reportedly extirpated from small site 800 feet east of I-5 and 400 feet north of Del Mar Heights Road. Probable hybrids between this species and *Dudleya variegata* were observed and photographed in the late 1970's north of Eastgate Mall Road. These plants had pale, cream yellow flowers intermediate between the two species.
- STATUS:** Short-leaved Dudleya is presently stable in San Diego County. This County endemic is imperiled by the proposed construction of new homes near the Carmel Mountain sites, and by subsequent impacts from hikers and bikers. This tiny succulent cannot be adequately censused except during the spring following the "corm" sprouting of leaves, and during the short flowering period. Late in the season the minute leaves dry and shrivel quickly. This species is recommended for Federally Endangered status. All sites should be fully protected with adequate buffers. Given its current association within Torrey Pine Forest and adjacent chaparral, the rarity of this species may be associated with the decline of that coniferous habitat since at least the Pleistocene. Conversely, Short-leaved Dudleya may be a relatively newly evolving species. *Dudleya blochmaniae* ssp. *blochmaniae* has oblanceolate leaves 10-60mm, while Short-leaved Dudleya has spoon-shaped leaves 7-15mm. *Dudleya variegata* has yellow flowers, not the white flowers of Short-leaved Dudleya.

MANY-STEMMED DUDLEYA [*Dudleya multicaulis* (Rose) Moran]

- LISTING:** CNPS List 1B R-E-D Code 1-2-3
State/Fed. Status -- /Species of Concern CRASSULACEAE May-Jul.
Global Rank G2 State Rank S2.1
- DISTRIBUTION:** San Diego County, Orange County, Los Angeles County, Riverside County, and San Bernardino County

HABITAT: Openings in Diegan Coastal Sage Scrub and Valley Grasslands are the typical haunts of this inconspicuous succulent perennial. Pebbles and small cobbles were common on the surface at all the Camp Pendleton locales. Many-stemmed *Dudleya* "corm" sprouts and is not readily identifiable except during the late spring and early summer when succulent leaves and flowers may be observed. Huerhuero loams and Olivenhain cobbly loam are soils mapped for the Camp Pendleton sites. Various substrates are noted in reports from north of San Diego County. Possible Associates: *Chorizanthe staticoides*, *Chlorogalum parviflorum*, *Dichelostemma capitatum*.

KNOWN SITES: A small population occurs in a sage scrub/grassland ecotone on Camp Pendleton south of Talega Canyon; a second site occurs north of San Mateo Creek on a ridge in similar habitat. A large population of over 1000 individuals was observed in the extreme northeastern corner of Camp Pendleton on a mild, south-facing slope of Military Sector Charlie. One old report is from the San Onofre Mountains near the immigration checkpoint; a number of additional sites have been reported from northern Camp Pendleton in the hills near San Mateo Creek, and a CNDDDB report from the southwestern end of Indian Potrero along a truck trail in the Santa Margarita Mountains. It is reported by Roberts for Orange County at Turtle Rock, Bommer Canyon, and Sycamore Hills; Irvine Lake and Weir Canyon in the Santa Ana Mountains; also Audubon Starr Ranch, Aliso-Wood Canyon Regional Park, Cañada Chiquita, and the west side of Cristianitos Canyon near the TRW facility. A population was reported in Lucas Canyon on a sage scrub covered ridgeline. A very old collection is from near Ontario in San Bernardino County. Reports are of scattered populations near Olsen Canyon on western Riverside County's Gavilan Plateau near the landfill; also near Interstate 15 and Indian Truck Trail. It is also reported by Boyd on Estelle Mountain and in Temescal Canyon on the periphery of the Gavilan Plateau. CNDDDB reports from Orange County are for Pelican Hills 2 miles east of Corona Del Mar, near the big bend area of Laguna Canyon and east to Mathis Canyon, 0.3 mile north of Laguna Beach High School, 0.6 mile east northeast of Cactus Point in Laguna Beach, Weir Canyon approximately 1 mile south of the Riverside Freeway exit, Peralta Hills about 0.5 mile south of the Anaheim Hills, the crest of the divide between Rancho Laguna's Bluebird Canyon and Aliso Canyon, the head of Dripping Cave Canyon east of the Top of the World Elementary School in Laguna Beach, east of Canyon Acres Canyon and west of Park Avenue in Laguna Beach, the divide between Arch and Porta Fina Canyons, west of Wood Canyon and north of Mathis canyon, Aliso Viejo approximately 2 miles southwest of the Laguna Hills, Weir Canyon, several locales in Cristianitos Canyon, U C Irvine campus west and downhill from the biology building, under the transmission lines near Fremont Canyon and southwest of Sierra Peak, Gypsum Canyon just south of the Riverside Freeway, the west side of Coal Canyon where the pipeline crosses the ridge road, Aliso Creek at the southern end of Sheep Hills, approximately 1 mile northwest of Niguel Hill, Seaview Park on Niguel Hill, about two hundred feet south of Bonita Canyon Drive, just north of the Bonita Reservoir, upper Laurel Canyon (i.e., Willow Canyon) about 1.6 miles south southeast of Signal Peak, west side of Laguna Canyon about 0.5 mile north of the junction with El Toro Road, east side of Laguna Canyon 1 mile north of the junction with El Toro Road, Sycamore Hills 1 mile north of the junction of Laguna Canyon Road and El Toro Road, Aliso Viejo Ridge 0.33 mile east of El Toro Road, Crystal Cove, 0.4 mile west of Coal/Gypsum Ridge Road east of Gypsum Canyon, approximately 0.25 mile north of Pelican Point, 3 miles east of San Juan Capistrano on the south side of Highway 74 and San Juan Creek, Shady Canyon in the San Juan Hills 2 miles northeast of Signal Peak, San Joaquin Hills east of Shady Canyon and southeast of Sand Canyon Reservoir, Bell Canyon 3 miles west of San Juan Hot Springs, Canada Gobernadora 0.8 mile west of Casper Regional Park's western boundary, north of San Juan Creek about 1 mile north of Highway 74, the vicinity of Canada Gobernadora 2-2.4 miles west of Highway 74, near Blind Canyon 1.1 miles north of the Orange/San Diego County boundary, 0.3 mile south of a clay pit in Section 12 about 1 mile east of the City of San Clemente's boundary, 2.6 miles east northeast of Signal Peak and 0.1 mile south of the City of Irvine boundary, 2.7 miles east southeast of Signal Peak and 0.3 mile west of Laguna Beach Road, 2.4 miles east northeast of Signal Peak and 0.7 mile west of Laguna Beach Road, 0.5 mile south southeast of "close"

survey mark and 1 mile east of Pacific Coast Highway, north of Santiago Creek and west of Blind Canyon, the south end of Gypsum Canyon, numerous locales within 1.5 miles north and west of Santiago Dam, Fremont Canyon 2-2.4 miles northeast of Santiago Dam, the south end of Gypsum Canyon, bluffs at Corona Del Mar, Goff Ridge in Laguna Beach, Bell Canyon near the confluence with Crow Canyon, a tributary to Laguna Canyon approximately 2.5 km northeast of Two Point Rock, and an old collection from Newport Bay; from Riverside County on the south side of Alberhill Mountain adjacent to open pit clay mines, just west of DiPalma's Italian Village 2 miles west northwest of Alberhill, a terrace west of Indian Canyon Wash in Temescal Valley, hills south of Corona between Fresno Canyon and Serfas Club Drive, Temescal Valley just west of the mouth of Indian Canyon, 0.8 mile west northwest of Prado Dam and 0.25 mile north of the County line on the north side of Santa Ana Canyon, Santa Ana Canyon 300 yards south of Riverside Freeway and 1 mile east of the Orange County line; in Los Angeles County from Marshall Creek near La Verne in the San Gabriel Mountains, Way Hill in San Dimas, numerous locales near Bonelli Regional County Park at Puddingstone Dam in the San Jose Hills south of San Dimas, on the Johnson's Pasture Fire Road just north of Claremont, the south side of Chatsworth Reservoir, north of the San Bernardino Freeway and west of Ganesha Boulevard near Puddingstone Dam, and an old collection from the Hollywood Hills; for San Bernardino County at upper Waterman Canyon at the end of Waterman Canyon Road on the north side.

STATUS: The populations of Many-stemmed *Dudleya* are relatively stable, with concentrations in the Santa Ana Mountains being lightly impacted by development within the foothills. According to unpublished notes from Roberts, most of the Orange County populations occur within relatively limited clusters of occurrence, and therefore the numerous reports of this species may misrepresent its range/status. The San Diego County sites at Camp Pendleton are potentially imperiled by military maneuvers. Substantial portions of sizeable populations should be protected. Focused surveys for this cryptic species outside of spring and early summer are questionable. Rarity of this species may be associated with isolation of suitable habitat within the greater Santa Ana Mountains area. Many-stemmed *Dudleya* has linear shaped leaves not the oblanceolate to spoon-shaped leaves of *Dudleya variegata*, leaves slightly versus strongly narrowed at the base, leaf base typically greater than 4mm wide versus generally less than 3mm, and petals fused 1-2mm versus 0.5-.1mm. In addition, they are geographically separated with Many-stemmed *Dudleya* north of the San Luis Rey River and Variegated *Dudleya* south of the river.

VARIEGATED DUDLEYA [*Dudleya variegata* (Wats.) Moran]

LISTING: CNPS List 1B R-E-D Code 2-2-2
 State/Fed. Status -- /Species of Concern CRASSULACEAE May-Jun.
 Global Rank G2 State Rank S2.2

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Openings in sage scrub and chaparral, isolated rocky substrates in open grasslands, and a proximity to vernal pools and mima mound topography characterize habitats utilized by this small, corm-like sprouting perennial with succulent leaves. Stockpen gravelly clay loams are utilized on Otay Mesa while Redding gravelly loams are mapped for the Miramar Mounds area. Usually this *Dudleya* grows in small areas quite devoid of shrub cover, even though Chamise, scrub oak, or sage scrub elements may occur nearby. Possible Associates: *Ferocactus viridescens*, *Selaginella cinerascens*, *Selaginella bigelovii*.

KNOWN SITES: Many thousands of Variegated *Dudleya* still grow in the grasslands east of Brown Field and north of Lone Star Road. A football field-sized plot with tens of thousands of plants was graded in 1986 at a site south of Brown Field on La Media Road. This population covered the entire field in a yellow bloom following years of good rainfall. A few thousand of these plants are still present north of Airway and west of La Media near a newly graded industrial park area

that protects some biological open space. This dudleya is still found scattered across Otay Mesa (e.g., near Wruck Canyon; between Johnson and O'Neal Canyons;), generally at the edges of the northern bluffs or near vernal pools. Colonies extend to the foot of Otay Mountain east of the Upper Reservoir on Otay Mesa. Other populations occur in Otay Valley, on Dictionary Hill, on the ridgeline west of the Sycamore Landfill in Santee, and at Miramar Mounds. Another small colony occurs west of Rolling Ridge Road and immediately south of Proctor Valley Road near Chula Vista. Herbarium specimens include the north side of La Jolla Valley 2 miles north of Santa Maria Mountain, hills near the mouth of Mission Gorge, the west side of San Miguel Mountain, 0.75 mile west of Dehesa School, on the Silver Strand, the Alva R 4-S Ranch near Black Mountain Road, Rice Canyon in Chula Vista, east of Del Mar, and near Little Cedar Canyon on Otay Mountain. Other reports are from the Sweetwater River on the west side of San Miguel Mountain, and 0.5 mile east of the junction of South Poway Parkway and Community Road. CNDDDB reports are from about 0.5 mile south of Otay Valley Road and 0.75 mile east of Interstate 805 just north of Spring Canyon on, just east of Dennery Canyon 0.75 mile north of Highway 117, near Moody Canyon south of Otay Mesa Road, the western edge of Otay Mountain about 5 miles east southeast of Brown Field, west of La Media Road near the Mexican border, Sycamore Canyon 1/2 mile downstream from the confluence with Clark Canyon Creek, numerous locales in the vicinity of Johnson Canyon and the former Brown Field Bombing Range, north of Brown Field and south of Bird Ranch near the Chester Grade, at Salt Creek about 0.8 mile northwest of the Lower Otay Filtration Plant, the west side of Rock Mountain and 0.7 mile north of the Otay River, near the mouth of Wolf Canyon about 0.5 mile north of the Otay River, about 1 mile south of Otay Lakes Road between Little Cedar Canyon and Cedar Canyon on the flanks of Otay Mountain, 0.3 mile west of Little Cedar Canyon and 1.9 mile northwest of Doghouse Junction, near Minnewawa Truck Trail about 0.5 mile south of Otay Lakes Road, about 1 mile south of Highway 94 and west of Sycamore Canyon, 1.3 miles south of Otay Lakes Road and north of Sycamore Canyon, 1.5 miles south of Highway 94 and 1.1 miles west of Sycamore Canyon, 0.5 mile west of San Diego State University (where possibly extirpated), near the Sycamore Canyon Landfill on the ridgetops both east and west of Little Sycamore Canyon, 0.8 mile north of Mission Dam on the first ridge west of Spring Canyon and 1.2 miles east of Fortuna Mountain Peak, 0.2 mile east of Pomerado Road and 1.6 miles north of Poway Road, 0.5 mile east of Pomerado Road and 1.3 miles north of Poway Road, 0.5-0.6 mile east of Pomerado Road and 0.9 mile north of Poway Road, 1.2 miles north of Black Mountain road and 2.3 miles west of Highway 395, just north of Black Mountain Road and 1.7 miles west of Highway 395, 0.2 mile south of Black Mountain Road and 1.1 miles west of Highway 395, southeast of Black Mountain Road and 2 miles west of the 4-S Ranch, La Jolla Valley about 2.4 miles west of Interstate 15 on the 4-S Ranch, the west end of La Jolla Valley, northeast of the head of La Zanja Canyon and west of the San Diego Aqueduct, both one and 1.5 miles north of the Carlton Hills School near Santee, Sycamore Canyon adjacent to Camp Elliot 1.2 miles downstream from the confluence with Clark Canyon Creek, a ridge approximately 0.5 mile west of the Eucalyptus Hills, 1.5 miles northwest of Mother Miguel Mountain and 0.7 mile northeast of the eastern tip of Sweetwater Reservoir, 0.3-0.6 mile north northwest of San Miguel Mountain, 3.2 km south of Lake Hodges Dam, on Otay Mountain about 1.5 miles east northeast of Buschalaugh Cove on Lower Otay Lake; also at scattered locales in Proctor Valley including just east of Indian Rock Corral on the east side of Proctor Valley Road, from 0.5-1.0 mile north of the tip of Upper Otay Reservoir in the Jamul Mountains, 1.1 miles east of Proctor Valley Road in the Jamul Mountains, and 0.8 mile due north of the eastern tip of Lower Otay Reservoir. An isolated CNDDDB report is from the U.S. Naval Radio Station at Imperial Beach just east of the beach. Old biological survey reports note sites south of Artesian Road and north of Lusardi Creek near Camino Juan Arturo, in Poway near La Manda and Pomerado Roads, south of Weld Blvd. and east of Cumbre Place in El Cajon, and the north of the South Bay Freeway near Sweetwater Reservoir. A very large population occurs near San Miguel Mtn. east of the Auld Golf Course.

Eleven specimens are recorded for Baja California in the herbarium at the San Diego Natural History Museum; south to 32° 5' North where collected by Moran (SD 49681) on the south

side of Guadalupe Valley above the 67 km Highway marker. This dudleya was relatively common beneath shrubs on a mesa on the south side of Valle de las Palmas in Baja California, approximately 1.5 mile west of the Tecate/Ensenada Highway.

STATUS: Variegated Dudleya is severely declining in San Diego County due to urban expansion. The cryptic nature of this species except during spring and early summer makes focused botanical surveys in possible habitat suspect outside these seasons. Widespread grading on Otay Mesa has eliminated major populations and outlying colonies. The land rush to take advantage of federal tax benefits bestowed on industrial parks adjacent to the Mexican border is the primary stimulus for this habitat loss. Despite the number of historically reported locales, recent losses indicate that all substantial populations should be protected, and that significant portions of all smaller populations should be placed into biological open space. *Dudleya multicaulis* has linear shaped leaves not the oblanceolate to spoon-shaped leaves of Variegated Dudleya, leaves slightly versus strongly narrowed at the base, leaf base typically greater than 4mm wide versus generally less than 3mm, and petals fused 1-2mm versus 0.5-.1mm. Variegated Dudleya has yellow petals unlike the white petals of *Dudleya blochmaniae*; known hybrids have intermediate traits with cream-colored flowers.

STICKY DUDLEYA [*Dudleya viscida* (Wats.) Moran

- LISTING:** CNPS List 1B R-E-D Code 2-2-3
State/Fed. Status -- /Species of Concern CRASSULACEAE May-Jun.
Global Rank G2 State Rank S2.2
- DISTRIBUTION:** San Diego County, Riverside County, and Orange County
- HABITAT:** This conspicuous succulent perennial grows predominantly on very steep north-facing slopes. It is amenable to shade and mesic conditions. San Miguel-Exchequer rocky silt loams are utilized near Del Dios Highway and Blasingame loams are found in the northern Camp Pendleton sites. Typically, Sticky Dudleya is situated on exposed gabbroic rock, growing on very shallow soils or from cracks on vertical rock slabs. Possible Associates: *Saxifraga californica*, *Jepsonia parryi*, *Dudleya edulis*.
- KNOWN SITES:** A large population of well over 10,000 individuals was discovered in "Devil's Gorge", where Devil's Canyon and San Mateo Creek meet, in the northeastern corner of Camp Pendleton. Scattered populations occur on bluffs south of the San Luis Rey River in Oceanside near Lawrence Canyon and Riverside Drive. Of these populations, several have been impacted from a CalTrans project. A City of Oceanside project on Canyon Drive impacted another site nearby where substantial numbers were transplanted upslope. Still another population on Poplar Drive immediately to the east was reportedly displaced by development and was partially transplanted to nearby locales with only fair success. Herbivory was the central problem. Additional San Diego County sites are found on steep north-facing slopes near Ysidora on Camp Pendleton, at Aliso Canyon at Camp Pendleton, and nearby on south-facing slopes north of the Santa Margarita River. At this latter site plants grow atypically in the understory of sage scrub on level terrain. A CNDDDB report is from four miles northwest of Margarita Peak in Cole Spring Canyon. One report is on San Marcos Creek 0.5 mile west of Rancho Santa Fe Road. The southernmost population occurs on a secluded riparian creek 1 mile west of Lake Hodges and south of Del Dios Highway and the San Dieguito River. A population is found in scattered rocks on Escondido Creek south of Paint Mountain Road in an area difficult to access. Also reported by Roberts for Orange County in Upper Hot Springs and San Juan Canyon in the Santa Ana Mountains. An old biological survey report notes this plant along the Sitton Peak Truck Trail. A small population of several hundred plants was found in Lucas Canyon at the boundary fence of the Cleveland National Forest in Orange County. A CNDDDB report notes this plant in San Mateo Canyon about 0.2 mile north of Fisherman's Camp within the wilderness area for extreme southwestern Riverside County.

STATUS: Sticky Dudleya populations are slowly declining. Colonies south of the San Luis Rey River are not being adequately protected with dedicated biological open space and appropriate buffers. While an extended and very extensive group of sub-populations has now been documented in the San Mateo Wilderness Area, it is still recommended that the southern range of the population (*i.e.*, south of the San Luis Rey River) be protected. Dudleyas are notoriously variable, and genetic material from these southern populations at the edge of the range should be maintained. Rarity of the species is strongly correlated with paucity of exposed, volcanically derived soil/rock in the region. The stickiness of the leaves of this plant is variable: from extremely sticky to only mildly sticky at the leaf bases. The leaves are not as cylindrical as *Dudleya edulis* and the pink flowers quickly differentiate Sticky Dudleya from the white flowers of that species.

MUNZ'S HEDGEHOG CACTUS (*Echinocereus engelmannii* (Parry) Ruempler var. *munzii* Pierce & Fosb.]

LISTING: CNPS Unlisted R-E-D Code - None
State/Fed. Status -- None CACTACEAE Apr.-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County, and San Bernardino County; Baja California, Mexico

HABITAT: Chaparral and a xeric, open sage scrub are the preferred habitat at Vail Lake of this distinctive cactus with long, twisting central spines. The Vail Lake locale has the soil type mapped as Badlands. In the mountains of San Bernardino County Munz's Hedgehog Cactus is found in pebble plains and Pinyon/Juniper Woodland which are apparently more typical habitat for this species. Possible Associates: *Yucca schidigera*, *Adenostoma fasciculatum*, *Eriophyllum confertiflorum*.

KNOWN SITES: Herbarium specimens examined with twisted spines were from near a ridge east of Stonewall Peak, and 2.5 miles east of Jacumba. A small population was examined in full flower in mid-May east of Lake Cuyamaca and a mile northeast of the intersection of State Highway 79 and S-2. An historical, unverified report is from Chariot Canyon. An old biological survey report notes this cactus south of Highway S-22 and east of Grapevine Canyon near Ranchita. It grows in localized abundance in the open scrub immediately north of Vail Lake; as well as near Sage in western Riverside County. Munz's Hedgehog Cactus is reported in Riverside County in Garner Valley below Kenworthy, in Bear Valley; as well as being reported by Benson in the San Bernardino Mountains. CNDDDB reports show locales for San Bernardino County at Coxey Meadow 1.5 miles northeast of Dawn O'Day Canyon, a ridge south of Woodlands 0.6 mile southeast of the intersection of Willow Lane and Meadow Lane, the Johnston Grade 1 mile east of Doble, the north end of Baldwin Lake, the southeast slope of Gold Mountain 1 mile from the summit, Gold Hill south of Baldwin Lake, north of Yocum Spring 1.25 miles west of the Rose Mine, Erwin Lake, east of Johnston Grade approximately 0.5 mile south of Top Spring along Smarts Ranch Road, and in Little Pine Flat 0.3 mile northeast of Shay Spring.

Fifteen herbarium specimens of *Echinocereus engelmannii* from Baja California are found at the San Diego Natural History Museum (some of which may represent the Munz' Hedgehog Cactus), south to 28° 44' North where collected by Moran (SD 60503) on the west slope of Cerro Quemazon. Identification for determining subspecies status is uncertain with these specimens.

STATUS: The present taxonomic status of this cactus is uncertain; in the 1993 Jepson Manual no varieties of this hedgehog cactus are recognized. Given the variability exhibited in spination traits, this may be an appropriate decision; however, the typical low desert habitat of this cacti is dissimilar in many respects to the arid lands in interior western Riverside County such as around Vail Lake, and even more so into the more montane Garner Valley, where the Munz's Hedgehog Cactus is localized. Benson notes this variety is best identified by the betacyanin pigmentation of the flowers with a bluish cast to the red flowers, and by the four central spines

instead of one. Typically the spines are twisted. Rarity of this varietal form seems to be correlated with expansion of a wide-ranging desert species into foothill locations with different ecological requirements.

LAGUNA MOUNTAINS GOLDENBUSH [*Ericameria cuneata* (Gray) McClatchie var. *macrocephala* Urbatsch]

- LISTING:** None 1B R-E-D Code 2-1-3
State/Fed. Status -- None ASTERACEAE Sept.-Dec.
Global Rank G5T2? State Rank S2.3
- DISTRIBUTION:** San Diego County
- HABITAT:** This shrub grows clustered around rocky knolls in montane chaparral. Sheephead rocky fine sandy loams are mapped for the Garnet Peak site. Possible Associates: *Garrya flavescens*, *Chaenactis parishii*, *Monardella nana*.
- KNOWN SITES:** This localized form of a much wider ranging species has a greater number of disk flowers per head than the typical form. It grows on Garnet Peak near the summit; a herbarium specimen was examined from Desert View Point in the Laguna Mountains. A CNDDDB report is from east of Pine Valley along the Noble Canyon Trail 0.3 mile south of Noble Canyon and 0.6 mile east of Pine Valley Road.
- STATUS:** Laguna Mountains Goldenbush is apparently quite rare and has a very limited range. All populations should be protected. Further taxonomic work should be done to re-determine if this is a distinctive variety of the wider ranging *Ericameria spathulata* variety *spathulata*. The Laguna Mountains Goldenbush may represent a newly evolving variety now relatively isolated from a much broader ranging population. Disk flowers on Laguna Mountains Goldenbush number 36-70 versus 7-32 in *Ericameria cuneata* var. *cuneata*.

PALMER'S GOLDENBUSH [*Ericameria palmeri* (Gray) Hall ssp. *palmeri*]

- LISTING:** CNPS List 2 R-E-D Code 3-2-1
State/Fed. Status -- /Species of Concern ASTERACEAE Sep.-Nov.
Global Rank G4T2T3 State Rank S1.1
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** This sizeable shrub grows along coastal drainages, in mesic chaparral sites, or rarely in Diegan Coastal Sage Scrub. Occasionally it occurs as a hillside element (usually at higher elevations inland on north-facing slopes). Las Posas fine sandy loam is mapped for the riparian site at Jamacha Road, while the hillside locale near Sequan Indian Reservation is Vista coarse sandy loam. Seasonally wet/moist locales are strongly preferred. Possible Associates: *Baccharis salicifolia*, *Sambucus mexicana*, *Salix* species.
- KNOWN SITES:** A large population in watercourses along Jamacha Boulevard and Campo Road has been heavily degraded by road expansion at this intersection. It is difficult to account for the very narrow U.S. range and rarity of this species. Its range is currently on the edge of urban sprawl and this species could become extremely rare if not managed effectively. A small colony in a drainage at the east end of Rice Canyon may no longer be extant following development of the area. A dozen shrubs were found on a rock knoll southwest of the fire station near Peaceful Valley Ranch Road in Jamul, at a site proposed for an Indian gambling casino. Another small colony found in the hills near the Singing Hills Golf Course, east of Hillsdale Road, is also proposed for development. A report from the Otay River floodplain is north of Lindbergh Street. A second report is of a small population clustered at the base of a north facing slope of Carmel Valley east of Interstate 5 and an abandoned nursery site; this site was destroyed for a freeway in 1992, but a few shrubs may have survived. Palmer's *Ericameria* grows on a hillside east of the Sequan Gambling Casino. Additional reports are for the south side of

Highland Valley Road near Honey Springs Truck Trail, near Old Coach Road in Poway, and at the San Diego Wild Animal Park. CNDDDB reports are along Highway 94 0.8 mile west of the intersection with Tecate Road, and in Steele Canyon 0.1 mile south of Highway 94 and 0.3 mile east of the road to Jamacha near The Oaks School. Another CNDDDB report from northwest of Lakeview and 0.4 miles southeast of the junction of Los Cocheros Road and Julian Avenue needs to be confirmed.

Found south in Baja California to 30° 2' North where collected by Moran (SD 80344) near Aguajito. Twenty-one specimens are recorded for Baja California at the San Diego Natural History Museum's herbarium. A vigorous population was seen west of San Pablo alongside the highway east of Tecate, Mexico.

STATUS: Palmer's *Ericameria* is substantially declining at its few outposts in the United States; it is a "sleeper" species which may be extirpated in the U.S. before it's missed. The large Jamacha Road population was seriously impacted by road widening, and was part of a local mitigation effort. The success of this mitigation should be closely watched. All sites should be fully protected with adequate buffers. This shrub appears hardy and should be considered for native plantings in appropriate habitat. It is difficult to determine why the northern range of this species terminates in southern coastal/foothill San Diego County. Habitat differences for occupied habitat to the south, and similar unoccupied habitat northward of its range do not superficially appear to be substantial. The related *Ericameria palmeri* var. *pachylepis* occupies a very different and much more xeric habitat in southern Riverside County. *E. p.* var. *pachylepis* has leaves 5-15mm in length versus 20-40mm with Palmer's *Ericameria*. The latter is generally a much taller shrub. The barriers to continued movement northward for Palmer's *Ericameria* are not well understood. Additional field work in Baja California is recommended to clarify this issue.

SAN JACINTO BUCKWHEAT [*Eriogonum apiculatum* S. Watson]

LISTING: CNPS List None R-E-D Code None
State/Fed. Status -- None POLYGONACEAE Jul.-Aug.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County, San Bernardino County

HABITAT: Dry, open places in disintegrated granitic sand in Joshua Tree Woodland, Pinyon-Juniper Woodland, and Yellow Pine Forest are reportedly utilized by this annual. Possible Associates: *Nemacladus* species; more information needed.

KNOWN SITES: Reports from San Diego County are from Garnet Peak, Pinyon Mountain Valley, Deer Flat, Palomar Mountain, and the Cuyamaca Mountains. This species is reported from Joshua Tree National Monument, the Little San Bernardino Mountains, the San Jacinto Mountains, and the Santa Rosa Mountains.

STATUS: Little information is available on San Jacinto Buckwheat; its current status is unclear within its arid, montane habitat. This species is presumed to be rare in San Diego County; more information is needed. Provisionally, it is recommended that substantial portions of all San Diego County populations be protected. San Jacinto Buckwheat is an annual, with coarsely hairy/glandular and primarily basal leaves; as well as an unribbed involucre with glabrous white perianth. The outer perianth lobes are abruptly tridentate and soft pointed. Rarity of this species may be associated with distinctive and uncommon microhabitat requirements.

DESERT BUCKWHEAT [*Eriogonum deserticola* S. Watson]

LISTING: CNPS Unlisted R-E-D Code None

State/Fed. Status -- None

POLYGONACEAE Jun.-Dec.

Global Rank None State Rank None

DISTRIBUTION: San Diego County, Imperial County; southwestern Arizona; northwestern Sonora, Mexico
HABITAT: This small shrub is a conspicuous component of a few well developed Desert Dune systems such as near Glamis in Imperial County. Possible Associates: *Palafoxia arida*, *Helianthus niveus*, *Croton californicus*.

KNOWN SITES: Desert Buckwheat grows sporadically in the small dunes north of Octotillo Wells which are outside of the off-road vehicle park activity to the west. It is reported from Palo Verde. An old herbarium specimen collected by Edmund Jaeger lists Borrego as the site of collection. On the dunes of the Sand Hills near Glamis in Imperial County it is locally a dominant shrub. Herbarium specimens examined from Imperial County were from the north slope of Signal Mountain, three miles south of Kane Springs, the Algodones Dunes, the west side of the Salton Sea, twelve miles west of Grays Well, seventeen miles west of Yuma, twenty-three miles east of Brawley, and near Highway 80 two miles east of the junction with State Highway 98.

No collections from Baja are found at the herbarium of the San Diego Museum of Natural History. Potential habitat occurs on the periphery of Laguna Salada.

STATUS: This shrub is now stable within its limited San Diego County range, but has historically been impacted by an off-road vehicle park north of Ocotillo Wells. Large areas of the Algodones Dunes in Imperial County, which formerly held substantial populations of Desert Buckwheat, have been almost completely denuded of vegetation by a vast off-road vehicle park. Desert Buckwheat is considered slowly declining throughout its California range. Given the dearth of dune habitat available to it locally, all San Diego County populations are recommended for protection. Rarity of this species locally is strongly correlated with a dearth of available dune habitat. Desert Buckwheat is an erect-growing perennial shrub with ovate, densely tomentose leaves, solitary involucre (unlike *Eriogonum fasciculatum*), no definable main axis above the first node, and a hairy perianth.

LEAFY BUCKWHEAT [*Eriogonum foliosum* Wats.]

LISTING: CNPS List 1B

R-E-D Code 3-2-2

State/Fed. Status -- None

POLYGONACEAE Jul.-Oct.

Global Rank G3 State Rank SH

DISTRIBUTION: San Diego County, Riverside County, San Bernardino County; Baja California, Mexico
HABITAT: Lower Montane Coniferous Forest along with Pinyon Juniper Woodland are reported for this buckwheat. Associates: More information is needed.

KNOWN SITES: A herbarium specimen was examined from Pine Valley, 1/4 mile from Alpine Creek Road in San Diego County which was collected on September 2 in flower. Reveal, who has worked extensively with this genus, reports a site from near Warner's Hot Springs.

Nine voucher specimens from Baja California are found at the herbarium of the San Diego Natural History Museum; south to 31° 1' North where collected by Forsberg (SD 90916) at Concepcion in the San Pedro de Martir.

STATUS: Little information is available on Leafy Buckwheat; its current status is unclear within its montane habitat. This species is presumed to be extremely rare in San Diego County; more information is needed. The involucre is smaller, and the lobes of the involucre are much more triangulate and pronounced than in forms of *Eriogonum gracile*; moreover the lobes of the perianth are distinctively widened at the base in Leafy Buckwheat. Provisionally, it is recommended that all populations be protected due to the paucity of collection sites in the U.S. Leafy Buckwheat is one of a group of related species which are superficially similar and may

require microscopic examination to adequately identify. In addition, within this group variability is common among different populations of the same species; underscoring the need to carefully assess key traits. Presumed rarity of Leafy Buckwheat may, in part, be due to field misidentifications. Given the montane range; loss of habitat due to human impacts may not yet be a significant factor. While this may be a relictual montane species stranded at higher elevations following the end of wetter Pleistocene conditions, more site specific range information is needed before reasons for rarity can be properly understood.

SLENDER BUCKWHEAT [*Eriogonum gracile* Benth. var. *incultum* Rev.]

- LISTING:** CNPS Unlisted R-E-D Code None
 State/Fed. Status -- None POLYGONACEAE Jul.-Oct.
 Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Riverside County; Baja California, Mexico
- HABITAT:** Deep, sandy loams at open locales in the foothills and at lower montane elevations are apparently utilized by this annual buckwheat. Presumed Associates: *Eriogonum fasciculatum*, *Eriogonum thurberi*, *Eriastrum densifolium*.
- KNOWN SITES:** The type locality for variety *incultum* is along East Grade Road 1.6 miles southeast of Palomar Mountain near the junction with S-6. Elsewhere throughout the County are plants which are neither as strongly robust nor so distinctly glabrous, but which may be best placed with variety *incultum*. Herbarium specimens examined with sparsely pubescent stems were from Dulzura, Sweetwater, Chollas Valley, Campo, Potrero, six miles west of Jacumba, west of Lake Hodges, Cole Canyon, Foster, Oak Grove, La Puerta Valley, north of Fallbrook near the Santa Margarita River, and Echo Dell. More collection information is needed. A population with sparsely haired stems is found in the meadows of Green Valley south of the Cuyamaca Rancho State Park Ranger Station.
- STATUS:** Little information is available on Slender Buckwheat; its current status is unclear within its foothill/montane habitat. Provisionally, no recommendations for protection are given until additional taxonomic work further clarifies the status of this variety in relation to the common *Eriogonum gracile* var. *gracile*. *E. g. incultum* has a glabrous inflorescence and the base of the axis is thinly hairy to glabrous. These differences, by themselves, may not warrant varietal status, even though local populations may harbor relatively uniform traits associated with *E. g. incultum*. Very hairy-stemmed plants associated with "typical" variety *gracile* occur in the higher elevations of the Peninsular Range; as well as in various locations north of San Diego County. Plants with distinctly shedding, but otherwise very hairy stems occur at many locales, and may mimic *E. g. incultum* as these annuals slowly decompose and most large patches of tomentum are shed. Lightly hairy-stemmed annuals are also relatively widely dispersed in the foothills and interior coastal areas; some geographical correlation exists with a general cline towards less hairy plants at the lower elevations. At the extreme are plants which are relatively glabrous at the base of the inflorescence axis. As a result of this variation, taxonomists will have to more firmly differentiate variety *gracile* from variety *incultum*; hopefully this would include traits other than level of hairiness. Reveal's original description of variety *incultum* notes that his herbarium specimens do not fully differentiate between the two varieties.

TOWER BUCKWHEAT [*Eriogonum molestum* E. Greene]

- LISTING:** CNPS List None R-E-D Code None
 State/Fed. Status -- None POLYGONACEAE Jun.-Oct.
 Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Riverside County, San Bernardino County, Los Angeles County

- HABITAT:** Open areas of large-grained, granitic sand in Lower Montane Coniferous Forest are utilized by this species on Palomar Mountain. Soils here are mapped as Crouch coarse sandy loam. Possible Associates: *Gilia capitata* ssp. *abrotanifolia*. More information is needed.
- KNOWN SITES:** A small population of this robust annual occurs on Palomar Mountain near East Grade Road, a short distance east of the intersection with South Grade Road. This species is reported from northern areas of the Transverse Range, the San Bernardino Mountains, and the San Jacinto Mountains.
- STATUS:** Little information is available on Tower Buckwheat; its current status is unclear within its foothill/montane habitat. This species is presumed to be extremely rare in San Diego County; more information is needed. Provisionally, it is recommended that all populations be protected. It is differentiated from *E. davidsonii* by larger involucre (4-7mm versus 3-4mm), and a generally taller growth habit (40-100mm versus 5-40mm). In the field this plant looks distinctly taller and lankier than *E. davidsonii*. Not enough site specific habitat information is available to address causes for the rarity of this species.

LARGE-LEAVED FILAREE [*Erodium macrophyllum* H. & A.]

- LISTING:** CNPS List 2 R-E-D Code 2-3-1
State/Fed. Status -- None GERANIACEAE Mar.-May
Global Rank G4 State Rank S2.1
- DISTRIBUTION:** San Diego County, Riverside County, Los Angeles County, Alameda County, Contra Costa County, Colusa County, Fremont County, Glenn County, Kings County, Kern County, Merced County, Monterey County, San Benito County, Santa Cruz County, San Joaquin County, San Luis Obispo County, San Mateo County, Santa Cruz Island, Solano County, Sonoma County, Stanislaus County, Tehama County, Yolo County; Arizona; Utah; Baja California, Mexico
- HABITAT:** This annual typically grows in Valley and Foothill Grasslands in open habitat on friable clay soils. Possible Associates: *Convolvulus simulans*, *Acanthomintha ilicifolia*, *Microseris* species.
- KNOWN SITES:** In San Diego County this small herb grows on cracked clay soils on a mesa on the northern flanks of Otay Valley, east of Rock Mountain. This site was heavily disked a decade after first observation and this filaree may no longer be extant here. It is reported from near El Capitan Dam, and near an old cement factory quarry on the Jamul Ranch near the Otay Lakes. Boyd reports this species in western Riverside County to the south of Lake Mathews, as well as on the south flank of Alberhill Mountain. Raven reports this filaree from the western trail of Malibu State Park in Los Angeles County. Smith reports this filaree in the Santa Barbara region as scattered on grassy flats on serpentine on the west slopes of Figueroa Mountain, on a hillside east of Black Willow Spring near Montgomery potrero, and on Santa Cruz Island. Hoover reports this species as frequent on open hillsides in the interior of San Luis Obispo County on friable, calcareous or gypseous clay soils. Twisselmann reports Large-leaf Filaree as occasional in the Temblor Range, near Tehachapi, at Mexican Mine in the extreme southwestern Tehachapi Mountains along the northwest side of Antelope Valley, and at Dry Bog Knoll at the head of Adobe Canyon in the Greenhorn Mountains. Thomas reports this annual as rare in the Santa Cruz Mountains near Pescadero. Unpublished reports are by R. Burgess near the Reagan Library in Ventura County, by V. Yadon in Priest Valley, by D. Lake noting one occurrence in Contra Costa County and one in Alameda County, by D. Keil at one location in the Caliente Range, by S. Bainbridge in the Cievro Hills as well as south of Chalome in the Bittersweet Pass area, by J. Ruygt with one population of approximately fifty plants in Napa County and a second population of less than 100 plants in Lake County, and by E. Cypher who has observed it at one site in Kern County and a second site in San Benito County.

One herbarium specimen from Baja California is at the San Diego Museum of Natural History at 30° 42' North collected from Arroyo de la Escopeta by Moran (SD 91524). It was also observed growing on the periphery of the vernal pools at Valle de las Palmas.

STATUS: This small annual is extremely lightly distributed in central and northern California, and is very rare in southern California. An informal consensus of opinion (Year 2000, unpublished) among 17 botanists working regularly in central and northern California counties where this species was historically reported, found that most had either never seen this species or observed it only once or twice. Large-leaved Filaree is presumed to be declining in southern California due to loss of its friable clay microhabitat. It is very close to extirpation in San Diego County. All populations in southern California are recommended for protection. Oftentimes, the distinctive clay soils where this species can occur include other sensitive species such as *Convolvulus simulans*. The very crumbly clay soil is itself uncommon in the region, and this undoubtedly helps account for the similar rarity of several species restricted to this substrate. Rarity of Large-leaved Filaree appears to be due to a combination of factors that could include a dearth of undisturbed and distinctive clay soil type, overgrazing in grasslands underlain by these distinctive clay soils, long-term climatic conditions no longer favorable for this species, and general habitat loss from urban expansion. The broadly reniform, shallowly lobed leaves of this filaree do not look like the leaves of other members of this genus found in California.

SAN DIEGO BUTTON CELERY [*Eryngium aristulatum* Jeps. ssp. *parishii* (Coul. & Rose) Math. & Const.]

- LISTING:** CNPS List 1B R-E-D Code 2-3-2
State/Fed. Status -- CE/FE APIACEAE Apr.-Jun.
Global Rank G5T2 State Rank S2.1
- DISTRIBUTION:** Riverside County, San Diego County; Baja California, Mexico
- HABITAT:** Vernal Pools or mima mound areas with vernal moist conditions are the preferred habitat for San Diego Button Celery. Redding gravelly loams appear to provide optimal soils for the populations at Miramar Mounds. This species is more tolerant of peripheral vernal pool habitat than most obligate vernal pool species with which it sometimes grows. Possible Associates: *Pogogyne abramsii*, *Brodiaea orcuttii*, *Psilocarphus brevissimus*.
- KNOWN SITES:** This herbaceous biennial is usually restricted to vernal pools and has been radically depleted in numbers over the last two decades on Kearny Mesa. It is still locally common within some of the remaining pools. It grows in "J" series pools on Otay Mesa and near Wruck Canyon, but was extirpated from many locales in this region by unchecked grading and discing following a "land rush" to develop the mesa. Several colonies grow in scattered vernal pools in downtown San Marcos near Pacific Street. Nearby in the grasslands by the intersection of Las Posas Road and Linda Vista Drive are several vigorous colonies established in still intact vernal pools. It is found along the railroad tracks and in the adjacent field west of Interstate 5 and north of Poinsettia Lane despite regular discing; this area was somewhat disturbed by the recent construction of the Carlsbad Poinsettia Train Station. A small population grows in the mima mound area north of Roll Reservoir on Otay Mesa. Reports are from upper Proctor Valley at the R3 + pool and at the K5 pools south of Otay Lake; an older report is from 0.75 mile north of the Mission Valley Shopping Center. In southern Camp Pendleton several small populations occur at Wire Mountain in isolated vernal pools. CNDDDB reports largely reiterate in greater detail, the sites already mentioned. Many of these reports are, in fact, found on the peripheries of single large pool systems and are not truly separate locales; sites include in the Otay region approximately 0.75 mile south southeast of Alta School and southeast of Brown Field, on the former Brown Field Bombing Range 2.1 miles northeast of Alta School, 1.5 miles west of Brown Field, 0.5 mile south of Lower Otay Campground, north and east of Buschalaugh Cove on Lower Otay Reservoir, east of Brown Field and 1.9 miles east northeast of Alta School, west of Brown Field and southeast of Dennery Canyon, northwest of Brown Field 1 mile northwest of Benchmark 505, 0.5 mile southwest of the eastern end of Moody Canyon and

0.5 mile west of Dillon and Finger Canyons, southeast of Dillon and Finger canyons along the south rim of Spring Canyon, south of Wruck Canyon and southeast of Spring Canyon, the south rim of Otay Mesa 0.5 mile northeast of Interstate 805 junction with the border crossing, 0.5 mile west of Wruck Canyon, above Dennery Canyon along Highway 117, south of Moody Canyon; near 50th Street and Adams in east San Diego (where likely extirpated); in the northern City of San Diego region at numerous locales on Miramar Marine Air Station, northeast of Montgomery Field Airport between runways and the eastern perimeter fence, west of Highway 163 between San Clemente Canyon and Clairemont Mesa Boulevard, both northeast and northwest of the Clairemont Mesa Boulevard and Highway 163 cloverleaf, southeast of the junction of Clairemont Mesa Boulevard and Highway 163, the vicinity of Highway 163 and Kearney Villa Road, north of Miramar Road and 0.5-1.0 mile east of Interstate 805, one mile south of the Mesquite benchmark east of Interstate 805 and north of Los Peñasquitos Canyon, northeast of the junction of Interstate 5 and Interstate 805, a mesa at the head of Deer Canyon north of Peñasquitos Canyon as well as a mesa between Peñasquitos and Deer Canyons, Lopez Ridge on the south side of Peñasquitos Canyon, Mira Mesa at the north end of Camino Ruiz, Mira Mesa east of Montongo Street and north of Swansea Place, north and south of Mira Mesa Boulevard (mapped as Pool Groups C9-C16), on both the south and north rims of Carroll Canyon, north of the junction of Carroll Canyon and Miramar Roads; also in the San Marcos region 0.25 mile southwest of Palomar College across Mission Road, 1 mile north of San Marcos near Twin Oaks Valley Road; in Chollas Park south of the Chollas reservoir spillway north of Ryan Road, and at the Chollas Heights Naval Radio Station on the north side of Zero Road. A large population still occurs in isolated vernal pools several hundred yards north of Lone Star Road and east of Brown Field, on northernmost Otay Mesa. CNDDDB information for Riverside County notes sites on the Santa Rosa Plateau at Pools C1, C3, and C4 on Mesa de Colorado, and 0.1 mile northeast of the largest vernal pool on Mesa de Colorado, as well as Pools B1-B3, B6, B8 on Mesa de Burro.

Eleven specimens are found from Baja at the San Diego Herbarium; south to 30° 28½' North where collected by Moran (SD 100923) north of Ejido Papalote.

STATUS: San Diego Button Celery is slowly declining with continued losses despite its Federally Endangered status. The number of known sites listed above is misleading; many of these locations were previously contiguous and now are remnant, peripheral colonies of once much larger populations. It is presumed that most U.S. sites for this species have been discovered. All populations should be fully protected with adequate buffers. The herbaceous bright green, young leaves of this species sometimes protrude from the shallow rain-filled vernal pool basins in spring; later in the drier flowering season the plant looks quite different and the spiny-ness of the plant is quite apparent.

CAMP PENDLETON BUTTON CELERY [*Eryngium pendletonensis* Marsden and Simpson]

LISTING:	CNPS List 1B State/Fed. Status -- None Global Rank G1 State Rank S1.1	R-E-D Code 3-3-3 APIACEAE Apr.-Jun.
DISTRIBUTION:	San Diego County	
HABITAT:	This population of button celery occurs in non-native grasslands in Huerhuero loams near ocean bluffs at Camp Pendleton. While <i>E. parishii</i> var. <i>aristulatum</i> does grow nearby on the east side of the freeway in vernal pools, this species occupies vernal moist grasslands near the beach bluffs. Camp Pendleton Button Celery, an herbaceous perennial, sometimes grows on minor slopes which would be extremely unusual for <i>E. p.</i> var. <i>aristulatum</i> . Observed pollinators include small beetles, native bees and wasps, as well as flies. Possible Associates: <i>Grindelia camporum</i> , <i>Lasthenia californica</i> , <i>Dudleya blochmaniae</i> var. <i>blochmaniae</i> .	

KNOWN SITES: Several thousand of these robust plants occur at Camp Pendleton on the grassland/beach bluffs north and immediately south of Cacklebur Creek; northward to Las Flores Creek and the lagoon. This still extensive habitat is primarily established within a corridor extending several hundred yards back from the beach bluffs, with many plants growing in dense patches in open grassland. Presumably, the occasional fogs create moist seasonal conditions for this population of *Eryngium*. A slightly disjunct population to the north at San Onofre State Park was reported in 2001.

STATUS: Camp Pendleton Button Celery should be fully protected. An extended mesa east of the sea bluffs to the foot of the San Onofre Mountains was once used for agricultural purposes prior to military designation and may have historically supported this species. Huerhuero loams occurred in some of these areas; however, it is unknown if Camp Pendleton Button Celery was well established here. Camp Pendleton Button Celery may represent a relictual species close to extinction; or conversely, it may be a relatively newly evolving and isolated phenomena. It is differentiated from other species in *Eryngium* section *Armata* by having a combination of broad flower bracts with thickened margins, pinnately divided leaves (*E. armatum* has unlobed leaves), and short, central primary stem axes (1-6 cm). Related *Eryngium pinnatisectum* from the Sierra foothills has a longer primary axis (7-32 cm), and silvery not greenish leaves. *Eryngium aristulatum* has narrow bracts with occasional spines.

SANDSTONE WALLFLOWER [*Erysimum capitatum* (Douglas)Greene "coastal San Diego County form"]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None BRASSICACEAE Feb.-Jun.
Global Rank None State Rank None

DISTRIBUTION: San Diego County

HABITAT: Old eroded dunes now well back from the existing beachline, and sandy locales in chaparral openings are utilized by the Sandstone Wallflower. Corralitos loamy sand is the soil type mapped for the coastal form of wallflowers at Torrey Pines State Park; Olivenhain cobbly loam is marked for Camp Pendleton. The very sandy substrate seems to be a prerequisite for this biennial species. Possible Associates: *Yucca schidigera*, *Corethrogyne filaginifolia* var. *linifolia*, *Lastarriaea coriacea*.

KNOWN SITES: A substantial population of wallflower grows on an ancient, raised sand dune at Wire Mountain on Camp Pendleton, and in similar terrain south of Mass 3 Road. Several plants noted growing at Torrey Pines State Reserve near a footpath may no longer be extant; however, a healthy population was found east of Torrey Pines Road near the marsh. A vigorous colony is located on the steep north-facing slopes of Carmel Valley just east of Interstate 5; as well as on a nearby, isolated knoll immediately west of the freeway. Two plants were seen on a southwest-facing slope just west of I-5 and north of Manchester Road in Encinitas, a few were found north of Sky Loft Road in Encinitas, and several were found in dense chaparral south of Del Mar Heights Road and east of El Camino Real in the proposed Carmel Valley Community Park. A substantial population occurs immediately west of I-15 on a knoll overlooking Penasquitos Lagoon. Old reports from near Collier Park and at nearby Sunset Cliffs are likely from colonies no longer extant. An old biological survey report notes a site north of Via de la Valle near Andres Drive.

STATUS: San Diego County populations may represent the widely ranging and quite variable *Erysimum capitatum* ssp. *capitatum*, or a distinct subspecies not yet described. The coastal form of wallflower in San Diego County is close to extirpation; it may only survive at the handful of sites listed. Coastal sites should be protected with adequate buffers until convincing taxonomic work is completed on San Diego County plants. The montane soils of typical *Erysimum capitatum* in San Diego are quite different from the sandstones occupied by the coast populations of wallflowers, with no geographically intermediate populations of wallflowers

found in the County. However, *Penstemon centranthifolius*, another montane species, also occurs at the Wire Mountain site. Additional taxonomic work is also recommended in this notoriously variable genus, to further assess the Sandstone Wallflower as it relates to the *Erysimum capitatum* complex. Examination of herbarium specimens of *E. ammophilum* (as it occurs in Santa Cruz County and on the coastal islands), a species to which the local populations were formerly attributed, indicates the San Diego plants have differently shaped fruiting siliques. A report of *Erysimum insulare* ssp. *suffrutescens* from coastal dunes in San Diego County may belong here. This is a woody, shrubbier much-branched perennial which is not known south of Los Angeles County. A form of wallflower with very broad main stems is occasionally found on the high desert near Tierra del Sol, indicating that additional taxonomic work is warranted throughout the County range of *Erysimum capitatum*.

ROCK NETTLE [*Eucnide rupestris* (Baill.) Thompson & Ernst]

- LISTING:** CNPS List 2 R-E-D Code 3-2-1
 State/Fed. Status -- None LOASACEAE Dec.-Apr.
 Global Rank G3 State Rank S2.2?
- DISTRIBUTION:** San Diego County, Imperial County; Arizona; Baja California, Mexico
- HABITAT:** Sonoran Desert Scrub in rock or talus is the preferred habitat. Acid Igneous rock land is mapped for the Indian Gorge site. Possible Associates: *Mohavea confertiflora*, *Mimulus bigelovii*, *Salvia columbariae*.
- KNOWN SITES:** This robust annual grows in rocky rubble at Indian Gorge; the only known location for San Diego County. An Imperial County collection is from Painted Gorge east of Ocotillo. An old biological survey report notes sites on the eastern slope of Carrizo Mountain, as well as near Mount Signal, Davies Valley, and Fossil Canyon. Shreve and Wiggins report this robust annual from near Coyote Wells in Imperial County, south to San Pablo in Baja California, and in the Pinacate Mountains of northwestern Sonora. A herbarium specimen was examined from Rancho Bonito in the La Abra Valley of Pima County, Arizona.

Twenty-five herbarium specimens from Baja California are found at the San Diego Natural History Museum, south to 27° 15' North where collected by Moran (SD 66277) on San Marcos Island. Other specimens are from Tiburon Island and San Esteban Island.

- STATUS:** Little information is available on the Rock Nettle; it is presumed stable in its as yet rarely developed desert habitat. The Indian Gorge locale in San Diego County is not threatened; more information is needed on similar rocky terrain in this region for possibly undiscovered populations. All populations should be protected. This very distinctive plant with conspicuous, shiny, yellow-green leaves and unusual greenish flowers is not likely to be missed by a knowledgeable botanist; and the rarity of this species on the western deserts should be presumed. San Diego County is at the extreme northwestern periphery of its range, and conditions may not be favorable for this species locally under current climatic conditions.

CLIFF SPURGE [*Euphorbia misera* Benth.]

- LISTING:** CNPS List 2 R-E-D Code 2-2-1
 State/Fed. Status -- None EUPHORBIACEAE Jan.-Aug.
 Global Rank G5 State Rank S3.2
- DISTRIBUTION:** San Diego County, Orange County, Riverside County, San Clemente Island; Baja California, Mexico
- HABITAT:** A Maritime Sage Scrub with a high incidence of cactus is typical of the preferred habitat for Cliff Spurge. Usually the scrub is quite low-growing and windswept near the beach; movement throughout this habitat is not difficult. Olivenhain cobbly loam is utilized on Otay Mesa;

Gaviota fine sandy loam is found at Point Loma. Possible Associates: *Mammillaria dioica*, *Ferocactus viridescens*, *Amblyopappus pusillus*.

KNOWN SITES: Extensive populations are found at the Naval Subbase and Cabrillo National Monument on Point Loma. It is well distributed in the maritime sage scrub near Gatchell Road. An excellent stand grows on south-facing slopes of Dillon Canyon on Otay Mesa; as well as in Spring Canyon to the east of Bolton Hall Road near San Ysidro. This low-growing shrub is also found on the west-facing slopes of Spooner's Mesa near the Mexican border, and near Dennery Canyon on the north-facing slope of Otay Mesa. An old report, where possibly no longer extant, is on a hillside overlooking a slough at Carlsbad; another report is on the north side of Agua Hedionda Lagoon. Old biological survey reports note sites in Moody Canyon on Otay Mesa, west of the Salk Institute in La Jolla; as well as north of the San Dieguito River and south of Via de la Valle on a bluff overlooking the Fairbanks County Club. This shrub is being planted at the California Terraces Mitigation Project on Otay Mesa. Another old report is from Jaeger's book on the Colorado Desert; referencing a desert site near the historic boundary of Pleistocene Lake Cahuilla. Cliff Spurge is localized on the bluffs at the headlands on Dana Point in Orange County. Roberts reports two small Orange County populations on beach bluffs in Corona Del Mar. It is also reported on the sea bluffs at San Clemente Island.

Seventy-seven herbarium specimens from Baja California are found at the San Diego Natural History Museum south to 27° 29' North where collected by Moran (SD 115893), west of Volcan tres Virgenes; also on islands to the south. It is locally common in Baja California on ocean bluffs from Rosarito Beach south to the Ensenada region, as at La Fonda and Baja Del Mar, and is widespread on Punta Banda.

STATUS: Cliff Spurge populations in the United States are continuing to decline with impacts to isolated populations on Otay Mesa. Widespread development during the last decade on Otay Mesa, continues to escalate following rezoning of the area as a bi-national business hub. This development is expected to continue to impact canyon populations. Future expansion of the Naval Subbase at Point Loma could also impact the local population. It is presumed that most United States populations of Cliff Spurge have already been discovered; as such, it is recommended that all remaining populations be protected. This species is available in the horticultural trade and can be utilized in protected plantings near the coast. Rarity of the species is strongly correlated with loss of habitat to urbanization along the immediate southwestern coastline, in concert with the dearth of potentially suitable beach-fronting canyonlands habitat from Torrey Pines State Park northward to the Orange County line. Much of the habitat immediately behind the beach bluffs in the north County consists of ancient uplifted sea terraces on mildly sloping mesas with soils perhaps not suitable for this species. Cliff Spurge is a somewhat spiny, low-growing shrub with brittle branches that exude a white, latex-like material when broken. The stalked flowers and spheric fruits are typical of the spurges and should readily identify this species to Family.

CALIFORNIA BARREL CACTUS [*Ferocactus cylindraceus* (Engelm.) Orc. var. *cylindraceus*]

LISTING: Unlisted R-E-D Code - None
State/Fed. Status -- None CACTACEAE Apr.-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Inyo County, Imperial County, San Bernardino County, and Riverside County; Arizona; Baja California and Sonora, Mexico

HABITAT: Sonoran Desert Scrub and Mojavean Desert Scrub are the general habitat of the California Barrel Cactus. While this cacti will grow on sandy alluvial plains, it also utilizes slopes and Acid Igneous rock lands. Benson differentiates between variety *lecontei* with a central spine 2-3 inches in length, and variety *acanthodes* with a central spine 3-6 inches in length. The former grows at higher elevations (i.e., 2,500-5,000 feet), while the latter usually inhabits the

200-1500 foot elevational range. Possible Associates: *Opuntia bigelovii*, *Opuntia echinocarpa*, *Fouquieria splendens*.

KNOWN SITES: California Barrel Cactus is common and widely distributed on the western fringe of the Colorado Desert. Densities are greatest on the rocky eastern slopes at the base of the Laguna Mountains, such as at Box Canyon. It is scattered from Mountain Springs Grade northward along Highway S-2 to the San Felipe Valley. It was observed on the western side of the Indio Hills near Monroe Street in Riverside County. Benson reports variety *acanthodes* from the New York and Whipple Mountains of San Bernardino County, occasional in the deserts of Riverside County, in the Chocolate Mountains of Imperial County, and in Arizona near the lower Gila River. Reported by Thorne for the eastern Mohave at Cedar Canyon; also by Shreve and Wiggins for Yuma County in Arizona and northwestern Sonora.

Sixteen species of California Barrel Cactus are found at the herbarium for the San Diego Natural History Museum south to 30° 44' North where collected by Moran (SD 91580) 4 miles southwest of San Isodoro.

STATUS: Recently delisted by CNPS, this cactus is locally abundant in the arid, low desert foothills. Loss of mature specimens to "cactus thieves," while of concern, is not considered a valid rationale for listing. This cactus species has longer central spines (>5cm versus <5cm) than its smaller coastal counterpart: *Ferocactus viridescens*.

SAN DIEGO BARREL CACTUS [*Ferocactus viridescens* (T. & G.) Britton & Rose]

LISTING: CNPS List 2 R-E-D Code 1-3-1
State/Fed. Status -- /Species of Concern CACTACEAE May-Jun.
Global Rank G4 State Rank S3.1

DISTRIBUTION: Coastal San Diego County; Baja California, Mexico

HABITAT: The optimal habitat for this cactus appears to be Diegan Coastal Sage Scrub hillsides; often at the crest of slopes and growing among cobbles. It occasionally is found on the periphery of vernal pools and mima mound topography at Otay Mesa, sometimes in considerable numbers. This presumably more mesic habitat (Stockpen gravelly clay loams) is unlike the very xeric situations where it is typically found. This barrel cactus utilizes a number of other soil types such as San Miguel-Exchequer rocky silt loams and Redding gravelly loams. Possible Associates: *Dudleya variegata*, *Nasella lepida*, *Artemisia californica*.

KNOWN SITES: San Diego Barrel Cactus occurs at numerous locales throughout the coastal region. Its highest densities are found on Otay Mesa with particularly large populations northeast of Brown Field and at the east end of Wruck Canyon. Other sites with vigorous populations include the Naval Subbase at Point Loma, Miramar Airfield lands, the east end of Otay Valley, and the flanks of Mother Miguel Mountain east of Bonita. Isolated plants grow in canyons on Otay Mountain. It is readily found in the Tijuana Hills and Torrey Pines State Park. San Diego Barrel Cactus becomes increasingly rare as one travels northward; a small colony is found on a north-facing slope near the mouth of the San Luis Rey River. Moving inland, populations also dwindle with most sites north of Interstate 8 occurring west of Interstate 15; isolated colonies occur east of here in the hills south of Poway, south to Mission Trails Regional Park; as well as in Santee on the ridgeline west of the Sycamore Landfill. Locales with over 100 individuals should be considered major sites. One eastern location is near the summit of an isolated hill with water tank adjacent to the San Diego River in Santee east of Hinsdale Street. Limited populations have been observed at sites near Clemson Drive on Mount Soledad, on the south-facing slopes of Poggi Canyon, in the sage scrub north of Otay Lakes, at scattered locales on the erosive northern slopes of the Penasquitos Canyon Preserve, near Tim Street in Bonita, east of Westview Drive in eastern Chula Vista, south of El Sentido near Rancho Santa Fe Farms, on the south-facing slopes of Rock Mountain in Otay Valley, east of the Upper Reservoir on Otay

Mesa, near Lynndale Lane east of Interstate 805 in Chula Vista, near Lake Murray Dam, on the southwest flanks of Black Mountain near Rancho Penasquitos, east of Interstate 15 near Mercy Road, near the southern terminus of Dillon Road on Otay Mesa, on the southern boundary of the Miramar landfill in San Clemente Canyon, north of Ocean Cove Drive in Encinitas, near the junction of Miramar Road and Interstate 805, near El Nido Road in Rancho Santa Fe, in Lux Canyon in Encinitas, in the canyonlands east of Lundquist Drive in Encinitas, on a knoll west of the cul-de-sac of La Bella in Olivenhain, close to Gatchell Road on the southern tip of Point Loma, on Dictionary Hill in Spring Valley near Grand Street, in La Zanja Canyon, and on the north-facing bluffs overlooking the Otay River near Bayer Boulevard. Old biological survey reports note sites below the Sweetwater Dam, in Carroll Canyon south of El Camino Memorial Park, at Yale Avenue near Lemon Grove west of Highway 94, on Peñasquitos Ranch east of Del Mar Mesa, south of Artesian Road and north of Lusardi Creek near Camino Juan Arturo, in Telegraph Canyon, near La Manda and Pomerado Road in Poway, west of Pomerado Road and north of the State Highway S-6 right-of-way, at the terminus of Adams Avenue overlooking Mission Valley, southwest of Sienna Canyon Drive in Encinitas, west of Olivenhain Cemetery, north of the San Dieguito River near Las Colinas Road, between La Glorieta Road and Rancho Santa Fe Road, near El Apajo Road just south and beyond the Rancho San Dieguito Boundary, in the hills south of San Dieguito Road and the Fairbanks Ranch Golf Course, at the northeastern corner of the El Camino Memorial Park, 0.5 mile north of La Zanja Canyon and 1 mile east of the San Dieguito Valley on Fairbanks Ranch, north of Via de La Valle near Andres Drive, south of Del Mar Heights Road and east of El Camino Real in North City West, on the Scripps Ranch near Miramar Reservoir, near Traubert Ranch Road in Encinitas, and in Moody Canyon on Otay Mesa. Numerous CNDDDB reports note sites on the south slopes of Long Canyon near Bonita, east of Sycamore Canyon and south of Clark Canyon 3 miles southwest of San Vicente Reservoir, 1 mile west of San Diego State University northwest of Fairmont Drive and Montezuma Road and southwest of Yerba Santa Park, one mile north of Carlton Hills and 1.7 miles northwest of Santana High, on a mesa north of Shepherd Canyon and the north end of Santo Road, in Oak Canyon 0.5 mile north of Old Mission Dam, the ridge on the east side of Tecolote Canyon in Linda Vista just west of Goodwin Street, Mission Hills, just east of the Easter Cross on Soledad Mountain, a ridge east of Pomerado Road between Vaughan Drive and Shallman Drive 1.5 miles north of Poway Road, 0.5 mile south/southeast of the junction of Poway Road and Pomerado Road, numerous locales southeast of Valley School in Poway, several locales southwest of Garden Road School in Poway, 0.25 mile west of Interstate 805 and 0.25 mile north of Eastgate Mall Road, a bluff between Del Mar and Torrey Pines Park, the east face of Soledad Canyon 0.5 mile south of Los Peñasquitos Canyon, on Spooners Mesa in the Tijuana Hills, 2.4 miles south of Del Dios south of Lake Hodges, north side of Black Mountain Road 1.7 miles west of Junction of Highway 395, several locales on the 4-S Ranch south of Black Mountain Road and west of Rancho Bernardo, several locales near the confluence of San Dieguito River and Lusardi Creek east of Rancho Santa Fe, the upper part of Little Sycamore Canyon near the County landfill, the south side of Otay Valley east of Interstate 805, north and south sides of San Clemente Canyon east of Interstate 805, various locales in Rice Canyon in Chula Vista, La Mesa on the northwest side of Fletcher Parkway and Amaya Drive, Kuebler Ranch on eastern Otay Mesa and east onto Otay Mountain, southeast of Lower Otay Reservoir, east of Rancho Los Peñasquitos Golf Course, south of Mira Mesa and south of Carroll Canyon west of Arjons Drive, east of Del Mar Heights 0.33 mile east of El Camino Real, near the intersection of Del Mar Heights Road and Dunham Way, a hillside east of Jamacha Boulevard north of the junction with Spring Glen Lane, north of Fletcher Parkway and east of Fanita Drive near La Mesa, east of the northernmost of the Santee Lakes, west of Chester Grade on Otay Mesa, at the end of Lymbrooken Lane south of Prospect Avenue in Santee, on a south-facing bank of Chollas Creek near Fairmont Avenue, various locales in and near Sycamore Canyon/Oak Canyon/Spring Canyon/San Clemente Canyon on Miramar Marine Air Station, northeast of the junction of Friars Road and Interstate 15, near Kearney Villa Road and Interstate 15, near Interstate 15 and Clairemont Mesa Boulevard, Lopez Ridge 1 mile north of Mira Mesa Boulevard, Gonzales Canyon on the east side of old El Camino Real Road near

Derby Downs Road, Wolf Canyon near Otay Valley, Salt Creek near Otay Valley, east of Buschalaugh Cove on Lower Otay Reservoir and locales near the dam, northwest of the intersection of Fury Lane and Sundown Lane in the El Cajon area, Chollas Heights Naval Radio Station, scattered locales in Proctor Valley, several locales near Upper Otay Reservoir, various locales east of the Eucalyptus Hills on the Fanita Ranch, north of Carlton Hills near Santee, and numerous locales in the Black Mountain Ranch area near the intersection of McGonigle Canyon Road and Black Mountain Road.

Twelve specimens are found in the San Diego Herbarium from Baja California; collected as far south as 30° North near Punta San Telmo by Moran (SD 59047). Limited Baja collections may reflect the difficulties in preparing herbarium specimens of this barrel cactus. It is locally common on the north coast of Baja California and occasionally inland such as in the hills overlooking Rodriguez Dam east of Tijuana, and about the vernal pool complex north of Cerro Bola near Valle de las Palmas. This barrel cactus regularly occurs in beach bluff sage scrub dominated by *Bergerocactus emoryi* such as found in the volcanic hills north of La Fonda, or on hillsides dominated by *Viguiera laciniata* such as at Baja Del Mar.

STATUS: San Diego Barrel Cactus is declining, but still grows at many locales. Once very common along the coast, many small and mid-sized populations are routinely being impacted by grading for urban development. Particularly hard hit are the once vigorous colonies on Otay Mesa. Substantial portions of all sizeable populations should be protected. While this species seems to be popular in the media because of its distinctive form, photographic charm, and dangerous spines -- aggressive public effort to protect small isolated populations is questionable. There are more sensitive plant species within the same plant association being virtually ignored, while the public becomes enamored with protecting this more common, fashionably high profile species. San Diego Barrel Cactus was once abundant in south coastal San Diego County and shows up in historical photos at many locations where the urban core of San Diego is now constructed (*e.g.*, the hillsides near the Laurel Street Bridge in Balboa Park). Current rarity is a direct result of urban expansion. This cactus species has shorter central spines (<5cm versus >5cm) than its larger desert counterpart: *Ferocactus cylindraceus*.

PALMER'S FRANKENIA [*Frankenia palmeri* Wats.]

LISTING: CNPS List 2
State/Fed. Status -- None
Global Rank G3G4 State Rank S1.1
R-E-D Code 3-3-1
FRANKENIACEAE May-Jul.

DISTRIBUTION: Coastal San Diego County; Baja California and Sonora, Mexico

HABITAT: This low-growing shrub occurs on the periphery of Salt Marsh. Generally, peripheral salt marsh habitat has been developed in San Diego County, with urban growth typically extending up to the very edge of the tidally inundated marshlands. At Gunpowder Point the Palmer's Frankenia grows on distinctive mounds that rise above the surrounding terrain; soils here are mapped as Huerhuero loam. Possible Associates: *Salicornia subterminalis*, *Suaeda esteroa*, *Distichlis spicata*.

KNOWN SITES: The only known extant native U.S. population occurs in Chula Vista at Gunpowder Point in the Sweetwater Salt Marsh where two small colonies survive. One old report where possibly still extant is the bay side of the southern Silver Strand. Another old 1902 report is from the Tijuana River Estuary. This species has been utilized in the last decade in horticultural plantings at several public gardens near the coast including along the causeway at Gunpowder Point and near the parking lot at the Tijuana Estuary Natural Preserve Visitor Center. Reported by Felger for Tiburon Island in the Gulf of California.

Forty-three collections of this species from Baja California are found at the San Diego Natural History Museum's herbarium; south to 26° 45' North where collected by Moran (SD 92359) along the coast. It is also found in mainland Mexico on the west coast of Sonora.

STATUS: Palmer's *Frankenia* is close to extirpation in the United States. Seedlings from the Sweetwater site should continue to be propagated and planted at secure locales around San Diego Bay. One horticultural planting was noted at the Tijuana River National Wildlife Refuge headquarters in Imperial Beach. Another planting is along the causeway leading to the Chula Vista Nature Interpretive Center at Gunpowder Point, not far from the native occurrence. All naturally occurring populations should be protected. Given the herbarium information, this species is clearly well distributed in salt marsh habitat in Baja California; rarity is a matter of political boundaries. It is unknown what specific microhabitat factors historically discouraged this species from ranging into salt marshes farther northward, where tidal waters are generally cooler, average air temperatures are colder, and summer rainfall is reduced. Unlike the locally common *Frankenia salina*, Palmer's *Frankenia* has smaller leaves (2-7mm versus 4-15mm), white flowers versus predominantly pink flowers, and leaf surfaces tightly rolled under versus mildly rolled under.

CHAPARRAL ASH [*Fraxinus trifoliata* (Torr.) Lewis & Epling -- synonym *Fraxinus jonesii* Lingel.]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None OLEACEAE Apr.-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: This tall shrub/small tree grows in arid, relatively open chaparral in northern Baja California. Possible Associates: *Adenostoma fasciculatum*, *Rhamnus ilicifolia*, *Heteromeles arbutifolia*.

KNOWN SITES: The only known native U.S. population grows on a chaparral hillside near Lee Valley Road, not far from the intersection with Skyline Truck Trail.

Fifty-nine herbarium specimens from Baja California are found at the San Diego Natural History Museum south to 30° 5' North where collected by Thompson (SD 115457), twenty-two miles east of El Rosario along Mexico's Highway 1. This species is locally common in the arid hills south of Tecate along the road to Ensenada.

STATUS: Chaparral Ash is only known from one disjunct U.S. population; all California sites should be protected. Given the herbarium information, this species is clearly well distributed in chaparral habitat in northern Baja California; rarity is a matter of political boundaries. It is unknown what microhabitat factors historically discouraged this species from ranging into chaparral farther northward. A closely related species, *Fraxinus dipetala*, occurs in less xeric chaparral habitat north of San Diego County. Unlike Chaparral Ash it has 5-7 leaflets not 1-3.

MEXICAN FLANNELBUSH [*Fremontodendron mexicanum* A Davids.]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- CR/FE STERCULIACEAE Mar.-Jun.
Global Rank G3? State Rank S2.1

DISTRIBUTION: San Diego County, Baja California

HABITAT: Closed Cone Coniferous Forest and Southern Mixed Chaparral are the Otay Mountain habitats adjacent to the flannelbush sites. Soils here are mapped as San Miguel-Exchequer rocky silt loams; however, it should be noted that this large bush usually occurs in alluvium on the periphery of Cedar Creek. Possible Associates: *Cupressus forbesii*, *Arctostaphylos otayensis*, *Lepechinia ganderi*.

KNOWN SITES: A limited population of mature shrubs grows along Cedar Creek on Otay Mountain. It may occur in other watercourses nearby not already noted by previous botanists; however, the entire known U.S. population is now restricted to Otay Mountain. Two very old collections from 1878 and 1894 at Proctor Valley have not been relocated. In addition, there is an 1875 collection labeled "Monument" which probably refers to a site in the hills east of Border Field; this also has not been relocated. Scattered reports well north of San Diego County probably represent planted specimen shrubs readily available in the nursery trade for many years, misidentifications, or horticultural hybrids.

A population from the vicinity of Arroyo Seco north of SanQuentin was previously reported from Baja California. This historical site was reportedly washed out by a substantial flood, and it may be extirpated at this locale. Recently a second native Baja site was discovered by botanist Dylan Hannon of Rancho Santa Ana Botanic Garden.

STATUS: Mexican Flannelbush is declining and possibly approaching extinction. All populations should be fully protected with adequate buffers. This species appears to be relictual and possibly poorly adapted to current climatic conditions. Its canyonlands habitat on Otay Mountain is quite unusual for the region, and to some extent may reflect a coastal coniferous forest influence from a bygone era. Flannelbush reproduces both sexually and asexually (sprouting from a lignotuber when the crown is injured). The closely related *Fremontodendron californicum* (sepal pits with silky hairs versus glabrous; stipules 2mm versus 4-4.5mm) is an abundant seed producer under climax chaparral conditions, but has displayed very low germination levels under laboratory trials. Optimal conditions for germination may be seldom encountered.

CHOCOLATE LILY [*Fritillaria biflora* Lindl. var. *biflora*]

LISTING: Unlisted R-E-D Code - None
State/Fed. Status -- None LILIACEAE Feb.-Jun.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County, Orange County, Los Angeles County, Ventura County, Santa Barbara County, San Luis Obispo County, Fresno County, Mendocino County, Monterey County, Napa County, San Benito County, Santa Clara County, Santa Cruz County, San Mateo County; Baja California, Mexico

HABITAT: This showy lily grows in mesic openings in sage scrub, chaparral, and perennial grasslands; sometimes in conjunction with clay substrates. At Otay Mesa it occurs in Olivenhain cobbly loam. Cobbles are often present as surface scatter where this plant grows in southern California. Small seeps are strongly correlated with its presence. Possible Associates: *Dichelostemma capitatum*, *Sisyrinchium bellum*, *Ophioglossum californicum*.

KNOWN SITES: A small population grows along the truck trail above Minnewawa Campground on Otay Mountain. A large population east of the 805 Freeway on the north-facing slopes of Otay Mesa was recently removed for Dennery Ranch residential housing. Another small population occurs east of Friendly Drive along the jeep road through the San Marcos Mountains. Chocolate Lily is uncommon north of Magee Road near the Riverside County line in openings in the chaparral; also on the ridgeline at Rancho Cielo southwest of Mount Israel Road in open chaparral. A substantial population comes up following good seasonal rainfall on the north-facing slopes of Poggi Canyon east of Orange Avenue in Chula Vista; as well as in nearby Rice Canyon west of Discovery Park on north-facing slopes. A small population grows at the northern edge of Otay Mesa east of Brown Field and north of a set of high quality vernal pools. Herbarium specimens from San Diego County were examined for Encanto, Rolando Heights, a mesa near San Ysidro, on Lake Murray Drive halfway to Bostonia, Poway, Upper San Onofre Canyon, McGinty Mountain, Rancho Santa Fe, Santee, Black Mountain Road near Rancho Peñasquitos, Black Canyon on the Otay Ranch, Sweetwater Lake, the north slope of San Miguel Mountain,

and the south side of the Otay River. It is reported from Bernardo, Del Mar, Point Loma, Jamul, Bonita, San Diego, Dehesa; and observed on the hillside south of Rick Street in Poway. Old biological survey reports note sites across the street from the Old Padre Dam, and northwest of San Marcos' Palomar College. A number of these historical sites may no longer be extant. In Riverside County it grows along Idaleona Road near the southern boundary of Harford Springs Park and near Washington Road in French Valley. Boyd reports it restricted to clay soils in Temescal Canyon and areas of the Gavilan Plateau. Lathrop and Thorne report it in the Santa Rosa Plateau region near the head of Miller Canyon on Mesa de Burro, on the east-facing slope of Miller Mountain near the USFS Tenaja Guard Station, and on the east slope of Mesa de Colorado. Raven reports it as local on clay slopes at scattered locales throughout the Santa Monica Mountains of Los Angeles County. Smith reports this species from the Santa Barbara region to Point Sal, inland in mountainous terrain to potrereros in the Sierra Madre Mountains and Lockwood Valley. Hoover reports this species on clay from the coast of San Luis Obispo County inland to near Creston, and utilizing loams at San Simeon. Thomas reports the Chocolate Lily for the Santa Cruz Mountains, and near Hillsborough and San Jose.

Wiggins reports the Chocolate Lily on the western flanks of the Sierra Juarez from Tijuana south to Ensenada; however, only a single voucher collection is found from Baja California (south of Tijuana) at the herbarium of the San Diego Natural History Museum.

STATUS: Chocolate Lily is severely declining in southern California, but may still be more widespread in central California near the coast. Substantial populations in San Diego County, Orange County, and Riverside County should be strongly considered for protection, despite the presumed extent of populations of this species to the north. Almost all the sites in coastal San Diego County are potentially in the path of urban expansion. Rarity of this species is correlated with urban expansion; however, this species is often absent from superficially suitable clay lenses where other more common bulbs are prolific. Herbivory may be an important factor. Many of the distinctive Chocolate Lily seedpods (large six-angled capsules) and unmistakable shiny brown flowers appear to be eaten before the seeds have a chance to mature and fall.

BORREGO BEDSTRAW [*Galium angustifolium* Nutt. ssp. *borregoense* Dempster]

LISTING: CNPS List 1B R-E-D Code 3-1-3
 State/Fed. Status -- CR/Species of Concern RUBIACEAE March
 Global Rank G5T2 State Rank S2.3

DISTRIBUTION: San Diego County

HABITAT: Sonoran Desert Sage Scrub is the general habitat for this subshrub. Little information is available on its microhabitat requirements. The common coastal subspecies *angustifolium* is well dispersed in open scrub, and this desert entity is presumed to utilize upland terrain (Acid Igneous rock lands) with somewhat protected slope aspects and perhaps more mesic, seasonal conditions than generally prevail in this region. Possible Associates: *Prunus fremontii*, *Caulanthus simulans*, *Astragalus palmeri*.

KNOWN SITES: Borrego Bedstraw is occasional growing in shaded locations beneath large boulders at Culp Valley Campground. CNDDDB reports are from Hellhole Canyon on a north-facing canyon wall from Hellhole Palms into South Fork, a trail along the south ridge of Hellhole Canyon from Culp Valley overlook to about 1 mile east on the ridges, in Grapevine Canyon about 0.75 mile west of Angelina Spring on a steep rocky cliff, Pinyon Mountain Valley, in Borrego Palm Canyon west of Borrego Springs on a northeast facing slope along the state park's Loop Trail. The type locality is from Borrego Palm Canyon.

STATUS: The Borrego Bedstraw is presumed stable in rocky desert terrain that is rarely developed. *Galium angustifolium* is a variable taxon and this entity is apparently a localized desert form of the wide-ranging species. All populations of Borrego Bedstraw should be protected. The

forms of *G. angustifolium* generally occupy more mesic circumstances than are found in desert locations; and their foothold near Borrego may be tenuous. *G. a. ssp. borregoense* has pyramidal inflorescences, is many-flowered, compoundly branched, and mature plants are 35-50 cm high to separate it from *G. a. ssp. jacinticum*. The corollas of Borrego Bedstraw are hispid unlike *B. a. ssp. angustifolium*. Stem angles are greatly expanded and exaggerated, presenting more surface than sides except in older stems. A population of *Galium* in gabbroic soils on Roblar Grade on Camp Pendleton has traits approaching *G. angustifolium ssp. gabrielense* and may represent an undescribed subspecies. Considerable vegetative variation exists in San Diego County for the *Galium angustifolium* complex, beyond the three described subspecies known from the region; more taxonomic work is warranted.

SAN JACINTO MOUNTAINS BEDSTRAW [*Galium angustifolium* Nutt. ssp. *jacinticum* Dempster & Stebb.]

- LISTING:** CNPS List 1B R-E-D Code 3-1-3
 Stat/Fed. Status -- None RUBIACEAE May-July
 Global Rank G5T1 State Rank 1.3
- DISTRIBUTION:** San Diego County, Riverside County
- HABITAT:** This herbaceous perennial bedstraw grows at the edge of a montane meadow, nestled into a minor rocky outcrop on Volcan Mountain. Soils for the site are mapped as Sheephead rocky fine sandy loam. Possible Associates: *Prunus virginiana*, *Clarkia rhomboidea*, *Gilia capitata*.
- KNOWN SITES:** Plants keying to San Jacinto Mountains Bedstraw were observed on Volcan Mountain at the eastern edge of a large meadow in open, mixed forest; not far from the old cattle trail leading down into San Felipe Valley. It is also reported at various locations in the western San Jacinto Mountains of Riverside County in yellow pine forest at circa 4200-6500 feet in elevation.
- STATUS:** The lone recorded San Diego County location may be preserved within the expanding Volcan Mountain open space design. This subspecies of the wide-ranging and very diverse Narrow-leaved Bedstraw (*i.e.*, *Galium angustifolium*) has a narrow, few-flowered, and few-branched inflorescence with a hairy corolla and a glabrous stem. Plants at the observed locality have unusually thick stems; although this subshrub is not tall. Given the variability of Narrow-leaved Bedstraw, this small population should be further examined taxonomically to compare material with typical plants found in the San Jacinto Mountains of Riverside County to the north. *Galium angustifolium ssp. jacinticum* has a narrow inflorescence, is relatively few-flowered, and the branching little compounded to separate it from *G. a. ssp. borregoense*.

JOHNSON'S BEDSTRAW [*Galium johnstonii* Dempster & Stebbins]

- LISTING:** CNPS List 4 R-E-D Code 1-1-3
 State/Fed. Status -- None RUBIACEAE Jun.-July
 Global Rank G3 State Rank S3.3
- DISTRIBUTION:** San Diego County (reported by CNPS), Los Angeles County, San Bernardino County, and Santa Barbara County
- HABITAT:** Lower Montane Coniferous Forest is the habitat for this herbaceous subshrub with hispid fruits and a cupped or campanulate flower. On Santa Rosa Peak it typically grows in partial shade beneath conifers. It is reported by Munz on dry slopes between 5000 and 7500 feet in the San Gabriel, San Bernardino, and San Jacinto Mountains. Possible Associates: *Pinus* species, *Pyrola picta*, *Astragalus leucolobus*.
- KNOWN SITES:** Johnson's Bedstraw is locally common on Santa Rosa Peak in western Riverside County, growing in coniferous forest. No sites for this species in San Diego County can be reliably reported, and no examples can be located of specimens which might be attributed by Dempster to San Diego County. However, given the extensive population observed on Santa Rosa Peak,

it is considered probable that this bedstraw also grows in nearby San Diego County on the southern flanks of this mountain. Herbarium specimens examined were from near the Angeles Crest Highway just south of Upper Chilao Recreation Area in the San Gabriel Mountains of Los Angeles County; also from near San Bernardino Peak.

STATUS: The status of Johnson's Bedstraw in San Diego County is unknown; it is possibly not present. Potential habitat occurs in the Santa Rosa Mountains. If present in this region, significant portions of any populations should be protected. Johnson's Bedstraw is separated from *Galium angustifolium* using a suite of traits: pedicel generally greater than the fruit versus lesser, upper nodes on stems significantly greater than lower, and fruit hairs less than fruit versus fruit hairs equal to or greater than size of fruit.

NUTTALL'S ISLAND BEDSTRAW [*Galium nuttallii* Gray ssp. *insulare* Ferris]

LISTING: CNPS List 4 R-E-D Code 1-1-3
State/Fed. Status -- None RUBIACEAE Mar.-Jun.
Global Rank G5?T3 State Rank S3.3

DISTRIBUTION: Santa Catalina Island, Santa Cruz Island, and Santa Rosa Island

HABITAT: Habitat for this bedstraw is presumed to be insular scrub. The common subspecies *nuttallii* along the coast utilizes relatively dense but low-growing and mesic sage scrub with a diverse shrub mix. Associates: More information needed.

KNOWN SITES: No verified sites for this species can be reliably reported for San Diego County.

STATUS: The status of Nuttall's Bedstraw in San Diego County is unknown; it is probably not present. Attributions by Dempster in 1962 for four specimens from Point Loma, Soledad Mountain, Chollas Valley, and Dehesa are not mentioned within her 1979 published material concerning the distribution of ssp. *insulare*. It appears a re-evaluation has deleted the prior specimens from inclusion within the present understanding of this species. Nuttall's Island Bedstraw is glabrous while *G. n.* ssp. *nuttallii* has herbage with tiny, sharp, curved hairs.

STICKY GERAEEA [*Geraea viscida* (Gray) Blake]

LISTING: CNPS List 2 R-E-D Code 2-1-1
State/Fed. Status -- None ASTERACEAE May-Jun.
Global Rank G3 State Rank S2.3?

DISTRIBUTION: San Diego County, Imperial County; Baja California, Mexico

HABITAT: High desert chaparral openings are the preferred habitat for this short-lived herbaceous perennial. Sandy, xeric locales are frequently utilized; fires seem to stimulate the spread of this species. Chamise is the most common constituent of the chaparral in the eastern San Diego County region where Sticky Geraea occurs; soils include Tollhouse rocky coarse sandy loam. Possible Associates: *Astragalus douglasii* var. *perstrictus*, *Linanthus bellus*, *Layia glandulosa*.

KNOWN SITES: The distinctive dried remains of this species were seen growing in sandy exposed locales along Kitchen Creek Road. Sticky Geraea is generally observed in high, transitional desert in sparsely inhabited portions of the county. An extensive population is found in the Smuggler's Cave region east of Jacumba. Most of this population occurs in Imperial County and meanders across the international fence into the Sierra Juarez Mountains of Baja California. Old reports are from Potrero, Campo, and Dubber. Old biological survey reports are from the intersection of Tierra del Sol Road and Highway 94, northwest of the intersection of Highway 94 and La Posta Road, near Tierra del Sol Road 2 miles south of the community of Tierra del Sol, 2 miles north of Cameron Corners, near Old Highway 80 and Carrizo Gorge Road, between Interstate 8 and Highway 94 east of Boulevard, along McCain Valley Road, in the boulder

fields near Bankhead Springs, north of Highway 94 near Tierra del Sol Road, south of Old Highway 80 near the corner of the La Posta Indian Reservation, east of Tierra del Sol near the railroad right-of-way, just south of Boulevard, and 0.5 mile north of Manzanita and east of Jewell Road.

Sticky Geraea has 26 collected specimens for Baja California within the San Diego Natural History Museum's herbarium. It ranges south to 28° 53' North where it was collected on the east slope of Cerro Santa Marta by Moran (SD 63006) in the Sierra San Borja. Its typical habitat here is with chamise, junipers, and piñons. It was relatively common in 1991 on a burn west of the turnoff to Rosa de Castillas, Mexico, on the main road to La Rumarosa; as well as being locally abundant just east of La Rumarosa.

STATUS: Sticky Geraea populations in San Diego County are presumed stable based on the limited development within its relatively wide-ranging habitat on the high desert. This perennial species with rayless flowers may be more common within its high desert/chaparral range than suspected; but its habitat is rarely a focus of botanical collectors. Sticky Geraea may also be more common following a fire.

CARAWAY-LEAVED GILIA [*Gilia caruifolia* Abrams]

LISTING: CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None POLEMONIACEAE May-Aug.
Global Rank G4? State Rank S3.3

DISTRIBUTION: San Diego County, Riverside County; Baja California, Mexico

HABITAT: Lower Montane Coniferous Forest and High Desert Chaparral are both utilized by this annual. Tollhouse rocky coarse sandy loam is found at the Miller Creek site, while Holland stony fine sandy loam is at the campground noted below. Usually the Caraway-leaved Gilia is found in clearings; it may be able to tolerate mild disturbance given its occasional proximity to trails. A number of the observed sites had occasional shade cover, although this does not seem to be a necessity. Possible Associates: *Pinus jeffreyi*, *Symphoricarpos mollis*, *Rosa californica*.

KNOWN SITES: This gilia is uncommon and scattered in the Jeffrey Pine Forest of the Cuyamaca Mountains such as along trails at Green Valley Falls and Cuyamaca Rancho State Park. A small population was found growing in a sandy wash west of Boulevard in the high desert, and a similar colony was seen in a peripheral wash near Miller Creek. This is a quite different habitat than typical reports indicate. Approximately 500 plants were seen in chaparral south of the American Adventure Campground near Harrison Park in the Cuyamaca Mountains. Herbarium specimens in the San Diego Natural History Museum are from sites near the road to Echo Dell, Banner Grade below Julian, Oasis Springs, Boulder Oaks, Featherstone Creek near Barona, Palomar Observatory, the south slope of Roderick Mountain, Los Coyotes Indian Reservation, Pala, Blue Canyon, Cuyamaca Peak, Desert View in the Laguna Mountains, Eagle's Nest, Corte Madera, Aguanga Fire Ridge, the road to Lone Fir Point in the Palomar Mountains, and on Otay Mountain. An old biological survey report notes a site 1 mile south of Julian High School. Another collection by Clokey is from east of Hemet in western Riverside County.

Twenty-two specimens are found at the San Diego Natural History Museum's herbarium from Baja California; south to 30° 52¼' North where collected by Moran (SD 96875) in the bed of an arroyo, 4 km west of Santa Cruz.

STATUS: Caraway-leaved Gilia is presently stable within its montane and transmontane habitats. Some populations are potentially impacted by various recreational uses in the Cuyamaca Mountains. High desert populations are in an area only rarely developed. Substantial portions of all sizeable populations should be protected. It is difficult to account for the low numbers of this

gilia found in seemingly suitable habitat. It may have strict/fussy microhabitat requirements. This annual gilia has lavender flowers with a very shallow throat/tube that is quite distinctive and unlike other members of its genus in the region; the petal lobes are purple marked near their base.

WHITE-FLOWERED GITHOPSIS [*Githopsis diffusa* A. Gray ssp. *candida* (Ewan)N. Morin]

- LISTING:** CNPS None R-E-D Code None
State/Fed. Status -- None CAMPANULACEAE Apr.-Jun.
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Orange County, Riverside County; Guadalupe Island and Baja California, Mexico
- HABITAT:** Lower Montane Coniferous Forest and Montane Chaparral are both utilized by this annual. It is typically seen in sandy openings in the chaparral around Cuyamaca Lake which are quite mesic following snow melt; however, this microhabitat soon becomes relatively dry as spring turns to summer. Soils here are mapped as Boomer stony loams. This species may be associated with ultramafic soils according to Morin. Possible Associates: *Quercus wislizenii*, *Linanathus parviflorus*, *Navarretia peninsularis*.
- KNOWN SITES:** This white flowered form of the "blue-cups" is locally common on the periphery of the meadows surrounding Cuyamaca Lake; generally within openings in the chaparral near shrubby Interior Live Oaks. These openings have an abundance of native annuals which bloom for a relatively short period as the weather warms up in spring. A small population was observed near the southern entrance to Cuyamaca Rancho State Park on the east side of the highway. It also grows in montane openings in the coniferous forest on Middle Peak where substantial light reaches the forest floor for a portion of each day. Herbarium specimens examined were from near Love Valley on Palomar Mountain, the south side of Morena Reservoir, and from Corte Madera Ranch. Roberts in unpublished information reports this species collected four times in Orange County.

No specimens are found at the San Diego Natural History Museum's herbarium from Baja California; however, it has the potential to occur within the northern Sierra Juarez given its U.S. distribution including locales such as Corte Madera.

- STATUS:** White-flowered *Githopsis* is rare in the mountains of San Diego County. Substantial portions of all sizeable populations should be protected. Continued development or habitat degradation around Cuyamaca Lake could significantly impact this species. *G. d.* ssp. *candida* has substantially larger corolla lobes (2-5mm versus <2mm) than *G. d. diffusa* or *G. d.* ssp. *filicaulis*. There is widespread taxonomic dissatisfaction with the current treatment of *Githopsis diffusa* utilized in the Jepson Manual. Workers in western Riverside County such as S. Boyd question whether the three entities (*i.e.*, *filicaulis*, *diffusa*, *candida*) are distinctive enough to warrant subspecies status. Nevertheless, small blue-flowered populations of plants in arid western Riverside County attributable to *G. d.* ssp. *diffusa* seem superficially different than the lanky and delicate plants attributable to *G. d.* ssp. *filicaulis* in the nearby foothills, and to the robust white-flowered forms of *G. d.* ssp. *candida* found in the higher mountains of San Diego County. To what extent this perceived difference is genetic, and to what extent it is merely a product of variable water availability and minor mineral soils differences needs to be investigated with garden experiments. The more robust white-flowered form can grow among other annual species (*e.g.*, *Navarretia peninsularis*) that as a group seem relictual and related to the end of the Pleistocene period, and the stranding of an association of chaparral annuals adapted to wetter late winter/spring conditions; as well as wetter or more humid summer/fall conditions than currently persist. This group of annuals also occupies better developed loamy soils that may have once been part of a broader expanse of pebble plain like habitat (*e.g.*, around Cuyamaca Lake), now broken up or displaced by granitic uplift (mountain building) and

exposure via erosion. In effect, associated with an ancestral soil type unlike those newly evolving on the nearby steep mountainous slopes. Future soil studies might elucidate this issue. The mountains of San Diego County retain the greatest average warm-season precipitation of any range in southern California according to Raven and Axelrod. This may also factor into the current range of White-flowered *Githopsis*.

MISSION CANYON BLUE-CUP [*Githopsis diffusa* Gray ssp. *filicaulis* (Ewan) Morin]

- LISTING:** CNPS List 3 R-E-D Code ?-3-3
 State/Fed. Status -- /Species of Concern CAMPANULACEAE May
 Global Rank G5T4Q State Rank S1.1
- DISTRIBUTION:** San Diego County, Riverside County; Baja California, Mexico
- HABITAT:** Isolated, sandy openings in chaparral are the typical habitat for this cryptic annual. Visalia sandy loam is mapped at the Moosa Canyon site. Populations observed were in full sun. Possible Associates: *Linanthus dianthiflorus*, *Mimulus diffusus*, *Linanthus parviflorus*.
- KNOWN SITES:** Mission Canyon Blue-cup is found growing near Highway 79, south of Green Valley in the Cuyamaca Mountains, where the chaparral gives way to conifers. A small population was found in a minor tributary of Moosa Canyon just east of Old Castle Ranch. It is cited in literature from a burn in Harbison Canyon, at Anahuac School, on the south fork of Featherstone Creek near Barona, at the north end of El Cajon Mountain northeast of Barona Mission, and at Silverwood Wildlife Sanctuary on the upper part of the chaparral trail. An old report from Murphy Canyon near the San Diego Mission may represent a locale long since disturbed by urban impacts. It is also reported in Riverside County below the hamlet of Sage, on rocky, gentle hills in coarse sandy soil between chamise and manzanita. It was seen in chaparral understory near the intersection of Colt Road and De Portola Road in western Riverside County.

Reported from Vallecito in northern Baja California.

- STATUS:** The status of the Mission Blue-cup in San Diego County is presumed stable. More information is needed. Given the dearth of collections and reports for this species, it is probably quite rare in San Diego County. *G. d. filicaulis* is poorly differentiated from *G. d. diffusa*; differences are primarily corolla color (pale blue versus deep blue); upper stem width (0.2-0.4 mm versus 0.4-0.8 mm); bract size (1-5mm versus 4-7 mm); and ovary size (3-4 times longer than wide versus 5-6.5 times longer than wide at top). Additional taxonomic work is warranted. Morin notes that size of *Githopsis* leaves and bracts is affected by environmental parameters; but also mentions that Mission Canyon Blue-cup plants grown from seed taken from Silverwood retained their described morphological traits. Provisionally, all populations in San Diego County are recommended for protection. This annual can be quite fragile, and it appears to have a short-flowering period with the plant withering soon in warm weather. Censusing for this species outside of its brief spring flowering season is not recommended, and would be extraordinarily difficult given the ephemeral nature of the plant. It is difficult to account for the rarity of this species in relatively undistinctive chaparral habitat; all the *Githopsis* species in the region may be relictual and poorly adapted to long-term climatic changes.

SAN DIEGO GUMPLANT [*Grindelia hirsutula* Hook. & Arn. var. *hallii* (Steyerm.) M. A. Lane]

- LISTING:** CNPS List 1B R-E-D Code 2-2-3
 State/Fed. Status -- None ASTERACEAE Jul.-Oct.
 Global Rank G5T2 State Rank S2.2
- DISTRIBUTION:** San Diego County

HABITAT: Montane meadows and lower montane Coniferous Forest, typically with sunny openings; are the preferred habitats for this species. Boomer stony loam is one soil type utilized by this sticky biennial herb. This gumplant prefers locales which are quite wet in the early spring, although such places usually dry quickly as spring turns to summer. Possible Associates: *Limnanthes gracilis* var. *parishii*, *Ranunculus californicus*, *Sidalcea malvaeflora*.

KNOWN SITES: Gumplant is locally abundant in areas around Cuyamaca Lake; particularly near Camp Hual-Cu-Cuish. It is also found at somewhat higher elevations such as Azalea Spring, as well as at the Shrine Camp in the Laguna Mountains, and in meadows east of Harrison Park. It grows in meadows at Pine Hills near the intersection of Eagle Peak Road and Blue Jay Drive, and as a ruderal plant along Japatul Valley Road just north of Interstate 8. Old biological survey reports note sites north of Julian along Farmer Road, nearby at the corner of Farmer Road and Wynola Road, at Crouch Meadow in the Laguna Mountains, west of Highway 79 and 2 miles southeast of Julian, the Hosking Ranch near Wynola, near Frisius Road in Pine Hills, near Eagle Peak Road and Pine Hills in the vicinity of Orinoco Gorge and Paine Bottom Gorge, and near Woodland Drive at Kentwood-in-the-Pines. Old reports are from Mesa Grande, Corte Madera, and the hills south of Lake Henshaw, . CNDDDB reports from the Lake Cuyamaca region are 0.2 mile north of Cuyamaca Reservoir, just north of La Puerta Springs, Fern Flat, east of Japacha Peak at the junction of Burnt Pine and West Mesa Loop Fire Roads, the south end of Green Valley, a variety of locales within 1 mile from the junction of the East Mesa Fire Road and the road to Oakzanita Peak, East Mesa on Dyer Spring Fire Road, Azalea Creek 0.25 mile northeast of Engineers Road; as well as at Inspiration Point along Highway 79 2.8 miles south of Julian, in Julian, at Bunton Flat 0.33 mile south/southwest of the intersection of Boulder Creek and Eagle Creek Roads, west of Engineers Road and north of Penstemon Road in the Cuyamaca Mountains, at Sentenac Creek south of Spencer Valley and 1.8 miles south of Wynola, Filaree Flat about Lucas Creek, west of Guatay along old Highway 80 and 1.2 miles east of Highway 79, Pioneer Mail near the picnic grounds, west of Troy Canyon and southwest of Wooded Hill, and near Stonewall Peak.

STATUS: San Diego Gumplant populations are relatively stable. Development around Cuyamaca Lake or expanded recreational uses in the area could impact this species over the long term. Substantial portions of sizeable populations should be protected. Introduction of this gumplant into peripheral montane locations may be possible as it sometimes acts as an aggressive colonizer. This species is geographically isolated in local mountains and may be restricted to specific soils and a rainfall regime that deter current range expansion. San Diego Gumplant does not have the whitish, almost varnished looking stems of *Grindelia camporum*; and the cauline leaves are generally widest near their base and not just below the tip.

PALMER'S GRAPPLING HOOK [*Harpagonella palmeri* Gray = *Pectocarya palmeri* (Gray) Veno]

LISTING: CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- /Species of Concern BORAGINACEAE Mar.-Apr.
Global Rank G4 State Rank S3.2

DISTRIBUTION: Los Angeles County, Orange County, Riverside County, San Diego County, Santa Catalina Island; Arizona; Baja California, Mexico

HABITAT: Clay vertisols with open grassy slopes or open Diegan Coastal Sage Scrub are typical habitats for this inconspicuous annual. Diablo clays are favored along the coast; Sloping gullied land is mapped for Table Mountain. Possible Associates: *Plagiobothrys collinus* var. *gracilis*, *Adolphia californica*, *Nasella pulchra*.

KNOWN SITES: Several thousand individuals grow on the slopes of Table Mountain near Jacumba. Otherwise most populations are small and scattered nearer the coast, such as the east end of Otay Valley near the mouth of Salt Creek, and just north of Cacklebur Creek west of Interstate 5. A small colony was seen east of the sand pits and just upstream of Sweetwater Reservoir; other small

sites are in open grasslands east of Via Del Charro in Rancho Santa Fe, near the northwestern entrance gate to the San Dieguito Reservoir, on the hillside west of the Pala Casino, east of Golden Haven Drive near La Jolla Village Drive, upstream of Sweetwater Reservoir near the old pipeline trestle, and on the southern flanks of Dictionary Hill. Palmer's Grappling Hook is localized on clay balds on Poser Mountain. Herbarium collections include Sequan Peak, west of Dehesa School, a burn on Poway Grade, and at Camp Kearny. Other herbarium collections where possibly no longer extant are from near the corner of Federal and Euclid in East San Diego, near the mouth of Mission Gorge, Fletcher Hills, Emerald Hills, the mouth of Alvarado Canyon, north of Grossmont High School, and in Olivenhain. Old biological survey reports note sites southwest of Sienna Canyon Drive in Encinitas, and near Steele Canyon Bridge and Highway 94 by the water tank. Another report is from Magee Road near the Riverside County line. CNDDDB reports are from the north end of Santo Road in Tierra Santa, on the east side of Tecolote Canyon near the end of Tait Street, on the east rim of Soledad Canyon 0.5 mile south of Peñasquitos Canyon, at Evans Point south of Oceanside, in Johnson Canyon on the south side of Otay Valley, on a sandstone bluff on the north side of San Elijo Lagoon, northeast of Rancho Santa Fe north of Del Dios Highway, on Miramar Marine Air Station north of Clairemont Mesa Boulevard and west of Santo Road, the lower southwest slope of Viejas Mountain just north of Otto Avenue, on the rim of Lux Canyon east of El Camino Real, the east slope of Barber Mountain west of Barrett Lake and south of Wilson Creek, just south of Encinitas Road about 400 yards from its junction with Linda Vista Drive, just north of Brown Field on Otay Mesa, northeast of Batiquitos Lagoon at 0.8, 1.8, and 1.25 miles due north of La Costa Country Club, northeast of Batiquitos Lagoon 0.4 mile northwest of the radio facility and north of San Marcos Creek, in northern Proctor Valley 2 miles east of the summit of San Miguel Mountain and 0.25 mile east of Indian Rock Corral, near Rancho de los Quiotes from 0.4 mile northeast to 0.4 mile southeast of the Rancho, 0.6 mile southwest of Rancho de los Quiotes, east of Sycamore Canyon approximately 2.7 miles south of the Goodan Ranch, along Proctor Valley Road 0.3 mile northwest of Gobbler's Knob southeast along Proctor Valley Road to the vicinity of Wild Man's Canyon, 2 miles west of the tip of Upper Otay Mesa and 0.3 mile due north of benchmark 664 north of Proctor Valley Road, west of the summit of Mother Miguel Mountain, off Basilone Road just east of I-5 on Camp Pendleton, 1.1 miles south of El Monte Park west of the reservoir, SW of Lone Jack Road and Double LL Ranch Road, near Wishbone Way in Encinitas, 0.7 mile NW of Cajon Park School and 2.3 mile NNW of Santee Fire Station, and north of Lusardi Creek approximately two kilometers from its confluence with the San Dieguito River. In western Riverside County Palmer's Grappling Hook grows in heavy clay soils on Alberhill Mountain, on the south slopes of Bachelor Mountain near Lake Skinner, and at Harford Springs Park near Idaleona Road. Old biological survey reports note sites south of Lee Lake near Interstate 15, and near Borel Road and the French Valley Airport. CNDDDB reports for Riverside County are in Temescal Canyon on the south side of Alberhill Mountain, 2 miles west/northwest of Alberhill just west of DiPalmas Italian Village, on the mesa just west of Skunk Hollow, 0.25 mile east of Winchester Road and 1.25 miles east of Murrieta Hot Springs and 0.5 mile south of Borel Road, south of Palomar Valley about 5 miles northeast of Murrieta and 1 mile south of Bundy Canyon Road west of Highway 395, on a terrace in Temescal Canyon Wash, on the southwest side of DePalma Road 0.1 mile east of Indian Truck Trail, on the south-facing slopes of Oak Mountain near Vail Lake and at other locales in this vicinity, on the southeast-facing slopes of Bachelor Mountain about 2.3 miles east of Washington Avenue, on the Gavilan Plateau 0.4 mile west of the junction of Lake Mathews Drive and Gavilan Road, at Kolb Creek/Pechanga Creek Divide two kilometers southwest of Yampa Ranch, on the south slope of Miller Mountain, and at the northwest base of Gavilan Peak; for Orange County between Trampas and Cristianitos Canyons 1 mile south of Highway 78, in Cristianitos Canyon 0.3 mile west of the clay pit. Reported in Orange County by Roberts at Dana Point, Casper's Regional Park, and Gabino Canyon in Rancho Mission Viejo. It is said to be frequent on Catalina Island by Thorne. Shreve and Wiggins report variety *arizonica* from Pima and Maricopa counties in Arizona. This species is also reported from Isla Guadalupe.

Twenty-three collections from Baja California are found at the San Diego Natural History Museum's herbarium; south to 27° 32' North where collected by Moran (SD 92554) on the north slope of Cerro Azul. Palmer's Grappling Hook grows by the tens of thousands on Cerro Dieciseis, a peak south of Tecate. Locally it is the dominant understory plant.

STATUS: Palmer's Grappling Hook is declining throughout southern California. Many historical sites are likely extirpated by urban development and agricultural discing. Surveys in annual grasslands must be careful to examine clay areas otherwise dominated by non-native grasses, and not presume only non-native elements are present. This annual cannot be reliably censused except during the spring and early summer before it has decomposed; it is likely under-reported during biological surveys. Significant portions of all sizeable populations should be protected. The rarity of this species is strongly correlated with urban expansion and subsequent loss of habitat. Given the vast tracts of mima mound habitat represented in the 1928 County aerial photography series which is now almost completely degraded or developed, Palmer's Grappling Hook may once have been common throughout the coastal plain. This is also an annual species which may do poorly in competition with introduced Eurasian grasses. The grappling hook like fruits are unique to the County flora and allow this ephemeral annual to be readily identified to species.

ORCUTT'S HAZARDIA [*Hazardia orcuttii* (Gray) Greene]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status Candidate/Species of Concern ASTERACEAE Aug.-Oct.
Global Rank G1G2 State Rank S1.1

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Open chaparral with Chamise is the habitat for Orcutt's Hazardia at the one known U.S. site. Soils are mapped as loamy alluvial land of the Huerhuero complex. Diegan Coastal Sage Scrub is found on the periphery of this localized population. Possible Associates: *Adenostoma fasciculatum*, *Quercus dumosa*, *Heteromeles arbutifolia*.

KNOWN SITES: A disjunct population of this Baja species is found east of El Camino Real in Encinitas on the periphery of a housing development.

Thirteen specimens from Baja California are found in the San Diego Natural History Museum's herbarium; south to 31° 7' North where collected by Moran (SD 65784) on a mesa 1.5 miles north of Arroyo Salado.

STATUS: The one known U.S. population is slowly declining; a re-examination in 1989 showed substantial site degradation since viewing the locale three years previously. Inhabitants, especially children, from the residences nearby were using and expanding footpaths for recreational uses. The potential for accidental fires is substantial. This species is recommended for California Endangered status. Given the degradation at the Encinitas site, it is also recommended that seed be gathered from this population (genetic material may be slightly different from the Baja material given the considerable disjunction) and horticultural shrubs be raised and transplanted into other regionally protected locales. All sites should be protected with adequate buffers. Recent Year 2000 information indicates a local landowner whose property includes a portion of the only U.S. population, may be in the process of digging up and relocating native Orcutt's Hazardia. Without some further mechanism for protection, there may be no legal recourse to halt such activities with this species or others under similar state/federal designations. It is difficult to explain the unusual disjunction between the primary Mexican populations and this outlying colony of U.S. shrubs. Possible explanations include the loss of intervening populations due to long-term climatic changes, or the introduction of seeds via animal dispersal. A few native plant species were moved about by indigenous native peoples, but typically these species had some culinary or religious significance. The leaves of

Orcutt's *Hazardia* are entire and not obviously serrated like *Hazardia squarrosa*, a species which is common in the region.

CURLY ABUTILON [*Herissantia crispa* (L.) Brizicky]

- LISTING:** CNPS List 2 R-E-D Code 3-1-1
State/Fed. Status -- None MALVACEAE Aug-Sep.
Global Rank G5 State Rank S1.3?
- DISTRIBUTION:** San Diego County; Arizona; Texas; Florida; Sonora and Baja California, Mexico; also South America
- HABITAT:** Sonoran Desert Scrub is the general habitat reported for this suffrutescent shrub. The locale in Vallecito Wash is mapped as Carrizo very gravelly sand. Possible Associates: *Hyptis emoryi*, *Justicia californica*, *Senecio flaccidus*.
- KNOWN SITES:** Reported growing on an embankment in Vallecito Wash in Mason Valley on the Anza-Borrego Desert, 0.2 mile west of Highway S2 along the southern line for Section 27. This is the only known extant locale for the county. A historical collection at Mountain Springs Grade has not been relocated. Reported by Wiggins from southern Arizona, Texas, southern Florida, and tropical South America. Reported by Daniel and Butterwick as occasional in the South Mountains near Phoenix.

Twenty specimens are found in the herbarium at the San Diego Natural History Museum; south to 22° 55' North where collected by Moran (SD 50625) near Cabo San Lucas.

- STATUS:** Status for Curly Abutilon in southern California is poorly understood; more collection information is needed. All California populations should be protected. It is difficult to account for the presence of this species in such low numbers and at so few known sites in the southern California deserts. The species does have an unusually expansive range for a native desert shrub. The lone San Diego County site may be the last vestiges of a relictual population better adapted to a prior climatic regime. Conversely, the population could be a recent introduction associated with desert camping activities, and the chance dispersal of Arizona seed picked up at a prior stop. The yellow flowers of Curly Arbutilon are 6-11mm in size, and the heart-shaped leaves resemble a number of shrubs in the Mallow Family. The inflated pumpkin-shaped (13-20mm) fruits are somewhat more distinctive.

SAN JACINTO GOLDEN-ASTER [*Heterotheca sessiflora* (Nutt.) Shinn. var. *sanjacintensis* Semple]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None ASTERACEAE July-Sep.
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County; Riverside County
- HABITAT:** Montane. Possible Associates: More information needed.
- KNOWN SITES:** Reported to be endemic to Mount Palomar and the San Jacinto Mountains. The Paratype is from just south of Idyllwild Park at Manzanita Drive in the San Jacinto Mountains. Another report of Golden-aster from Warner Hot Springs in San Diego County may key here.

- STATUS:** This glandular subshrub (35-105mm tall) has a capitulescence form and extremely undulate leaves similar to *Heterotheca sessiflora* var. *fastigiata*; but its leaves are far less densely strigose and the hairs are larger. It has 5-13 strap-shaped ray flowers and 25-45 disc florets. Little is known about this recently described perennial; all San Diego County specimens away from the immediate beach (see *H. sessiflora* ssp. *sessiflora*) should be re-examined. All sites should be protected unless additional collection information determines otherwise.

BEACH GOLDEN-ASTER [*Heterotheca sessiliflora* (Nutt.) Shinn. ssp. *sessiliflora*]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None ASTERACEAE Mar.-Jul.
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County; southern California coast; Baja California, Mexico
- HABITAT:** Coastal Sage Scrub in sandy locales is the general habitat for this herbaceous perennial. The locale in Del Mar has soils mapped as Terrace Escarpment. Reported habitat in counties to the north consists of beach bluffs and maritime locales. Possible Associates: *Chorizanthe procumbens*, *Isocoma menziesii*, *Eriogonum fasciculatum*.
- KNOWN SITES:** A small vestigial population survives at the south end of a disturbed field, at the foot of a slope on the south side of San Dieguito Lagoon, growing in dense sage scrub. The understory here is quite sandy and Torrey Pines occur well upslope. Reported sites for San Diego County are for San Elijo Lagoon, Torrey Pines, Pacific Beach, Ocean Beach, North Island, Silver Strand, San Diego, and the boundary monument at the Mexican border. A site where recently introduced is at the D Street Fill in National City. Most of these reported sites are in highly urbanized areas along the coast and are probably no longer extant. Reported by Raven from oak woodland near Lake Sherwood in Los Angeles County.

Three specimens from Baja California are found at the herbarium of the San Diego Natural History Museum south to 31° 49' North, on the dunes south of Ensenada where collected by Moran (SD 117823).

- STATUS:** The San Diego County populations of Beach Golden-Aster are almost extirpated. This subspecies appears quite distinct from other subspecies of golden-aster with its typically large leafy bracts subtending the single flowering head. Taxonomic work is needed to clarify its relationship to these other entities. It may merit full species status. More collection information is needed from throughout southern California and Baja California. It is presumed that most of its coastal habitat has been developed in San Diego County. Provisionally all San Diego County populations are recommended for protection. Current rarity may be a product of extraordinary impacts to most habitat immediately adjacent to southland beaches.

LAGUNA MOUNTAINS ALUM-ROOT [*Heuchera brevistaminea* Wiggins]

- LISTING:** CNPS List 1B R-E-D Code 3-1-3
State/Fed. Status -- None SAXIFRAGACEAE May-Jul.
Global Rank G2 State Rank S2.3
- DISTRIBUTION:** San Diego County
- HABITAT:** Rocky outcrops in montane chaparral are the usual habitat for this alum root. Metamorphic rock lands are mapped for the Oasis Springs site. Plants here cling to steep rocky faces where they are wedged into crevices, or perched on precarious exposed slabs where they are unlikely to be impacted by herbivores. Possible Associates: *Cystopteris fragilis*, *Selaginella asprella*, *Chaenactis parishii*. Prairie Falcons (*Falco mexicanus*) nest near concentrations of this species in the Laguna Mountains.
- KNOWN SITES:** This herbaceous perennial is typically well protected, growing in precarious rocky locations near Garnet Peak, Oasis Spring, and Mount Laguna. It has been reported from the north side of Monument Peak near the summit; as well as near Oriflamme and Potrero Canyons not far to the east of Sunrise Highway. A CNDDDB report notes a nearby site in upper Cottonwood Canyon 0.5 mile north of Sunrise Highway at Pioneer Mail Picnic Grounds. A population of alum-root growing on rock near the saddle between Santa Rosa Peak and Toro Peak in western Riverside County had short stamens on the few flowers which had as yet bloomed, and these

plants may represent a heretofore unknown northern range extension of the Laguna Mountains Alum-root; more collections are needed.

STATUS: Laguna Mountains Alum-Root is stable in San Diego County and likely imperiled only by plant collectors. All populations should be protected. Current rarity seems to be a product of strict microhabitat requirements for the species which are not widely available. An unusual microclimate occurs on the rocky summits at the desert/montane transition. Severe up-lifts and down-drafts of winds are quite common here. On occasion it may be impenetrably foggy in the County mountains including the summit of Garnet Peak, while only yards away as the cliffs drop off precipitously to the desert it may be brilliantly sunny. Laguna Mountains Alum-Root occupies this abrupt transition zone. Unlike *Heuchera rubescens*, the styles and most or all the stamens are included in the flower, rather than conspicuously exerted.

SAN DIEGO COUNTY ALUM-ROOT [*Heuchera rubescens* Torrey var. *versicolor* (Greene) Stewart]

LISTING: CNPS List 2 R-E-D Code 3-1-1
State/Fed. Status -- None SAXIFRAGACEAE May-Jun.
Global Rank G4T2T3 State Rank S1.3?

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Rocky outcrops in montane chaparral are the preferred habitat of the San Diego County Alum-Root. At the Hot Springs Mountain summit the exposed rock is mapped as Acid Igneous rock land; the surrounding terrain is Crouch rocky coarse sandy loam. Competition from shrubs is minimal within the boulder crevices where this herbaceous perennial grows. Possible Associates: *Silene parishii*, *Mimulus fremontii*, *Adenostoma fasciculatum*.

KNOWN SITES: This species grows in large boulder fields at the summit of Hot Springs Mountain. The colony occurs in an exposed, easily degraded location next to the old Fire Watch Tower. It is also found on Cuyamaca Peak below the summit where well protected by precipitous terrain. A report is from near the triple falls of the San Luis Rey River east of Barker Valley; another report needing verification is from the east end of Harper Canyon on a north-facing rock wall. Also reported from 1-1.5 miles south of Pine Mountain near Indian Creek.

One specimen from Baja California is found at the herbarium of the San Diego Natural History Museum from 31° 2' North, on the north slope of Cerro 2828 where collected by Moran (SD 69111).

STATUS: San Diego County Alum Root is declining at the Hot Springs Mountain locale. This site needs protection from the occasional visitors who are intrigued by the fire tower. Additional plants may grow well below the summit in rocks which are quite dangerous to investigate, except by highly competent rock climbers and bushwhackers. All sites should be protected. Current rarity seems to be a product of strict microhabitat requirements that appear to limit this species to rock cliffs which are poorly accessible to herbivores, and rocky outcrops at the County's highest elevations. Unlike *Heuchera brevistaminea*, the styles and all the stamens are conspicuously exerted beyond the flower.

GRACEFUL TARPLANT [*Holocarpa virgata* (Gray) Keck ssp. *elongata* Keck]

LIST: CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- / Species of Concern ASTERACEAE Aug.-Nov.
Global Rank G5T3 State Rank S3.2

DISTRIBUTION: San Diego County, Riverside County, Orange County

HABITAT: This plant frequents annual and perennial grasslands. Near the Miramar landfill it grows abundantly on Chesterton fine sandy loam among Eurasian grasses. Usually shrub cover is not

well developed at Graceful Tarplant sites, with a heavy incidence of invasive non-native grasses and herbs. Possible Associates: *Lessingia filaginifolia*, *Isocoma menziesii* var. *decumbens*, *Lotus scoparius*.

KNOWN SITES: This species is locally common in the grasslands around Lake Henshaw, as well as about Otay Lake and nearby Proctor Valley. A population of at least 10,000 plants occurs on the slopes on the south side of Sweetwater Reservoir, in the canyon east of the eastern terminus of San Miguel Avenue. It is also found east of San Dieguito Reservoir near Aliso Canyon Road, west of the Miramar Landfill near Interstate 805, in mildly disturbed areas of the Pauma Valley, throughout Peñasquitos canyon west of Black Mountain Road, north of Miramar Road and west of the 805 Freeway, and in open terrain at upland locales around Cuyamaca Lake. It is scattered about eastern Otay Mesa such as in O'Neal Canyon; as well as in Otay Valley. It is lightly scattered in openings in sage scrub in the hills east of Via de Las Flores in Rancho Santa Fe. Herbarium specimens examined were from El Cajon, Poway, La Mesa, and Jamacha Junction. A population occurs on Butterfly Ridge east of the Auld Golf Course. Reports are from the Inaja Memorial in the Cuyamaca Mountains, Lakeside, and San Diego. It is locally abundant in the grasslands near Sweetwater Reservoir. Old biological survey reports note this species on a hill east of Murphy Canyon and north of Mission Gorge Road, on the north side of Carmel Valley near Interstate 5, near Fanita Drive in Santee, and at Rancho Monserate; also north of Tenaja Road and east of Squaw Mountain on the Santa Rosa Plateau. In Riverside County it grows southwest of Cherry Street in Temecula, and south of Polly Butte near Hemet in open grasslands. Lathrop and Thorne report it as localized on the Santa Rosa Plateau.

There are no specimens of Graceful Tarplant at the herbarium of the San Diego Natural History Museum from Baja California.

STATUS: It is difficult to account for the limited range of this late-flowering species. The unusually late flowering period may account to some extent for limited herbarium collections. Where it occurs, usually in mildly disturbed or overgrazed grassland, it is often abundant and numbering in the thousands. As its habitat is often situated on comparatively level, sparsely vegetated terrain, it is presumed to be substantially declining in San Diego County and western Riverside County due to urban development. Provisionally, substantial portions of all large populations should be protected. Additional collection data is needed to further assess the distribution and rarity of this distinctive species. A related Federally Endangered species (*Holocarpha macradenia*) grows on coastal grassy slopes in the Monterey Bay area. Other more common related species occur in the Sierra Nevada foothills. Absence of collection data from northern Baja California is puzzling. One potential hypothesis is that Graceful Tarplant was once much more common during the wetter Pleistocene, and is now poorly adapted locally to the generally more arid conditions prevailing over the last few millennia. As a result, it still occurs in substantial numbers at a few sites where conditions are optimal, but it is poorly adapted to grow in more limited numbers at less favorable sites. Controlled experimental growing conditions in a nursery might shed some light on its preferences. Graceful Tarplant has intriguing stalked phyllaries with open pit glands on the tips that are unique to the County flora; and diagnostic for identifying this annual species even when it is dried and slowly decomposing.

VERNAL BARLEY [*Hordeum intercedens* Nevski]

LISTING: CNPS List 3 R-E-D Code ?-2-2
State/Fed. Status -- None POACEAE Mar.-Jun.
Global Rank G? State Rank S3S4

DISTRIBUTION: San Diego County, Orange County, Riverside County, Los Angeles County, Anacapa Island, Kings County, Mono County, Santa Barbara County, Santa Barbara Island, San Benito County, San Clemente Island, Santa Cruz Island, Santa Catalina Island, San Mateo County, San Nicolas Island, Santa Rosa Island, Ventura County; Baja California, Mexico

HABITAT: This annual grass typically occurs in saline flats and depressions in grasslands or with vernal pool basins. Possible Associates: *Brodiaea* species, *Lythrum hyssopifolium*, *Eryngium aristulatum*.

KNOWN SITES: This small grass was observed in San Diego County in small vernal pool basins near Dillon Road on Otay Mesa; and is locally common in disturbed grasslands in the vicinity. Apparently this species was once common growing among the historic mima mounds of western Otay Mesa, and still survives in mesic grasslands where frequent discing does not always lead to its extirpation. It is also localized nearby in the open grasslands north of Highway 905 towards Heritage Road. It is reported from Witch Creek and about vernal pools on Camp Pendleton. Herbarium specimens were examined from Camp Kearney, the south side of the Otay River, and on the beach at San Diego; as well as from Santa Barbara Island and San Clemente Island. Reported by Raven along a rill in dry adobe on the northeast slopes of Conejo Mountain. Reported by Smith for the Santa Barbara region (under the name *Hordeum pusillum*) in vernal meadows from Santa Barbara to Goleta (e.g., Railroad and Animas roads, State and Constance streets, and Isla Vista tract); also Anacapa Island and Santa Cruz Island. Recent reports from Orange County note populations at Costa Mesa, as well as near Quail Hill. Riverside County reports are for mixed populations of *Hordeum intercedens* and the similar *Hordeum depressum* peripheral to vernal pool habitat in Hemet.

Five specimens from Baja California are recorded at the herbarium of the San Diego Natural History Museum south to 29° 12' North where collected by Moran (SD 76827) five miles northwest of Punta Blanca.

STATUS: Little Barley is presumed to be declining in southern California due to extensive loss of vernal pool and isolated alkaline wetlands habitat. This small grass is more common than the few collections indicate. More information is needed from vernal pools in the City of San Diego and Hemet areas. On Otay Mesa it sometimes grows in fields dominated by *Hordeum murinum* which may superficially appear similar if a bit more robust. If you closely examine a spikelet of Little Barley you will notice the lemma awns on the lateral spikelets are much shorter than those of *Hordeum murinum*, and the glumes of the central spikelet are distinctly flattened unlike *Hordeum depressum*. Aside from the last mentioned species in this complex genus, Little Barley often has a shorter appearance in terms of the spikelet lengths than typical spikelets of other barley species found in San Diego County (e.g., *Hordeum brachyantherum*, *H. jubatum*, *H. murinum*). Provisionally, it is recommended that substantial portions of all populations in coastal southern California should be protected; significant portions of smaller populations should also be protected when possible. Given the extraordinary loss of mima mound/vernal pool habitat along the coast over the last 100 years, Vernal Barley may have once been much more common. Rarity appears to be correlated with habitat conversion to urban uses, over-grazing, and agricultural pursuits.

CLEVELAND'S HORKELIA [*Horkelia clevelandii* (E. Greene) Rydb.]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None ROSACEAE Jun.-Aug.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County; Baja California, Mexico

HABITAT: Drier portions of montane meadows are the preferred habitat of the Cleveland Horkelia in the Laguna Mountains. Soils at the Shrine Camp site in the Lagunas are mapped as Loamy Alluvial Land. Possible Associates: *Lessingia filaginifolia*, *Aster* species, *Elymus elymoides*. This is the host plant of the sensitive Laguna Mountains Skipper (*Pyrgus ruralis lagunae*).

KNOWN SITES: Colonies of this horkelia grow at the east end of the Laguna Meadows near the Shrine Camp; north of the Sunrise Highway at the northeastern corner of Cuyamaca Reservoir; as well as in

meadows along upper Kitchen Creek Road. This species is also reported from the Cuyamaca Mountains and Palomar Mountains of San Diego County. Plants from Baja California may be a distinct species. Sanders (unpublished) reports this species as not rare in the San Jacinto Mountains of Riverside County.

This perennial herb is reported from damp meadows in the Sierra Juarez and Sierra San Pedro Martir of Baja California; these populations may constitute a related species or subspecies.

STATUS: Cleveland Horkelia is presumed to be severely declining in its San Diego County montane meadow habitat due to extensive historical cattle grazing. More collection information from both San Diego and Riverside counties is needed to fully assess its status. The rarity of the Laguna Mountains Skipper may be directly tied to the declining populations of this butterfly's host plant. Given this circumstance, all substantial populations of this horkelia in the Laguna Mountains are recommended for protection. *Unlike Horkelia cuneata and Horkelia truncata*, that also grow in the County, Cleveland's Horkelia has lateral leaflets that are palmately veined at their base; not pinnately veined.

MESA HORKELIA [*Horkelia cuneata* Lindley ssp. *puberula* (E. Greene) Keck]

- LISTING:** CNPS List 1B R-E-D Code 2-3-3
State/Fed. Status -- None ROSACEAE Feb.-Sep.
Global Rank G4T2 State Rank 2.1
- DISTRIBUTION:** San Diego County, Orange County, Riverside County, Ventura County, Santa Barbara County, Los Angeles County, San Bernardino County, San Luis Obispo County
- HABITAT:** Sandy or gravelly areas in chaparral and sage scrub are the preferred habitat of the Mesa Horkelia. Possible Associates: More information needed.
- KNOWN SITES:** An old herbarium collection comes from Magee Ranch near Pala. This population may still be extant, but has not been relocated. Sanders (unpublished) reports this species as barely extant in San Bernardino County.
- STATUS:** Mesa Horkelia, a perennial herb, is differentiated from the closely related Wedgeleaf Horkelia (*Horkelia cuneata* ssp. *cuneata*) by its flowering inflorescence in open rather than somewhat congested cymes, herbage with hairs sparsely glandular rather than glandular villous to nonglandular hairs, its hypanthium obscurely pilose to glabrous within (rather than densely pilose), filament bases that can be wider than one millimeter, and pedicels that can be greater than 12 millimeters. Lateral leaflets are pinnately veined not palmately veined as with *Horkelia clevelandii*; and leaflets are 5-12 per side, not 1-3 per side as with *Horkelia truncata*. Boyd (unpublished) notes that some populations may be intermediate between these two subspecies. This inland subspecies of *Horkelia cuneata* may have been heavily impacted by historical loss of habitat on the eastern periphery of the Los Angeles basin. All San Diego County populations are recommended for protection. More information is needed to adequately assess reasons for rarity.

RAMONA HORKELIA [*Horkelia truncata* Rydb.]

- LISTING:** CNPS List 1B R-E-D Code 3-1-2
State/Fed. Status -- None ROSACEAE May-Jun.
Global Rank G3 State Rank S2.3
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Chamise Chaparral is usually present at Ramona Horkelia sites. The extensive populations along Roblar Grade occur in a low-growing, moderately dense chaparral mapped with Cieneba

very rocky coarse sandy loam. Possible Associates: *Arctostaphylos* species, *Salvia clevelandii*, *Ceanothus* species.

KNOWN SITES: A very large population of Ramona Horkelia was discovered on Roblar Grade in the Santa Margarita Mountains. It is rare on Mount Woodson and locally common near the peak at Black Mountain-Lusardi. Old reports are from Temescal Valley near Mesa Grande, Viejas Mountain, and McGinty Mountain. A sizeable population occurs on Iron Mountain including along the trail above the Salvation Army Camp site. Herbarium collections from the County include sites near Hidden Glen, the south slope of Roderick Mountain, above Flynn Springs, the south fork of Featherstone Creek, and the northeastern slope of El Cajon Mountain. Old biological survey reports note this species on the north slope of Lawson Peak and nearby on the north slope of Gaskill Peak. CNDDDB reports are for 1.2 miles south of the upper San Luis Rey river and 0.7 mile west of Lusardi Canyon (i.e., Black Mountain), 1 mile northwest of the junction of Deer Springs Road and Interstate 15, along the Tule Springs Road for 1 mile to the Rancho Alegria Gate approximately 1 mile southwest of Mineral Hill, and 0.75 mile south of Wildcat Spring and 1 mile north of the Burney Ranch in the Tule Springs region.

One specimen from Baja California is found at the herbarium of the San Diego Natural History Museum; collected at 32° 4' North on the north slope of Cerro Blanco by Moran (SD 73044).

STATUS: Ramona Horkelia populations are presently stable given the limited historical development to its rugged foothill habitat. The Roblar Grade population is an important site and deserves specific protection from USMC Camp Pendleton. All populations should be protected. This species' rarity is associated with its restrictive use of metavolcanic and gabbroic soils that are only sporadically distributed in the region. Ramona Horkelia has lateral leaflets pinnately veined not palmately veined as with *Horkelia clevelandii*; and has 1-3 leaflets per side, unlike *Horkelia cuneata* with 5-12 leaflets per side.

NEWBERRY'S VELVET-MALLOW [*Horsfordia newberryi* (Wats.) Gray]

LISTING: CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None MALVACEAE Feb.-Dec.
Global Rank G4 State Rank S3.3

DISTRIBUTION: San Diego County, Riverside County, Imperial County; Arizona; Sonora and Baja California, Mexico

HABITAT: Sonoran Desert Scrub is the general habitat for this suffrutescent shrub. Rocky desert canyonlands are where one usually encounters this distinctive mallow with velvety textured leaves. The velvet-mallow is typically found within jumbles of large boulders; often not far from steep canyon drainages. Acid Igneous rock land may be mapped for soils in these areas. Possible Associates: *Perityle emoryi*, *Pleurocoronis pluriseta*, *Ferocactus cylindraceus*.

KNOWN SITES: This conspicuous shrub occurs in most of the larger desert canyons south of Vallecito Valley and west of Highway S2 in the Sawtooth, Tierra Blanca, and Jacumba mountains. It is locally common in Flat Cat Canyon north of Hellhole Canyon near Anza Borrego Park Headquarters. More specific reports are from Mortero Wash, Lava Flow Wash, Inner Pasture, Fish Creek, Vallecito Stage Station, and Borrego Valley. Rather than finding substantial colonies, one is more likely to see scattered shrubs growing among weathered granite boulders. Unpublished reports by Boyd include several from the edge of the Santa Rosa Mountains and one from the Chocolate Mountains. Reported by McLaughlin from the Picacho State Recreation Area in Imperial County. Reported by Butterwick as rare to occasional near South Mountain Park in Phoenix. Reported by Felger on Isla Tiburon and Isla San Esteban in the Gulf of California.

Nineteen specimens are found in the herbarium at the San Diego Natural History Museum from Baja California.

STATUS: The San Diego County populations of Newberry's Velvet-mallow are presumed stable; this shrub is sparsely but well distributed on the desert slopes east of the Laguna Mountains, southward to the Mexican border. Flowering may follow any seasonal rainfall. No specific recommendations are made for protection. This species is undercollected and not truly rare within its desert foothill habitat. The yellow or pale orange flowers (petals 8-10mm), relatively long and shallowly cordate leaf blade (3-15cm) with a distinctive velvety yellow-green tomentum, and considerable size (10-30 dm) of this shrub make Newberry's Velvet-mallow easily identifiable in the field.

SAN DIEGO SUNFLOWER [*Hulsea californica* T. & G. ex Gray]

LISTING: CNPS List 1B R-E-D Code 2-1-3
State/Fed. Status -- None ASTERACEAE Apr.-Jun.
Global Rank G2 State Rank S2.1

DISTRIBUTION: San Diego County

HABITAT: Montane Coniferous Forest and lightly disturbed chaparral are preferred by San Diego Sunflower. This species is definitely a fire follower, and may occur in some numbers following fires at the upper elevations of the Laguna Mountains; otherwise it usually is found in small colonies or singly in mildly disturbed locales. Occasionally it is found beneath pine canopy. Mottsville loamy coarse sand is mapped for the disturbed locale in Pine Valley. Possible Associates: *Pinus jeffreyi*, *Clarkia rhomboidea*, *Camissonia strigulosa*.

KNOWN SITES: This plant is rare and scattered on burns in small colonies throughout the Laguna Mountains such as at Pine Valley, along Sunrise Highway, north of the I-8 off-ramp near Buckman Springs, and near Garnet Peak. No large permanent concentrations of *H. californica* are known. It is quite conspicuous and not likely to be missed when in flower. Reports from the Palomar area may be referable to *Hulsea heterochroma*. Old reports from the Laguna and Cuyamaca Mountains include Chariot Canyon, Stonewall Peak, Cherry Flat, and Japacha Peak; as well as southeast to Campo. Herbarium specimens in the San Diego Natural History Museum include collections from 1 mile east of Green Valley Falls, Hot Springs Mountain near Eagle's Nest, Espinosa Trail near Pine Creek, Harper Ranch, Glencliff Campground, southeast of Buckman Springs, Cottonwood Valley, Airplane Ridge, Desert View, Fred Canyon, and at Inspiration Point. An old biological survey report notes this species 1 mile south of Julian High School.

STATUS: San Diego Sunflower populations are presumed stable. Additional recreational use in the Laguna Mountains will inexorably cause a decline in the population as peripheral coniferous forest habitat, preferred by the species, is further degraded by human activities. In addition, stringent fire suppression in the mountains may adversely affect this species, which may rely on natural fire cycles. Habitat for substantial populations noted following fires should be protected, regardless of whether or not plants are observed in following years as the vegetation matures. In effect, a seed bank should be presumed to still be present for this fire follower. San Diego Sunflower has strikingly woolly and glandular long hairs on the lower leaves; with 3-4 flowering heads per stem (versus one) to differentiate it from forms of *Hulsea vestita*.

MEXICAN HULSEA [*Hulsea mexicana* Rydb.]

LISTING: CNPS List 2 R-E-D Code 3-1-1
State/Fed. Status -- None ASTERACEAE Apr.-Jun.
Global Rank G3G4 State Rank S1.3

DISTRIBUTION: San Diego County

HABITAT: This species was likely collected on volcanic soils at the Table Mountain site, in open, high desert chaparral. Possible Associates: More information needed.

KNOWN SITES: One old historical collection by Gander is from Table Mountain northeast of Jacumba, several miles from the Mexican border.

Thirty-five specimens from Baja California are found at the herbarium of the San Diego Natural History Museum; collected as far south as 28° 45' North in the valley of San Juan by Moran (SD 60677).

STATUS: This showy biennial is presumed stable in San Diego County. The historical collection site has not been rediscovered. However, Table Mountain is little explored and a population likely still exists. Habitat on Table Mountain is near the northernmost range extensions for a number of other Baja plants and animals. All populations should be protected. Baja herbarium data indicates this species may be well distributed south of the international border, and its rarity a product of political boundaries. Mexican *Hulsea* has glandular lower leaves and yellow ligules on the ray flowers to differentiate it from *Hulsea heterochroma*.

BEAUTIFUL HULSEA [*Hulsea vestita* Gray ssp. *callicarpa* (Hall) Wilken]

LISTING: CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- None ASTERACEAE May-Oct.
Global Rank G5T3 State Rank S3.2

DISTRIBUTION: San Diego County, Riverside County, Orange County

HABITAT: This herbaceous perennial grows in mildly disturbed or rocky locales in chaparral and Lower Montane Coniferous Forest. It may regularly occur as a fire follower. Possible Associates: *Pteridium aquilinum*, *Streptanthus bernardinus*, *Apocynum androsaemifolium*.

KNOWN SITES: Plants growing on Cuyamaca Peak show some traits of *H. heterochroma*. Herbarium specimens examined from elsewhere in San Diego County are from the Los Coyotes Indian Reservation, Lost Valley, Hot Springs Mountain, and Palomar Mountain; from nearby Riverside County herbarium specimens were seen from Strawberry Creek near Idyllwild and from an unspecified locale in the San Jacinto Mountains. A report is from near Aguanga. In Riverside County this hulsea grows on North Mountain east of Hemet along the summit fire road, near Idyllwild in the San Jacinto Mountains at chaparral edges, and near the turnoff to Santa Rosa Peak in the Santa Rosa Mountains.

STATUS: This herb is part of an extremely variable complex with traits tending to vary from mountain range to mountain range; some intergradation is likely with *Hulsea heterochroma* and *Hulsea californica*. It does not have the extremely hairy phyllaries and large flowering heads of the latter, nor the strongly reddish ray flowers of the former. Nevertheless, petals are sometimes orange or with a reddish hue, and phyllaries can be moderately hairy. More information is needed to determine how common this species is in the mountains of western Riverside County; particularly following fires. Provisionally, significant portions of all sizeable populations are recommended for protection. This species is presumed stable given the limited recent loss of habitat within its foothill/montane range. Beautiful has woolly and glandular long hairs on the lower leaves; with one flowering heads per stem (versus 3-4) and long peduncles (>5cm) to differentiate it from *Hulsea californica*.

WRIGHT'S HYMENOTHRIX [*Hymenothrix wrightii* A. Gray]

LISTING: CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None ASTERACEAE Jun.-Sep.
Global Rank G5 State Rank S3.3

DISTRIBUTION: San Diego County; Arizona; New Mexico; Sonora and Baja California, Mexico.

HABITAT: This small biennial or perennial species grows on open, somewhat arid slopes near montane meadows and in montane chaparral openings. Coniferous forest may occur nearby. Soils at Inspiration Point are mapped as Boomer stony loams. Possible Associates: *Lessingia flaginifolia*, *Linanthus pygmaeus*, *Eriogonum wrightii*.

KNOWN SITES: Wright's Hymenothrix is found at the Inspiration Point loop road south of Julian, on the ridgelines east of Kentwood In The Pines, and along the west side of Sunrise Highway, northeast of Pine Valley where the road begins a steep ascent from vast open grasslands into dense coniferous forest. Herbarium specimens examined were from the west slope of Cuyamaca Peak, Palomar Mountain, Pine Valley, near Shrine Camp, near the Cuyamaca Rancho State Park lodge, and northwest of Camp Hual-cu-cuish. Reports are from near the Cuyamaca Lodge, the Stonewall Mine, Laguna Camp, Wooded Hill, Vallecito Trail, and Pine Valley.

Five Wright's Hymenothrix specimens have been collected from Baja California which are deposited at the San Diego Museum of Natural History's herbarium. This widely distributed shrub has been collected as far south as 31°35' where collected by Moran (SD 79892) two miles southeast of Portezuelo de Jamau peak.

STATUS: This species is presumed stable in San Diego County. Much of its habitat now lies within the Cleveland National Forest. Substantial portions of all larger populations should be protected. Wright's Hymenothrix ranges eastward to Arizona and New Mexico, and this species may be relictual in our region and adapted to a southwestern desert mountain, summer rainfall regimen that now occurs erratically in the mountains of San Diego County. When not in flower Wright's Hymenothrix is a relatively inconspicuous subshrub. The leaves are pinnately or ternately dissected into narrow lobes (see line drawing in Jepson Manual). The disk flowers are white with purplish tips, and growing in flat-topped clusters.

SLENDER-LEAVED IPOMOPSIS [*Ipomopsis tenuifolia* (Gray) V. Grant]

LISTING: CNPS List 2 R-E-D Code 2-1-1
State/Fed. Status -- None POLEMONIACEAE Mar.-May
Global Rank G3G4 State Rank S2.3?

DISTRIBUTION: San Diego County, Imperial County; Baja California, Mexico

HABITAT: Pinyon Juniper Woodland and higher elevations with Sonoran Desert Scrub are the preferred habitat for this showy subshrub with bright red flowers. Near Jacumba this species is associated with large boulders and soils mapped as Acid Igneous rock lands. Surrounding vegetation is relatively open and conditions are quite xeric; the Slender Leaved Ipomopsis may grow from rocky crevices among the boulders. Possible Associates: *Phacelia affinis*, *Juniperus californica*, *Leptodactylon pungens*.

KNOWN SITES: This shrub was seen in limited numbers growing in rocks at Carrizo Gorge. All reported County sites for this striking and quite rare species are nearby. It is also scattered on the grade into Smuggler's Cave, east of Jacumba.

Fifty-two specimens have been collected from Baja California which are deposited at the San Diego Museum of Natural History's herbarium. This widely distributed shrub has been collected as far south as 29° 19' at Cerro San Luis by Moran (SD 54543).

STATUS: San Diego County populations of Slender-leaved Ipomopsis are apparently stable. Historical impacts within the boulder fields near Dubber and Carrizo Gorge have been minimal, except for the historical construction of the famous railroad line. Given its limited distribution in the United State, all populations of Slender-leaved Ipomopsis should be protected. Substantial distribution information for areas south of the international border indicate the rarity of this species is based on political boundaries; in reality it may be relatively common in northern Baja

California. The large red tubular flowers (15-28mm) on this shrub are striking and difficult to confuse with other native species. The narrow leaves are linear, unlike *Epilobium canum*, which also has long red tubular flowers, and is in the unrelated Evening Primrose Family.

DECUMBENT GOLDENBUSH [*Isocoma menziesii* (Hook. & Arn.) Nesom var. *decumbens* (Greene) Nesom]

- LIST:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- None ASTERACEAE Apr.-Nov.
Global Rank G5T3? State Rank S2.2
- DISTRIBUTION:** San Diego County, Orange County, San Clemente Island, Santa Catalina Island; Baja California, Mexico
- HABITAT:** This species is presumed to utilize coastal sage scrub habitat intermixed with grassland, and is more partial to clay soils than other closely related varieties. Possible Associates: *Deinandra conjugens*, *Lessingia filaginifolia*, *Nasella pulchra*.
- KNOWN SITES:** The *Isocoma menziesii* complex is one of the most confusing plant taxonomic groups in San Diego County. Under Nesom's concept (Phytologia, February 1991), *I. m.* var. *decumbens* is an arachnoid form of the widely ranging *Isocoma menziesii* with mostly gray tomentose entire leaves (which can have a few teeth near the apex). Such forms are concentrated (but not exclusively) in the vicinity of Bonita northward to the Miramar Marine Air Station. While these plants often appear quite distinctive and may sometimes grow sympatrically with primarily glabrous or lightly haired and somewhat glutinous leaved plants (identified by Nesom as variety *menziesii*), elsewhere in coastal portions of San Diego County are numerous populations with seemingly intermediate traits. Substantial numbers of plants conforming to the description of variety *decumbens* grow near Proctor Valley Road in eastern Chula Vista, from west of Rolling Ridge Road to Gobblers Knob. It is locally abundant in the hills east of the terminus of San Miguel Avenue near Mother Miguel Mountain. South of Miramar Road and east of I-805 on Miramar Air Station grow similar plants; glabrous shrubs are also in this area. North of the Donovan Prison on Otay Mesa were observed populations with similar traits; the hairier leaved forms tended to occur on clay-laden slopes, while the glabrous forms tended to occur on shallower, rockier substrates not associated with heavy clays. A small population was observed in the grasslands a half mile east of the Jamul Fire Station. Plants close to variety *decumbens* are occasional in Penasquitos Canyon. In Lee Valley southeast of Phelps Corner, growing in transitional foothill sage scrub, are plants referable to variety *decumbens*. At this more inland locale leaf traits were relatively uniform. In mid/coastal portions of the County such as in the grasslands north of College Boulevard in Carlsbad near the proposed community golf course, very hairy forms of variety *decumbens* are found growing in the dense clays. North of Palomar Airport Road and approximately a mile east of El Camino Real are disturbed grasslands with additional, similar plants. Throughout the north/coastal area one finds plants generally conforming to variety *decumbens*; although in many cases more typical forms of *I. m.* var. *menziesii* may occur nearby. Ross reports this species from San Clemente Island.
- STATUS:** The status of Decumbent Goldenbush in San Diego County is poorly understood; more information is needed on the limitations under which *I. m.* var. *decumbens* is assignable to specific populations. Taxonomic work is necessary to adequately assess the coastal goldenbushes; currently there is still disagreement on this genus with differing concepts as to varieties or subspecies. Decumbent Goldenbush is not addressed within the Jepson Manual (1993). The keys with Meredith Lane's treatment of *Isocoma menziesii* in the Jepson Manual do little to clarify population differences observed in the field; and do not reflect the diversity found at many locations. Given the Nesom definition, populations dominated by relatively short shrubs, with typically few (but variable in number) shallow teeth on relatively hairy leaves, can be assigned to *I. m.* var. *decumbens*. A number of other varieties occur in coastal San Diego County. Plants similar to inland forms of typical *Isocoma menziesii* var. *menziesii*,

but with a "distinctive prostrate habit," occur on the sea bluffs at the southern tip of Point Loma (Reiff and Gaviota fine sandy loams), about the salt marsh at Imperial Beach, are reported at scattered locales north of La Jolla (usually quite near the ocean), and range southward along the immediate coastline into northern Baja California. One small population of *Isocoma menziesii* variety *sedoides*, with broadly spatulate leaves, was observed growing on ocean bluffs near San Elijo State Beach, in a mix of exotic plantings and vestigial sage scrub. This variety is otherwise only recorded from similar habitat nearby in Encinitas. The influence of this predominantly northern/insular shrub may account for some of the diversity of traits observed in the San Diego region. Moreover, *Isocoma menziesii* variety *vernonioides* is present in northern San Diego County (it is often the dominant form in western Riverside County), as indicated by shrubs with leaves that are shallowly toothed along their margins to the base. Very hairy plants with "deeply toothed leaves almost to the base of an unusually narrow leaf rachis" (almost like *Machaeranthera juncea*) grow north of H Street and west of Del Rey Boulevard in Chula Vista. These plants are also found near Paseo Ladera and Telegraph Canyon Road to the south, and appear to constitute a very localized, endemic entity which is herein termed *Isocoma menziesii* (Hook & Arn.)Nessom variety *evanii* Reiser [Recommended R-E-D Code 3-3-2, List 1B]. The soils utilized by this shrub are not like the dense clay-soils microhabitat typical of *I. m.* var. *decumbens*. There is a looser, sandier floodplain component; although these sandier inclusions are sometimes found at the toe of slope for Linne clay loams. In Marron Valley near the confluence of Cottonwood Creek and Tecate Creek (together forming the Tijuana River) are hundreds of densely hairy shrubs conforming to variety *evanii* (San Diego Museum of Natural History herbarium #134520 and #65796), with a robust growth form and deeply toothed leaves. This robust, more horizontally growing and tangled shrub habit is quite unlike variety *menziesii* or variety *decumbens*, and this extended and isolated population (soils mapped as Riverwash) further supports separation of variety *evanii*. The population here extends across the river into Mexico. Soils in Marron Valley are very sandy and atypical of variety *decumbens*. To summarize the varieties of *Isocoma menziesii* observed in San Diego: 1) typical variety *vernonioides* with shallowly toothed leaves to near the base is concentrated in the north County towards Camp Pendleton and Rainbow and often occurs on very hard-packed soils; 2) typical variety *menziesii* with a few shallow teeth towards the leaf apex and a glabrous (to mildly hairy leaf) is concentrated on loams in the south/mid County and foothills at many locations; 3) variety *sedoides* is a locally rare spatulate-leaved insular/more northerly based entity with a foothold on erosive seabluffs near Cardiff/Encinitas/Carlsbad; 4) a locally common, semi-prostrate and glabrous shrub with shallow teeth at the apex growing only on the immediate windswept beach bluffs and salt marsh edges; 5) variety *evanii* is a rare shrub that is deeply toothed along the entire, very hairy and comparatively narrow leaf rachis; growing in sandier substrates near the Mexican border and extending into northern Baja California; 6) variety *decumbens* is a relatively common, very hairy leaved plant with shallow teeth mostly towards the apex that occurs primarily on clay substrates in the mid and south County. Given these parameters, plants still may be found that show some intergradation of traits, particularly level of hairiness. For example, very hairy forms of variety *vernonioides* are sometimes found in the mid and north County that have shallowly toothed leaves. Also seen are localized complexes of various hairy forms of variety *menziesii*; not growing on clays. Under these conditions, hairy shrubs may grow next to glabrous shrubs; but even these hairy shrubs usually maintain a greener and differently appearing leaf coloration than with typical grayish, arachnoid-leaved variety *decumbens*. Despite all the plasticity and variation observed in San Diego County, there do appear to be some good correlations between soil type, leaf shape, shrub form, and geographic distribution for these six varieties of coastal goldenbush. Given all this information, it must still be stated that *Isocoma menziesii* variety *decumbens* is too common in the region to warrant CNPS listing status, and should probably be deleted; while variety *evanii* warrants such listing.

SAN DIEGO MARSH ELDER [*Iva hayesiana* Gray]

- LISTING:** CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status --/Species of Concern ASTERACEAE Apr.-Sep.
Global Rank G3? State Rank S2.2?
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Creeks or intermittent streambeds are the preferred habitat for this low-growing, conspicuous shrub. It is rarely situated on seeps near creeks. Typically, the riparian canopy is open allowing substantial sunlight to reach this marsh elder. Sandy alluvial embankments with cobbles are frequently utilized. Within the southwestern portion of the County this plant may occur in steep watercourses where other riparian vegetation is not present. While soils are usually mapped as Riverwash, these steeper locales can include various series including San Miguel-Exchequer or Huerhuero loams. Possible Associates: *Juncus acutus*, *Baccharis salicifolia*, *Ambrosia psilostachya*.
- KNOWN SITES:** The highest concentrations for this shrub occur in the Otay River from Salt Creek in the east, west to Beyer Boulevard. It is found along intermittent streams around Lower Otay Lake, and is to be looked for in any drainage in the south County near the coast. Large populations occur in the Tijuana River in Marron Valley; as well as upstream in Tecate Creek. San Diego Marsh Elder is uncommon on Otay Mesa in Spring Canyon and other nearby seasonal watercourses. It is fairly common in drainages on Otay Mountain. This shrub is also found within most drainages on the northern slopes of San Miguel Mountain, nearby Mother Miguel Mountain, the creek south of Proctor Valley Road and west of Rolling Ridge Road, and in Little Hansen Creek; it is locally common along Peñasquitos Creek from just east of Interstate 15 west to Interstate 5, in Carroll Canyon, in La Zanja Canyon, and is uncommon along Escondido Creek and its tributaries. Generally, the farther north one goes the smaller and more localized the populations; for example those on San Marcos Creek below the dam. A vigorous population grows on a well-developed riparian creek 1 mile west of Lake Hodges and south of Del Dios Highway and the San Dieguito River. Small populations were seen in a canyon drainage west of Black Mountain Road and north of Peñasquitos Canyon, east of Fairbanks Ranch near Lusardi Canyon, and near Proctor Valley Road. San Diego Marsh Elder is abundant in the Tijuana River in Marron Valley near the border with Mexico. An old biological survey report notes this shrub in San Elijo Canyon southwest of Harmony Grove. The species' range is primarily west of Interstate 15 and south of Highway 78.
- Thirty-one Baja California collections in the San Diego Herbarium indicate a considerable range and distribution. It was collected as far south as 28° 17½' North by Moran (SD 54071) in a canyon east of Gill Peak on Cedros Island. San Diego Marsh Elder is common in a drainage several miles east of Rodriguez Dam in Baja California on the highway to Tecate, Mexico.
- STATUS:** San Diego Marsh Elder is considered stable but potentially affected by modifications and degradation of coastal drainages in San Diego County. It is a rather aggressive shrub that could expand its range if introduced into coastal creeks where it is not presently found. Substantial portions of sizeable populations should be protected. San Diego Marsh Elder becomes markedly less common as one moves northward from major drainage to major drainage in coastal San Diego County. The San Onofre Mountains in concert with the southwestern extension of the Santa Ana Mountains provide a limited geological barrier to movement northward of this species, as the relatively broad coastal plain is suddenly "pinched" against the Pacific Ocean. Nevertheless, it is still difficult to account for its limited presence in creeks in the Oceanside area such as along the San Luis Rey River system. San Diego Marsh Elder is a shrub with relatively fleshy, entire, oblanceolate leaves. It regularly grows in concentrations rather than as isolated plants, and its ragweed-like racemes of flowers quickly identify it to species.

SOUTHERN CALIFORNIA BLACK WALNUT [*Juglans californica* Wats.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- None JUGLANDACEAE Jan.-May
Global Rank G3 State Rank S3.2
- DISTRIBUTION:** Orange County, Riverside County, San Diego County, Santa Barbara County, San Bernardino County, Ventura County, Los Angeles County
- HABITAT:** This tree grows 20-50 feet tall in open savannah, oftentimes in habitat best labeled walnut woodland. Typically, the understory is limited such as in the Chino Hills. Heavy grazing has occurred throughout most of the historical range where this tree is concentrated. Clays seem to be prevalent in many of the locales where this small tree is found, and this walnut may be more tolerant of clay soils than are most native trees and woody shrubs. Trees show some preference for deep alluvial soils with high water-retention capacity; they tend to grow in creekbeds, on alluvial terraces, and on north-facing slopes. The extensive root system includes a deep taproot; typical life span for this tree has been estimated at 100 years. Possible Associates: *Ribes speciosum*, *Salvia leucophylla*, *Toxicodendron diversilobum*.
- KNOWN SITES:** In San Diego County walnuts are scattered along the Sweetwater River near Dehesa and Sloane Canyon. These populations are questionably native, although isolated individuals upstream from Sequan are not close to historic settlements. Diegueno or Luisueno pre-Columbian transport from the north may account for the introduction of the walnut into the area. This walnut is also reported from Cottonwood Canyon near the Santa Rosa Plateau, Bonsall, Jamacha Junction, and near the Tenaja Truck Trail and De Luz. Substantial walnut woodlands occur in Orange County such as at Tonner Canyon near the boy scout camp. Walnuts grow on mesic north-facing slopes of Telegraph Canyon near Yorba Linda and the Diemer Filtration Plant. Slopes with walnut woodland were seen throughout the Chino Hills near the Prado Basin. Concentrations of trees tended to occur here on the steepest slopes where cattle grazing was limited by the terrain. There are numerous other locales for Orange County. Herbarium specimens examined include Carbon Canyon and Brea Canyon Road in Orange County; the San Jose Hills near Pomona, Topanga Canyon, and Claremont Wash in Los Angeles County; also Santa Catalina Island. Smith reports this tree in the Santa Barbara region is sparsely scattered from Carpenteria to Las Cruces Hot Springs, Alisal and Alamo Pintado creeks near Solvang, to Los Olivos and the mouth of Jalama Creek; also along State Highway 150 near Rincon Creek east towards Casitas Pass; Padre John Canyon; Ojai. Raven reports this tree from throughout the Santa Monica Mountains of Los Angeles County, growing with oaks or in chaparral on mesic north-facing slopes.
- STATUS:** The Southern California Black Walnut is declining throughout its range. Hybridization with introduced horticultural walnut trees is reported to pose a problem. Overgrazing of habitat has been the primary impact during recent decades with an apparent loss of young trees among increasingly senescent stands; however, urban development focusing on substantial regrading of steep slopes is becoming a major threat to foothill populations. Overgrazing in optimal walnut habitat could be a significant factor in the inability of this species to maintain population vigor. Many of the historical populations of this tree occur in now relatively open habitat with over a century of intermittently heavy grazing pressures. Areas such as the Chino Hills in Orange County provide a distinctive microhabitat which is generally absent from San Diego County, and this walnut species may have growth requirements which are not optimally met south of the Santa Ana Mountains. Other factors may be affecting reproduction. This species is also very susceptible to crown rot; during drought years little if any fruit is produced. This tree is unlikely to be confused with any native trees, but is similar to other introduced horticultural walnuts. The leaflets on *Juglans regia*, the English Walnut, are fewer in number (7-9 versus 11-19)

SOUTHWESTERN SPINY RUSH [*Juncus acutus* L. ssp. *leopoldii* (Parl.) Snog.]

LISTING: CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- None JUNACEAE May-Jun.
Global Rank G5T5 State Rank S3.2

DISTRIBUTION: San Diego County, Los Angeles County, Santa Catalina Island, Santa Barbara County, Ventura County, Orange County, and San Luis Obispo County; Baja California, Mexico

HABITAT: Coastal Salt Marsh at brackish locales, Alkaline Meadows, and Riparian Marshes are all utilized by this rush. At mid-elevations this species may occur in limited numbers along drainages with willow riparian vegetation or sycamore woodland. On the desert Spiny Rush may grow at palm oases. A variety of soil types are used including Tujunga sand and Riverwash. Wherever water can pond along substantial seasonal drainages, this rush has potential habitat. It usually drops out of the flora at moderate elevations. Possible Associates: *Baccharis salicifolia*, *Anemopsis californica*, *Salicornia virginica*.

KNOWN SITES: This distinctive large bushy rush is common in marshes throughout coastal San Diego County. It is abundant in the San Diego River flood control channel west of Interstate 5. It is common in the Sweetwater River in Bonita, in the Otay River concentrated around old sand mining ponds, and in similar habitat on the San Diego River in Mission Gorge, on the San Dieguito River below Lake Hodges, and on the Otay River. It is sometimes found in vestigial dunes and marshes on the Silver Strand. This rush is frequently found on the eastern periphery of the coastal lagoons such as Agua Hedionda, San Dieguito, and San Elijo. It was seen at a palm oasis in the Coachella Valley in Riverside County and grows around similar springs in San Diego County on the Colorado Desert such as Mountain Palm Springs. Small to mid-sized populations can be found along Agua Hedionda Creek in Vista, in La Zanja Canyon, in Little Hansen Creek near the Sweetwater Reservoir, near Moonlight Beach in Encinitas, in the drainages west of Black Mountain and Rancho Penasquitos, on Escondido Creek in Olivenhain, and to the east of this near Aliso Canyon Road. Small numbers are scattered in boggy grasslands near San Miguel Avenue in Sunnyside. Herbarium specimens in San Diego include Otay Mountain, the Jamul Mountains, Cottonwood Creek, and Flynn Springs. It is readily seen growing in alkaline marshes paralleling Proctor Valley Road near Jamul. This rush is well distributed within the Tijuana River in Marron Valley; as well as further upstream in Tecate Creek on the Mexican border. Also, it is locally common about Newport Back Bay in Orange County. This species is reported from Santa Catalina Island southeast to Sonora, Mexico. Reported by Roberts for Orange County at Bolsa Chica and Monarch Beach. Reported by Raven as frequent in seepages and by coastal marshes in the Santa Monica Mountains region. Wallace reports spiny rush from Santa Catalina Island. Smith reports this shrub at salt marshes in Carpinteria, Goleta, and Gaviota; and inland at Little Caliente and Agua Caliente springs. Reported by Hoover from Morro Bay, Avila, and Pismo Beach.

Thirty-six specimens for Baja California are found at the San Diego Natural History Museum's herbarium; south to 23° 24' north where collected by Mudie (SD 93683) at the beach near San Pedrito. Southwestern Spiny Rush is common in a drainage several miles east of Rodriguez Dam in Baja California, on the highway to Tecate. It is locally abundant near the mouth of Guadalupe Valley and occurs at a variety of other wetland locales in northern Baja California.

STATUS: Southwestern Spiny Rush populations in San Diego County are now relatively stable despite several decades of losses associated with widespread regional reductions in wetlands. This species can be readily grown in suitable habitat, and given its broad current distribution, and spectrum of extant wetland population locations, it should be delisted. It is too common for rarity consideration. Southwestern Spiny Rush is indeed quite large (< 140cm), and is spiny-tipped on the cylindrical leaves; bearing little resemblance to other native plants west of the deserts.

COOPER'S RUSH [*Juncus cooperi* Engelm.]

- LISTING:** CNPS List 4 R-E-D Code 1-1-1
Stat/Fed. Status -- None JUNCACEAE April-May
Global Rank G4 State Rank S3.3
- DISTRIBUTION:** San Diego County, Imperial County, Inyo County, Riverside County, San Bernardino County; Nevada.
- HABITAT:** This robust shrubby rush is found uncommonly in desert alkali sinks. Possible Associates: species of *Atriplex*, *Suaeda moquinii*, *Allenrolfea occidentalis*.
- KNOWN SITES:** Growing in the alkaline marsh north of Round Mountain near Jacumba. Reported (unpublished) by Clifton from the eastern side of the Imperial Valley on the eastern side of the Coachella Canal. A. Peterson (unpublished) reports this species from Funeral Mountains, Death Valley, Black Mountains, Cottonwood Mountains, Grapevine Mountains, and Saline Valley.
- STATUS:** Potential habitat for this species is little disturbed except at oases sites that attract hikers and campers. Desert wetlands are generally poorly developed in San Diego County. Cooper's Rush should be searched for in Carrizo Marsh. Any County populations should be protected if native. Cooper's Rush is restricted to the deserts and has firm, acute sepals unlike the thin, obtuse sepals of *Juncus acutus*; moreover the fruit is larger than the enclosing perianth.

CALIFORNIA KALLSTROEMIA [*Kallstroemia californica* (Watson) Vail]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None ZYGOPHYLLACEAE Aug.-Oct.
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Imperial County, Riverside County, San Bernardino County; Arizona; Texas; Baja California, Sonora, and Sinaloa, Mexico
- HABITAT:** Hard-packed, sandy locales in open Sonoran Desert Scrub is sometimes utilized by this species. Possible Associates: *Tribulus terrestris*, *Boerhaavia* species, *Sisymbrium* species.
- KNOWN SITES:** This small annual herb was observed in San Diego County in the early 1980's near the highway east of Banner growing in open Pinyon/Juniper Woodland. Only a few plants were seen at a mildly disturbed locale. This small population may have been introduced either by cattle brought into the area or by motorcoach/car. A herbarium specimen examined is from east of June Wash in the Anza-Borrego Desert; a second specimen is from Mt. Signal in Imperial County near the U.S./Mexico border. Other herbarium specimens seen were from Arizona at Organ Pipe Cactus National Monument, near Yuma, Sulphur Springs Valley, and near Douglas.
- Nine specimens are found at the herbarium of the San Diego Museum of Natural History from Baja California south to 28° 4' North where collected by Hastings and Turner (SD 92269); two specimens were also examined from Sonora and one specimen from Sinaloa.
- STATUS:** Populations in California deserts are presumed rare but stable. California Kallstroemia is something of a taxonomic misnomer as most of its population apparently occurs east and south of California. Given its rarity in the state, it is recommended that all apparently naturally occurring populations be protected in California. San Diego County is at the northwestern periphery of a relatively wide range, and current climatic conditions may not provide adequate summer rainfall -- such as is found in Arizona and further eastward -- for a number of desert adapted species. With the gradual uplift of the Peninsular Range, rain shadow effects likely worsen with each century of change, also gradually limiting historical winter rainfall to the western deserts. The petals of California Kallstroemia are smaller (3-5mm versus 6-30mm)

than two species of *Kallstroemia* introduced into California; moreover, it has a style that is considerably smaller than the attached 10-lobed fruit.

CROWNED GOLDFIELDS [*Lasthenia coronaria* (Nutt.) Ornduff]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None ASTERACEAE Mar.-May
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Orange County, Riverside County, San Bernardino County, Ventura County; Baja California, Mexico, Isla Guadalupe, Mexico
- HABITAT:** This annual prefers openings in Diegan Coastal Sage Scrub and Coastal Bluff Scrub. It also occurs in very sandy locales in chaparral. Possible Associates: *Phacelia* species, *Cryptantha* species, *Layia platyglossa*.
- KNOWN SITES:** Crowned Goldfields is occasional on the sandy sea bluffs at Torrey Pines State Park, in the Tijuana Hills just west of Border Field State Park, in sandy substrates on Point Loma near Fort Rosecrans National Cemetery, and in Otay Valley east of Interstate 805. Herbarium specimens were examined from Chollas Valley, Mahogany Canyon east of San Diego, Balboa Park, the Silver Strand, Sweetwater Valley, the northern base of San Miguel Mountain, the north side of Proctor Valley Road, Japatul, Sloane Canyon, Harbison Canyon, Whispering Oaks on the Sweetwater River, 0.75 mile west of Dehesa, the north slope of Mount Soledad, on the north side of the San Luis Rey River 16 miles west of Rincon, Poway Grade, Lilac, northern Escondido, Mission Hills, San Diego, Pacific Beach, Kearny Mesa, Rolando Heights; as well as inland at Oak Grove. It is reported from Denny Canyon on the northwestern side of Otay Mesa, at Otay Lake, University Heights, Sweetwater Dam, Bernardo, Moro Hill, Del Mar, Fallbrook, and Lake Hodges. This annual is relatively common at numerous locales in southwestern Riverside County such as near Sage, as well as in the Vail Lake region.

Fifteen voucher specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 29° 35' North where collected by Moran (SD 76845) at Arroyo Santa Catarina.

- STATUS:** Crowned Goldfields is seriously declining along the coastal plains of southern California due to widespread loss of habitat for residential development, but this species is still present in a number of fragmented stands of Diegan Coastal Sage Scrub and Riversidian Sage Scrub, as well as in the limited patches of Coastal Bluff Scrub still extant. During drought years it may mimic the much more common *Lasthenia californica* with entire leaves; small plants may not develop the large pinnate lobes and relatively hairy vestiture seen on typical mature plants. Declines in western Riverside County have likely been less significant; however, this region is now the focus of massive residential expansion. Crowned Goldfields may need to be completely reassessed by year 2020 following continued urban growth. At present, no recommendations are made for listing. Crowned Goldfields has relatively broad cauline leaves that are clearly pinnately divided on mature plants; unlike the linear entire leaves of the regionally abundant *Lasthenia californica*.

COULTER'S GOLDFIELDS [*Lasthenia glabrata* Lindl. ssp. *coulteri* (Gray) Ornduff]

- LISTING:** None 1B R-E-D Code 2-3-2
State/Fed. Status -- / Species of Concern ASTERACEAE Feb.-Jun.
Global Rank G4T3 State Rank S2.1
- DISTRIBUTION:** San Diego County, Orange County, Riverside County, Los Angeles County, Kern County, Santa Barbara County, San Bernardino County, San Luis Obispo County, Ventura County, Santa Rosa Island; Baja California, Mexico

HABITAT: This species occurs in salt marsh areas near the coast at the extreme upper end of tidal inundation. It has also been noted on the periphery of vernal pools such as near Miramar Airfield. Coulter's Goldfields utilizes alkaline marshes in the inland valleys of western Riverside County. Possible Associates: *Frankenia salina*, *Atriplex* species, *Cressa truxillensis*.

KNOWN SITES: A sizeable population is concentrated at the east end of Peñasquitos Lagoon near the frontage road paralleling the freeway; this road is proposed for widening into the marsh. A small colony was found south of Miramar Road west of the intersection with Eastgate Mall, growing in very mesic grasslands near vernal pools. A small population was found in a drainage north of the intersection of H Street and Proctor Valley Road in eastern Chula Vista. Water was impounding adjacent to Proctor Valley Road during the spring in a shallow alkaline-ish basin that would not typically be thought of as suitable habitat. Herbarium collections examined include the Tijuana River Valley, the east end of Mission Bay, Sorrento Slough, National Ranch, a salt marsh on San Marcos Creek in Green Valley, at the mouth of the Sweetwater River, and on a saline flat near Old Town. Some of these locales may no longer be extant. Additional herbarium specimens were from Sunset Beach as well as a valley west of the Coyote Hills near Buena Park in Orange County. In Riverside County this species occurs in moist locales in Hemet near the corner of Florida and Warren. Massive fields of the common goldfields, *Lasthenia californica*, are present here with Coulter's Goldfields restricted to the mesic periphery of drainages.

Two collections from Baja California are found at the San Diego Natural History Museum; south to 31° 55¼' North where collected by Moran (SD 104965) 3.5 miles west/northwest of Ojos Negros.

STATUS: This species is severely declining throughout its range due to wetland degradation. All populations are recommended for protection in San Diego County. The dearth of collection sites and the utilization of secondary wetland habitats seems to point to a natural decline in optimal habitat for this species, that is compounded by a myriad of cumulative wetlands impacts throughout southern California over the last two hundred years. Coulter's Goldfields has phyllaries which are fused into a cup unlike *Lasthenia californica*, *Lasthenia coronaria*, or *Lasthenia microglossa*; and noticeably longer ligules on the ray flowers (4-14mm) than *Lasthenia glaberrima*. Coulter's Goldfields is sometimes hydroseeded into irrigated uplands.

PRIDE-OF-CALIFORNIA [*Lathyrus splendens* Kell.]

LISTING: CNPS List 4
State/Fed. Status -- None
Global Rank G3? State Rank S3.3

R-E-D Code 1-1-2
FABACEAE Apr.-Jun.

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Xeric chaparral habitat with a predominance of Chamise is utilized by this climbing perennial with tendrils; it is typically located clambering through woody shrubs. Fallbrook and Cieneba-Fallbrook rocky sandy loams are the mapped soil types near Barrett Junction. The chaparral is generally low growing with a moderately open canopy; however, it can occur in dense vegetation on north-facing slopes. Possible Associates: *Salvia mellifera*, *Gnaphalium californicum*, *Chorizanthe leptotheca*.

KNOWN SITES: This showy pea is occasional and conspicuous in flower, growing amid chaparral off Highway 94 from Jamul to Tecate Junction. It is found immediately north of Tecate on the eastern flanks of Tecate Mountain in both dense and open chaparral. It is occasional on the high desert such as near Miller Creek, as well as in the hills south of the Potrero Library. Likely hybrids with some traits of *Lathyrus laetiflorus* ssp. *alefeldii* were noted in places such as Glen Lonely and south of Donohoe Mountain at the edge of the range of *Lathyrus splendens*. Old reports include Dulzura, Tecate Mountain, McCann Valley, Campo, in hills above the

Dehesa School House, Live Oak Springs, Barrett Junction, the Walker Ranch in Jacumba, Mountain Springs, and 0.5 mile southwest of Boulevard. Old biological survey reports note sites 0.25 mile east of Marron Valley Road and south of Highway 94, just south of Boulevard, on Mother Grundy Truck Trail, just east of Tecate Junction, southeast of Manzanita and south of the Calexico Lodge, and north of the junction of Highway 94 and Highway 188.

Thirteen specimens from Baja California are found in the San Diego Natural History Museum's herbarium; south to 32° 23' North where collected by Moran (SD 72331) 3.3 miles southeast of Neji. It is locally common alongside the Tecate/Ensenada Highway in the hills north of Valle de las Palmas. It was seen growing on a burn 1 mile west of the turnoff for Rosa de Castillas on the highway to La Rumarosa in Baja California.

STATUS: The Pride-of-California, sometimes called the Campo Pea, is presently stable within its United States distribution. Ranch style development in the Potrero and Barrett Junction area may be impacting a limited portion of its potential habitat. Range limitations appear to be associated with preferences for metavolcanic soil types within otherwise rather ordinary mixed chaparral habitat along the U.S. and Mexico border. Nevertheless, this species tends to remain at mid elevations even though such soil types extend to higher elevations. Pride-of-California has a deep wine-red flower unlike the pinker flowers of the regionally common *Lathyrus vestitus*, and the banner of the flower is very strongly reflexed (120-180 degrees).

HEART-LEAVED PITCHER SAGE [*Lepechinia cardiophylla* Epling]

LISTING: CNPS List 1B R-E-D Code 3-2-2
State/Fed. Status -- /Species of Concern LAMIACEAE Apr.-Jul.
Global Rank G2 State Rank S2.2

DISTRIBUTION: San Diego County, Orange County, and Riverside County; Baja California, Mexico
HABITAT: Chaparral and Cismontane Woodland are both utilized by this broad-leaved shrub. Iron Mountain has primarily Friant rocky fine sandy loams and is covered in a relatively dense, mature chaparral. In Baja California this shrub was found in a low-growing and quite xeric Chamise chaparral on volcanic derived soils. Exchequer soils are reported for Orange County with associated, locally rare species that may include Knobcone Pine (*Pinus attenuata*) and Tecate Cypress (*Cupressus forbesii*); as well as *Ceanothus* dominated chaparral. Other Possible Associates: *Ceanothus tomentosus*, *Chamaebatia australis*, *Arctostaphylos glandulosa*.

KNOWN SITES: One reported San Diego County locale is on a ridge leading to the peak of Iron Mountain near Dos Picos County Park near Ramona. A nearby population occurs at a saddle along the major east-west hiking trail that crosses Iron Mountain. Reported by Roberts for Orange County at Claymine Canyon, Bald Peak, and Upper Maybe Canyon in the Santa Ana Mountains. CNDDB reports for Orange County are for the headwaters of Coal Canyon just west of the national forest boundary, along the divide road near the radio facility on Sierra Peak, 0.5 mile southeast of Sierra Peak near the divide road, the northeast side of Bald Peak, a ridge between Ladd and East Fork Canyon, along Indian Trail near Santiago Peak, on Trabuco Peak, 0.25 mile southeast of Beeks Place above the main divide road, on Horsethief Trail, along the northern main divide road approximately 2 miles from its junction with the main divide road, and both the northwest and northeast slopes of Pleasants Peak.

Twelve specimens for Heart-leaved Pitcher Sage are found at the San Diego Natural History Museum's herbarium. It has been collected by Moran as far south as 31° 12' North (SD 13287A) south of Rancho Escondido. A large population was seen in northern Baja California on the steep slopes of Cerro Bolla.

STATUS: Heart-leaved Pitcher Sage is still relatively stable within its foothill and montane habitat in the Santa Ana Mountains. It is also apparently stable on Iron Mountain in San Diego County.

Current development here is limited to the lower flanks of the mountain and to several minor dirt roads. This disjunct population lies in an intermediate area between the concentrated populations in the Santa Ana Mountains and the sites in the coastal mountains of northern Baja California. Curiously, other intermediate populations have yet to be located, and it is replaced by *Lepechinia ganderi* in southwestern San Diego County. *Lepechinia ganderi* has noticeably narrower calyx lobes and the leaf base is not cordate. An undescribed species of *Lepechinia* is reported in the Agua Tibia Wilderness area and may enter San Diego County; a published description of this species is awaited. All San Diego County populations of Heart-leaved Pitcher Sage should be protected. Given the few collections over a relatively extended montane range spanning Orange and San Diego counties and northern Baja California, this species appears to be relictual in nature.

GANDER'S PITCHER SAGE [*Lepechinia ganderi* Epling]

- LISTING:** CNPS List 1B R-E-D Code 3-1-2
 State/Fed. Status -- /Species of Concern LAMIACEAE Jun.-Jul.
 Global Rank G2 State Rank S2.2
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** This shrub with a distinctive acicular calyx is apparently restricted to metavolcanic derived soils in chaparral. The preferred soil type is San Miguel-Exchequer rockysilt loams, with a low-growing but relatively dense chaparral dominated by Chamise and Black Sage. Edaphic considerations appear to be critical in determining the potential range of this species. The vegetation is relatively xeric with high summer temperatures; and for the coastal region low winter temperatures, resulting in seasonal extremes. Possible Associates: *Ceanothus otayensis*, *Chamaebatia australis*, *Arctostaphylos otayensis*.
- KNOWN SITES:** Several healthy populations occur at the upper elevations on Otay Mountain (as near Doghouse Junction) and extend westward to a ridgeline overlooking Otay Mesa which retains a substantial population of Tecate Cypress. It also grows on the western flanks of the Jamul Mountains and on San Miguel Mountain. Several hundred were seen growing in Chamise dominated chaparral south of Donohoe Mountain.

Only four specimens from two sites for Baja California are found in the San Diego Natural History Museum's herbarium. One site is reported on Cerro Jesus Maria. It was also found on Cerro el Dieciceis 11 km southeast of Tecate at 32° 28½' North by Moran (SD 101635). Gander's Pitcher Sage is replaced to the south and south by *Lepechinia cardiophylla*, and may be extraordinarily rare in both the United States and Baja California, Mexico.

- STATUS:** Gander's Pitcher Sage is currently stable in the United States. Proposed development on the western slope of the Jamul Mountains could pose some significant impacts. The BLM has considered increased recreational use of Otay Mountain, and has recently upgraded the primary east/west access road which is presently little utilized. This shrub is strongly recommended for California Endangered status, given its extremely limited range. All populations should be protected. Rarity is strongly correlated with strict adherence to metavolcanic soils that are restricted in the region. The closely related *Lepechinia cardiophylla* has noticeably broader calyx lobes and the leaf base is mildly cordate.

BORREGO VALLEY PEPPER-GRASS [*Lepidium flavum* Torr. var. *felipense* C. L. Hitchc.]

- LISTING:** CNPS List 1B R-E-D Code 3-2-3
 State/Fed. Status -- /Species of Concern BRASSICACEAE Mar.-May
 Global Rank G5T1 State Rank S1.2
- DISTRIBUTION:** San Diego County

HABITAT: Sonoran Desert Scrub on comparatively open flats is the preferred habitat of this small annual. The Little Blair Valley site includes substantial sandy, open terrain, and a temporary alkaline wetland microhabitat. Possible Associates: *Hoffmannseggia glauca*.

KNOWN SITES: Growing in Little Blair Valley in the southern edge of a large playa in the deepest portion of the basin. Apparently, numbers at this location vary considerably from year to year based on winter and early spring rainfall; during some years the population can extend some considerable distance towards an artificial drainage swale. During spring 2001, following heavy late winter rainfall, the basin was brilliantly blooming with many thousands of sulphur yellow-flowered plants. A report is for nearby Blair Valley several hundred yards from the S2 highway turnoff in alkaline lowlands; during drought years this small population does not appear. Old reports are from Borrego Valley and San Felipe Valley. CNDDDB reports are from a canyon west of Borrego Springs, and Yaqui Wells.

Seven Baja California specimens at the San Diego Natural History Museum's herbarium are not recorded as variety *filipense*, but may represent closely allied populations; south to 31° 38' North where collected by Moran (SD 83906) near Llano Colorado.

STATUS: Limited San Diego County populations of Borrego Valley Pepper-grass are potentially impacted by increased camping and other desert recreational activities in Little Blair Valley, which is sometimes a staging area for group activities. Populations apparently vary substantially from year to year based on rainfall, and known populations may be extraordinarily difficult to relocate in years of poor rainfall. All populations should be protected. Vernal, alkaline wetlands are quite rare in this region of the Anza-Borrego Desert, and Borrego Valley Pepper-Grass may have evolved in relative isolation with few opportunities for expansion. The prostrate habit and bright sulphur yellow flowers are quite distinctive on Borrego Valley Pepper-Grass, and should serve to identify this species in its desert basin habitat.

DWARF PEPPER-GRASS [*Lepidium latipes* Hook. var. *latipes*]

LISTING: CNPS Unlisted R-E-D Code - None
State/Fed. Status -- None BRASSICACEAE Mar.-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Merced County, Colusa County, Marin County, Napa County, Santa Barbara County, Tehama County, Yolo County, San Clemente Island, Santa Cruz Island; Baja California, Mexico

HABITAT: This miniscule annual in the Mustard Family grows at Camp Pendleton on Terrace Escarpments within feet of beach bluffs. Shrubs are not present here; vegetation consists of Eurasian grasses and a few vestigial native elements. It has previously been reported in the region on the periphery of Southern Hardpan Vernal Pools. Possible Associates: *Dudleya blochmaniae*, *Chorizanthe procumbens*, *Plagiobothrys collinus*.

KNOWN SITES: Dwarf Pepper-Grass may be extirpated from vernal pools on Otay Mesa. A small colony grows within yards of steep ocean bluffs south of Cocklebur Creek in Military Sector Victor on Camp Pendleton. A substantial but localized population grows in a protected area of vernal pools at the southern terminus of Santo Road. A report is from vernal pools near the intersection of Calbaugh and Brea in Ramona. Reported by Thorne as rare and possibly extirpated on Santa Catalina Island. Reported by Thomas for the southern portion of San Francisco Bay and the Santa Clara Valley; also Mayfield 3 miles south of San Jose. Reported by Bowerman from Donner Canyon and a canyon south of Arroyo del Cerro near Mount Diablo.

Six specimens from Baja California are found at the San Diego Natural History Museum's herbarium; south to 31° 51' North where collected by Moran (SD 105041) in a depression in

a cleared field, 7 km southwest of Ojos Negros. It was observed in small numbers in a small roadside vernal pool near Los Hormos, south of the Guadalupe Valley on the old highway to Ensenada

STATUS: Dwarf Pepper-Grass is almost extirpated in San Diego County. The one known extant locale at Camp Pendleton is precariously placed and will probably erode onto the beach below within the next decade or two; disturbed soils occur only yards to the east. Rare plant surveys in the fall and winter may not note this cryptic annual, even if it is present in limited numbers. This species was formerly listed by the CNPS, but has been deleted as too common within the northern portions of its range. It is quite rare in southern California, where all populations should be fully protected. Given the considerable disjunction between the more substantial northern populations, and plants in the southern regions, taxonomic research is recommended to determine if the southern plants are relatively similar to their northern counterparts, or if they may represent an as yet unidentified subspecies. Rarity appears to be correlated with the loss of most vernal pool habitat in San Diego County. This species may only have occurred sporadically in the tens of thousands of pools once present on the coastal plain. While some conservative estimates are higher, an examination of the 1928 aerial photograph series for the County indicates that less than 1% of vernal pool/mima mound habitat may remain extant. The narrow and relatively deep notch on the seed pouch/fruit on Dwarf Pepper-Grass differentiates this annual from other pepper-grass species (see Jepson Manual line drawing).

ROBINSON PEPPER-GRASS [*Lepidium virginicum* L. var. *robinsonii* (Thell.) Hitchc.]

- LISTING:** CNPS List 1B R-E-D Code 3-2-2
State/Fed. Status -- None BRASSICACEAE Jan.-Jul.
Global Rank G5T2? State Rank SH
- DISTRIBUTION:** San Diego County, Riverside County, Orange County, Los Angeles County, San Bernardino County, Santa Barbara County, Santa Cruz Island, San Nicolas Island; Baja California, Mexico
- HABITAT:** This annual herb grows in openings in chaparral and sage scrub at the coastal and foothill elevations. Sites where this species is typically observed are relatively dry, exposed locales, rather than beneath a shrub canopy or along creeks. It may be associated with volcanic substrates. Possible Associates: *Nasella lepida*, *Chorizanthe fimbriata*, *Achnatherum coronatum*.
- KNOWN SITES:** This pepper-grass is found in the San Vicente Reservoir region on the periphery of the coastal plain. Herbarium specimens examined from elsewhere in San Diego County are from Otay Lake, Tecate Junction, Rancho Santa Fe, north of the Scripps Institute in an area that includes a number of typically more inland elements, the San Luis Rey Valley, Federal Boulevard near Emerald Hills in San Diego, Whispering Oaks near the Sloane Ranch, Florida Street near Balboa Park in San Diego, Harbison Canyon, the Ryan Oak Glen Preserve northeast of Escondido, and near the county line and U.S. 395. An isolated, but fairly vigorous population was observed on the hill east of Massachusetts Avenue and north of Freeway 94 in La Mesa. It is occasional in openings in the chaparral on the southeastern flanks of Iron Mountain, in Peutz Valley, in the hills north of Pala Road near Pala Del Norte Road, on the hill west of Barrett Junction, and on the western flanks of Otay Mountain. A small population was also observed in Gregory Canyon near Pala. The CNDDDB reports this species on Point Loma, as well as near Campo. Roberts reports this species in his Orange County checklist; Boyd reports it lightly distributed throughout the Gavilan Hills of western Riverside County, and near Lake Skinner. Smith reports variety *robinsonii* from Pelican Harbor on Santa Cruz Island. Wallace reports this species from San Nicolas Island.

Five specimens from Baja California are found at the herbarium of the San Diego Natural History Museum, south to 30° 20' North where collected by Moran (SD 127352).

STATUS: Robinson Pepper-grass is presumed stable in southern California. This small annual sometimes replaces both *Lepidium nitidum* and *Lepidium lasiocarpum* in the sage scrub and chaparral understory as the coastal plains give way to the foothills of San Diego County. Chamise Chaparral and a xeric sage scrub occupy most of this foothill zone, and it is an area that has not been intensively collected by botanists due to the paucity of endemic plants and dearth of distinctive microhabitats. In truth, Robinson Pepper-grass' microhabitat may not be particularly distinctive, and it may occur at numerous other locations in the lower foothills. Provisionally, protection is only recommended for portions of sizeable populations. Pepper-grass species are notoriously variable in leaf shape. Unlike Robinson Pepper-grass, most forms of *Lepidium nitidum* in San Diego County have linear cauline leaves, *Lepidium virginicum* var. *pubescens* has broad cauline leaves which are not deeply dissected or lobed. Tiny forms of *Lepidium virginicum* var. *pubescens* can look superficially like Robinson Pepper-grass; however, the basal leaves of the later are also typically deeply divided and lobed. *Lepidium oblongum* var. *insulare* is a short-statured plant (0.5-2dm) that has hairs circling the margin of the fruit, and is usually found only on the immediate coast in San Diego County. *Lepidium lasiocarpum* usually has its upper cauline leaves subentire and not lobed; as well as hairy fruits.

WARNER SPRINGS LESSINGIA [*Lessingia glandulifera* Gray var. *tomentosa* (Greene) Ferris]

LISTING: CNPS List 1B R-E-D Code 2-1-3
State/Fed. Status -- /Species of Concern ASTERACEAE Sep.-Oct.
Global Rank G4?T2 State Rank S2.3

DISTRIBUTION: San Diego County

HABITAT: High Desert Chaparral or grassland are apparently the primary habitats of this annual. Sandy openings (Mottsville loamy coarse sand) in very xeric Chamise Chaparral, or possibly the periphery of alluvial drainages (such as Buena Vista Creek near Ranchita) should be searched for Warner Springs Lessingia. Possible Associates: *Lessingia filaginifolia*, *Eriogonum gracilis*, *Eriogonum wrightii*.

KNOWN SITES: This hairy stemmed variety is reported from an extensive population along Chihuahua Valley Road south of Mitchell Camp; also a nearby site in Chihuahua Valley 1 mile west of Boden Field. A vigorous population was observed along the highway shoulders west of the intersection of San Felipe Road and Montezuma Valley Road near Lake Henshaw. Other reports are from near Highway 79 three miles west northwest of the Warner Springs post office, and from Agua Caliente Creek near Warner Hot Springs. Herbarium specimens are from Cañada Buena Vista east of Old Warners' Ranch above a road cut, on the road shoulder west of Highway 79 near Barrett Hill Road in Valle de San Jose, and on a cut bank on Highway S-2 two miles east of Highway 79. An unverified report notes this plant at Skunk Hollow in western Riverside County; CNPS reports for Baja California cannot be confirmed.

STATUS: Warner Springs Lessingia may be stable owing to the dearth of development in the Warner/Ranchita region; however, overgrazing by cattle, may have severely reduced historical populations. More information is needed on its response to grazing pressures. Taxonomic work is recommended to more precisely delineate the distinctive traits of variety *tomentosa*, that has densely persistently white-tomentose herbage, entire cauline leaves, and tannish or white stems. All substantial populations should be protected. This entity appears to be an ecological form growing on the periphery of the ranging *Lessingia glandulifera* var. *glandulifera*. In general, Warner Springs Lessingia appears to be a more robust plant than its common desert relative.

SHORT-SEPALED LEWISIA [*Lewisia brachycalyx* Engelm. ex Gray]

LISTING: CNPS List 2 R-E-D Code 2-2-1

State/Fed. Status -- None
Global Rank G5 State Rank S3.2

PORTULACACEAE May-Jun.

DISTRIBUTION: San Diego County and San Bernardino County; Arizona; Baja California, Mexico
HABITAT: Montane Meadows are the primary habitat of this fleshy-leaved perennial. Snow melt may trigger growth of this small, cryptic species which is difficult to locate except when in flower in spring. It grows in areas devoid of shrub cover which are best characterized as montane seeps; perennial grasses while present, are usually low growing, and the vegetation is more open than with typical Montane Meadows of this region. Boomer stony loam is a soil type utilized at Lake Cuyamaca. Possible Associates: *Madia elegans*, *Allium amplexans*, *Brodiaea orcuttii*.

KNOWN SITES: Short-sepaled *Lewisia* grows in open rocky meadows above Cuyamaca Lake. This species is reported in Big Bear Valley in the San Bernardino Mountains. Reported by Lehr from Arizona. One herbarium specimen seen was from the west side of Highway 78, 200 yards north of the Camp Wolahi Road. A specimen in a Ponderosa Pine forest at Coconino County, Arizona, was also examined.

Three specimens from Baja California are found at the herbarium for the San Diego Natural History Museum. All are in the general vicinity of Laguna Hansen. One locale has a collection by Oberbauer (SD 103738) in a meadow 2 miles north of the lake (approx. 32° 6' North latitude).

STATUS: Short-sepaled *Lewisia* is stable but potentially imperiled in San Diego County by the expansion of housing around Cuyamaca Lake. All local populations in this region should be protected. The habitat of this species is extremely wet and fragile in early spring, and care must be taken not to do considerable damage to the meadows while crossing on foot. This appears to be a relictual Pleistocene species that was "stranded" in the higher Peninsular ranges after climatic conditions changed markedly and Sierra Nevada elements generally retreated northward. *Lewisia brachycalyx* has two sepal like bracts immediately subtending the two sepals, unlike other species of *Lewisia* in southern California.

OCELLATED HUMBOLDT LILY (*Lilium humboldtii* Roezl. & Leichtl. ssp. *ocellatum* (Kell) Elwes]

LISTING: CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- /Species of Concern LILIACEAE Apr.-Jul.
Global Rank G4T3 State Rank S3.2

DISTRIBUTION: San Diego County, Los Angeles County, Ventura County, Santa Barbara County, San Bernardino County, Santa Cruz Island, Santa Rosa Island, Riverside County, San Luis Obispo County, Orange County

HABITAT: This lily typically grows on relatively dry montane slopes beneath dense coniferous canopy. Boomer stony loams are utilized near Cuyamaca Lake. Possible Associates: *Piperia* species, *Pyrola picta*, *Corallorhiza maculata*.

KNOWN SITES: Ocellated Humboldt Lily is scattered at various places at the upper elevations of the Cuyamaca Mountains in San Diego County beneath pines and fir including near the Azalea Spring Trail; they also occur in very shaded locales near Doane Pond in the Palomar Mountains. Ocellated Humboldt Lily has also been reported from several additional locales on Palomar Mountain (e.g., Barker Valley) and near San Vicente Reservoir. Old biological reports also note this species near Cutca Valley in the Palomar Mountains, and near the northern slope of Lawson Peak. Smith reports this species in the Santa Barbara region from Casitas Pass to the San Julian area in the Santa Ynez Mountains; inland to upper Cuyuma Valley, Sespe Creek, and Thorn Meadows. He also notes an old collection from Santa Cruz Island. Wallace reports this lily from Santa Rosa Island. Raven reports this species in the Santa Monica Mountains of Los Angeles County as localized in the vicinity of Rustic Canyon and areas westward. In Orange

County in the Santa Ana Mountains small numbers of tiger lilies occur near the Holy Jim Trail, as well as in a side drainage of Silverado Canyon.

STATUS: Some populations are imperiled by hikers who dig this bulb for transplantation to their gardens (where they most likely quickly expire). All substantial montane populations are recommended for protection; isolated individuals should be retained within open space whenever possible. The montane population closely adheres to areas of coniferous forest, and while well distributed, seldom includes substantial numbers of plants at any one location. Unusually tall lilies (>6 feet) growing in clusters alongside Roblar Creek and San Mateo Creek in the Santa Margarita Mountains, under relatively mesic shaded conditions, may represent a taxonomically distinct form, or the related *Lilium pardalinum* ssp. *pardalinum*. This species has distinctive horizontally growing, rhizome-like bulbs -- quite unlike the ovoid and erect-growing bulbs of Ocellated Humboldt Lily. Unfortunately, the bulbs may have to be dug to confirm an identification to specific species.

LEMON LILY [*Lilium parryi* Wats.]

LISTING: CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- /Species of Concern LILIACEAE Jul.-Aug.
Global Rank G3 State Rank S2.1

DISTRIBUTION: San Diego County, Riverside County, Los Angeles County, San Bernardino County; Arizona

HABITAT: Montane Riparian Forest is the general habitat for Lemon Lily. In the Palomar Mountains it occurs in partial shade in very mesic conditions close to French Creek. Soils here are mapped as Loamy alluvial land. Possible Associates: *Cicuta douglasii*, *Aster* species, *Muhlenbergia rigens*.

KNOWN SITES: Lemon Lily is very rare and localized near French Creek on Palomar Mountain. As the flowers are quite conspicuous, it is extremely difficult to protect this lily from "flower pullers" who encounter the species by chance. Apparently, other sites near more heavily traveled Doane Pond are no longer extant except for one reported small population. The reintroduction of bulbs grown from local seed seems the only alternative to extirpation. A herbarium specimen was noted from the south fork of the Santa Ana River in the San Bernardino Mountains where this lily is reportedly locally common. Also reported at the east end of the San Gabriel Mountains and sporadically in the San Jacinto Mountains. Reported by Krantz near Bluff Lake, southwest of Big Bear Lake. Reported by Lehr for Arizona where it also warrants protection.

STATUS: Lemon Lily is close to extirpation in San Diego County and is uncommon throughout its California range. All populations should be protected. Sparse local distribution indicates this species may be relictual, and declining naturally throughout its San Diego County range. Collections for gardens early in the 20th century may have seriously depleted what was even then a very limited population. The yellow flowers of Lemon Lily are diagnostic for a native lily growing in southern California.

PARISH'S MEADOW-FOAM [*Limnanthes gracilis* T. J. Howell var. *parishii* (Jeps.) C. Mason]

LISTING: CNPS List 1B R-E-D Code 2-2-3
State/Fed. Status -- CE/Species of Concern LIMNANTHACEAE Apr.-Jun.
Global Rank G3T2 State Rank S2.2

DISTRIBUTION: San Diego County, Riverside County

HABITAT: Montane Meadows, largely devoid of shrubs, and with concentrations of annuals and herbaceous perennials -- not grasses -- is the preferred habitat of *Limnanthes*. At Cuyamaca Lake, where this annual grows in profusion, Crouch rocky coarse sandy loam and loamy

alluvial land are utilized. Possible Associates: *Ranunculus californicus*, *Blennosperma nanum*, *Castilleja densiflora*.

KNOWN SITES: Parish's Meadow-Foam is common in meadows around Cuyamaca Lake. It is uncommon now at Shrine Camp in the Laguna Mountains; and locally in the nearby El Prado Meadow. Cuyamaca Lake has one of the few extensive wildflower displays still found in San Diego County in the spring. *L. gracilis* is a dominant species at this time. Herbarium specimens are from the entrance road to the Lucky Five Ranch near a tributary to Oriflamme Canyon, at Harper's Creek, in the southern half of Mendenhall Valley in the Palomar Mountains, on the banks of Orinoco Creek just west of Eagle Peak Road, and near Cedar Creek on the Inaja Reservation. Other reports come from a small population near Pine Hill Guard Station, near a pond northeast of Harrison Park east of Highway 79, the meadows at Filaree Flat westward along Lucas Creek, Indian Canyon, and Pine Creek Road at Pine Valley Creek. CNDDDB reports identify populations near the road into Oriflamme Canyon off County Highway S-1 near the Pedro Fages Marker, in Canebrake Canyon 1.5 miles northeast of the northern end of Lake Cuyamaca, Los Rasalies Ravine in Lower Laguna Meadows, Fern Flat on Cuyamaca Peak, near Indian Creek south of Pine Mountain, near Pine Valley Creek 1.8 miles SW of Deer Park, SW of Pine Mountain 0.5 mile south of Indian Potrero, a canyon east of Sunrise Highway three miles south of the junction of Highway 79 and Highway S-1 in a tributary of Oriflamme Canyon, 0.25 mile southwest of Paso Picacho Campground, at Azalea Spring, La Puerta Springs, on West Mesa 0.15 mile northwest of Japacha Spring, Japacha Creek 0.25 miles southwest of Japacha Spring, along Harper Creek on the east side of Cuyamaca Rancho State Park, just south of Rattlesnake Valley along Harper Creek, and the mouth of Stonewall Creek at Green Valley. Reported by Lathrop from the largest vernal pool on Mesa de Colorado in western Riverside County.

STATUS: Parish's Meadow-Foam is slowly declining in San Diego County and Riverside County; increased recreational uses of montane meadows are impacting the vigor of local populations. Further development around Cuyamaca Lake could result in piecemeal survival of what in some years is still one of the last remaining, vast wildflower displays in either coastal or montane San Diego County. While it may not be feasible to always protect entire populations, substantial and relatively cohesive portions of all major and secondary populations should be protected. This species is not readily identifiable in meadows outside of the short blooming season, and surveys in potential habitat out-of-season should take this into account. Rarity appears to be strongly correlated with a post-Pleistocene retrenchment from formerly suitable meadow habitat. The extant population on Mesa de Colorado, at a relatively low elevation, indicates this species may once have been more widespread in the foothill areas under a wetter climatic regime. Parish's Meadow-Foam is a small annual with entire to three-lobed leaves and conspicuous white flowers that age pink. It typically grows in substantial colonies that may flower in considerable numbers simultaneously -- hence its common name.

DESERT BEAUTY [*Linanthus bellus* (Gray) Greene]

LISTING: CNPS List 2
State/Fed. Status -- None
Global Rank G2G3 State Rank S2.3?

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: High Desert Chaparral, usually in broad sandy openings, is the typical habitat of Desert Beauty. This small annual uses Mottsville loamy coarse sand at Boulevard, as well as northward in the McCain Valley. Numerous other annuals grow sympatrically here in very productive, high desert terrain. Open, sandy upland locales, anywhere in the region where reports are concentrated, may potentially contain this species. Possible Associates: *Gilia diegensis*, *Linanthus parviflorus*, *Geraea viscida*.

R-E-D Code 2-1-1
POLEMONIACEAE Apr.-May

KNOWN SITES: Desert Beauty grows at Boulevard on the boundaries of this hamlet, and in well drained sand at Bankhead Springs. A sizeable population is found in McCain Valley where various species of annuals may be abundant following rare "wet years." Old reports from the same region include Tierra Del Sol, Hipass, and Jacumba; it is also reported south of Lost Valley Road in McCain Valley, and south of Interstate 8 east of Live Oak Springs. Old biological survey reports note sites between Old Highway 80 and Interstate 8 west of the Boulevard exit, between the same two roads near Manzanita, and near Tierra del Sol Road 2 miles south of Tierra del Sol. CNDDDB reports are 1.5 miles SSW of Coombs Peak at the SDSU Sky Oaks Biological Field Station, on the road from Chihuahua Valley to Lost Valley Boy Scout Camp, near the north fork of Bow Willow Creek one mile WSW of Sombrero Peak, Lark Canyon two miles NNW of the landing strip, north of Boulevard 1.1 mile east of I-8 at Jewell Valley Road, and 3 miles south of Live Oak Springs and one mile west of Tierra Del Sol Road.

Twenty-seven collections for Baja California are found in the San Diego Herbarium. It was collected as far south as 30° 22½' North by Moran (SD 88817) on the eastern slope of Cerro Matomi. Typically this species occurs in gravelly, granitic soil or sand.

STATUS: Populations of Desert Beauty are presently stable in San Diego County, but limited residential development near Boulevard is making inroads into this high desert region. While readily identifiable in late spring when flowering, this tiny ephemeral annual is unlikely to be readily noted during the remainder of the year. Desert Beauty appears to be a predominantly northern Baja California high desert chaparral species. The broad plain of chaparral in the eastern Sierra Juarez of Baja California extends as a unit to the southern base of the Laguna Mountains. Not coincidentally, the range of Desert Beauty extends to the natural northern perimeter of this chaparral unit. *Linanthus bellus* is superficially similar to the common *Linanthus dianthiflorus*, but among other differences the petals are not finely toothed, and the calyx is free to the base rather than fused by membranes. *Linanthus orcuttii* also has fused calyx lobes.

SANTA ROSA MOUNTAINS LINANTHUS [*Linanthus floribundus* (Gray) Munz ssp. *hallii* Mason]

LISTING: CNPS List 1B R-E-D Code 3-1-3
State/Fed. Status -- None POLEMONIACEAE May-Jul.
Global Rank G4T1 State Rank S1.3

DISTRIBUTION: San Diego County, Riverside County

HABITAT: Sonoran Desert Scrub is the reported habitat for this little known linanthus. Relatively barren, rocky terrain where this species might grow is common on the southern flanks of the Santa Rosa Mountains. Possible Associates: More information needed.

KNOWN SITES: An old report is from the southern flanks of the rugged and seldom botanically explored Santa Rosa Mountains near Coyote Canyon. A 1921 Edmund Jaeger collection is reported from Rockhouse Canyon. A 1955 report is from east of Clark Dry Lake in an area called Rattlesnake Canyon. There are no known recent sightings.

STATUS: The current status of the Santa Rosa Mountains Linanthus is unknown. Historical inroads into the southern flanks of the Santa Rosa Mountains are minimal, and this species is accordingly presumed stable. More collection information is needed; provisionally, all populations should be fully protected. This plant differs from typical subspecies *floribundus* by its smaller flowers and leaves which are mainly entire (lower leaves sometimes 3-5 cleft). Several populations of *Linanthus floribundus* examined on the southern flanks of Santa Rosa Peak at higher elevations all keyed to subspecies *floribundus*. Santa Rosa Mountains Linanthus appears to be a desert-adapted ecological form of a relatively common and well-distributed southern California perennial.

ORCUTT'S LINANTHUS [*Linanthus orcuttii* (Parry & Gray) Jeps.]

LISTING: CNPS List 1B R-E-D Code 2-1-2
State/Fed. Status -- /Species of Concern POLEMONIACEAE May-Jun.
Global Rank G4 State Rank S2.3

DISTRIBUTION: San Diego County, Riverside County, Los Angeles County; Baja California, Mexico

HABITAT: Montane Chaparral and lower Montane Coniferous Forest are typically utilized by this small, showy annual. Crouch stony fine sandy loams are mapped for a Palomar State Park site, while Tujunga sand occurs at the Agua Caliente Creek site. At the former, Orcutt's *Linanthus* was seen at several locales in limited, sunny openings beneath an otherwise coniferous canopy; at the latter site it grows on the moist embankments of the creek beneath cottonwoods and willows. Tollhouse series soils are reported for the Eagle Crag site. Possible Associates: *Mimulus diffusus*, *Lithophragma* species, *Lessingia filaginifolia*.

KNOWN SITES: This *Linanthus* is rare along the campground trail below Nate Harrison Grade in Palomar State Park; also nearby, below Boucher Hill, in openings in coniferous forest. A small population occurs in a sandy drainage with chaparral north of Oakzanita near the State Park boundary. This species is apparently quite rare and localized. It is scattered along Agua Caliente Creek in wet sand at Warner Hot Springs. Old reports are from Hot Springs Mountain, Garnet Peak, and Monument Peak. CNDDDB reports are from the Palomar Mountains at the eastern foot of Morgan Hill, near Bailey's Camp, on the old road to Henshaw Dam, south of Wildhorse Peak, and in Upper Doane Valley; as well as along the truck trail from Los Coyotes Indian Reservation to the Lost Valley area, on Airplane Ridge in Cuyamaca Rancho State Park, at the base of Oakzanita Peak, at the north end of Cutca Valley where the road crosses the creek, along the old Palomar Road Divide from 0.7-0.7 miles ENE of Eagle Crag Summit, SE slope of Pine Mountain just west of Puerta de la Cruz Road, along Sunrise Highway north of Camp Ole Station north of Mount Laguna, near Mount Laguna at the Guymon Lodge, at Oasis Spring, and east of Hot Springs Mountain north of San Ignacio. Another CNDDDB report notes a 1925 CAS herbarium collection from near Pasadena in Los Angeles County; this specimen may be misidentified, given the disjunct locale, and should be re-examined.

Nine herbarium specimens from Baja California are found in the San Diego Natural History Museum; south to 30° 43' North at Santa Eulalia in the San Pedro Martir Mountains where collected by Moran (SD 100673).

STATUS: Orcutt's *Linanthus* populations are apparently stable given the limited historical impacts to potential montane habitat and previously identified sites. Many of the reported sites lie within state park or national forest lands. All populations should be protected. Reasons for its rarity in the mountains are not obvious. This may be a predominantly Baja California species that requires distinctive microhabitat requirements to flourish. Orcutt's *Linanthus* is superficially similar to the common *Linanthus dianthiflorus*; however among other differences the corolla lobes are entire rather than finely toothed, and the leaves are not lobed.

OTAY MOUNTAIN LOTUS [*Lotus crassifolius* (Benth.) Greene var. *otayensis* Moran]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- /Species of Concern FABACEAE May-Aug.
Global Rank G5T1 State Rank S1.1

DISTRIBUTION: San Diego County

HABITAT: Chaparral, dominated by Chamise and *Ceanothus* species, is found throughout the habitat of this lotus on Otay Mountain. Soils here are mapped as San Miguel-Exchequer rocky silt loams. Mild soil disturbance may enable this plant to pioneer on road cuts, and possibly on burns. Possible Associates: *Arctostaphylos otayensis*, *Ceanothus otayensis*, *Lepechinia ganderi*.

KNOWN SITES: This herbaceous perennial is very rare at upper elevations on Otay Mountain, such as east of Doghouse Junction. A CNDDDB report is nearby along Minnewawa Truck Trail one mile north of Doghouse Junction.

This shrub was initially discovered in Baja California upslope and west of the dirt road to La Zorra, approximately nine miles north of the Guadalupe Valley turnoff. A vernal pool is situated on the east side of the road. It was locally common on one south-facing hillside of chamise chaparral in an area that had burned.

STATUS: Otay Mountain Lotus is presently stable on Otay Mountain, however, it was recently impacted by road improvements to facilitate Border Patrol forays across the primary east/west access road on Otay Mountain. The flowers of Otay Mountain Lotus are differently patterned from typical *Lotus crassifolius* var. *crassifolius* - this entity may warrant full species status. The former also has distinctly soft hairy leaves versus glabrous to strigose leaves. Unless more outlying populations are discovered, this large lotus should be considered imperiled, despite its protected locale. It is one of the rarest species in San Diego County. A California Threatened status is recommended; all populations should be fully protected with appropriate buffers. Rarity of this species is strongly correlated with its strict adherence to metavolcanic soils, and the dearth of such soils in the region.

PYGMY LOTUS [*Lotus haydonii* (Orcutt) Greene]

LISTING: CNPS List 1B R-E-D Code 2-1-2
State/Fed. Status -- None FABACEAE Jan.-Jun.
Global Rank G3 State Rank S2.3?

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Open Sonoran Desert Scrub on dry, rocky slopes is utilized by Pygmy Lotus in the Anza-Borrego Desert. Associates: More information is needed.

KNOWN SITES: This diminutive perennial species is uncommon in very open, somewhat rocky terrain near Yaqui Wells; as well as scattered in open desert terrain at Mountain Springs near the freeway turn-off. Three herbarium specimens examined were from Bisnaga Alta Wash, the southeast slope of Pinyon Mountain, and Palm Canyon near Jacumba.

Two herbarium specimens from Baja California are found at the San Diego Natural History Museum; south to 30° 51' North where collected by Moran (SD 75351) on a divide between Arroyo Santa Cruz and San Antonio. The other locale is labeled El Socorro.

STATUS: Pygmy Lotus is presumed stable in San Diego County, given its relatively undisturbed habitat on rugged and rocky desert slopes. Until additional collection information arises, all sites should be protected. Pygmy-Lotus is a relatively nondescript species with surficial similarities to other related subshrubs in the genus. The curved, twisting pods (6-9mm) are quite unlike the straight dehiscent pods (2-4cm) of *Lotus rigidus*. It may be regularly overlooked, and presumed to be the latter species. Unlike the much shrubbier *Lotus scoparius*, it has tiny leaflets 2-5mm versus 4-12mm; as well as smaller fruit (6-9mm versus 10-15mm). The majority of the population may occur in little explored areas on the arid western deserts of Baja California, Mexico; however, this perennial should be presumed to be rare until additional collection information is gathered.

NUTTALL'S LOTUS [*Lotus nuttallianus* Greene]

LISTING: CNPS List 1B R-E-D 3-3-2
State/Fed. Status -- /Species of Concern FABACEAE Mar.-Jun.

Global Rank G1 State Rank S1.1

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Coastal Dunes, particularly well protected back dunes with minimal human foot traffic, are the preferred habitat of Nuttall's Lotus. Soils are mapped as beach sands and riverwash. Possible Associates: *Nemacaulis denudata* var. *denudata*, *Camissonia cheiranthifolia*, *Abronia maritima*.

KNOWN SITES: This prostrate biennial occurs at Border Field; it is uncommon in the back dunes behind the beach and more common near the border fence. A minuscule population occurs on a solitary dune at Torrey Pines State Park near the salt marsh. It was found growing on disturbed sandy soils near the mouth of the San Luis Rey River at an unprotected locale. Small colonies occur southwest of Emory Cove on the Silver Strand including the sandy, weedy locales between the state park fenceline and the highway. Extensive colonies are now reported on dredge fill sand along the northwestern Silver Strand along inner San Diego Bay. A good site is straddling the Least Tern Colony just north of the Santa Margarita River. Half of the population is outside the fenced, tern breeding grounds and is potentially imperiled. A number of isolated sub-populations are reported to be extant around San Diego Bay including several thousand south of Sea World Drive and just west of Interstate 5 and north of Friars Road; another sizeable population across the street on the northwestern side Sea World Drive; a few plants just east of Sunset Cliffs Boulevard and north of the San Diego River near the jetty; another small population in a vacant area north of a boat dock near the northeastern terminus of 404 South Shores Drive, a small population at South Shores immediately across the water south of Fiesta Island; a few plants between the San Diego Rowing Club and yacht club near the western terminus of El Carmel Place; a small population in an unused school sandlot playground east of Mission Boulevard and south of Santa Barbara Place; a vigorous population expanding within the least tern breeding area on Mariners Point in Mission Bay; several hundred at Hospitality Point northwest of the Quivira Way traffic circle; near the sandy knoll at the Kendall-Frost Preserve; and scattered near the jetty west of Sunset Cliffs Boulevard on the north side of the San Diego River and south of Quivira Way. A small population occurs on the D Street Fill in National City at a marginal Least Tern Colony nest site that is under consideration for alteration to coastal salt marsh. Old collections are from Ocean Beach, Pacific Beach, North Island, and Encinitas; they may represent extirpated sites. CNDDDB reports are from the U.S. Naval Radio Receiving Facility at Imperial Beach, in a narrow strip south of Sea World Drive in Mission Bay, old sites somewhere along the beaches at both Encinitas and Del Mar, at the south end of Cardiff State Beach, and at South Carlsbad State Beach just south of the mouth of Batiquitos Lagoon and west of Highway S-21. Another report is from near the mouth of San Elijo Lagoon. It is scattered between the bike path and the highway along the Silver Strand

Fourteen specimens are found from Baja California at the San Diego Natural History Museum's herbarium; south to 30° 2½' North where collected on dunes of Bocano el Rosario by Moran (SD 106029).

STATUS: Nuttall's Lotus is expanding its population slowly under more rigid protection measures over the last decade, after a precipitous decline. It is still a good candidate for Federally Endangered status. Recreational use of beaches has increased dramatically in the last century, and the long-term outlook for this species depends upon the level of human protection provided. Impacts on northern Baja California beaches can be expected to follow a similar decline over the next few decades. All substantial native populations should be protected. Pioneering new populations should be assessed on a site by site basis for protection. A Nuttall's Lotus preserve is underway by the City of San Diego for a triangular strip of land southeast of Sea World near the San Diego River. Substantial quantities of sand were trucked into this location to prepare the site. Rarity of this species is strongly correlated with human associated beach impacts. Aside from its prostrate growth habit and its presence along only the immediate beaches, Nuttall's Lotus has conspicuously peduncled flowers 1-3cm in length (unlike *Lotus hamatus*). *Lotus heermannii* also has a prostrate growth habit but is a much more robust perennial rather

than annual plant, has very hairy leaves, and the leaves are not usually so well (almost "neatly") spaced apart as they are with Nuttall's Lotus.

MOUNTAIN SPRINGS BUSH LUPINE [*Lupinus excubitus* Jones var. *medius* (Jepson) Munz]

- LISTING:** CNPS List 1B R-E-D Code 2-1-2
State/Fed. Status -- /Species of Concern FABACEAE Mar.-Apr.
Global Rank G4T2 State Rank S2.3
- DISTRIBUTION:** San Diego County and Imperial County; Baja California, Mexico
- HABITAT:** Pinyon Juniper Woodland and Sonoran Desert Scrub at higher elevations are utilized by this herbaceous shrub. Rositas loamy coarse sand is the soil type mapped for some colonies of this bush lupine near Jacumba. Alluvial, sandy washes on the periphery of stream channels may be a preferred microhabitat. This lupine generally grows in the open, unencumbered by woodier shrubs. Possible Associates: *Nemacladus* species, *Eustoma exaltatum*, *Acacia greggii*.
- KNOWN SITES:** This lupine is rare at In-Koh-Pah County Park and nearby Myers Creek. It is fairly common along the trail to Smugglers Cave and southward a few plants were seen just across the Mexican border into the Sierra Juarez Mountains. Old reports from nearby locales include McCain Valley, Carrizo Gorge, Canebrake Canyon, and Table Mountain. Herbarium specimens are from Dos Cabezas, east of Monument Peak, east of the Sawtooth Mountains and south of Inner Pasture, and in the In-Koh-Pah Mountains south of Rockhouse Canyon. CNDDDB reports are from lower Storm Canyon, in Vallecito Valley near the mouth of Storm Canyon, the south edge of Vallecito Valley west of The Potrero, several locales in The Potrero, several locales in Inner Pasture north of the summit of Red Top Mountain, at a number of sites in Canebrake Wash and near the Pepperwood Jeep Trail, in Rockhouse Canyon both east and west of the rockhouse structure, in McCain Valley 0.3 mile north of the junction of McCain Valley Road and the road to Lost Valley, other nearby locales in McCain Valley, at various sites north and west of Table Mountain, 1.65 miles due east of the confluence of Tule Creek and Carrizo Gorge, southeast of Table Mountain near both the Mica Gem Mine and the Mira Gem Mine, south of Table Mountain and immediately north of Old Highway 80, in Jacumba Jim Canyon; also in Imperial County in Myer Valley.

Six specimens from Baja California are found at the herbarium for the San Diego Natural History Museum; south to 29° 19' North where collected by Moran (SD 54574) on a granitic ridge northwest of Cerro San Luis.

- STATUS:** Mountain Springs Bush-Lupine appears to be an ecological desert variant of a wide-ranging California shrub. The deep, blue flowers (not lavender to purple) of Mountain Springs Bush Lupine, and taller growth habit (> 7dm) are superficially different from typical low-growing *L. excubitus* var. *austromontanus*. Moreover, the habitat -- desert mountain washes -- is quite distinctive. *Lupinus excubitus* var. *hallii* has larger flowers (14-18mm versus 9-13mm), and has greenish hairy leaves rather than silvery gray hairy leaves. The populations of Mountain Springs Bush Lupine in San Diego County are presently stable, owing to limited development of its high desert habitat. All populations should be protected.

CALIFORNIA BOX-THORN [*Lycium californicum* Nutt.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-1
Stat/Fed. Status -- None SOLANACEAE Mar.-Jul.
Global Rank G4 State Rank S3.2
- DISTRIBUTION:** San Diego County, Orange County, Los Angeles County, Channel Islands; Baja California, Mexico

HABITAT: This conspicuous shrub occupies a narrow band of habitat behind the immediate beaches, both in upper areas of coastal salt marsh and on sandstone slopes. Soils are mapped as Huerfano Urban land complex in the high marsh at Imperial Beach. Possible Associates: *Suaeda esteroa*, *Salicornia subterminalis*, *Frankenia salina*.

KNOWN SITES: Well distributed from the Mexican border to the Orange County line in San Diego County. The California Box-Thorn is occasional in the Tijuana Hills near Border Field, locally common at the periphery of the salt marsh in Imperial Beach, lightly represented around San Diego Bay including at Gunpowder Point, sparsely represented at Famosa Slough near Ocean Beach, uncommon in vestigial tracts of sage scrub on western Mount Soledad, occasional on the bluffs at Torrey Pines, occasional in sage scrub around Batiquitos Lagoon, and sporadically distributed along the coastal bluffs on Camp Pendleton. A vigorous population occurs on a bluff north of the mouth of San Onofre Creek. All populations occur within a short distance of the coast, although a very few locations on the northern flanks of Otay Valley and in Spring Canyon on Otay Mesa occur west of I-15. Gary Wallace reports this species on Anacapa Island, San Nicolas Island, Santa Barbara Island, Santa Catalina Island, and San Clemente Island. Raven reports this species from the mouth of Latigo Canyon, Charmlee County Park, and the vicinity of Santa Monica in Los Angeles County. In San Clemente in Orange County this species is occasional east of the railroad tracks on erosive bluffs.

Wallace reports this species from Isla Guadalupe in Mexico. The shrub is locally common on the coast of northern Baja California.

STATUS: California Box-Thorn is severely declining with coastal development in San Diego County. This species was once a common and sometimes dominant shrub on the sea bluffs of the region; as well as in sage scrub on the periphery of the coastal lagoons. Its increasing rarity is directly related to urban expansion along the immediate coast. The entire, small white corolla of California Box-Thorn is 4-6mm. Other related and even more uncommon coastal species such as *Lycium andersonii* and *Lycium brevipes* have floral tubes from 5-10mm in length; and the leaves are not round in cross section.

FREMONT'S DESERT-THORN [*Lycium fremontii* Gray]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None SOLANACEAE Jan.-Apr.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Imperial County, Riverside County, Santa Rosa Island; Arizona; Sonora, Guadalupe Island, and Baja California, Mexico

HABITAT: Sonoran Desert Scrub in alkaline locales is the reported habitat of this spiny shrub. Possible Associates: More information is needed.

KNOWN SITES: A few large shrubs occur at the mouth of Quartz Vein Wash near The Narrows and Ocotillo Wells. Herbarium specimens are reported from three miles north of Scissors Crossing, Borrego Valley, and Vallecito Stage Station. This shrub is also reported from Canebrake Canyon and Split Mountain. Another report comes from near the Painted Canyon area of Mecca Hills in the Coachella Valley of Riverside County. Reported by Knight as infrequent in washes in eastern Imperial County. Sanders (pers. com.) reports this species as occasional in the desert areas near the Colorado River such as near Needles. Reported by Wallace from Santa Rosa Island as well as Guadalupe Island in Mexico. Reported by Daniel & Butterwick as occasional along washes in the South Mountain region near Phoenix, Arizona. Herbarium specimens were also examined from Arizona at Komatke, Cone Butte, twelve miles east of Buckeye, the Gila Mountains, south of the South Mountains, Cochran, Tempe, Tule Wells, and Tumamoc Hill near Tucson; as well as from Sonora, Mexico. Reported by Felger & Lowe from Tiburon Island in the Gulf of Mexico.

Ten specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 24°5' North where collected by Moran (SD 72930) at Arroyo Conejo.

STATUS: This species is presumed stable locally at isolated desert sites. The status of Fremont's Desert Thorn in San Diego County is poorly understood; more collection information is needed. Substantial portions of all County populations are recommended for protection. It is distinguished from *Lycium parishii* by a calyx tube 4-8mm rather than 2.5-5mm, and lobes 1-2mm rather than 2-4mm; as well as an affinity for alkaline flats versus rocky slopes and canyonlands. Although the petal lobes of *Lycium brevipes* are substantially larger (*i. e.*, 2-6mm) than the smaller lobed *Lycium fremontii* (1-2mm), it can be difficult to differentiate when not in flower. Collection information implies it is relatively widely distributed in Arizona.

PARISH'S DESERT-THORN [*Lycium parishii* Gray]

LISTING: CNPS List 2
State/Fed. Status -- None
Global Rank G3? State Rank S2S3

DISTRIBUTION: San Diego County, Imperial County, San Bernardino County, and Riverside County; Arizona; Sonora, Mexico

HABITAT: Sonoran Desert Scrub with sandy plains and desert washes is the reported habitat of this spiny shrub. At Mountain Palm Springs it occurs in a somewhat alkaline site, at a locale immediately adjacent to a seasonal creek. Possible Associates: More information needed.

KNOWN SITES: This shrub is uncommon at Mountain Palm Springs near the palm groves. A single plant was found on a mildly disturbed hillside south of UC Riverside near the freeway. Herbarium specimens also include a site on the east slope of the Tierra Blanca Mountains; as well as near Fossil Canyon in the Coyote Mountains of Imperial County; in Maricopa, Pinal, and Pima counties of Arizona; on San Marcos Island in the Gulf of California, and near Sonoita in Sonora, Mexico. A planted specimen of this rare shrub is found in the Rancho Santa Ana Botanical Garden near Claremont in Los Angeles County; numerous other sensitive California shrubs, trees, and perennial herbs grow in the outstanding gardens of this facility which focuses on native California vegetation.

One specimen from San Marcos Island in the Gulf of California, east of Baja California, is found at the herbarium of the San Diego Natural History Museum.

STATUS: This species is presumed stable within its desert habitat. The status of Parish's Desert-Thorn in San Diego County is poorly understood; more collection information is needed. All populations should be protected. This species appears to be better adapted to the present climatic regime on the eastern deserts beyond San Diego County. *Lycium fremontii* is distinguished from *Lycium parishii* by a calyx tube 4-8mm rather than 2.5-5mm, and lobes 1-2mm rather than 2-4mm; as well as an affinity for alkaline flats versus rocky slopes and canyonlands. *Lycium andersonii* leaves are glabrous not glandular hairy like Parish's Desert-Thorn. *Lycium brevipes*, also found on the desert, has broader corolla lobes (1/3 to = tube), and glandular puberulent leaves.

COULTER'S LYREPOD [*Lyrocarpa coulteri* Hook. & Harv. var. *palmeri* (Wats.) Roll.]

LISTING: CNPS List 4
State/Fed. Status -- None
Global Rank G5T4 State Rank S3.3

DISTRIBUTION: San Diego County, Imperial County; Baja California, Mexico

HABITAT: Sonoran Desert Scrub, particularly in gravelly soil and among boulders, is the preferred habitat of this suffrutescent biennial. Shrub vegetation is generally open in the vicinity of Coulter's Lyre-Pod. Possible Associates: *Ambrosia dumosa*, *Pleurocoronis pluriseta*, *Mirabilis tenuiloba*.

KNOWN SITES: This species is scattered, usually in small populations, in a number of desert canyons. It was seen at several canyons near The Narrows along the foot of the slopes on the south side of Highway 78. Another small population occurs along the sandy wash in Flat Cat Canyon north of Hellhole Canyon in Anza Borrego. Herbarium specimens examined were from the Tierra Blanca Mountains, 2 miles west of the Vallecito Stage Station, near the summit of Yaqui Pass, below the lower mouth of Sentenac Canyon, and in Borrego Valley. Old reports are from Pinyon Wash, at the Narrows Earth Trail, Culp Canyon, northeast of Yaqui Meadows, in Olla Wash, Redrock Canyon, Barrett Canyon, Powderhouse Canyon, and Sandstone Canyon. This shrub is reported by Felger on Tiburon Island and Datil Island in the Gulf of California.

Twenty-three specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 28° 43' North where collected by Moran (SD 60541) on rocky slopes near San Juan Mine.

STATUS: Given the limited development in Anza-Borrego State Park and this species' preference for boulder strewn areas and rocky slopes, the San Diego County populations of Coulter's Lyrepod are considered stable. Substantial portions of all sizeable populations should be protected. This shrubby species is relatively inconspicuous when not in flower. It may be substantially undercollected both in the desert canyons of San Diego County and southward into the deserts of northern Baja California. The orbiculate to lyre shaped fruits are relatively distinctive, as are the long and conspicuously twisted brownish to dull purple petals (1.5-2.5cm).

LAGUNA MOUNTAINS ASTER [*Machaeranthera asterioides* Greene var. *lagunensis* (Keck) Turner]

LISTING: CNPS List 2 R-E-D Code 3-3-1
State/Fed. Status -- CR/Species of Concern ASTERACEAE Jul.-Aug.
Global Rank G5T2T3 State Rank S1.1

DISTRIBUTION: San Diego County

HABITAT: Lower Montane Coniferous Forest is the available habitat utilized on Mount Laguna. The coniferous forest here is relatively open providing occasional shade during portions of the daylight hours, interspersed with periods of exposure to direct sunshine. Jeffrey Pine is the dominant tree growing on these Crouch coarse sandy loams. The montane meadows of this region are often heavily grazed, and such activities may have historically limited this herbaceous perennial to peripheral meadowlands. Possible Associates: *Lessingia filaginifolia*, *Clarkia rhomboidea*, *Poa pratensis*.

KNOWN SITES: Laguna Mountains Aster is common, but very local near the community of Mount Laguna and Wooded Hill. A 1989 fire may have promoted an expanded population. General boundaries of this population appear to be east of Wooded Hill, south of Mount Laguna School, west of Desert View Ranch Road, and north of Morris Ranch and Horse Meadows. An old biological report notes a site in Crouch Meadow. CNPS reports of this plant in Baja California cannot be verified.

STATUS: The Laguna Mountains Aster within its limited range is stable but potentially impacted by general community development activities: it is imperiled by horse and cattle grazing, increased recreational activities in the meadows, and construction of mountain cabins. All substantial populations should be protected, and it is recommended that significant portions of all smaller colonies be protected. It is difficult to account for the extremely localized range of this species, because it is relatively common in a few large montane meadows. The closely related *M. a.*

var. *asterioides* grows near the Colorado River and eastward, and this eastern connection may indicate the Laguna Mountains Aster is relictual and now only surviving in a few optimal locations that mimic current-day Arizona and New Mexico montane growing conditions. In fact, the meadows around the community of Laguna do superficially more closely resemble the mountains of southeastern Arizona, rather than the wetter and much closer Cuyamaca Mountains to the north. The Laguna Mountains Aster has numerous blue-purple ray flowers (unlike the yellow ray flowers of *Machaeranthera juncea*), and hairy not glandular phyllary tips like *Machaeranthera canescens*.

RUSH-LIKE BRISTLEWEED [*Machaeranthera juncea* (Greene) Shinnars = *Haplopappus junceus* Greene]

- LISTING:** CNPS List 4 R-E-D Code 1-1-1
 State/Fed. Status -- None ASTERACEAE Jun.-Oct.
 Global Rank G5 State Rank S3.3
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** A xeric, low-growing Chamise Chaparral or Diegan Coastal Sage Scrub is the preferred habitat of this inconspicuous subshrub. Acid Igneous rock lands are found at the Santee locale. Rush-like Bristleweed usually grows in exposed locations with rocky substrate that does not foster much annual understory. This is an inconspicuous species which flowers late and is probably under-reported. Possible Associates: *Gutierrezia sarothrae*, *Chorizanthe fimbriata*, *Adenostoma fasciculatum*.
- KNOWN SITES:** Bristleweed is found in chaparral along Highway 94 near Jamul, and in similar habitat off Montanya Drive near Lilac Road. It grows with some abundance on steep chaparral slopes in Lee Valley, and is rare in similar habitats in nearby Rancho Jamul, north of Chocolate Summit Road in Alpine, and north of Bermuda Lane in El Cajon. Typically, only small numbers of this species are found at any single site. Much of the potential habitat occurs in inland chaparral areas of San Diego County which have not been thoroughly investigated. Over 100 plants were seen on a rocky hillside in Santee east of Magnolia Drive in 1990. It grows along disturbed trails at Swartz County Regional Park, and is occasional on the south flanks of Viejas Mountain, near Poway Grade not far from its intersection with Highway 67, in the rugged hills south of Japatul Valley Road, and north of the freeway in Alpine. Several plants were seen in chaparral covered plains east of Pala. Old reports are from Twin Peaks in Poway and far southeast to Potrero. Bristleweed is scattered in the hills east of Longs Gulch near Barona. Numerous old biological survey reports note this species at Sequan Truck Trail, Dye Road in Ramona, Peutz Valley Road near Interstate 8, San Vicente Creek West of Wildcat Canyon Road, Silva Road near Flinn Springs, Steele Canyon, south of Japatul Road and west of the junction with Lyons Valley Road, Highway 94 just west of Jamul, south of Interstate 8 adjacent to Flinn Springs County Park, south of Oak Creek Road near Lake Jennings, both to the east and on the southwestern flanks of Starvation Mountain, northeast of Dorothea Terrace in Poway, 1 mile west of Campo near Highway 94, near Blossom Valley Road and Flinn Springs, a west-facing slope above Honey Springs Road on Honey Springs Ranch, Hester Granite Pit on Willow Glen Road north of Oak Drive near Dehesa, north of Tavern Road and Interstate 8 in Alpine, near Poway Road southwest of Espola Road, south of Woods Valley Road on Bear Ridge 0.75 mile east of Valley Center Road, north of the junction of Highway 94 and Highway 188 at the turnoff to Tecate, the south side of Lyons Valley Road and Honey Springs Truck Trail, near Rangeland Road in Ramona, west of Anthony Road near Lilac, south of Peutz Valley, northwest of San Marcos' Palomar College, on The Mesa southeast of Singing Hills Country Club and west of Sloane Ranch, Willow Glen Road near Dehesa, near South Grade Road in Alpine, west of Harbison Canyon near Crest, near Goat Peak north of Beeler Canyon near Poway, north of Lilac Road and west of Anthony Road, south of Schoolhouse Canyon and east of Bandy Canyon, near Valley Center Road south of Rincon Springs, and near Old Coach Road in Poway south of Highland Valley Road.

Thirty-one collections from Baja California are found in the San Diego Herbarium. It ranges south to 30° 44' North where it was collected by Moran (SD 91386) at the head of Arroyo San Simon.

STATUS: This shrub is slowly declining in San Diego County as urban expansion reaches into the foothill region. Numerous undiscovered populations likely exist for this species. Provisionally, it is recommended that substantial portions of sizeable populations be protected. This species appears to be an opportunist that pioneers in chaparral areas that have recently burned. Dense, senescent chaparral may exclude Rush-like Bristleweed; or limit it to mildly disturbed locations such as trail-sides. The narrow leaf rachis of this small shrub is offset by deeply pinnately and bristle-tipped lobes. These distinctive leaves are typically sparsely distributed so that the plant can look almost leafless -- making it easily overlooked. Rush-like Bristleweed may not be closely related to other species of *Machaeranthera*, and ultimately may be placed into its own genus.

INDIAN VALLEY BUSH MALLOW [*Malacothamnus aboriginum* (Rob.) Greene]

LISTING: CNPS List 1B R-E-D Code 2-2-3
State/Fed. Status -- None MALVACEAE Apr.-Oct.
Global Rank G3 State Rank S3.2

DISTRIBUTION: San Diego County, Fresno County, Monterey County, San Benito County

HABITAT: Montane Chaparral and lower Montane Coniferous Forest are the preferred habitats of this herbaceous shrub. At the few known sites in San Diego County, Indian Valley Bush Mallow exhibits a tendency to grow in minor rocky outcrops within a relatively diverse chaparral flora. Sheephed rocky fine sandy loam is mapped for the Mount Laguna site. Possible Associates: *Adenostoma fasciculatum*, *Symphoricarpos mollis*, *Rhus trilobata*.

KNOWN SITES: Several dozen vigorous plants grow just north of the San Diego State Astronomical Observatory on a rocky knoll. A patchy colony at Garnet Peak is surrounded by planted pines. Two other colonies are reported nearby. The population at the old tracking station on the peak at Mount Laguna is apparently extirpated. There is an unconfirmed report from Black Mountain-Lusardi. Similar plants from distant southern San Benito County, eastern Monterey County, and western Fresno County are reported in the Jepson Manual (1993) as this species.

STATUS: In San Diego County this shrub is declining and close to extirpation. The small population on Garnet Peak has been unnecessarily surrounded by individual shrub fences causing major site disturbance; planted pines are now "shading-out" this colony. Genetic affinity with the populations far to the north near San Benito should be investigated to determine if this is an unusual disjunction, or rather if separate subspecies/species status is warranted. If the latter, this entity deserves a 3-3-3 R-E-D Code. The San Diego County form retains narrow-bractlets. All local populations should be protected. Few, if any, shrubs in San Diego County share the unusual disjunct California distribution of Indian Valley Bush Mallow. The absence of intermediate populations strongly suggests the local population may be of substantial antiquity and now relictual in nature. Indian Valley Bush Mallow has broader subtending bractlets below the calyx than *Malacothamnus fasciculata* and *Malacothamnus densiflorus* (3-9mm wide versus < 1mm).

BROWN TURBANS [*Malperia tenuis* Wats.]

LISTING: CNPS List 2 R-E-D Code 3-1-1
State/Fed. Status -- None ASTERACEAE Mar.-Apr.
Global Rank G4? State Rank S1.3

DISTRIBUTION: San Diego County, Imperial County; Baja California, Mexico

HABITAT: Sonoran Desert Scrub is the general habitat for Brown Turbans. Near Ocotillo it grows on arid slopes with shallow soils, as well as rocky surface rubble with few large boulders and little competition from shrubs. Possible Associates: *Chorizanthe rigida*, *Chaenactis carphoclinia*, *Fagonia pachyacantha*.

KNOWN SITES: A limited population occurs on volcanic slopes at Mortero Wash near Highway S-2 in San Diego County. This inconspicuous annual is occasional in low hills east of Ocotillo, east of Fossil Canyon Road in Imperial County. It is also seen on volcanic flats south of Pinto Wash on the Yuha Desert of Imperial County. An old biological survey report notes this annual on the eastern slope of Carrizo Mountain. CNDDDB reports are from 6 miles south of Ocotillo on a ridge southeast of Elephant Trees Nature Trail, a canyon near Mountain Springs Campground, near Split Mountain, as well as near Fish Creek.

Fifteen specimens from the deserts of Baja California are found in the San Diego Herbarium; south to 26° 14' North where collected by Moran (SD 92699) on a rocky flat near Pozo de San Juanico. A substantial local population was observed near the highway east of La Rumarosa on the desert flanks of the Sierra Juarez Mountains, growing in very rocky terrain.

STATUS: The status of Brown Turbans in San Diego County is poorly understood. More collection information is needed. Existing populations are presumed to be stable. Provisionally, all populations should be protected. The rarity of Brown Turbans appears to be the result of distinctive and uncommon microhabitat requirements. This species is also fairly cryptic and may be under-reported in the desert foothills. Brown Turbans does not have ray flowers, and the inconspicuous pink-tinged disk flowers and brownish calyx give this species its well selected common name. This small annual may also grow on a brownish volcanic substrate that closely matches the color of the plant, allowing it to be easily overlooked.

SPEARLEAF [*Matelea parvifolia* (Torr.) Woods]

LISTING: CNPS List 2 R-E-D Code 3-1-1
State/Fed. Status -- None ASCLEPIADACEAE Mar.-May
Global Rank G5? State Rank S2.2

DISTRIBUTION: San Diego County, Riverside County, San Bernardino County; Arizona; Texas; Baja California, Mexico

HABITAT: Spearleaf grows in Sonoran Desert Scrub on arid plains and near arroyos. At Plum Canyon this twining herb with a woody rootstock was found at the crest of a sandy embankment. Shrub cover in the vicinity was fairly well developed. Some shade was provided by the subshrubs around which this vine-like plant was entwined. Possible Associates: *Sarcostemma hirtellum*, *Ayenia compacta*, *Bernardia myricifolia*.

KNOWN SITES: A small population occurs in Plum Canyon climbing on larger shrubs. A second small population was found in the saddle of the low hills near Little Blair Valley. This species is easily overlooked when not in fruit (a long follicle to 5-7 cm), and its true rarity is difficult to determine. An old report comes from Yaqui Well. One collection is from south of the Inner Pasture and Agua Caliente Springs, and east of the Sawtooth Mountains. East of San Diego County are desert reports from Corn Spring, Cottonwood Spring, and near Kelso. A herbarium specimen from the Chuckwalla Mountains was examined. A CNDDDB report from Riverside County is for Cactus Spring Trail near Horsethief Creek in the Santa Rosa Mountains; as well as for San Bernardino County from the west end of Indian Cove Campground. Reported by Shreve and Wiggins as discontinuous from the eastern Mohave desert to western Texas; also reported in Deep Canyon in the Coachella Valley of western Riverside County. Reported by Lehr for Arizona; a herbarium specimen was seen from Tucson. Daniel and Butterwick report this species as occasional to rare in the South Mountains near Phoenix.

Sixteen specimens from Baja California are found at the herbarium of the San Diego Natural History Museum; south to 27° 7' North where collected by Moran (SD 92479) on the southeastern peak of Picachos de Santa Clara.

STATUS: Spearleaf populations on the southern deserts are presumed stable, given the limited historical disturbances within its desert habitat. Taking into account the paucity of reported sites in the region, all populations should be protected. San Diego County lies at the western periphery of the desert range of this species, and conditions may not be optimal for the local establishment of Spearleaf. The leaf (0.5-2cm) of *Matelea parviflora* is sagittate, or spear-like; and its small greenish or purplish flowers are easily camouflaged as it twines through much larger shrubs.

HAIRY STICKLEAF [*Mentzelia hirsutissima* Wats.]

LISTING: CNPS List 2 R-E-D Code 2-1-1
State/Fed. Status -- None LOASACEAE Apr.-May
Global Rank G3? State Rank S2S3

DISTRIBUTION: San Diego County, Imperial County; Baja California, Mexico

HABITAT: Sonoran Desert Scrub growing on rocky hillsides and desert mesas is the reported habitat. At Yaqui Pass this biennial was found in small boulders on an arid slope with limited competition from shrubs. Possible Associates: *Pectocarya* species, *Opuntia bigelovii*, *Camissonia chamaenerioides*.

KNOWN SITES: Several plants were seen growing in rocky outcrops at Yaqui Pass. This conspicuous species is quite rare in the deserts of San Diego County. Old reports are from Borrego Palm Canyon, lower Box Canyon, Mountain Springs, near Agua Caliente, and Canebrake Canyon. It is also reported from the Yuha cut-off in Imperial County. CNDDDB reports are from Mountain Palm Springs; as well as the south side of the mouth of Rockhouse Canyon in the In-Koh Pah Mountains, and nearby approximately one mile east of the mouth of this canyon.

Eighteen specimens from Baja California are found at the herbarium of the San Diego Natural History Museum, south to 27° 7' North where collected by Moran (SD 92316) on the north slope of the southeastern peak of Picacho de Santa Clara. Other specimens are from Isla Angel de la Guardia and the Mejia Islands.

STATUS: Hairy Stickleaf is presumed stable in San Diego County given the limited historical impacts to its rocky desert habitat. All sites should be protected. This species appears to be a predominantly Baja desert annual/biennial which reaches its extreme northwestern range in San Diego County. Hairy Stickleaf has greenish bracts unlike the white-scarious bracts rimmed with green of *Mentzelia involucreta*; moreover, the latter has distinctive large cream colored flowers with orange veins (not pale yellow). The fruits are 5-8mm in width; wider than the narrow fruits of a number of desert species of *Mentzelia* found in Anza Borrego.

SMALL-FLOWERED MICROSERIS [*Microseris douglasii* (DC) Sch.-Bip ssp. *platycarpa* (Gray) Chambers]

LIST: CNPS List 4 R-E-D Code 1-2-2
State/Fed. Status -- None ASTERACEAE Mar.-May
Global Rank G4T3 State Rank S3.2

DISTRIBUTION: San Diego County, Orange County, Los Angeles County, Riverside County, San Clemente Island, Santa Catalina Island; Baja California, Mexico

HABITAT: This nondescript annual is typically found on clay lenses in perennial grasslands, on the periphery of vernal pools, or in broad openings in sage scrub. Possible Associates: *Uropappus lindleyi*, *Stebbinsoseris heterocarpa*, *Nasella pulchra*.

KNOWN SITES: Small-flowered *Microseris* grows near the vernal pool complex north of Peñasquitos Canyon and west of Black Mountain Road (north of Dormouse Road). It was seen in limited numbers on north-facing slopes overlooking Otay Lakes Road near Bonita, south of Camino Del Cerro Grande Road. A large population was found in clay north of unpaved Otay Valley Road east of the drainage flanking Rock Mountain. A small population occurs at the top of the small knoll west of the Otay Landfill overlooking Poggi Canyon. Recent reports are from northeast of Proctor Valley Road near Horseshoe Bend. Herbarium specimens examined were from Camp Kearny, near Ramona, Otay Mesa, Point Loma, Rancho Santa Fe, National City, San Diego, Sweetwater Valley, Mission Grade in Mission Hills, Point Loma, and Miramar; also San Clemente Island and Santa Catalina Island. Reported sites include San Luis Rey, and Mission Valley. Reported at the California Terraces Mitigation Area on Otay Mesa. A number of historical sites may be extirpated, as this species tends to grow in flatlands which have been extensively developed in the region. Reported from near the intersection of Roblar Road and Basilone Road on Camp Pendleton. Lathrop and Thorne report this species as infrequent on the Santa Rosa Plateau of western Riverside County. A population was recently reported from Fairview Regional Park near Costa Mesa in Orange County.

Six voucher specimens from Baja California are found at the herbarium at the San Diego Natural History Museum; south to 30° 39' North where collected by Moran (SD 91178) on a ridge 7 miles northeast of Las Escobas.

STATUS: This annual is presumed to be severely declining in southern California owing to urban development. Small-flowered *Microseris* is extremely difficult to census for except during its short flowering season in early and mid spring. The plants dry up and decompose relatively quickly after setting seed. Until more collection information can be gathered, all substantial sites are recommended for protection, and substantial portions of all smaller populations should be placed into biological open space. It is not common in grassy areas of coastal San Diego County as reported in the 1994 CNPS Inventory of Rare and Endangered Vascular Plants. This species is in fact now quite uncommon in this region; although current distribution implies this species may once have been much more common throughout the now developed coastal mesas. Small-flowered *Microseris* is typically found in areas of native bunchgrasses, and it does well on cracked clay lenses where competition from shrubs is poor. Planting it as a seeded component of sage scrub -- with loamy soils -- is not recommended. Unlike *Uropappus lindleyi* this species has conspicuous brown not white pappus when in seed, and the flowering head nods. The dandelion like seed head has pappus scales which are not notched on the tip like the closely related *Stebbinsoseris heterocarpa*. This trait can be seen unaided with a discriminating eye. *Microseris elegans*, *Microseris douglasii* var. *douglasii*, and *Microseris douglasii* var. *tenella* have very small pappus scales below the awn, unlike Small-flowered *Microseris*. A number of these related plants can grow in close proximity, so examining the pappus really is necessary to correctly determine the specific species.

LOW BUSH MONKEY FLOWER [*Mimulus aridus* (Abrams) Grant = *Diplacus aridus* Abrams]

LISTING: CNPS List 4 R-E-D Code 1-1-2
State/Fed. Status -- None SCROPHULARIACEAE Apr.-Jul.
Global Rank G4? State Rank S3.3

DISTRIBUTION: San Diego County, Imperial County; Baja California, Mexico

HABITAT: Desert Chaparral on the eastern slopes of the Peninsular Range is the primary habitat of this shrub. It seems particularly well adapted to rock outcrops. Soils are mapped as Acid Igneous rock lands for the population in Carrizo Gorge. Shrub cover is often open due to the presence of very large granitic boulders interspersed throughout the terrain. Possible Associates: *Pleurocoronis pluriseta*, *Asclepias albicans*, *Ipomopsis tenuifolia*.

KNOWN SITES: This conspicuous shrub grows in rocks near the Carrizo Gorge railroad spur by Dubber, and scattered among the boulder piles near the San Diego County line at Mountain Springs. The desert foothills are little explored and this species may be somewhat more common than available herbarium specimens would indicate. Reports are from Ranchita, the San Ysidro Mountains, Grapevine Canyon, Canebrake Canyon, Mortero Palms, between Shaw Canyon and Potrero Canyon, above the Dos Cabezas Campground; onto the southern high desert at Jacumba, Bankhead Springs, and Hipass. An old biological survey report notes a site near Bankhead Springs 1 mile west of Highway 80 and 0.25 mile north of the Mexican border.

Found in Baja California south to the Sierra San Borja at 28° 47' where collected by Moran (SD 60653) north of Cerro el Sauco. Only 5 collected specimens from Baja California are found at the San Diego Natural History Museum's herbarium.

STATUS: Low Bush Monkey Flower populations are presumed stable, based on limited historical impacts to the rocky, desert slope habitat of this species. Substantial populations should be protected. This shrub is referred to *Mimulus aurantiacus* Curtis in the Jepson Manual as a local form of a highly complex and variable species. However, this shrub maintains a distinctive desert habitat separate from other forms, and may now be evolving along a separate lineage with some degree of geographic isolation. Plants growing in semi-desert chaparral near Aguanga at the Riverside/San Diego County line have a very hairy calyx but are otherwise quite similar in growth habit and flower morphology to Low Bush Monkey Flower; such plants do provide a geographical linkage to forms once designated as *Mimulus longiflorus*, but now considered part of the *Mimulus aurantiacus* complex. Low Bush Monkey Flower has a lemon yellow corolla, the corolla tube is usually exerted from the calyx, and the leaves are not impressed-veiny above. Other members of this complex do not typically share all these traits.

CLEVELAND'S BUSH MONKEY FLOWER [*Mimulus clevelandii* Bdg.]

LISTING: CNPS List 4
State/Fed. Status -- None
Global Rank G3G4 State Rank S3.2
R-E-D Code 1-2-2
SCROPHULARIACEAE May-Jul.

DISTRIBUTION: San Diego County, Orange County, and Riverside County; Baja California, Mexico

HABITAT: Chaparral and Lower Montane Coniferous Forest are both utilized by this showy herbaceous perennial. This species is somewhat intermediate between the woodier and the annual members of *Mimulus*. San Miguel-Exchequer rocky silt loams are the soil type utilized on Otay Mountain; this species appears to strictly follow metavolcanic or gabbroic soils. The microhabitat generally consists of open locales in xeric chaparral dominated by Chamise, with exposed rock nearby and shallow soils available. This species is regularly found near the summits of mountain peaks, and may have some limiting temperature requirements for optimal habitat. Possible Associates; *Chamaebatia australis*, *Calamagrostis koelerioides*, *Pickeringia montana*.

KNOWN SITES: Several populations are flourishing at higher elevations of Otay Mountain and Tecate Peak. It is locally abundant on the summit of Black Mountain-Lusardi. Old reports are from Guatay Peak, Corte Madera, 2 miles northeast of the Corral Canyon Forest Station, Tecate Peak, the Agua Tibia Mountains, Los Pinos Mountain, 1 mile east of Green Valley Falls, Japacha Peak, Harrison Grade, Pine Valley, the Agua Tibia Mountains, Lawson Peak, Viejas Mountain, and Cherry Flat on Cuyamaca Peak. Cleveland's Bush Monkey Flower is also reported by Roberts in the Santa Ana Mountains at Upper Silverado Canyon, Trabuco Canyon, and Hot Springs Canyon; as well as on Santiago Peak and Modjeska Peak.

This monkey flower grows south in Baja California to 32° 3' North where collected by Moran (SD 75794) on the summit of Cerro Blanco. Only 4 specimens for Baja California are now found at the San Diego Herbarium.

STATUS: Cleveland's Bush Monkey Flower populations in San Diego County are stable. It is potentially impacted by transmitting equipment often erected at mountaintop locales, as this species has a strong preference for peaks and upper ridgelines. All substantial populations should be protected; significant portions of smaller, isolated populations should be placed into biological open spaces. Rarity of this species is strongly correlated with the restricted distribution of its preferred soil types. *Mimulus clevelandii* is more herbaceous and low-growing than typical mature shrubs in the *Mimulus aurantiacus* complex; moreover the upper leaf surface is hairy, the calyx is generally swollen at the base, and the corolla is yellowish. *Mimulus aridus* growing at the desert edge also has yellowish flowers, but it is a woodier shrubby species without a hairy leaf surface.

PALOMAR MONKEYFLOWER [*Mimulus diffusus* Grant =or closely related to *Mimulus palmeri* Gray]

- LISTING:** CNPS List 4
State/Fed. Status -- None
Global Rank G4Q State Rank S3.3
- DISTRIBUTION:** San Diego County, Orange County, and Riverside County; Baja California, Mexico; also outside southern California in the Sierra Nevada foothills, the Tehachapi Mountains, western Mohave, and outer South Coast Ranges
- HABITAT:** Lower Montane Coniferous Forest and Chaparral understory are typically utilized by this small but colorful annual. Near Warner's Hot Springs this plant was flowering on the partially shaded, moist embankments of Agua Caliente Creek in a riparian woodland; south of Green Valley Campground it was found in xeric openings in the Chamise dominated chaparral. At Shrine Camp it occurred beneath conifers near very mesic meadows. These very different habitats may indicate some genetic variation occurs within these populations, or that it can tolerate a wide variety of microhabitats. Soil types utilized include Reiff fine sandy loam at Shrine Camp, and Tujunga Sand at Agua Caliente Creek. Possible Associates: *Gilia* species, *Linanthus* species, *Navarretia* species.
- KNOWN SITES:** Palomar Monkeyflower is occasional in ecotonal chaparral/Jeffrey Pine habitat near the southern entrance to Cuyamaca Rancho State Park. It is rare at Shrine Camp in the meadow; one vigorous colony occurs near Descanso north of Merrigan Ranch. It is found along Agua Caliente Creek in wet sand near Warner's Hot Springs. A small population was found on the western summit of Tecate Peak; another small population was seen approximately a half mile east of Mussey Grade Road and the entrance to the Salvation Army Campground. It is also reported from scattered San Diego County locales that include Santa Ysabel/Witch Creek, Boulder Creek, Pine Valley, and McCain Valley. Herbarium specimens at the San Diego Natural History Museum are from Lost Valley near Los Coyotes Indian Reservation, Lark Canyon Near Live Oak Spring, Morena Lake, Corte Madera, a meadow at the foot of Morgan Hill in the Palomar Mountains, at Echo Dell, a burn between Campo and Canyon City, at the Silverwood Wildlife Sanctuary near Barona, Airplane Ridge in the Cuyamaca Mountains, the hills above Lake Wohlford, and at Oakcrest Park in Encinitas. Specimens in nearby Riverside County are from Kenworthy Station in Garner Valley and near Santa Rosa Mountain Road. This species grows in a xeric chaparral at lower elevations in western Riverside County near the intersection of Colt Road and De Portola Road; also to the south near Calle Azur and Glen Oak Valley Road, and just east of the Dripping Springs Ranger Station. An old biological survey report notes this species on a hillside west of the Laurel Cemetery on Mesa de Burro of the Santa Rosa Plateau. It is reported by Roberts for the vicinity of Trabuco Peak, Orange County.

Eighteen specimens from Baja California are found in the herbarium of the San Diego Natural History Museum south to 31° 41' North where collected by Moran (SD 83849) two miles south of Rancho Tres Hermanos.

STATUS: Palomar Monkeyflower is slowly declining in southern California. Increased recreational activity (*i.e.*, camping, hiking) in the mountains is likely to further impact specific known populations. Substantial portions of all sizeable populations should be protected. The populations mentioned herein are listed in synonymy with *Mimulus palmeri* in the 1993 Jepson Manual under the David Thompson treatment; however, *Mimulus diffusus* is being retained as a distinctive species in the CNPS listings pending additional taxonomic research. Regardless of its nomenclatural position, Palomar Monkeyflower is likely found at quite a few as yet unrecorded sites in the County. In older Munz keys *M. palmeri* is reputed to have larger calyx lobes (1-2mm versus 0.5mm) than *Mimulus diffusus*, and its range was said to be from the San Bernardino Mountains northward. A number of other purplish flowering *Mimulus* are known from San Diego County or in nearby counties, making correct identification of each sometimes a challenge. *Mimulus androsaceus*, *Mimulus rubellus*, and *Mimulus breweri* all grow in southern California and have distinctly smaller tubular purplish flowers (tube < 10mm versus 12-15mm). *Mimulus parishii* has a hairy calyx tube and grows in/near wetlands such as streamsides. *Mimulus purpureus* has a two lipped corolla lobe. *Mimulus fremontii* and *Mimulus congdonii* have pedicels less than the calyx length subtending the flowers, while *Mimulus diffusus* has pedicels 2.5-4.5cm long.

SLENDER-LOBED FOUR O'CLOCK [*Mirabilis tenuiloba* Wats.]

LISTING: CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None NYCTAGINACEAE Mar.-May
Global Rank G4 State Rank S3.3

DISTRIBUTION: San Diego County, Riverside County, Imperial County; Baja California, Mexico

HABITAT: Sonoran Desert Scrub on sandy, gravelly, or rocky slopes is the preferred habitat of this herbaceous perennial. Sites examined in The Anza-Borrego Desert were xeric, but relatively well protected locales near boulders. Possible Associates: *Asclepias albicans*, *Justicia californica*, *Viguiera parishii*.

KNOWN SITES: Slender-lobed Four O'Clock is seen occasionally in desert canyons such as in Meyers Creek. It is also found on the Borrego Palm Canyon Nature Trail. Herbarium specimens are from the Jacumba Mountains and in Borrego Palm Canyon. Old reports are from Mount Tule/Carrizo Gorge, The Narrows, North Mortero Wash, and Lava Flow Wash. This shrub is occasional alongside washes east of Coyote Wells, in Shell Canyon, and in rugged canyons south of Pinto Wash in Imperial County. It is reported from Deep Canyon in the Coachella Valley of Riverside County.

Twenty collections from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 25° 51' North where collected by Moran (SD 66783) on a broad sandy wash near Marquer Bay.

STATUS: Slender-lobed Four O'Clock populations in San Diego County are likely stable based on the limited historical impacts to its desert habitat. It may be overlooked due its superficial similarity with white flowering forms of *Mirabilis bigelovii*, a common desert species. More collection data is needed. Quite a few unrecorded populations are expected to be discovered in the future. Provisionally, it is recommended that substantial portions of all sizeable populations be protected. San Diego County appears to be at the northern end of range of a rather extensive Baja California population. Unlike *Mirabilis californica* and *Mirabilis bigelovii*, Slender lobed Four O'Clock has ascending not spreading leaves, a larger involucre (> 10mm), and lanceolate not ovate perianth lobes. Slender lobed Four O'Clock also has flower lobes that do not readily retain a regular symmetry, often having an "unkempt" somewhat folded white shape. In addition, the leaves are often incredibly sticky to the touch.

FELT-LEAVED MONARDELLA (*Monardella hypoleuca* Gray ssp. *lanata* (Abrams) Munz]

- LISTING:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- None LAMIACEAE Jun.-Jul.
Global Rank G5?T2 State Rank S2.2
- DISTRIBUTION:** San Diego County, Orange County; Baja California, Mexico
- HABITAT:** Chaparral understory is the usual habitat for this suffrutescent perennial. Typically it occurs beneath mature stands of Chamise in xeric situations. San Miguel-Exchequer rocky silt loams are found at the Otay Mountain sites, while Acid Igneous rock lands occur on Mount Woodson. Possible Associates: *Pedicularis densiflora*, *Chamaebatia australis*, *Pickeringia montana*.
- KNOWN SITES:** A sizeable population grows in the chaparral understory at upper elevations of Otay Mountain. *M. hypoleuca* ssp. *hypoleuca* with strongly bicolored leaves occurs in the Delta Sector of the Santa Margarita Mountains on Camp Pendleton. An old collection from De Luz may also be this entity. The two subspecies appear quite distinct within their typical ranges but may intergrade to some extent in northern San Diego County. The Felt-leaved Monardella is uncommon on Mount Woodson, localized near the summit of Black Mountain-Lusardi, near Tecate Peak, along the Foster Truck Trail near the saddle on Iron Mountain, and near the crest of Sequan Peak. Several scattered populations grow in the San Marcos Mountains west of Rag Doll Lane. Collections in the San Diego Herbarium are from west of Lake Hodges at the end of Mt. Israel Road, El Cajon Mountain, McGinty Peak, Lawson Peak, Lyons Peak, Cuyamaca Peak, Potrero Peak, Featherstone Creek near Barona, and Poser Mountain. It is also reported from San Miguel Mountain and Viejas Mountain. Old biological survey reports note this subshrub on the slopes immediately south of Hidden Glen, at Rancho Ballena, and northwest of Lyons Peak near Skyline Truck Trail. CNDDDB reports are from 1.2 miles south of the San Luis Rey River and 0.7 mile west of Lusardi Canyon, south of Cuyamaca Peak Road and east of Fern Flat Road in Cuyamaca Rancho State Park, the south and east slopes of Barber Mountain, on old Viejas Grade, and 2 miles north northwest of Potrero on Coyote Holler Road. A CNDDDB report from near the Blue Jay Campground in the Santa Ana Mountains of Orange County may be ssp. *hypoleuca*.

In the San Diego Herbarium 8 specimens are found from Baja California. It has been collected as far south as 32° 3' North on the north slope of Cerro Blanco by Moran (SD 73054).

- STATUS:** Felt-leaved Monardella populations are presumed stable in San Diego County, given this species' tendency to occupy undeveloped peaks and mountainous ridgelines. All substantial populations should be protected, and significant portions of all smaller populations are also recommended for protection. Along with a suite of other sensitive shrubs restricted to metavolcanic and gabbroic soils in the County, the rarity of this species is strongly correlated with the dearth of suitable habitat in the region. This small shrub has a strong mint odor and hairy, linear-lanceolate leaves that arch between the rolled under margin.

WILLOWY MONARDELLA [*Monardella linoides* Gray ssp. *viminea* (Greene) Abrams]

- LISTING:** CNPS List 1B R-E-D Code 2-3-2
State/Fed. Status -- CE/FE LAMIACEAE Jun.-Aug.
Global Rank G5T3 State Rank S2.1
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Riparian scrub, usually at sandy locales in seasonally dry washes, is the typical habitat of this small subshrub. Generally there is no canopy cover and river cobbles may lie in close proximity; scattered Western Sycamores grow nearby in most of these drainages. Willowy Monardella typically occupies the periphery of seasonal drainages or intermittent creeks, and may be adapted to occasional flooding episodes to expand its local populations downstream; pioneering in newly created embankments of cobble and silty materials. Soils are mapped as

Stony lands in West Sycamore Canyon and Riverwash in San Clemente Canyon. Possible Associates: *Platanus racemosa*, *Baccharis salicifolia*, *Juncus dubius*.

KNOWN SITES: One colony in San Clemente Canyon has been partially displaced by a freeway spur for Highway 52. A vigorous Otay Mountain population of *M. linoides* has wider leaves than typical ssp. *viminea* and is similar to specimens collected by R. Moran in Baja California. This form may represent a distinct unpublished subspecies. Old reports from urban drainages are often either extirpated sites or imperiled by peripheral urban impacts including activities such as horse and hiking trails along the canyon bottoms. A limited population was observed in the upper reaches of West Sycamore Canyon south of Poway. A population on a sandy embankment in Lopez Canyon a quarter mile upstream from Camino Santa Fe is threatened by erosion. A large population in Carroll Canyon west of Camino Ruiz, with unusually large tangled shrubs growing in a cobbled drainage, is threatened by industrial park development. Old biological survey reports note populations in Carroll Canyon and Murphy Canyon. CNDDDB reports are from 2 miles west of Mira Mesa in Lopez Canyon, 1 mile northwest of Mira Mesa in Lopez Canyon, 1 mile northeast of El Camino Memorial Park in a tributary of Carroll Canyon, within the Carroll Canyon drainage, in Kearney Mesa 0.25 mile north of Miramar on the east side of Frontage Road, Carroll Canyon drainage 0.33 mile east of Interstate 15, Sycamore Canyon from Benchmark 471 upstream approximately 1.7 miles, 0.3 km east of the rifle range on the Miramar Marine Station, along Clark Canyon to 1 mile from its mouth, scattered in San Clemente Canyon on Miramar Marine Air Station lands, in Murphy Canyon on the east side of Interstate 15, Spring Canyon 4.5 miles east of Miramar near the eastern boundary of Miramar Marine Air Station, and 0.3 mile south of Gooden Ranch in a side canyon to the west of Sycamore Canyon.

No specimens for subspecies *viminea* are found in the San Diego Herbarium from Baja California. However, 18 specimens recorded as variety *hypoleuca* are found here south to 32° 3½' North where collected by Moran (SD 94888) east of the main summit of Sierra Blanca. Some of these Baja plants are poorly differentiated from ssp. *viminea*. Taxonomic work is needed to clarify the range of the various subspecies.

STATUS: Willowy Monardella is severely declining in total numbers in San Diego County. The sandy embankments in major canyon riparian systems along the coast, that are the primary microhabitat of Willowy Monardella, are rapidly being developed, degraded, or eroded away and lost due to occasional heavy flooding. Horse and hiking trails could be cumulatively quite damaging in some areas that coincide with known populations. It is seriously imperiled throughout most of its extremely narrow range. One CalTrans mitigation site in San Clemente Canyon for plants lost during the expansion of Highway 52 showed virtually all tagged specimens dead when the location was visited in the summer of 1987. Yards away, a few "native" *M. linoides* were in full flower and thriving. Nursery stock planted here was apparently not drought tolerant, and appeared to not have been adequately irrigated and then carefully weaned from such artificial irrigation. Reports of this species are concentrated in just a few watersheds and riparian creeks primarily within northern areas of the City of San Diego; surrounding habitat is quickly being engulfed by urban development. All populations should be protected. Subshrubs on Otay Mountain, in nearby Marron Valley, and southward into Baja California may represent an as yet unidentified subspecies or closely related species. *Monardella linoides* ssp. *linoides* growing on Garnet Peak and at a few other arid high elevation sites in San Diego County has distinctly ashy-gray (not greenish) leaves. Willowy Monardella can sometimes flower well into the winter months if unusually warm conditions prevail. However, during drought periods, vigorous plants may die back to basal material with a minimal exposure of green leaves; and such plants are consequently easily overlooked. This is especially true if prominent, old dried flowering heads have decomposed. As a result, censusing for this shrub requires optimal timing. This is a species that should be utilized locally for experimental plantings with seedlings grown from nursery supplied stock. Some success has been noted growing this plant from cuttings. Information gathered from such experiments

might shed some light on its challenging microhabitat requirements; as well as help explain its rarity or absence within superficially suitable, seasonal watercourse habitat in the region.

HALLS MONARDELLA [*Monardella macrantha* Gray ssp. *hallii* Abrams]

- LISTING:** CNPS List 1B R-E-D Code 2-1-3
State/Fed. Status -- None LAMIACEAE Jun.-Aug.
Global Rank G5T3 State Rank S3.3
- DISTRIBUTION:** San Diego County, Orange County, Riverside County, San Bernardino County
- HABITAT:** Lower Montane Coniferous Forest and Montane Chaparral are the general habitat of this small, woody perennial. Most sites examined were near rocky rubble and boulders where shrub cover was limited; canopy may either provide occasional shade or be lacking. At Mount Laguna the soil types utilized include Crouch coarse sandy loam. Possible Associates: *Cheilanthes covillei*, *Linanthus floribundus*, *Phlox austromontana*.
- KNOWN SITES:** This colorful herb grows near the Shrine Camp in the Laguna Mountains, and along Milk Ranch Road in the Cuyamaca Mountains.. Old reports are from the Palomar Mountains northeast of Boucher Hill; as well as from both French Creek, and west of Dyer Spring in the Cuyamaca Mountains. This entity is also reported by Roberts for the Modjeska Peak area of the Santa Ana Mountains, Orange County. *M. macrantha* (not delineated to subspecies level) has recorded herbarium specimens at SD from North Peak, Engineer Road in Pine Hills, South Peak, Harrison Peak, Japacha, Laguna Meadow, Middle Peak, Sunrise Highway, Inspiration Point, the Lightning Ridge Trail, Guatay, Heise County Park, west of Palomar Mountain, French Creek, Fry Creek, and Chimney Peak; if ssp. *hallii* is distinct, some of these specimens may be better referred to this entity than ssp. *macrantha* which ranges northward to the Santa Lucia Mountains. CNDDDB entries for San Diego County are for the Cuyamaca Mountains at 0.2 mile southeast of the junction of West Mesa Loop Fire Road and Burnt Pine Fire Road, the west Mesa Loop Fire Road 1.1 miles east southeast of Cuyamaca Peak, Japacha Peak, Fern Flat, Azalea Spring off the Azalea Spring Fire Road, northeast of Cherry Flat and northwest of the road to Cuyamaca Peak, west from the eastern boundary of Cuyamaca State Park near the East Mesa Fire Road, 0.4 mile east southeast of Oakzanita Peak along the trail to the peak, 1 mile east southeast of Oakzanita Peak, 0.3 mile up the hiking trail from the trailhead near Highway 79 crossing the Sweetwater River, the West Mesa Loop Fire Road on the northwestern end of Airplane Ridge near the junction with the riding and hiking trail, the West Mesa Loop Fire Road on the southeastern end of Airplane Ridge, Middle Peak Loop Fire Road north northwest of the peak, Middle Peak Loop Fire Road midway between the peak and Camp Hual-cu-cuish, near Milk Ranch on the Middle Peak Loop Fire Road, 0.75 mile down the southwest slope of North Peak on the northeastern side of Engineers Road, 0.4 mile east northeast of Cosmit Peak and 0.1 mile southeast of Engineer Road on the slope west of Azalea Creek, and near Descanso; also on Aguanga Ridge, alongside the Palomar Divide Truck Trail north and west of Highpoint Lookout, approximately 1.25 miles southeast of Highpoint Lookout, 0.25 mile south of the junction of Oak Grove and High Point Truck Trail near Lone Pine Spring, the Doane Nature Trail in Palomar State Park, both Boucher Hill and Chimney Creek in the Palomar Mountains, along the Crosley Trail near a tributary to Arroyo Seco Creek (as well as .2 mile south of Crosley Saddle and .7 mile northeast of Crosley Saddle in the Agua Tibia Wilderness), 0.5 mile east of Eagle Crag, and in the Cutca Valley. CNDDDB records for Riverside County are from Sugarloaf in the Santa Ana Mountains, on the trail to San Jacinto Peak above the Marion Mountain Campground, and 12 miles north of Idyllwild; from San Bernardino County along University Creek Truck Trail and below Yucaipa Ridge 1 mile south of Highway 38, Mill Creek south of Mill Creek Public Camp, and City Creek Road in the San Bernardino Mountains.
- STATUS:** This taxon is differentiated from *Monardella macrantha* ssp. *macrantha* primarily by the latter's glabrous to sparsely hairy stem (versus hairy), and elliptic to ovate and more or less glabrous

and non-ciliate leaf (versus triangular-ovate and hairy/ciliate). Intermediates are common according to a note in the James Jokerst treatment of this genus in the Jepson Manual (1993). As such, a focused study to determine if subspecies *hallii* warrants separate status is needed. Geographic separation, microhabitat distinctions, or convincing genetic differences should be present to maintain the current taxonomy. Hall's *Monardella* populations in San Diego County are presumed stable. This plant sometimes grows in open rocky locales where the fragile stems can be damaged by hikers resting momentarily among the boulder falls. Provisionally, it is recommended that sizeable populations be protected. Hall's *Monardella* appears to be a southern geographical variant of a wider ranging species.

SAN FELIPE MONARDELLA [*Monardella nana* Gray ssp. *leptosiphon* (Torr.) Abrams]

- LISTING:** CNPS List 1B R-E-D Code 3-2-2
 State/Fed. Status -- / Species of Concern LAMIACEAE Jun.-Jul.
 Global Rank G4G5T2 State Rank S2.2
- DISTRIBUTION:** San Diego County
- HABITAT:** Lower Montane Coniferous Forest is the preferred habitat of this small woody perennial. At the Jeff Valley site the soils are mapped as Crouch coarse sandy loams; canopy cover from *Pseudotsuga macrocarpa* provides substantial shade. Possible Associates: More information needed.
- KNOWN SITES:** San Felipe *Monardella* was observed growing in coniferous woodland near the entrance to Jeff Valley in the Palomar Mountains. The degree of pubescence for this subspecies may be more variable than previously noted; corolla lobes are distinctly longer in the Jeff Valley population than in typical *Monardella nana* ssp. *nana* found on Mount Laguna. A localized population which was apparently this subspecies was seen near the summit of Hot Springs Mountain. Several small plants also presumed to be this subspecies, although not in flower, were found west of Barrel Springs and north of San Felipe in the chaparral. CNDDDB reports are for the south side of the Palomar Truck Trail northwest of Benchmark 5590, on the Barker Valley Trail, several locales near the High Point Lookout, north of East Grade Road between Dyche Valley and Will Valley, on a firebreak along Oak Grove Truck Trail, 1.5 miles east of High Point Lookout, 1 mile southeast of High Point, Pine Hills/Palomar southeast of Dyche Valley. Herbarium specimens are from the Fry Creek Campground, near the stop of the grade on the southwestern slope of Palomar Mountain, Mendenhall Valley, San Felipe, Palomar Observatory, Aguanga Ridge, Los Coyotes Indian Reservation, Deer Flats, and south to the Banner Grade 3 miles from Julian. CNPS reports for Baja California cannot be verified.
- STATUS:** San Felipe *Monardella* is presumed stable in San Diego County. A gradual cline of varying traits from one subspecies into the next may typify this *monardella*, despite distinct geographic centers of distribution for each subspecies. This subspecies usually has very pale, cream-colored flowers unlike the white flowers of ssp. *nana*; as well as longer corolla lobes circa 7-10mm. In addition, it has a wider corolla tube 1-1.5mm wide and less hairy leaves than ssp. *arida* or ssp. *tenuiflora*. *Monardella nana* ssp. *nana* is locally abundant near Desert View Overlook by Mount Laguna and picks up on the southern end of the range of ssp. *leptosiphon*. *Monardella nana* ssp. *arida* ranges to the north of the San Felipe *Monardella* and was observed on Santa Rosa Peak; herbarium specimens were seen from the San Jacinto Mountains. Herbarium specimens of *M. n. tenuiflora* were seen taken from above the James Reserve in Hall Canyon; as well as between Fuller Creek and Idyllwild in the San Jacinto Mountains. This more northeasterly subspecies may extend its range into San Diego County. Taxonomic work is warranted to more clearly define all of these subspecies. Provisionally, all populations of the San Felipe *Monardella* should be protected.

CALIFORNIA SPINEFLOWER [*Mucronea californica* Benth.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- None POLYGONACEAE Mar.-Aug.
Global Rank G3 State Rank S3.2?
- DISTRIBUTION:** San Diego County, Orange County, Riverside County, San Bernardino County, Los Angeles County, Santa Barbara County, San Luis Obispo County, Ventura County, Kern County, Monterey County
- HABITAT:** This ephemeral annual herb grows in very sandy microhabitats in coastal sage scrub, chaparral, and dunes. It is also reported from grasslands and cismontane woodlands. Possible Associates: *Lastarriaea coriacea*, *Polycarpon depressum*, *Cardionema ramosissimum*.
- KNOWN SITES:** In San Diego County only two extant sites are known. One small population was observed northwest of Fort Rosecrans Cemetery on Point Loma growing on property controlled by the U.S. Navy. A recent report is from the Guy Fleming Trail at Torrey Pines State Park. Herbarium specimens were examined from Torrey Pines, Pacific Beach, and the San Luis Rey Valley. In Los Angeles County this species is reported from the El Segundo Dunes near LAX Airport. Smith reports this species in the Santa Barbara region from Fox Canyon in Santa Barbara, Buellton to Lompoc, Los Alamos, Santa Maria, Pt. Sal, Nipomo Mesa, lower Cuyama River canyon; also on dunes at Pt. Conception, Pt. Arguello, and Surf. Hoover reports this species in San Luis Obispo County in the upper Salinas Valley from Atascadero eastward to the north end of the La Panza Range and southward to near Pozo; also locally common around Morro Bay and southward along the beaches, and on dunes just south of Hazard Canyon. Reveal reports this species in extreme western San Bernardino County and northwestern Riverside County. Herbarium specimens were examined from Cajon Pass in San Bernardino County, Playa del Rey in Los Angeles County, South of Sudden Ranch Gate on Vandenberg Air Force Base as well as Graciosa Ridge in Santa Barbara County, northwest of Guadalupe in San Luis Obispo County, and near Wild Horse Creek in Monterey County. Raven reports the California Spineflower in Los Angeles County on sandy flats behind Point Dume.
- STATUS:** Formerly plants near the ocean with larger bracts were called variety *suksdorfii*. Given the paucity of reported sites in southern California, and the likelihood that most historical habitat occurred near the coast in areas now heavily urbanized, it is recommended that all southern California populations be protected. California Spineflower is substantially declining in the region due to coastal urban development, and may be locally extirpated over much of its historical range in southern California. Rarity in southern California appears to be strongly correlated with the extraordinary impacts to back dune habitat throughout the region. A number of stabilized dune species are capable of thriving and substantially expanding their numbers when placed into a well defended dune location not subject to human foot traffic and direct human associated impacts. A vast Los Angeles coastal prairie extending from the Ballona Dunes southward to Malaga Cove which may have once been the habitat center for this species is now virtually eradicated and urbanized. This area of predominantly native annuals with few shrubs and perennial grasses extended approximately 18 kilometers from north to south and 3-5 kilometers inland from just behind the coastal dunes. The relatively flat terrain was underlain by pre-Flandrian stabilized sand dunes. Few records exist of its presence and the last large tract of approximately 300 acres was destroyed in the late 1960s. This is an extraordinary example of a large distinctive habitat which is virtually extirpated. *Mucronea* has been separated by taxonomists from the genus *Chorizanthe*. The former has only one bract per inflorescence node rather than 2-3. In the genera *Centrostegia* and *Dodecahema* the involucre is spiny-awned at the base and tip, not merely at the tip as in *Mucronea*. These small annuals, once all grouped as "spineflowers," are sometimes found intermingled with several species present.

SAN DIEGO GOLDEN STAR [*Muilla clevelandii* (Wats.) Hoover]

- LISTING:** List 1B R-E-D Code 2-3-2
State/Fed. Status -- / Species of Concern THEMIDACEAE Apr.-May
Global Rank G2 State Rank S2.2
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Valley Grasslands, particularly near Mima Mound topography or the vicinity of vernal pools, are the preferred habitat of this perennial corm. This plant does not typically grow in the shade of woody perennials, but rather in somewhat open locales. Redding Cobbly loams are mapped for locations near Miramar, while Stockpen gravelly clay loam is found with the populations on northeastern Otay Mesa. Given the dearth of shrubs associated with *Muilla*, clay soils with good shrink/swell potential are obviously preferred. Possible Associates: *Nassella pulchra*, *Sisyrinchium bellum*, *Bloomeria crocea*.
- KNOWN SITES:** This corm grows near vernal pools on Otay Mesa north of the Donovan Prison. It is scattered at sites near the Miramar Mounds and on Miramar Air Station south of the eastern terminus of Eastgate Mall. Scattered populations occur around Lower Otay Lake, such as at the east end near the Daley Rock Quarry. Major populations covering many acres were reported from Proctor Valley, as well as by Escondido Creek near Via de las Flores. A massive population is found east of the Auld Golf Course on Butterfly Ridge near the southern base of San Miguel Mountain. Very large populations are found on the ridgeline west and northwest of Sycamore Landfill in Santee. Here plants grow in great masses around *Selaginella cinerascens* balds. A small population is found alongside the Sweetwater River upstream of the Sweetwater Reservoir and just north of the old wooden bridge. Additional reports where possibly still extant include 0.5 mile west of San Dieguito Reservoir, Lopez Canyon, near Beeler Creek in Poway, west of Escondido Creek near the San Diego Second Aquaduct, Mission Trails Park, southwest of Denk Reservoir in Carlsbad, Murphy Canyon, 0.5 mile southwest of Santana High School in north Santee, the west slope of San Miguel Mountain, and at the Kuebler Ranch on eastern Otay Mesa. Herbarium specimens include Foster (i.e., San Vicente Reservoir) and a locale at Rancho Santa Fe. CNDDDB reports are for the south end of Santo Road near Murphy Canyon, just north of Shepherd Canyon and west of Mission Trails Regional Park, 0.8 mile north of Mission Dam, a ridge north of Fortuna Mountain, Little Sycamore Canyon, a mesa south of San Diego State College [likely extirpated], both east and south of the Miramar Marine Air Station runways, west of Highway 163 between San Clemente Canyon and Clairemont Mesa Boulevard, in Mission Hills [possibly extirpated], the old Brown Field Bombing Range, near the Otay Mountain Truck Trail, the eastern edge of Otay Mountain one mile north of the Mexican border, the western edge of Otay Mountain both 0.5 and 1.25 miles north of the Mexican border, Little Cedar Canyon on Otay Mountain, between the San Diego River and Mast Boulevard 1000 feet east of Cuyamaca Street in Santee, a mesa between Black Mountain Road and Interstate 15 south of Peñasquitos Canyon, north of Little Sycamore Canyon on a ridge 0.25 mile east of Quail Canyon, near 50th Street and Adams in San Diego [likely extirpated], 0.5 mile south of the Lower Otay Reservoir camping area, north of San Clemente Canyon between the sand mining pit and Highway 163, the vicinity of Highway 163 and Kearney Villa Road, south and east of the Miramar Marine Air Station runways, near the west gate of this air station, 2.5 miles south of Alpine on the Sky Mesa Ranch near South Grade Road, west of Wolf Canyon near Otay Valley, west of La Media Road 1.5 miles south of Brown Field, west of Sycamore Canyon and a jeep trail, 0.7-1.1 miles south of the junction of Highway 94 and Honey Springs Road, Cedar Canyon on Otay Mountain, Minnewawa Truck Trail about 0.5 mile south of Otay Lakes Road, both east and west of Little Cedar Canyon, Chollas Heights Naval Radio Station, southeast of Black Mountain Road near the 4-S Ranch, several locales north of the tip of Upper Otay Reservoir, the east side of the Otay Reservoirs between the upper and lower lakes, southeast of San Marcos Creek Canyon approximately 1.75 miles southwest of Lake San Marcos Dam, southeast of Rancho Santa Fe Road on both side of an intermittent watercourse approximately 2.2 miles southwest of Lake San Marcos, and 1.3 miles north of Otay Lakes Road and west of Jamul Creek. A number of the CNDDDB

reports represent peripheral colonies of a single larger population; hence fewer populations are recorded than may be apparent.

Only three collections from Baja California are found at the San Diego herbarium; south to 32° 22' North where collected by Moran (SD 102127) on the south side of Valle de las Palmas.

STATUS: San Diego Golden Star is severely declining with the urban expansion of the City of San Diego and outlying cities and communities. *Muilla clevelandii* will be heavily impacted in the 2000-2020 period by continued urban expansion. The large Proctor Valley populations are imperiled by proposed Rolling Hills Ranch development, and expected severe potential secondary impacts from an influx of humans into this still lightly utilized area. Currently this species is not being adequately protected, and a number of development sites with good potential for occurrence are not being adequately censused in the spring; it is difficult to identify except when in flower during this period. During years of poor rainfall, as with the late 1980's, populations of this corm may not flower, or deceptively bloom in only limited numbers. Apparent rarity in Baja California should be factored into any analysis of the level of endangerment for this species. Populations have undoubtedly declined substantially within the last two decades, along with the loss of peripheral vernal pool habitat. The broadened filament base (the filament sits on a conspicuously raised base) of San Diego Golden Star should be carefully examined as *Bloomeria crocea* is superficially quite similar and much more common in San Diego County. It may be that populations of *Muilla clevelandii* are being overlooked and mistaken for *Bloomeria crocea*. Habitat of both is sometimes similar. All substantial populations should be protected; significant portions of smaller populations should also be protected.

LITTLE MOUSETAIL [*Myosurus minimus* L. ssp. *apus* Greene]

- LISTING:** CNPS List 3 R-E-D Code 2-3-2
State/Fed. Status -- / Species of Concern RANUNCULACEAE Mar.-Jun.
Global Rank G5T2Q State Rank S2.2
- DISTRIBUTION:** Riverside County, San Bernardino County, San Diego County, Butte County, Alameda County, Contra Costa County, Colusa County, Solano County, Stanislaus County, Kern County; Oregon; Baja California, Mexico
- HABITAT:** Vernal Pools are the habitat utilized by Little Mousetail. This cryptic species typically grows in the deeper portions of vernal pool basins, sprouting immediately after the surface water has evaporated. The stature of plants and population densities of *Myosurus minimus* change dramatically from wet to dry years. Soils are mapped as Huerhuero loam for both Little Mousetail sites near Dillon Road in the southwestern portion of the county, and for Stewart Mesa in the northwestern portion of the county. Bosanko clays are reported for a site in the Gavilan Hills of Riverside County. Possible Associates: *Centunculus minimus*, *Crassula aquatica*, *Isoetes orcuttii*.
- KNOWN SITES:** Vernal pools north of Peñasquitos Canyon, purchased as mitigation by CalTrans, possess a limited population for Little Mousetail. A substantial population of this species grows on the periphery of the vernal pools and even into the adjacent mesic grasslands at the south end of Dillon Road on Otay Mesa. During dry years *Myosurus* has not been found at this Dillon Road locale, while following one particularly rainy winter, the colony consisted of at least several hundred mature individuals. Several healthy populations of variety *apus* occur in vernal pools south and north of Mass 3 Road on Camp Pendleton. A small population was found in a vernal pool northeast of the confluence of Cottonwood Creek and Tecate Creek in Marron Valley. The deepest pool in the shallow mima mounds area was the location of this isolated and small population. Reports are from vernal pools on the mesa north of the eastern arm of Lower Otay Lake in the K6 pools; next to the newly constructed Carlsbad Poinsettia Train Station; as well as within vernal pools near the intersection of Calbaugh and Brea in Ramona. An older report

is from the west side of Proctor Valley Road 1.9 miles north northeast of Upper Otay Reservoir. CNDDDB reports are from the south end of Santo Road in Tierra Santa, west of Ramona 1.4 miles north of the junction of Highway 67 and Highland Valley Road, west of Ramona just south of the Ramona Airport, approximately 0.5 mile south of Lower Otay Campground, above Dennery Canyon along Highway 117 on Otay Mesa, and 0.75 mile east of Highway 75 and 0.25 mile south of Highway 117 on Otay Mesa. A sizeable population occurs in Hemet in western Riverside County near the intersection of Florida and Warren. An estimated 1000 plus plants were observed in a massive vernal pool on the corner of Stowe Road and California Road near Hemet during spring 1992. An old report by Munz places this species in a vernal pool near March Air Force Base in western Riverside County. CNDDDB reports from Riverside County are for Hartford Springs County Park, from four pools on Mesa de Burro, as well as two pools from Mesa de Colorado on the Santa Rosa Plateau.

Four Baja California specimens are found at the herbarium for the San Diego Natural History Museum; south to 31° 16½' North where collected by Moran (SD 101579) at a vernal pond on the south side of a river near Erendira. Limited numbers were seen in a vernal pool complex north of Cerro Bola and west of the Tecate/Ensenada Highway in Valle de las Palmas, Baja California.

STATUS: Little Mousetail is declining throughout its limited southern California range. The Camp Pendleton populations are imperiled by development for varied military activities; locales near Hemet are clearly imperiled by urban expansion. In the Dieter Wilken treatment of *Myosurus* in the Jepson Manual (1993), subspecies *apus* is not given distinctive recognition, but is mentioned within the discussion of *M. minimus*. The relationship of disjunct southern California populations with plants in the San Joaquin Valley also needs to be addressed. On Otay Mesa much larger *Myosurus* plants are sometimes found in vernal pools near Spring Canyon; the inflorescence exceeds the leaves and this plant dwarfs the tinier version that has a minute inflorescence almost hidden among the tiny leaves. In the past these were sometimes separated as *Myosurus minimus* var. *apus* for the smaller form, and *Myosurus minimus* var. *filiformis* for the larger. To what extent these differences are genetic is not known. Timing and duration of rainfall may be a factor. Until taxonomic questions are resolved, it is recommended that all sizeable southern California populations of either form should be protected. Rarity of this species is correlated with the loss of the overwhelming majority of vernal pools in San Diego County due to urban expansion.

MUD NAMA [*Nama stenocarpum* Gray]

LISTING: CNPS List 2 R-E-D Code 3-2-1
 State/Fed. Status -- None HYDROPHYLLACEAE Jan.-Jul.
 Global Rank G4G5 State Rank S1S2

DISTRIBUTION: San Diego County, Orange County, Los Angeles County, Imperial County, San Clemente Island; Arizona; Texas; Baja California, Mexico

HABITAT: This tiny annual herb grows on the muddy embankments of ponds and lakes. It is also reported to utilize river embankments. Possible Associates: *Petunia parviflora*, *Ammannia coccinea*, *Callitriche* species.

KNOWN SITES: In San Diego County the Mud Nama grows on the muddy periphery of Sweetwater Reservoir at a number of locations. An herbarium specimen was examined from the Sweetwater Valley downstream from the reservoir. It is also present at the slump ponds south of Otay Mesa Road in the upper reaches of Spring Canyon. Old reports are from Rickey Dam near Bonita and from San Luis Rey. Raven reports this species in Los Angeles County near Sawtelle and Santa Monica.

Four specimens from Baja California are found at the herbarium of the San Diego Natural History Museum, south to 31° 1 3/4' North at Mesa el Rodeo where collected by Moran (SD 102694).

STATUS: This species may be introduced into southern California via recreational watercraft. The extant San Diego sites are all associated with highly modified, man-made wetlands. Provisionally, substantial portions of all California populations are recommended for protection until the origin of these scattered populations can be determined. Status of Mud Nama is presumed to be stable or expanding; although this species is still very uncommon in the region. The small (4-6mm) white to cream or even faintly purplish, funnel-shaped flowers are not generally found with other similar annuals at the muddy edges of ponds or other water bodies.

SPREADING NAVARRETIA [*Navarretia fossalis* Moran]

- LISTING:** CNPS List 1B R-E-D Code 2-3-2
State/Fed. Status -- /FT POLEMONIACEAE Apr.-Jun.
Global Rank G2 State Rank S2.1
- DISTRIBUTION:** Riverside County, San Diego County; Baja California, Mexico
- HABITAT:** Vernal Pools and vernal swales are the preferred habitat of this small annual. Population size is strongly correlated with rainfall; during drought years plant numbers may be drastically reduced. Depth of pool appears to be a significant factor as this annual is rarely found in the shallow pools. Huerhuero loam is mapped for both the Dillon Road population and the vernal pool complex on Stewart Mesa at Camp Pendleton. Possible Associates: *Psilocarphus brevissimus*, *Crassula aquatica*, *Pogogyne nudiuscula*.
- KNOWN SITES:** A vigorous population grows in the "J" series of vernal pools near Dillon Road on Otay Mesa. A particularly outstanding, well preserved pool has been protected as a mitigation site, and has been fenced. *Orcuttia californica* is common in this pool. *Navarretia fossalis* also grows in conspicuous mounded pools on La Media Road in an area which will probably soon be graded. A small colony occurs in a minor vernal swale near the northern terminus of Dillon Road. It is common in the single, large vernal pool just north of Mass 3 Road on Camp Pendleton. Spreading *Navarretia* also grows in the vast vernal pool near the Ramona Airport; the population is reported to fluctuate dramatically from year to year based on winter and spring rainfall. The small populations reported in downtown Ramona along Main Street are scheduled for imminent development. It may still be extant at the highly degraded vernal pool system in San Marcos east of Pacific Street. Former outstanding vernal pools containing *N. fossalis* around the Tijuana Airport and immediately south of the border, are now severely degraded owing to a bi-national effort to develop Otay Mesa and the ceaseless urban expansion of the City of Tijuana. An old biological survey report notes this species southwest of Day Street in Ramona. Several pools on the isolated finger mesa west of Heritage Road and south of Otay Mesa Road are reported to still retain this species. A recent report is from next to the newly constructed Carlsbad Poinsettia Train Station. CNDDDB reports for San Diego County note sites just south of Otay Mesa Road at the east end of Moody Canyon, both north and northwest of Brown Field, northeast of Montgomery Field between the runways and the fence, the vicinity of Highway 163 and Kearney Villa Road, a mesa at the head of Deer Canyon north of Peñasquitos, north of the junction of Carroll Canyon Road and Miramar Road, north of Miramar Road and one mile east of Interstate 805, east of Brown Field, 0.5 mile south southeast of the Alta School [an historic site] on Otay Mesa, on the southeastern edge of Sweetwater Reservoir, near Artesian Road 1.25 miles east of the junction of El Mirador road and El Vuelto Road, a vague site one mile north of San Marcos near Twin Oaks Valley Road, near the southwestern corner of Linda Vista and Bent Street in San Marcos, a western finger canyon of the southwestern arm of Otay Mesa, above Dennery Canyon along Highway 117 on Otay Mesa, and just west of La Media Road 1.5 miles south of Brown Field. A report is from near Davis Road by the San Jacinto Wildlife Reserve, and east of California Street and north

of the railroad tracks near Hemet in western Riverside County; old reports are from Skunk Hollow. A very large population numbering in at least the tens of thousands grows in a massive vernal pool on the corner of Stowe Road and California Road near Hemet. A substantial population grows in a vernal pool one half mile east of Los Caballos Road and south of Highway 79 near Vail Lake. CNDDDB reports for Riverside County are from 1 mile east of Perris, just northeast of the intersection of California Road and Marvin Hull Road near Perris, and in the San Jacinto Wildlife Area east of Davis Road and north of the San Jacinto River levee.

Twenty-four collections from Baja California are found in the San Diego Herbarium; south to 30° 28½' North where collected by Moran (SD 100928) north of Ejido Papalote. This species is common in the vernal pool complex north of Cerro Bola and west of the Tecate/Ensenada Highway at Valle de las Palmas.

STATUS: Spreading *Navarretia* is severely declining throughout its range. Much of its habitat on Otay Mesa is now being developed following industrial rezoning of the area. *N. fossalis* is extremely rare on the mesa, growing principally in only a few of the remaining southernmost pools. All sizeable populations should be protected; substantial portions of smaller populations are also recommended for protection. Rarity of this species is a result of tremendous urban development virtually throughout the historical range of Spreading *Navarretia*. Differentiating the small annual species of *Navarretia* requires some care. Spreading *Navarretia* is not strongly glandular like *Navarretia atractylodes*, the subspecies of *Navarretia hamata*, or *Navarretia peninsularis*. These plants are not generally found in vernal pool basins, but can occasionally occur at the edges of more poorly defined and shallow vernal basins. *Navarretia intertexta* and *Navarretia tagetina* have ovate corolla lobes rather than linear lobes (< 1mm wide). In *Navarretia prostrata*, which also grows in vernal pools, the plant is prostrate and the inflorescence is almost buried in the center of the basal leaves; while in *Navarretia fossalis* the flowers sit above the leaves in a cyme. The former also has flowers that often have a bluish hue, in contrast to the white flowers of the latter.

BAJA NAVARRETIA [*Navarretia peninsularis* Greene]

LISTING: CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- None POLEMONIACEAE Jun.-Aug.
Global Rank G3? State Rank S2.2

DISTRIBUTION: San Diego County, San Bernardino County, Kern County; Baja California, Mexico

HABITAT: In the Cuyamaca Mountains this tiny annual grows in mesic openings in the chaparral on mild slopes adjacent to Cuyamaca Lake. It is reported from Lower Montane Coniferous Forests. Possible Associates: *Allium campanulatum*, *Polygonum parryi*, *Phlox gracilis*.

KNOWN SITES: A sizeable population occurs at a few scattered locales around Cuyamaca Lake in San Diego County. Herbarium specimens examined are all from nearby at Azalea Spring, the west slope of Middle Peak, southeast of Camp Hual-cu-cuish, and 1/4 mile east of Chambers Park near Cuyamaca Lake. It is reported from two locales in Holcomb Valley in San Bernardino County.

Eight specimens from Baja California are found at the herbarium of the San Diego Natural History Museum, south to 32° 6' North in the Sierra Juarez at Rancho los Pantalones where collected by Moran (SD 105532).

STATUS: Given the presumed rarity of this species in the United States, all populations are recommended for protection. Baja *Navarretia* is presumed stable in the mountains of southern California; however, it may occur at so few locales, that loss of any sizeable populations may be significant. The extensive range of this species and few collections indicates it is a relictual species that may not be well adapted to current climatic conditions in the region.

Differentiating this small annual from other related species, some of them historically referred to as "skunkweeds," can be difficult. *Navarretia fossalis*, *Navarretia prostrata*, *Navarretia intertexta*, and *Navarretia tagetina* are not glandular plants, while Baja Navarretia has glandular puberulent leaves. *Navarretia atractyloides*, *Navarretia hamata* ssp. *hamata*, and *Navarretia hamata* ssp. *leptantha* (with a thread-like corolla tube), typically have conspicuously broader outer leafy bracts subtending the flowers than the linear bracts of Peninsular Manzanita. Be forewarned that both *N. atractyloides* and *N. hamata* can be variable in leaf shape, plant size, flower color, and flower shape. They do not always conform neatly to the keys in the Jepson Manual and warrant further genetic studies. In addition, Peninsular Navarretia is only known from higher elevations in the mountains.

PROSTRATE NAVARRETIA [*Navarretia prostrata* (A. Gray)Greene]

- LISTING:** CNPS List 1B R-E-D Code 2-3-3
 State/Fed. Status -- None POLEMONIACEAE Apr.-Jul.
 Global Rank G2? State Rank S2.1?
- DISTRIBUTION:** San Diego County, Los Angeles County, Riverside County, Merced County, Monterey County, San Bernardino County, Orange County
- HABITAT:** This navarretia is apparently restricted to vernal pools. On Kearney Mesa it grows at mid levels within the deeper pools to the basin bottoms of the shallower pools. Within the larger vernal pools on the Santa Rosa Plateau it is sometimes a dominant plant of the basins. Possible Associates: *Eryngium aristulatum* ssp. *parishii*, *Crassula aquatica*, *Myosurus minimus* var *apus*.
- KNOWN SITES:** This small annual is rare in vernal pools near Kearney Villa Road and Highway 52 in the northern City of San Diego. A herbarium specimen examined is from fifty yards north of Chesapeake Road in the Miramar area. Prostrate Navarretia is locally common in the larger vernal pools on Mesa de Colorado on the Santa Rosa Plateau of western Riverside County. It is reported from several locales in low-lying areas along the San Jacinto River floodplain between Lakeview and Perris. A herbarium specimen was also examined from the Santa Lucia Mountains east of Jolon in Monterey County. A population was recently reported from Fairview Regional Park near Costa Mesa in Orange County. Also reported by Bainbridge (unpublished) as common in vernal pools at the San Luis NWR and Kesterson NWR. Yadon (unpublished) reports this species at Fort Ord on Asp Road flowering at the end of April.
- STATUS:** Given the presumed rarity of this species and its restriction to but a few vernal pool systems, all populations are recommended for protection. Prostrate Navarretia is severely declining in San Diego County where the construction of Highway 52 was directed through the corner of the Miramar vernal pool system -- that unfortunately included the only sizeable known concentration of Prostrate Navarretia in the region. Surveys are needed to determine how much of this fragmented population now remains. Taxonomic work is recommended to examine the similarities between the southern California populations and the disjunct Merced and Monterey county populations; they may represent two closely allied but different taxa. Vast tracts of vernal pool habitat was destroyed in the early 20th century from Carlsbad to Oceanside and San Marcos, leaving minimal herbarium collection data. As a result, the current disjunction between northerly sites and the isolated southern San Diego County population may be a direct result of relatively recent habitat destruction. Differentiating the small annual species of *Navarretia* requires some care. Prostrate Navarretia is not strongly glandular like *Navarretia atractyloides*, the subspecies of *Navarretia hamata*, or *Navarretia peninsularis*. These plants are not generally found in vernal pool basins, but can occasionally occur at the edges of more poorly defined and shallow vernal basins. *Navarretia intertexta* and *Navarretia tagetina* have ovate corolla lobes rather than linear lobes (< 1mm wide). In *Navarretia fossalis*, which also grows in vernal pools, the plant is not prostrate and the inflorescence is not buried in the center of the basal leaves; but instead the flowers sit above the leaves in a cyme. Prostrate Navarretia

also has flowers that often have a bluish hue, in contrast to the white flowers of *Navarretia fossalis*.

COAST WOOLLY-HEADS [*Nemacaulis denudata* Nutt. var. *denudata*]

- LISTING:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- None POLYGONACEAE Apr.-Sep.
Global Rank G4T2 State Rank S2.2
- DISTRIBUTION:** San Diego County, Los Angeles County, Orange County, Santa Catalina Island; Baja California, Mexico
- HABITAT:** This prostrate annual is found in well developed coastal sand dunes along the beaches. The back dunes, in mildly protected locales, seem to be preferred. Possible Associates: *Abronia maritima*, *Camissonia cheiranthifolia*, *Lotus nuttallianus*.
- KNOWN SITES:** Small populations occur in the dunes north of the mouth of the Santa Margarita River, on a minuscule sandy embankment just west of the Pacific Coast Highway on the periphery of Peñasquitos Lagoon, on the Silver Strand to the west of Emory Cove near Imperial Beach, and on the back dunes at Border Field State Park. Tens of thousands of plants grow at the D Street Fill on sandy terrain prepared for Least Terns. This tern site has been unsuccessful and the site is being considered for conversion to salt marsh. A significant portion of the vigorous Emory Cove population lies between the fence line for the Silver Strand State Beach and the southbound shoulder of the highway. A large expanding population occurs at the least tern nesting site on Mariners Point in Mission Bay, and on the tern site at Delta Beach on San Diego Bay. Herbarium specimens examined include a marsh near Cardiff, Del Mar Beach, beach fill for the National City tidelands, Coronado Beach, Mussel Beds near Ocean Beach, Old Town, Ocean Boulevard and G Street in Coronado, Imperial Beach, and at the Boundary Monument. Most of these locales are likely no longer extant. CNDDDB reports are from near the Encina Power Plant, from Coronado Cays and the nearby Naval Amphibious Base, and a 1928 report from the beaches north of Encinitas. Roberts reports this species for Orange County.

Ten specimens from Baja California have been collected for the herbarium at the San Diego Natural History Museum; south to Puerto Santa Catarina at 29° 31 minutes North where found by Moran (SD 84016).

- STATUS:** Coast Woolly-heads is severely declining and is almost extirpated in San Diego County due to extensive recreational beach use -- leaving few expanses of dune habitat available. Several specimens of the desert dwelling ssp. *gracilis* (or a hybrid) are known from the coast (reported at Oceanside and the marine base on San Diego Bay); other possible hybrids with ssp. *denudata* are reported from Baja California. All sites of Coast Woolly-heads should be protected. The D Street Fill population consisting of many thousands of plants, likely the largest known colony, has expanded enormously due to efforts to reduce non-native weeds in preparation for possible Least Tern nesting. A recent proposal to alter this site use due to lack of nesting interest on the part of the terns, could threaten the entire population. Coast Woolly-heads is a potential candidate for Federally Endangered status; all the larger populations appear to occur at locations managed as tern nesting sites. Focused field work is necessary for a more detailed assessment. *N. denudata* ssp. *denudata* has red involucral bracts with white wool, unlike the brownish bracts with tawny wool of *N. denudata* ssp. *gracilis*; in addition there are 12-30 flowers per involucre in the former versus 5-12 in the latter.

SLENDER WOOLLY-HEADS [*Nemacaulis denudata* Nutt. var. *gracilis* Goodm. & Benson]

- LISTING:** CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status -- None POLYGONACEAE Mar.-May

- Global Rank G4T3? State Rank S2S3
- DISTRIBUTION:** San Diego County, Orange County, Riverside County, Los Angeles County, Imperial County; Arizona; Baja California and Sonora, Mexico
- HABITAT:** This species prefers well developed dunes whether on the desert or rarely, along the coastal beaches. Possible Associates: *Abronia villosa* var. *villosa*, *Geraea canescens*, *Eriogonum deserticola*.
- KNOWN SITES:** This prostrate annual occurs on the dunes adjacent to the Anza-Borrego Desert in San Diego County. Herbarium specimens were examined from both Oceanside and San Diego Bay along the coast; however, these locales may be extirpated. A 1903 Abrams collection is reported from the mouth of the Tijuana River. CNDDDB reports are from North Coronado Island and near Ocean Beach on the coast. An old report is from Carrizo Creek in the desert. In Imperial County this species was seen on sandy, mesquite hummocks near Ocotillo; as well as in protected locales of the Sand Hills dune system near Glamis. It is reported from Deep Canyon in the Coachella Valley of Riverside County.

Eight specimens from Baja California are found at the herbarium of the San Diego Natural History Museum, south to 28° 15' North at El Datillan north of Rancho Miramar where collected by Moran (SD 65061). This annual was seen in the dunes at the north end of Laguna Salada.

- STATUS:** Slender Woolly-heads may be more common than collection records indicate on the desert, particularly in the Algodones Dunes east of El Centro in Imperial County. However, given the paucity of U.S. sites, it is provisionally recommended that all substantial U.S. populations be protected. This species is presumed to be slowly declining in southern California due to extensive ORV use of many dune areas, and consequent habitat degradation. Current rarity may also be due to a lack of suitable dune habitat on the western deserts to adequately support populations of this species. *N. denudata* ssp. *denudata* has red involucral bracts with white wool, unlike the brownish bracts with tawny wool of *N. denudata* ssp. *gracilis*; in addition there are 12-30 flowers per involucre in the former versus 5-12 in the latter.

CISMONTANE NOLINA [*Nolina cismontana* Dice in edit.]

- LISTING:** CNPS List 1B R-E-D Code 3-2-3
State/Fed. Status -- / Species of Concern LILIACEAE Jun.-Jul.
Global Rank G1 State Rank S1.1
- DISTRIBUTION:** San Diego County, Orange County, Ventura County
- HABITAT:** This distinctive shrub generally grows in xeric Diegan Coastal Sage Scrub and open chaparral. In Orange County erosion is often conspicuous on Cienega soils where it occurs; Las Posas fine sandy loams are mapped for the San Luis Rey River site. Also reportedly utilized are other soil types including Lodo, Calleguas-Arnold complex, and Anaheim. Possible Associates: *Adenostoma fasciculatum*, *Tetracoccus dioicus*, *Calochortus weedii* var. *intermedius*.
- KNOWN SITES:** Cismontane Nolina grows in considerable numbers northeast of Gregory Canyon on the south-facing slopes overlooking the San Luis Rey River. It is also found in limited numbers near Highway S-16 just north of Pala. Additional reports from San Diego County are 4.5 km northeast of Mount Olympus along Magee Truck Trail, west of Trujillo Creek and southwest of Magee Truck Trail, and the western slope of Viejas Mountain. It is locally common in the rugged terrain east of Live Oak Canyon Road and south of the Hamilton Truck Trail in Orange County. A number of reports are for the western flanks of the Santa Ana Mountains in this region, as well as Claymine Canyon. Additional reports are from near Medea Creek two km SSE of Simi Peak, as well as the foothills of the Santa Ynez Mountains near the head of the Santa Ana Valley in Ventura County.

STATUS: Cismontane *Nolina* is slowly declining in the Pala region owing to land clearance for orchards and extensive residential yards, and is also imperiled in the foothills of the Santa Ana Mountains by residential development. All substantial populations are recommended for protection; significant portions of smaller populations should be placed into biological open spaces. The erratic distribution of this species indicates it may be a relictual component of a juniper woodland association now almost absent from cismontane southern California. Another possible member of this association may be *Berberis nevinii*.

DEHESA NOLINA [*Nolina interrata* Gentry]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- CE/ Species of Concern LILIACEAE Jun.-Jul.
Global Rank G2 State Rank S1.2

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Open Southern Mixed Chaparral and Chamise Chaparral are the preferred habitats of this distinctive shrub. Near the Dehesa School a series of fires have left stands of this *Nolina* in a disturbed annual grassland. Most populations apparently occur on Las Posas stony fine sandy loams. Possible Associates: *Tetracoccus dioicus*, *Viguiera laciniata*, *Acalypha californica*.

KNOWN SITES: A distinctive population clustered near Dehesa School shows an atypical, proliferating growth habit; repeated subjection to fire may be an important factor. This species is well scattered in the open scrub west of the school. Healthy colonies are at scattered locales on McGinty Peak; they constitute an important extended population and should be protected. Vigorous colonies occur on Sequan Peak, and are also found around a broad native grassland approximately one mile south of Suncrest. It is also reported on Barber Mountain, near Lawson Valley Road and its intersection with Skyline Truck Trail, Jamul Butte, Wood Valley, Pat's Mountain, and on the west side of Sloane Canyon on The Mesa.

Three populations are known in Baja California with the southernmost being at Rancho de la Cruz north of Ensenada at 31° 58' North; where collected by Moran (SD 109041). A specimen from this locale is located in the San Diego Natural History Museum's herbarium. It is also reported from Canon Arce and Rancho la Fortuna.

STATUS: The Dehesa *Nolina* populations in San Diego County are presently stable, but are being slowly impacted by the clearing of lands for isolated homesites. All populations should be protected. Dehesa *Nolina* appears to be a relictual species that is persisting in the region under less than optimal growing conditions. While some plant species evolve quickly enough to meet substantial climatic changes such as occurred following the end of the Pleistocene period; other species persist through tenacity and perseverance; retrenching in range and awaiting a climatic reversal. This latter strategy may not always be successful, and the Dehesa *Nolina* may be a species that could become extinct under the current sustained climatic regime. It is most closely related to *Nolina parryi*. That species has stems moderate in length (0.3-2.1 meters versus short stems (<.4 meters), mature rosettes composed of 65-220 leaves versus 30-90 leaves, leaves 20-40mm wide versus 12-30mm wide above the expanded base, and an inflorescence stalk at basal diameter 26-90mm versus 14-35mm, and smaller seeds 3-4mm versus 4-5mm in length.

CALIFORNIA CLOAKFERN [*Notholaena californica* D. C. Eat.]

LISTING: CNPS Unlisted R-E-D Code - None
State/Fed. Status -- None POLYPODIACEAE Feb.-Apr.
Global Rank None State Rank None

is scattered in chaparral openings on Miramar Air Station east of Interstate 805 and south of Miramar Road; a small colony was found in open stands of Chamise on the southwestern portion of Carmel Mountain. Another small population was observed in a meadow on the Boulder Oaks Ranch west of Mussey Grade Road near Iron Mountain. A very large population covering acres was reported from Proctor Valley. A report comes from the south side of Lower Otay Lake. Herbarium collections at San Diego's Museum of Natural History include specimens collected south of Poway Grade, on Point Loma above Loma Portal, the southeast end of Lee Valley, at Lake Murray, the northeastern slope of El Cajon Mountain, Camp Kearny, Mount Soledad, a hill west of Felicita Park, and near the corner of Balour and Encinitas Drive in Encinitas. Old biological survey reports note sites near Sundance Avenue and Carmel Mountain Road, west of Valley Center Road and south of Banbury Drive, in Carroll Canyon east of El Camino Memorial Park, a west facing slope above Honey Springs Road on Honey Springs Ranch, on Goat Peak north of Beeler Canyon in Poway, on the east slope of Bottle Peak near Lake Wohlford, and on the east side of Genesee Avenue and bounded by Miramar Road and La Jolla Village Drive and Regents Road. Reported by Roberts from Orange County at Temple Hill in Blue Bird Canyon near Laguna Beach.

Observed in *Aesculus parryi* dominated chaparral at Jatay in Baja California; no specimens are currently found in the herbarium at the San Diego Natural History Museum for Baja California.

STATUS: California Adder's Tongue Fern is declining in San Diego County. Populations are typically quite small and growth is triggered by the slightest rainfall. As a result, this cryptic species is often difficult to find at known sites during extended periods without rainfall. Censusing for this fern is best done only following substantial rainfall. Given its apparent rarity in southern California, substantial portions of sizeable populations are recommended for protection. Rarity of this species appears to be primarily correlated with loss of coastal San Diego County habitat due to urban development. *Ophioglossum californicum* is a perennial, primitive fern-like plant with 1-3 tiny bright yellow-green, sterile leaves; the longest to 4.3cm but often smaller. Within these tiny mildly folded leaves rises a small fertile spike with 8-15 pairs of sporangia. No other plants in the local native flora resemble this species. The tiny leaves and fertile spike usually emerge only after a rainfall, remain visible on the surface for a short time, and are easy to overlook. They often grow in localized clusters.

SNAKE CHOLLA [*Opuntia californica* (Torrey & A. Gray) Cov. var. *californica* = *Opuntia parryi* Engelm. var. *serpentina* (Engelm.) L. Benson]

LISTING: CNPS List 1B R-E-D Code 3-3-2
 State/Fed. Status -- / Species of Concern CACTACEAE Apr.-May
 Global Rank G3T2 State Rank S1.1

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Diegan Coastal Sage Scrub-on xeric hillsides is the preferred habitat for this prostrate to suberect cane type cactus. Soils include Huerhuero loam in Otay Valley, Gaviota fine sandy loam on Point Loma, and Redding cobbly loam in Balboa Park. Possible Associates: *Ferocactus viridescens*, *Mammillaria dioica*, *Simmondsia chinensis*.

KNOWN SITES: Scattered shrubs are found growing from Florida Canyon in Balboa Park to the Mexican border. Population densities are typically small. A good population is found on a hillside south of the Lower Otay camping area. An excellent population grows on the Subase at Point Loma, south of McClelland Road. A few plants were seen in open sage scrub west of the Otay Landfill on south-facing slopes. Significant colonies are found on the northern slopes and bluffs of Poggi Canyon, and nearby close to Lynndale Lane in Chula Vista. Old biological survey reports note sites near Dillon Road on Otay Mesa, in Moody Canyon on Otay Mesa, near Glen Abbey Memorial Park in Bonita, and in Telegraph Canyon. CNDDDB reports are from several locales in Rice Canyon in Chula Vista, near San Ysidro, south of Otay Mesa Road and north

of Moody Canyon, on a south-facing bank of Chollas Creek adjacent to Fairmont Avenue, and both 1.0 and 1.3 miles east of Rock Mountain in Otay Valley.

Five specimens are recorded for Baja California at the herbarium in the San Diego Natural History Museum; south to 31° 5½' North where collected by Moran (SD 106379) near Los Zaguaritos. It is occasional on a hill overlooking Rodriguez Dam, east of Tijuana, Mexico.

STATUS: Snake Cholla is substantially declining in San Diego County. This cacti is not often protected in situ when it occurs in areas of development, and is becoming quite rare. Mitigation plans sometimes call for moving cacti to newly cut slopes in artificial habitats where its long term establishment is suspect. Most known sites are imperiled by development within the next 5-10 years. This plant is capable of being propagated and rooted from stem segments, and should be strongly considered for use on protected lands within its historical range. The prostrate growth habit of this species is quite distinct from variety *Opuntia californica* var. *parkeri* (formerly variety *parryi*), from which it is geographically isolated. John Rebman notes that variety *californica* has a shorter tubercle and no longer central spine in contrast to *O. p.* var. *parkeri*. Sizeable populations are recommended for protection. Smaller populations should be protected on-site within biological open space, or if necessary, transplanted to high quality native sage scrub habitat in dedicated biological open space. Rarity of this species appears to be the result of extensive loss of habitat due to coastal urban development, in concert with a limited natural range in northern Baja California and southwestern San Diego County. A number of desert species invaded coastal Baja California and the extreme southwestern corner of San Diego County at some time in the distant past when different, presumably much drier climatic conditions prevailed. *Simmondsia chinensis* is often an indicator shrub for this plant association that is now relictual in the region and sometimes includes Snake Cholla. The cholla may have evolved from a desert ancestral species when confronting different adaptive requirements to survive on the coast. Most of this plant association lies south of the San Diego River, which appears to be a significant northern geographic boundary for a number of primarily Baja California plant species.

HOFFMANN'S CHOLLA [*Opuntia X fosbergii* Wolf]

LISTING: CNPS Unlisted R-E-D Code - None
State/Fed. Status -- None CACTACEAE April
Global Rank None State Rank None

DISTRIBUTION: San Diego County

HABITAT: This robust cholla grows on alluvial fans at the eastern foot of the Laguna Mountains on the desert's edge. Possible Associates: *Ferocactus cylindraceus*, *Fouquieria splendens*, *Ambrosia dumosa*.

KNOWN SITES: This species is locally abundant in the Anza-Borrego Desert within a very limited area from Mason Valley south to Canebrake Canyon; primarily west of Highway S-2.

STATUS: Hoffmann's Cholla is stable in San Diego County. This cactus is well protected with much of its population within the Anza-Borrego State Park boundaries. This cane type cholla is considered a natural hybrid, with *Opuntia bigelovii* as one parent and *Opuntia echinocarpa* as another possible parent. Hoffmann's Cholla may warrant full species status given the uniformity of traits and large number of plants found in a relatively dense, clustered population. Additional taxonomic work is recommended. This entity may provide a good illustration of localized speciation at an early stage; not coincidentally the primary population occurs near a habitat transition from the desert lowlands to the desert foothills. In *Opuntia bigelovii* the tubercle length is approximately equal to the width, while with Hoffmann's Cholla tubercle length is approximately twice the width. *Opuntia echinocarpa* has densely spiny fruit while

Hoffmann's Cholla is spineless. *Opuntia X munzii* typically has more spines per tubercle (9-16 versus 7-10); as well as spheric seeds versus irregularly shaped seeds.

WIGGINS' CHOLLA [*Opuntia wigginsii* L. Benson]

- LISTING:** CNPS List 3
State/Fed. Status -- None
Global Rank G3Q State Rank S1.2?
- DISTRIBUTION:** San Diego County, Imperial County, Riverside County; Arizona
- HABITAT:** Sonoran Desert Scrub on sandy soils of the lower desert (below 1000 feet) is the reported general habitat of this shrubby cane-type cactus. Possible Associates: More information is needed.
- KNOWN SITES:** No recent San Diego County sightings of this cacti are known. Reports from the hills northeast of Vallecito Wash, near Canebrake Wash, and on the eastern edge of Mason Valley cannot be confirmed and may be misidentifications. Reported by L. Benson on the Carrizo Desert in extreme eastern San Diego County and in northeastern Imperial County; in Arizona he notes its occurrence from Quartzite to the Gila River and the edge of Maricopa County. CNDDB reports for Imperial County note sites in the vicinity of San Felipe Creek approximately 2 miles west of Harpers Well, and a site near Palo Verde. One old biological survey report notes a site in San Sebastian Marsh in Imperial County.
- STATUS:** The status of plants conforming to historical descriptions of Wiggin's Cholla on the California deserts is presumed stable given the low level of historical disturbance to potential habitat. A note in the Jepson Manual (1993) mentions that this cane cholla is a possible hybrid between *Opuntia ramosissima* and *Opuntia echinocarpa*; however, it is still retained in the CNPS listings. John Rebman, a taxonomic worker in the genus *Opuntia*, considers Wiggin's Cholla synonymous with *Opuntia echinocarpa* and not worthy of taxonomic recognition. Munz keys Wiggins' Cholla as having terminal joints 7-9mm in diameter versus terminal joints at least 15mm in diameter in mature *Opuntia echinocarpa*. General variability of macro-features, natural hybridization, and the introduction of non-native species within the genus *Opuntia* can make identification of individual plants challenging.

WOLF'S CHOLLA [*Opuntia wolfii* (Benson) Baker]

- LISTING:** CNPS List 4
State/Fed. Status -- None
Global Rank G4? State Rank S3.3
- DISTRIBUTION:** San Diego County, Imperial County; Baja California, Mexico
- HABITAT:** This large cactus grows in Sonoran Desert Scrub, usually on alluvial fans or rocky slopes in open terrain. Possible Associates: More information needed.
- KNOWN SITES:** This cacti is reported from San Felipe Valley, Vallecito Canyon, Jacumba, and Sentenac Canyon. It is locally common at Mountain Springs Grade near Imperial County. Large, robust chollas with fat, stubby joints that key to this entity occur at a variety of locales in the Anza Borrego Desert such as near Borrego Springs, as well as to the south along Highway S-2.
- STATUS:** Historically this species was included within *Opuntia echinocarpa* collections, and was not described until 1969 as a distinctive variety of that species, with conspicuously larger joints. In the 1993 Jepson Manual it is treated as a distinct species. The limited number of collections may not indicate its true distribution, nor how common it may be locally. Chollas are both troubling to collect and difficult to mount, and are generally undercollected. Provisionally, substantial portions of all sizeable populations are recommended for protection. More

information is needed. Given the limited development within its desert habitat, Wolf's Cholla is presumed stable. *Opuntia echinocarpa* generally has a terminal stem segment less than 2dm and a tubercle length less than twice the width, and *Opuntia wolfii* generally has a terminal segment greater than 2dm and a tubercle length greater than three times the width. In practical terms, *Opuntia echinocarpa* often looks as if it has short stubby terminal segments.

CALIFORNIA ORCUTT GRASS [*Orcuttia californica* Vasey]

- LISTING:** CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- CE/FE POACEAE Apr.-Jun.
Global Rank G2 State Rank S2.1
- DISTRIBUTION:** Riverside County, San Diego County, Ventura County, Los Angeles County; Baja California, Mexico
- HABITAT:** Vernal Pools are the preferred habitat of this inconspicuous prostrate grass. Stockpen gravelly clay loam is mapped for the Dillon Road population while the Skunk Hollow site has Ramona sandy loam. At the few locales examined, vernal pool associates were not representative of the pool flora in the region, but limited to certain species. California Orcutt Grass tends to grow in wetter portions of the vernal pool basins, but this annual does not show much growth until the basins become somewhat desiccated. Possible Associates: *Psilocarphus brevissimus*, *Navarretia fossalis*, *Myosurus minimus* var. *apus*.
- KNOWN SITES:** California Orcutt Grass is common in a very few "J" series pools on Otay Mesa; it is particularly well developed at the south end of Dillon Road near Spring Canyon. This grass is reported near the Miramar Air Field runway. A recent report is from vernal pools next to the newly constructed Carlsbad Poinsettia Train Station. CNDDDB records for San Diego County note sites northeast of Brown Field on Otay Mesa one mile north/northeast of the Alta School, 0.8 mile south/southeast of the Alta School, adjacent to the west side of Highway 163 approximately 1 mile north of Clairemont Mesa Boulevard, approximately 0.25 mile southwest of a finger canyon north of the southern rim of Otay Mesa, in Spring Canyon south of Dillon Road on the southern rim of Otay Mesa, north of Wruck Canyon on southern Otay Mesa, and one mile east of San Ysidro at the "E-4 1/2 Pond" 0.5 mile east of the port of entry along the south side of the road. It is also reported from Skunk Hollow, a massive vernal pool in western Riverside County which very rarely ponds substantial water; as well as on the Santa Rosa Plateau. Vast, almost monotypic stands grow in the vernal pool complex on the corner of Stowe Road and California Road near Hemet. An old report from the junction of Western Avenue and Rosecrans Avenue in Los Angeles around the old municipal airport is apparently an extirpated site. CNDDDB records for Riverside County are for six pools on Mesa de Burro and three pools of the Mesa de Colorado of the Santa Rosa Plateau, and a site near Murrieta Hot Springs which may be extirpated. Recent reports are from Thousand Oaks and Newhall, in Ventura County and Los Angeles County respectively.
- Thirteen collections from Baja are found at the San Diego Herbarium; south to 30° 56½' North where collected by Moran two km northwest of Ejido Ruben Jaramillo.
- STATUS:** California Orcutt Grass is slowly declining throughout its range. Until the mid-1990s, populations on southern Otay Mesa were regularly impacted by free ranging cattle and horses that were allowed to wallow in the few vernal pools remaining in the area. The border patrol heavily utilizes dirt roads adjacent to some of these pools, and the road shoulders continue to expand into the pool areas. Populations near Hemet are clearly imperiled by urban expansion; sizeable portions of the California Road and Stowe Road population are disked on a yearly basis; ostensibly for an almost nonexistent threat of fire to nearby homes. One of the rarest plants in San Diego and Riverside counties; all populations should be protected. In some years of sporadic rainfall this annual grass may not germinate, and appear to be absent or to occur in low numbers in pools where it is normally abundant. At the Stowe and California road site

near Hemet in Riverside County, the population can vary substantially from year to year; other climatic factors in addition to yearly rainfall may encourage growth (*e.g.*, timing of rainfall sequences; pool chemistry). Complex microhabitat requirements might explain the occasional presence of California Orcutt Grass in some pools and their absence from seemingly similar nearby pools. General rarity of this species is strongly correlated with catastrophic loss of vernal pool habitat throughout southern California; associated first with heavy grazing pressure and agricultural dry-land farming of mesic areas (where vernal pool presence in an otherwise arid region, implied crop success); and later with extensive loss of flatlands for housing and commercial development. *Orcuttia californica* is an annual grass that is restricted to vernal pools; it has inflorescence branches (3-6cm) that are exerted but not readily seen at arms's length. The lemma is distinctly five-toothed.

BAJA CALIFORNIA BIRDBUSH [*Ornithostaphylos oppositifolia* (Parry) Small]

- LISTING:** CNPS List 2 R-E-D Code 3-3-1
 State/Fed. Status Endangered / None ERICACEAE Jan.-Apr.
 Global Rank G4 State Rank S1.1
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Coastal Chaparral is found at the lone U.S. site for birdbush. The shrub cover here is relatively dense; soils are Olivenhain cobbly loam. Associates: *Xylococcus bicolor*, *Adenostoma fasciculatum*, *Agave shawii*.
- KNOWN SITES:** Baja California Birdbush is found near Boundary Monument 256 in the Tijuana Hills.
- Forty specimens from Baja California are found at the San Diego Natural History Museum's herbarium; south to 30° 23' north where collected by Moran (SD 54663) 1.5 miles east of Rancho El Cipres.
- STATUS:** Baja California Birdbush is declining at its one United States locale. On a visit in 1987, some "brushing" was evident at the site, which is the only known location in the United States for this distinctive shrub. The U.S. Border Patrol activities, including their preference for the clearance of brush near the border fence, threaten this population. The population has in Year 2000 been again proposed to be removed. Fire is another endangerment factor in evidence. All U.S. sites should be protected in situ. Baja California Birdbush has opposite, linear shaped and bicolored leaves unlike the related manzanitas in the region. *Xylococcus bicolor* and *Comorostaphylos diversifolia* have similar obovate to oblong leaves, unlike *Ornithostaphylos oppositifolia*.

SHORT-LOBED BROOM-RAPE [*Orobanchę parishii* (Jeps.) Heckard ssp. *brachyloba* Heckard]

- LISTING:** CNPS List 4 R-E-D Code 1-2-2
 State/Fed. Status -- / Species of Concern OROBANCHACEAE May-Aug.
 Global Rank G4?T3 State Rank S3.2
- DISTRIBUTION:** San Diego County, San Luis Obispo County, San Nicolas Island, Santa Catalina Island, Santa Cruz Island, San Miguel Island, Santa Rosa Island; Baja California and Isla Guadalupe, Mexico
- HABITAT:** Coastal Bluff Scrub and Coastal Dunes are the reported habitat for this species. On Point Loma the habitat (soils mapped as Terrace Escarpments) is a wind-swept, low-growing sage scrub with sandstone openings; at Torrey Pines this broomrape was reported at the edge of the pine canopy on a slope facing the ocean. Possible Associates: More information needed.
- KNOWN SITES:** Reported from San Diego County along the Guy Fleming Trail at Torrey Pines State Reserve (not noted at this locale during the following two years), on Point Loma Navy property near Fort Rosecrans (site inexplicably destroyed in 1988 for construction of a narrow repair road),

and in a sandy bottom in Lux Canyon in Encinitas where commercial or housing development is underway in Year 2000. CNDDDB reports are from San Miguel Island for the west side of Cuyler Harbor, at Harris Point Peninsula, 0.5 mile southeast of Adams Cove; from Santa Catalina Island from Ben Weston Beach; from San Nicolas Island 0.25 mile west of Elephant Seal Beach, northeast of Elephant Seal Beach, 0.25 mile northwest of San Nicholas Island, Dutch Harbor, 0.25 mile northeast of Daytona Beach, at the east end of the island 0.25 mile west of the lighthouse, on the road northwest of Jehemy Beach, just east of Dutch Harbor, south of Jackson Hill on a road near the beach, east of Sea Lion Beach on a road 0.25 mile inland, 0.25 mile inland from Elephant Seal Beach; from Santa Cruz Island between Black Point and Christi Ranch Beach, at the south end of Christi Ranch Beach; in San Luis Obispo County south of Oso Flaco Beach; and on the west end of Santa Rosa Island.

Collected in Baja California by Moran (SD 102353) at the head of a small arroyo, 2 km west of Cerro Solo at 31° 10' North. The specimen is at the San Diego Natural History Museum.

STATUS: Short-lobed Broom-rape is close to extirpation in San Diego County. All populations should be fully protected with adequate buffers. This species may be hindered in San Diego County by its tenuous, parasitic life cycle; in concert with a loss of habitat to urban development along the immediate coast where optimal growing conditions (*i.e.*, similar, moister conditions such as prevail on the offshore islands) are naturally limited. *Orobanche bulbosa* also grows occasionally near the coast, but has purplish flowers (not buff to pinkish), and often has a curious knobby shape (hence its common name).

BAJA BUR-COMB [*Pectocarya peninsularis* I. M. Johnston]

LISTING: CNPS IIST 2
State/Fed. Status -- None
Global Rank None State Rank None

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Open, Sonoran Desert Scrub in sandy, silty, or gravelly soil is the reported habitat of this small annual. Possible Associates: More information needed.

KNOWN SITES: U.S. reports of this species are from northwest of the Narrows and Borrego Valley.

R-E-D Code 3-2-1
BORAGINACEAE spring

The Baja Bur-comb is reported in Baja California from the Llano San Quintin south to the Desierto de Vizcaino.

STATUS: This species is superficially similar to several other bur-combs growing on the desert, and it may be more widely distributed than the few reports would indicate. Unlike the closely related *Pectocarya heterocarpa*, the Baja Bur-comb has a pedicel in fruit free from the nutlet, cauline nutlets generally straight not curved, and the lower three sepals equal. The broad nutlet margin on Baja Bur-Comb has a bathtub like shape. Further taxonomic examination of the *P. heterocarpa* and *P. peninsularis* group is warranted; Baja Bur-comb may be merely a Baja California variant of the broader ranging *P. heterocarpa* from the southwestern deserts. Given the paucity of known U.S. sites, it is recommended that all U.S. populations should be protected.

CALIFORNIA PENSTEMON [*Penstemon californicus* (Munz & Jtn.) Keck]

LISTING: CNPS List 1B
State/Fed. Status -- None
Global Rank G3? State Rank S2.2

DISTRIBUTION: Riverside County; Baja California

R-E-D Code 3-2-2
SCROPHULARIACEAE May-Jun.

HABITAT: This small subshrub is reported in chaparral and Lower Montane Coniferous Forest. Possible Associates: More information needed.

KNOWN SITES: Herbarium specimens were examined from a site in Garner Valley 2 miles below Kenworthy, and a second locale near Aguanga: both north of the San Diego County line. Munz reports California Penstemon from the Hemet Valley. Other reports from Riverside County are west of Sheep Mountain in the Santa Rosa Mountains, between Forbes Ranch Road and Lake Hemet, and west of Mountain Center. CNDDDB reports are from approximately 1 mile northwest of Kenworthy, at Kenworthy Station, 1.5 miles northwest of Kenworthy, on Quinn Flat in the Garner Valley, the desert divide near Pyramid Peak on the Pacific Crest Trail, 1.5 miles north of the west end of Horse Creek Ridge, east of Toro Peak in the Santa Rosa Mountains, at the south end of the Garner Valley east of the Palms to Pines Highway, northwest of the Kenworthy Station east of the Pines to Palms Highway in the Garner Valley, and between Quinn Flat and Goff Flat north of Morris Ranch Road in the eastern Garner Valley.

STATUS: This species is presumed stable in the foothills of the San Jacinto Mountains. All populations should be protected. Known populations of California Penstemon are disjunct from Baja California to Riverside County, bypassing San Diego County. The distance from Riverside County reports to the San Diego County line is not substantial. Some potential habitat at suitable elevations occurs in San Diego County in the Oak Grove region and elsewhere. The disjunction noted underscores the possibility this is a relictual species that may have been naturally extirpated from San Diego County due to changing climatic conditions. *Penstemon californicus* is a spreading subshrub with comparatively small, hairy, linear to narrowly oblanceolate and entire leaves (7-15mm); and purple to bluish-purple flowers. *Penstemon heterophyllus* has longer leaves (>20mm) and magenta to blue flowers.

SAN JACINTO BEARDTONGUE [*Penstemon clevelandii* Gray var. *connatus* (Munz & Jtn.) Holmgren]

LISTING: CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None SCROPHULARIACEAE Mar.-May
Global Rank G5T4 State Rank S3.3

DISTRIBUTION: San Diego County, Riverside County, and Imperial County; Baja California, Mexico

HABITAT: Montane Chaparral openings are used by San Jacinto Beardtongue near Santa Rosa Peak. Chaparral is relatively dense here and of considerable height. Possible Associates: *Salvia pachyphylla*, *Chaenactis parishii*, *Adenostoma sparsifolium*.

KNOWN SITES: No recent San Diego County sightings are known. A population of presumed *Penstemon spectabilis* in the canyonlands north of Barona has one clustered group of plants with bright pink corollas (*i.e.*, usually associated with San Jacinto Beardtongue); while most but not all (*e.g.*, in eastern Longs Gulch) plants scattered in the hills nearby are bluish-purple and more typical of *P. spectabilis*. Reports of this species in the County are otherwise from a very narrow range near Garnet Peak. On the Palms to Pines Highway in Riverside County this species occurs along the road near the Santa Rosa Peak turnoff. It is localized along Santa Rosa Peak Road, sometimes occupying mildly disturbed roadcuts. This species is also reported nearby from Deep Canyon.

STATUS: San Jacinto Beardtongue is presumed stable within its limited range along the desert-facing slopes of the Peninsular Range. *P. clevelandii* var. *connatus* differs from *P. spectabilis* var. *spectabilis* by flower color (bright pink versus bluish purple or blue), size of corolla (19-22 mm versus 24-34 mm), and size of anther sacs (1.3-1.6 mm versus 1.8-2.4 mm). These two plant species may be more closely associated than previously known given observations of the somewhat intermediate population north of Barona. Its specific status in San Diego County is unknown; more collection information is needed. All substantial populations should be protected. A note in the Jepson Manual (1993) mentions that San Jacinto Beardtongue may

warrant full species status and separation from other varieties of *Penstemon clevelandii*. However, an alternative possibility is that this entity is a subspecies of *Penstemon spectabilis*, or a natural hybrid derived from the two species that is now relatively stabilized.

THURBER'S BEARDTONGUE [*Penstemon thurberi* Torr.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- None SCROPHULARIACEAE May-Jul.
Global Rank G5 State Rank S3.2?
- DISTRIBUTION:** San Diego County, Riverside County, San Bernardino County, Imperial County; New Mexico; Arizona; Nevada; Baja California, Mexico
- HABITAT:** Sonoran Desert Scrub and Pinyon Juniper Woodland are utilized by this showy subshrub. It grows on both sandy and rocky plains. Mecca coarse sandy loams are mapped for the Earthquake Valley site where much of the shrub cover has been grazed, leaving grasslands and occasional subshrubs such as Thurber's Beardtongue. Possible Associates: More information is needed.
- KNOWN SITES:** This subshrub was noted growing in Earthquake Valley south of Scissors Crossing. Most individuals are found along the fencing facing Highway S-2, in a cow pasture across the street from limited roadside commercial structures. Herbarium specimens examined are from Mountain Palm Springs, the Los Arenas Ranch in San Felipe Valley, and from Blair Valley for San Diego County; on the Kelso Sand Dunes, and 3 miles southwest of Government Holes on the road to Gold Valley in the Providence Mountains for San Bernardino County; and in Gila and Navajo counties for Arizona. Reported by Daniel & Butterwick as locally common along Walnut Creek with interior chaparral in the South Mountain region near Phoenix, Arizona. Reported by Shreve and Wiggins eastward into New Mexico.
- Five specimens for Baja California are found in the San Diego Natural History Museum to 31° 19' North where collected by Moran (SD 53921) on a silty flat 4 miles east of San Matias Pass.
- STATUS:** This penstemon is apparently declining in southern California. Judging from its scattered collection sites, it may have been very sparsely distributed in the region over at least the last several hundred years. Thurber's Beardtongue is close to extirpation in San Diego County with few colonies apparently still extant. The site in Earthquake Valley is enclosed by fencing and heavily grazed by cattle. It is obviously imperiled at this locale. All populations should be protected. Thurber's Penstemon is an openly branched subshrub (20-80cm) with narrowly linear cauline leaves, and relatively small -- lavender, rose, or blue-purple flowers (8-15mm).

GOLDEN-RAYED PENTACHAETA [*Pentachaeta aurea* Nutt.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-2
State/Fed. Status -- None ASTERACEAE Apr-July
Global Rank G4 State Rank S3.2
- DISTRIBUTION:** San Diego County, Los Angeles County, Orange County, Riverside County, San Bernardino County; Baja California, Mexico.
- HABITAT:** Mesic montane grasslands and sage scrub are utilized by this annual. Possible Associates: *Papaver californicum*, *Osmadenia tenella*, *Lasthenia californica*.
- KNOWN SITES:** Golden-rayed Pentachaeta was once relatively common on the flat tablelands around the City of San Diego. Most of this habitat is now urban/residential development. It still occurs at scattered locations in sage scrub openings and particularly near vernal pools at Miramar Air Station. It also is found in protected locations at Torrey Pines State Park, and in mima mound habitat on Del Mar Mesa. While it is severely declining along the immediate coast due to loss

of habitat, it also occurs at scattered locations in the foothills, and is locally common in the Cuyamaca Mountains. It is particularly abundant in the grasslands around Cuyamaca Lake, but also extends up into the meadows at the higher elevations, and southward to the Laguna Lakes. Reports along the coast include San Onofre Canyon, La Jolla, Point Loma, Kearny Mesa, De Luz, Moro Hill, and Otay Mountain; and in the mountains at Rattlesnake Valley, Pine Hills, Morris Ranch, Descanso; as well as at the desert's edge in Banner.

Golden-rayed *Pentachaeta* occurs at scattered coastal locations in northern Baja California.

STATUS: This species was recently listed by CNPS -- primarily due to its rarity to the north of San Diego County -- but does not warrant this level of concern. Golden-rayed *Pentachaeta* is still locally quite common in the Cuyamaca Mountains; with a number of scattered locations in the foothills and along the coast. As a result, no protection measures are recommended. *Pentachaeta aurea* often has many yellow ray flowers (14-52) tightly circling the relatively small head. This linear and alternately-leaved annual is usually short statured in our area but can reach 36cm in height. *Pentachaeta* is placed into the Jepson Manual's key for Asteraceae in Group 10: heads radiate, receptacle naked, pappus) or low crown. Other small yellow flowering annuals which may grow with *Pentachaeta aurea* include *Blennosperma nanum* (leaves usually pinnately lobed) and the common "goldfields" (*Lasthenia californica*), which has fewer ray flowers (6-13) and usually fewer and broader phyllaries (4-13 in goldfields).

GAIRDNER'S YUMPAH [*Perideridia gairdneri* (H. & A.) Math. ssp. *gairdneri*]

LISTING: CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- / Species of Concern APIACEAE Jun.-Oct.
Global Rank G5T3 State Rank S3.2

DISTRIBUTION: San Diego County, Orange County, Kern County, Monterey County, Napa County, Santa Clara County, Santa Cruz County, San Luis Obispo County, Solano County, and Sonoma County

HABITAT: Broad-leafed Upland Forest and Chaparral are some reported habitats for this tuberous rooted herbaceous perennial. To the north of San Diego County, grassy flats, north-facing slopes, and openings in pine woods are utilized. Possible Associates: More information needed.

KNOWN SITES: There are no recent sightings for this inconspicuous species in San Diego County. Historical and possibly erroneous reports from Sweetwater, Mesa Grande, and Ramona have not been relocated. Roberts reports this species as collected in Orange County in 1932 near the Bolsa Chica Gun Club. Thomas reports this yumpah from Pebble Beach, Año Nuevo Point, Palo Alto, Big Basin, and Santa Cruz in Santa Cruz County. Hoover reports it near Cambria for San Luis Obispo County; Bowerman reports it for the west fork of Emmons Canyon and also Dan Cook Canyon in the Mount Diablo area of central California.

STATUS: The status of this species in San Diego County is unknown. Gairdner's Yumpah is possibly extirpated from the region. The location of a valid specimen collected from San Diego County is needed to verify prior occurrence in the area. All populations in southern California should be protected. This herbaceous perennial (3-14dm) member of the Carrot Family is relatively nondescript with linear cauline leaves 1-2 pinnate or 1-2 ternate, and 7-14 small white ray flowers clustered around heads in 15-40 flowered umbels.

WILD PETUNIA [*Petunia parviflora* Juss]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None SOLANACEAE Apr.-Aug.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Los Angeles County, Santa Barbara County, Ventura County, San Luis Obispo County, Monterey County, San Benito County, Santa Clara County, Santa Cruz County, San Mateo County, Santa Rosa Island; Arizona; Utah; southeastern U.S.; Mexico; South America

HABITAT: This small annual usually grows in this region on the muddy embankments of lakes, ponds, and streams, but may occur in a variety of wetland situations. Possible Associates: *Nama stenocarpum*, *Gnaphalium palustre*, *Rorippa palustris*.

KNOWN SITES: In San Diego County Wild Petunia grows on the periphery of the Laguna Lakes in the Laguna Mountains, and is locally common on the periphery of Sweetwater Reservoir. Herbarium specimens include a variety of locales: Old Mission Dam, the Sweetwater Valley near Bonita, Lakeside, Mission Valley, Corte Madera, Pine Valley, Lindo Lake, Mission Bay, Logan Heights, Lake Hodges, Poway Junction, the south end of Cuyamaca Lake, and on Otay Mesa in vernal pool J29A. It is also reported from the San Luis Rey River, Rancho Santa Fe, Mount Soledad, Mission Valley, Pine Valley, and Warner Ranch. Raven reports this species in Los Angeles County near marshy ground at Malibu Lake. Hoover reports this species from San Luis Obispo County near the Salinas River at San Miguel and Paso Robles, Grant Lake, Arroyo Grande, and the Santa Maria River. Smith reports Wild Petunia in the Santa Barbara region along the lower Santa Ynez and Santa Maria rivers, to Los Alamos and Zaca Lake; also on Santa Rosa Island. Thomas reports this species in the Santa Cruz Mountains at Golden Gate Park where it is invasive, in San Francisco, Spring Valley Lakes, Crystal Springs Lake, Searsville Lake, Santa Cruz, Chittenden Pond, and Pajaro River. Roberts checklist of plants in Orange County includes this species. Herbarium specimens examined include locales in Arizona at the confluence of the Salt and Gila rivers, Quitobaquito at Organ Pipe Cactus National Monument, and near Sacaton on the Gila River.

Twenty-seven specimens of Wild Petunia from Baja California are found in the herbarium of the San Diego Natural History Museum, south to 23° 49' North where collected northwest of Triunfo by Moran (SD 50632). Collections from Coahuila and Sonora were also examined.

STATUS: This annual can be invasive and now occurs at various locales where it was not present at the turn of the century. However, it does not yet appear to be operating in this mode in San Diego County, where it is still quite uncommon. Given its broadening California range, no recommendations for protection are made. Wild Petunia is presumed to be uncommon, but stable to expanding in southern California. Whether or not this species is native to San Diego County is difficult to determine; they were only a handful of natural lakes (*e.g.*, Laguna Lakes) in the County prior to 1850, and suitable habitat would have been sparsely distributed on seasonal rivers and streams subject to droughts and erratic, potentially habitat devastating floods. The small purplish funnel-shaped flowers (4-6mm) are relatively conspicuous despite their small size. Leaves on this petunia are oblanceolate (5-14mm) and somewhat fleshy.

IVE'S PHACELIA [*Phacelia ivesiana* Torrey]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None HYDROPHYLLACEAE Mar.-Jun.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Imperial County, San Bernardino County; Arizona; Idaho; Nevada; Utah, New Mexico; Wyoming; Colorado; Baja California, Mexico

HABITAT: This small annual grows on desert dunes and in very sandy areas of desert scrub. Near Ocotillo it was observed among mesquite thickets on an isolated system of small dunes. Possible Associates: *Prosopis glandulosa*, *Palafoxia arida*, *Croton californicus*.

KNOWN SITES: One report is from Borrego Springs in San Diego County. A scattered population was found on dunes southeast of Ocotillo on the north side of the Yuha Desert highway within Imperial

County. A herbarium specimen was examined from the Kelso Sand Dunes of San Bernardino County. Reported by Thorne, Prigge, & Hendrickson as a rare annual of the Kelso Dunes and Mesquite Mountains. Norris reports this species from Death Valley. Knight reports this phacelia as rare in washes in the Muddy Mountains of Imperial County.

No specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; however, the Ocotillo sighting was not far from the Mexican border with Baja California, and this species is expected.

STATUS: Ive's Phacelia is apparently quite rare in southern California; in part, this is correlated with the very limited high quality dune habitat available for this species on the western deserts. Substantial portions of all populations in San Diego County are recommended for protection. Occasionally on our deserts substantial rainfall sequences coincide with optimal flowering requirements for a variety of annuals. During such years enormous numbers of annuals will flower in areas that typically may only support a much more limited bloom. Given its local rarity, Ive's Phacelia is best searched for in such years. The vast range of Ive's Phacelia indicates San Diego County provides only peripheral range habitat. While a number of other species of Phacelia occur on the San Diego County deserts, this species has very tiny corollas (2-4mm) with white lobes and a yellow tube. The deeply lobed to more or less compound leaves (10-60mm) are similar to others in this genus.

BEACH PHACELIA [*Phacelia ramosissima* Lehm. ssp. *australitoralis* Munz]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None HYDROPHYLLACEAE Apr.-Aug.
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, San Luis Obispo County, Santa Barbara County, Ventura County, Los Angeles County, Orange County; Santa Rosa Island; Santa Cruz Island; Baja California, Mexico
- HABITAT:** This herbaceous perennial grows on sandy substrates in sage scrub near the beach, salt marshes, and coastal bluffs. Corralitos loamy sand is present at the Penasquitos Lagoon site. Possible Associates: *Camissonia lewisii*, *Croton californicus*, *Lotus heermannii*.
- KNOWN SITES:** Beach Phacelia grows near McGonnigle Road and south of Carmel Valley Road on the north side of Penasquitos Lagoon. It is also present south of Monument Road in Smuggler's Gulch near the international boundary. Reported from Carlsbad and San Marcos Creek in San Diego County. Herbarium specimens examined are from below Juncal Dam in Santa Barbara; as well as at South Peirpont Bay in Ventura. Reported by Raven at Point Dume in Los Angeles County. Wallace reports it at Santa Rosa Island and Santa Cruz Island. Hoover reports it at Nipomo Mesa and Nipomo Dunes in San Luis Obispo County. Smith reports plants intermediate to subspecies *suffrutescens* in interior Santa Barbara County; as well as coastal plants east of Pt. Arguello and the San Julian area. Roberts reports this plant in Orange County.

A specimen was examined collected from a bluff south of La Mision in Baja California.

STATUS: This beach form of a wide-ranging phacelia does not have a glandular inflorescence. The long, setose hispid hairs on the stem are distinctive and have a pustulate bulbous base. Beach Phacelia occupies a narrow corridor of coastal habitat which is extraordinarily disturbed in southern California. A thorough analysis of extant populations should be conducted to determine the current status. The Beach Phacelia has generally been ignored and may be one of the most severely impacted plants in the coastal flora.

BRAND'S PHACELIA [*Phacelia stellaris* Brand]

- LISTING:** CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- None HYDROPHYLLACEAE Mar.-Jun.
Global Rank G1G2 State Rank S1.1
- DISTRIBUTION:** San Diego County, Los Angeles County; Baja California, Mexico
- HABITAT:** This annual grows in sandy openings in Diegan Coastal Sage Scrub near the coast. At Border Field the soils are mapped as Marina loamy coarse sand. In Los Angeles, this species once thrived on pre-Flandrian stabilized dunes situated behind the active back dunes on the beach. Possible Associates: *Dudleya attenuata*, *Camissonia lewisii*, *Agave shawii*.
- KNOWN SITES:** A small population is still extant on a bluff at Border Field State Park within a few hundred yards of the Mexican border. A report is of a small population on the north side of the mouth of the Santa Margarita River on the back dunes. Herbarium specimens record sites in the bed of the San Diego River, on the Silver Strand, and at Crown Point. These historical locales may no longer be extant. Old reports include Downey in Los Angeles County, where probably no longer extant, and near Old Town in San Diego. A vast habitat consisting of coastal prairie extending from the Ballona Dunes approximately 18 km south to Malaga Cove in Los Angeles County, and 3-5 kilometers inland, is now virtually extirpated. Photographs of this area from the late 1930s indicate the flora consisted primarily of native annuals largely devoid of shrubs and perennial grasses; at least locally, Brand's Phacelia was a dominant species.

Six specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 30° 22 minutes North where collected by Moran (SD 91250) on coastal dunes 4 miles southeast of Santa Maria.

- STATUS:** This species is almost extirpated in the United States, and apparently quite rare in Baja California. It is recommended for Federally Endangered status. The Border Field site is situated in a sandy opening which is readily degraded by foot traffic from the numerous tourists to this park; as well as by illegal immigrants crossing at the fence immediately to the south. A synonym for Brand's Phacelia is *Phacelia douglasii* var. *cryptantha*. All populations should be fully protected with adequate buffers. The habitat of Brand's Phacelia is primarily coastal back dunes, perhaps the most impacted major vegetation type in San Diego County. Only minuscule portions of its former habitat bordering the Pacific Ocean remain; and those areas are all at least mildly disturbed. Unhindered recreational use of beaches is the primary culprit. This species is recommended for Federally Endangered status. Brand's Phacelia when mature is a smaller plant than others in its genus growing near the beaches of San Diego County. This annual is reminiscent of a *Nemophila* to some extent, and has a small (3-5mm), widely bell-shaped, light blue to purplish corolla. Small-flowered forms of *Nemophila menziesii*, however, have distinctive reflexed appendages between the calyx lobes.

SANTIAGO PEAK PHACELIA [*Phacelia suaveolens* Greene var. *keckii* (M. & J.) J. T. Howell]

- LISTING:** CNPS List 1B R-E-D Code 3-1-3
State/Fed. Status -- / Species of Concern HYDROPHYLLACEAE May-Jun.
Global Rank G5T1 State Rank S1.3
- DISTRIBUTION:** Orange County, Riverside County
- HABITAT:** Closed Cone Coniferous Forest and chaparral are the reported habitats utilized by this distinctively leaved annual. Possible Associates: More information needed.
- KNOWN SITES:** Once considered endemic to the Santa Ana Mountains, this species has been reported in a drainage near Wild Horse Peak in the Agua Tibia Wilderness area. While this area is within Riverside County, the lone plant found may well have been a wash down element from the

higher slopes southward in nearby San Diego County. CNDDDB reports are near Glen Ivy Trail to Santiago Peak on a dry ridge, and on Pleasants Peak.

STATUS: Any populations in the Agua Tibia Wilderness Area are presumed stable. Presumed habitat for this rarely observed species is stable within the Santa Ana Mountains. All populations should be fully protected; given the paucity of known sites, this species should be considered for Federally Endangered status. The Jepson Manual notes this entity may best be considered a full species. *P. s.* var. *suaveolens* is from northern California; indicating that Santiago Peak Phacelia may well be relictual in nature. Santiago Peak Phacelia has a widely elliptic to ovate leaf that is distinctive for a coastal southern California species (see Jepson Manual), and lavender to purple bell-shaped flowers (7-11mm).

PENINSULAR PHACELIA [*Phacelia umbrosa* E. Greene]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None HYDROPHYLLACEAE July
Global Rank None State Rank None

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: This small annual grows in rocky areas of desert canyons in the mountains west of Borrego; soils here are mapped as Acid Igneous rock lands. It is reported to utilize chaparral and oak/pine woodland in Baja California. Possible Associates: More information is needed.

KNOWN SITES: One nineteenth century report by Orcutt is from the southwestern Colorado Desert. Small flowered populations of phacelias generally conforming to the description of Peninsular Phacelia were observed on a trail near the highway in Culp Valley, and in the western San Felipe Hills -- but these plants have conspicuous hairy styles and key to *Phacelia cryptantha*.

No specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; however, this taxon is poorly understood and careful examination of the Baja collection could result in specimens being uncovered.

STATUS: Peninsular Phacelia is apparently related to the wide-ranging *Phacelia distans* (which has a spheric not ovoid to elliptic fruit, deciduous corolla, and pedicel not less than 1mm) and may also bear a superficial resemblance to *Phacelia cryptantha*. The last mentioned is relegated to a range in the northern Mojave Desert eastward to Utah under the Wilken/Halse/Patterson treatment of phacelias in the Jepson Manual; but plants in the San Felipe Hills key here. Reports of *P. cryptantha* from Borrego Palm Canyon, Indian Canyon, and Box Canyon may refer to Peninsular Phacelia. Still another superficially similar phacelia found within its potential range is *P. tanacetifolia* with stems stiffly erect not decumbent, leaflet tips acute not rounded, inflorescence dense and branched, not open below and unbranched, and fruit glabrous below the middle not puberulent. Given the present circumstances, all legitimate populations in San Diego County are provisionally recommended for protection. Small populations of plants near Victorville as well as Palmdale on the southwestern Mohave Desert also show some similarities with the description of this species. Additional taxonomic work is needed to more adequately identify the true distribution of Peninsular Phacelia. It is representative of a limited group of California species that have not been adequately resolved in the field, or taxonomically in the herbarium. Many more such plants were published as full species in the 1800s and early 1900s, and have been subsequently determined to be synonymous with another described species. However, the suite of traits associated with Peninsular Phacelia may, in fact, ultimately be determined to be distinctive enough to maintain its species status.

WHITE FIESTA FLOWER [*Pholistoma racemosum* (Nutt.) Constance]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None HYDROPHYLLACEAE Feb.-May
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County; Orange County, Los Angeles County; Channel Islands; Baja California, Mexico
- HABITAT:** This annual is typically observed in densely growing sage scrub, often in locales with substantial surface rock. Possible Associates: *Pholistoma auritum*, *Solanum tenuilobatum*, *Ferocactus viridescens*.
- KNOWN SITES:** Small populations have been observed on Dictionary Hill, on the slopes by the Sweetwater River and nearby San Miguel Mountain, in Rice Canyon in Chula Vista, on the flanks of Otay Valley and in the tributary canyons, on the western flanks of Otay Mountain, and growing in rocks on the hill east of Massachusetts Avenue and north of the 94 Freeway. It occasionally occurs further inland such as the hills southeast of Dulzura. It is reported from Dehesa, the Sloane Ranch, Emerald Hills, Mission Gorge, Barrett Junction, San Pasqual, Miramar, Pacific Beach, Mission Hills, Lake Murray, and San Diego.

This species is distributed in Baja California from the western foothills of the Sierra Juarez south to near San Borja; as well as occurring on some islands in the Gulf of California and on Isla Guadalupe.

- STATUS:** White Fiesta Flower is substantially declining throughout its coastal San Diego County range due primarily to residential construction. While this plant may once have been relatively common in the southwestern corner of the County, its sage scrub habitat has been severely reduced in total acreage. This species would be a good choice for monitoring as it may be a good indicator species to assess sage scrub losses in southwestern San Diego County; it typically occurs in floristically diverse, pristine scrub habitat and not in degraded sage scrub. White Fiesta Flower has a narrowly winged leaf petiole unlike *Pholistoma auritum*, and the leaf lobes are irregularly toothed.

GREENE'S GROUND CHERRY [*Physalis greenei* Vasey & Rose]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None SOLANACEAE Mar.-Jun.
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** The understory of relatively xeric and open Diegan Coastal Sage Scrub is utilized by this annual ground cherry. Soils are mapped as Terrace Escarpments and Huerhuero loams at Otay Valley sites. Possible Associates: *Opuntia prolifera*, *Artemisia californica*, *Adolphia californica*.
- KNOWN SITES:** A vigorous population grows on the south-facing hillside adjacent to Otay Valley Road where the street jags southward to cross the Otay River. Other small colonies are found further to the east along the south-facing slopes of Otay Valley. Another population is found nearby within a dense stand of cholla on the flanks of Salt Creek west of Lower Otay Lake. One isolated subshrub was seen on a steep slope near the terminus of Hidden Mountain Road south of El Cajon. A few plants were observed in the floodplain of a canyon north of Dehesa. Old reports are from Fallbrook, San Marcos, and Potrero. Herbarium collections note sites three miles below Barrett, the head of Dillon Canyon on Otay Mesa, May Ranch in Santee, Whispering Oaks near the Sloane Ranch on the Sweetwater River, and close to a bridge over the San Luis Rey River near Bonsall. A population is reported near the southern boundaries of Camp Pendleton on Moro Hill. Reported by Roberts in Orange County above Moro Canyon in the San Joaquin Hills, in the Sycamore Hills, and north of San Juan Canyon.

Two Baja California herbarium specimens are found at the San Diego Natural History Museum; south to 32° 21' North where collected by Moran (SD 83321) one and a half miles east of Rosarito. It has also been collected on Cedros Island.

STATUS: Greene's Ground Cherry was originally described by Vasey and Rose and considered a distinct species until merged with *Physalis crassifolia*, a primarily desert dwelling species, in the 1994 Jepson floristic treatment of the Solanaceae. The flowers are typically a flat and muted greenish-white in the coastal annuals formerly referred to *P. greenei*, while the desert plants of typical *P. crassifolia* often have a yellow, glossier hue. In addition, the coastal annuals generally have a more compact form than the desert biennials which can be quite lanky. Although the taxonomic merging may be appropriate, additional work on this coastal form is warranted. Given the apparent rarity and continuing decline of any coastal *Physalis* in San Diego County, and in the absence of convincing genetic studies, significant portions of all coastal populations are provisionally recommended for protection.

THURBER'S PILOSTYLES [*Pilostyles thurberi* Gray]

- LISTING:** CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None RAFFLESACEAE January
Global Rank G5 State Rank S3.3
- DISTRIBUTION:** San Diego County, Imperial County, Riverside County; Arizona; Nevada; Baja California and Sonora, Mexico
- HABITAT:** Sonoran Desert Scrub flatlands are the general habitat of this little collected and cryptic species. Possible Associates: parasitic on *Psorathamnus emoryi* and other species in the genus.
- KNOWN SITES:** Thurber's Pilostyles was seen 4.5 miles west of the Imperial County Line on Highway S-2, near the power lines. Herbarium specimens examined were from the Carrizo Badlands, Egg Mountain, Canyon Sin Nombre, Fonts Point Wash, and in the Jacumba Mountains east of Carrizo Canyon. CNDDDB reports from San Diego County are from the Carrizo Badlands Overlook, behind the ranger station at Ocotillo Wells State Vehicular Recreation Area, 2 miles from Ocotillo Wells in this recreation area, and north of the Coyote Mountains and south of the Carrizo Badlands. Herbarium specimens from Imperial County are 0.6 mile south of San Felipe Creek and west of Highway 99 near the Salton Sea, between Coyote Mountain and U.S. Highway 80, 1.7 miles south of San Felipe Creek, at Mount Signal, in the Davies Valley, and 2 miles west of Plaster City on Highway 80; a specimen was also noted from Sonora, Mexico. CNDDDB reports from Imperial County note sites 0.6-0.7 mile south of San Felipe Creek west of the Salton Sea along Highway 86, 1000 yards north of Highway 78 and 2.3 miles west of Highway 86, along county road S-2 two miles east of the San Diego County Line, 0.8 mile southeast of Kane Springs, in Pinto Wash on the Yuha Desert, at Tule Wash at both 2.0 and 2.75 miles east of the San Diego County line and two miles west of Plaster City along county road S-80, between San Felipe Creek and Tarantula Wash two miles north of Highway 78, 0.25 mile west of Mosca on the north side of the Superstition Mountains, less than 0.13 mile east of Mosca, in the Superstition Hills, 1 mile west/southwest of Kane Spring, 1.5 miles southeast of Kane Spring, 1.5 miles southeast of Elmore Desert Ranch south of Highway 99, 6 miles northwest of Kane Spring and south of Highway 99, several locales east of the Superstition Mountains, 3.5 miles south of Dry Lake and 2.5 miles north of the gravel pit and north of Filaree Canal, 1 mile north of Superstition Mountain in the parachute test range, north of the naval reservation and 5 miles southeast of Superstition Mountain, the northeastern corner of Superstition Mountain Parachute Test Range, 5 miles southeast of Superstition Mountain, 2.5 miles southeast of Superstition Mountain, along the jeep trail at the head of Surprise Wash, and near Ocotillo between Coyote Mountain and U.S. Highway 80. Shreve and Wiggins report it from near the mouth of the Gila River in Yuma County, Arizona.

STATUS: Thurber's *Pilostyles* is presumed stable on the southern deserts, given the limited impacts to its relatively extensive potential habitat. The status of this fleshy parasitic plant, which embeds itself in the stems of its host plant, is poorly known in San Diego County; more collection information is needed. This is a minute, cryptic species which may not superficially appear to be a flowering plant (see Jepson Manual line drawing). The dried flowers on the stems can resemble a brown, scale-type insect from a distance. Substantial portions of sizeable populations should be protected. This species likely occurs at many more locales than are reported; however, its cryptic nature allows it to be readily overlooked. The Rafflesiaceae is a primarily a tropical family of plants in the Americas, and Thurber's *Pilostyles* appears to be a relictual element which as a parasite may have followed the *Psorathamnus* group of shrubs northward from Mexico.

TORREY PINE [*Pinus torreyana* Parry ex Carr. ssp. *torreyana*]

LISTING: CNPS List 1B R-E-D Code 3-2-3
State/Fed. Status -- / Species of Concern PINACEAE cones Jan.-Dec.
Global Rank G1T1 State Rank S1.2

DISTRIBUTION: San Diego County; Santa Rosa Island

HABITAT: Closed Coniferous Forest along the coast near Del Mar is the mainland habitat of the Torrey Pine. This is a vestigial tree which survives at Torrey Pines State Park where fogs often create a much more mesic climate than elsewhere in coastal San Diego County. Loamy alluvial land of the Huerhuero complex, Terrace Escarpments, and to a lesser extent Corralitos loamy sand are mapped for the state park lands where this pine flourishes. Undoubtedly the moderate temperature regime based on close proximity to the ocean, and the local fogs and cloud cover which sometimes hug the coastline at Del Mar, enable the Torrey Pine to thrive. Temperatures frequently are as much as 20 degrees warmer only a few miles farther inland during the summer months. Possible Associates: *Dudleya blochmaniae* ssp. *brevifolia*, *Corethrogyne filaginifolia* var. *linifolia*, *Arctostaphylos glandulosa* ssp. *crassifolia*.

KNOWN SITES: Healthy populations occur at both the southern and northern extensions of the Torrey Pines State Reserve. Fire is an omnipresent threat as is beetle damage following drought years. Nearby peripheral populations outside of the Reserve occur on private lands and are sometimes imperiled by development. Vigorous stands are found northward into Crest Canyon in Del Mar. This pine is widely planted in the region as an ornamental. Planted stands will occasionally generate seedlings such as on the northwestern slope of Carmel Mountain and near Oak Crest Park in Encinitas. Variety *insularis* is reported growing naturally on Santa Rosa Island with a sizeable forest still extant on the south shore of Beechers Bay. A CNDDDB report notes a small stand in Box Canyon near the southeast anchorage for Santa Rosa Island.

STATUS: The San Diego County population of the Torrey Pine is somewhat declining due to beetle infestation and human induced fires. Generally, the cities of Del Mar and San Diego stringently protect these trees from residential developments. All native populations should be protected. Fossil evidence for Torrey Pine indicates it once ranged elsewhere along the beaches of southern California, and may have been much more common during cooler and wetter phases of the Pleistocene. This pine grows relatively quickly and large planted specimens can mimic mature, naturally occurring trees; however all trees outside the few clusters of historically documented groves and under 200 years of age are likely introduced. Ring core samples would be necessary to prove presence of an individual at an undocumented site prior to the Mission period. Torrey Pines have five leaves per bundle and relatively small cones (< 16cm); the leaf sheath is persistent; and the basal scale tip knobs are somewhat pyramidal and only minutely prickly.

COOPER'S PIPERIA [*Piperia cooperi* (Wats.) Ryd.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-2
State/Fed. Status -- None FABACEAE Jan.-Jun.
Global Rank G4 State Rank S3.2
- DISTRIBUTION:** San Diego County, Los Angeles County, Santa Cruz Island, Santa Catalina Island; Baja California, Mexico
- HABITAT:** At Dulzura this perennial herb was found beneath the shade of a sycamore, on a vernal moist embankment above a rocky outcrop. A large population on the Submarine Base at Point Loma reportedly grows through iceplant in a very atypical situation. Shallow soils on small rockfalls adjacent to watercourses may be utilized; soils at population sites on Point Loma are mapped as Gaviota fine sandy loams. Possible Associates: *Jepsonia parryi*, *Saxifraga californica*, *Dudleya lanceolata*.
- KNOWN SITES:** Several of these inconspicuous orchids with a tuber-like caudex were seen at the mouth of a canyon near the Dulzura Cafe. A lone Cooper's Piperia was seen in flower on an erosive sandstone hillside near the intersection of Jimmy Durante Boulevard and San Dieguito Racetrack View Drive in Del Mar. Herbarium specimens were examined from Point Loma, Ocean Beach, Torrey Pines, Mount Soledad, La Jolla, the south arm of El Capitan Reservoir, Corte Madera Ranch, Alpine, Cowles Mountain, Whispering Oaks near Sloane Ranch, Forster, a bluff west of the junction of the San Diego River and Barona Creek, canyons north of Tecate Mountain, three miles below Barrett, in Emerald Hills, Harbison Canyon, the northeastern slope of El Cajon Mountain; as well as east to Jacumba. It is reported from Paradise Valley, Carlsbad, and Rice Canyon. Plants possibly keying to this species were reported by Raven from Malibu Creek, Cold Creek, upper Solstice Canyon, and Truncas Canyon in the Santa Monica Mountains of Los Angeles County. Also likely representing this species are reports by Wallace from Santa Cruz Island and Santa Catalina Island.

Four herbarium specimens from Baja California are found at the San Diego Natural History Museum; south to 31° 10' North where collected by Moran (SD 102357) at the south rim of a canyon two km west of Cerro Solo.

- STATUS:** Much of the back country habitat noted in herbarium collection sites is still extant; however, most of the coastal bluff habitat associated primarily with older collections, is now replaced by homes and residential yards. Cooper's Piperia is slowly declining throughout San Diego County. Substantial portions of all larger populations should be protected. No recommendations are made for isolated individuals. Several related species are also found in the County including *Piperia unalascensis* (with the tip of the perianth upcurved); that under a reassessment of this genus now encompasses a specimen from North Peak high in the Cuyamaca Mountains; *Piperia leptopetala* (lip of perianth narrowly lanceolate, lateral petals recurved, spur curved) which has been collected on Otay Mountain, at Echo Dell, the west slope of Cuyamaca Peak, and at Azalea Creek; as well as *Piperia transversa* (spur much longer, greater than 6mm) from a number of montane locations including Volcan Mountain, Azalea Creek, Palomar Mountain, Corte Madera, Middle Peak, and Boucher Hill. Given this distribution, piperias that are found along the coast are probably Cooper's Piperia, as are some of the plants at mid-elevations; although these may include *P. leptopetala* with its distinctly differently shaped flower. Old herbarium specimens labeled *Habenaria unalascensis* and taken from coastal locales may be *Piperia cooperi*.

NARROW-PETALED REIN ORCHID [*Piperia leptopetala* Rydb.]

- LISTING:** CNPS List 4 R-E-D Code 1-1-3
Stat/Fed. Status -- None ORCHIDACEAE Apr.-Aug.
Global Rank G3 State Rank S3.3

DISTRIBUTION: San Diego County; Los Angeles County, San Bernardino County, Fremont County, Mariposa County, and other scattered counties northward to Washington State. Included are collections in the North Coast Ranges, the Cascade Range, Sierra Nevada, the South Coast Ranges, the Transverse Range, and the Peninsular Range.

HABITAT: This orchid occupies dry shrublands and woodlands at mid-elevations. The Jepson Manual reports this species up to 2200 meters in elevation. Possible Associates: More information needed.

KNOWN SITES: Only a handful of locations are reported from San Diego County.

STATUS: Presumed declining in southern California. Given the substantial re-working of the entire genus by several taxonomic workers (including Morgan and Ackerman, 1990), and the changing of numerous herbarium labels to represent newly described or re-established taxa, it is difficult to assign specific reports to specific species. Narrow-petaled Rein Orchid has a green perianth throughout, a narrowly lanceolate lip, lateral recurved petals, and a downward pointed and curved spur. Similar Rein Orchids in the region have lateral petals spreading to pointed forward, and an oblong to deltate lip.

BEAR POPCORN- FLOWER [*Plagiobothrys collinus* (Philbr.) Johnston var. *ursinus* (Gray) Higgins]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None BORAGINACEAE April-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County, Los Angeles County; Baja California, Mexico

HABITAT: In Pine Valley this small, compact annual grows in relatively arid openings in a low-growing, montane sage scrub. Soils here are mapped as La Posta loamy coarse sand. Possible Associates: *Swertia parryi*, *Eriogonum wrightii*, *Linanthus parviflorus*.

KNOWN SITES: A small population was observed in Pine Valley near the creek. Similar habitat occurs at a number of locales elsewhere in this area. Plants found on burns on the northwestern flank of Tecate Mountain and on a hill near Honey Springs Road southwest of Mother Grundy Truck Trail may key to this species. Bear Popcorn-Flower is reported from both the San Bernardino and San Jacinto Mountains.

Herbarium specimens from Baja California are found at the San Diego Natural History Museum; south to °' North where collected by (SD).

STATUS: This is a distinct variety of the common California Popcorn-Flower which is a compact, caespitose plant with an inflorescence that is shorter than the leaves. The leaves can be very tightly and densely packed as they clasp the somewhat vertical stem. Substantially more collection information is needed on Bear Popcorn-Flower. Extensive areas of potential habitat occur in the San Bernardino and San Jacinto mountains. Provisionally, significant portions of all sizeable San Diego County populations are recommended for preservation.

SAN BERNARDINO BLUE GRASS [*Poa atropurpurea* Scribn.]

LISTING: CNPS List 1B R-E-D Code 2-2-3
State/Fed. Status -- /FE POACEAE Apr.-Jun.
Global Rank G2 State Rank S2.2

DISTRIBUTION: San Diego County, Riverside County, and San Bernardino County

HABITAT: Montane Meadows surrounded by coniferous forest are the preferred habitat of this rhizomatous perennial grass. According to Krantz, it blooms earlier than other *Poa* species. At Laguna Lakes the soil type is mapped as loamy alluvial land. These meadows have been heavily grazed

and now have a mix of native annuals and herbaceous perennials, along with substantial Eurasian grasses. Small rocky areas within meadows may be a preferred microhabitat. Possible Associates: *Horkelia clevelandii*, *Poa pratensis*, *Astragalus douglasii*.

KNOWN SITES: San Bernardino Blue Grass is growing at scattered locations in meadows near Big Laguna Lake sympatrically with abundant *Poa pratensis*; it is very difficult to find the former due to the abundance of the latter. It is also present in the meadows of Cuyamaca Lake east of the highway and approximately a quarter mile northeast of the causeway. Reports also include locales along the fenceline of Cuyamaca Rancho State Park and the Lucky Five Ranch about a quarter miles east of the road to Los Vaqueros Horse Camp growing with *Downingia concolor* ssp. *brevior*, along the fenceline near the Kemp Ranch gate, west of rocky outcrops and 15-20 feet east of a wooden fence along the west side of Little Laguna Meadow, a wet meadow along a seasonal tributary of Morena Creek 3 km SSE of Long Valley Peak, and in Mendenhall Valley. CNDDDB reports here are on the north side of Los Rasalies Ravine, and in nearby Filaree Flats. Four locales within the meadow have been mapped. Old reports are from nearby Crouch Meadow and at Mendenhall Valley in the Palomar Mountains. It is also reported north of San Diego County at Big Bear Lake by Eagle Point, and nearby at Bluff Lake in the San Bernardino Mountains. CNDDDB reports for San Bernardino County are from the north shore of Baldwin Lake, the south shore of Big Bear Lake between Eagle Point and Stanfield Cutoff, about 1.5 miles east of Holcomb Valley, in Holcomb Valley, in Cienega Seca one mile southwest of Onyx Peak, at the eastern edge of Bluff Lake, just south of Meadow Park in the town of Big Bear Lake, the Presbyterian Conference grounds west to the south shore of Metcalf Bay, the Pan Hot Springs area of Big Bear City, Shay Meadow near the southeastern end of Big Bear Boulevard in Big Bear City, between Aeroplane Lane and Big Bear City Airport, at Moonridge near the golf course and ski areas, at Wildhorse Spring 3.4 miles southeast of Woodlands, Erwin Lake just east of Woodlands at the end of Meadow Lane, and at the east end of Erwin Lake about 1 mile east of Woodlands.

STATUS: This grass is presumed to be slowly declining in the San Bernardino Mountains due to residential development in areas of montane meadows. More information is needed regarding the status of this grass in San Diego County. Questions arise concerning the taxonomic integrity of this species in the Laguna Mountains. It may be getting "swamped" genetically by the very common *Poa pratensis* which apparently includes both native and introduced strains. Overgrazing by cattle has severely degraded the Laguna meadows and undoubtedly led to the extirpation of most of the historical population. Removal of grazing cattle from the Laguna Meadows is needed to protect not only this species but a number of uncommon or sensitive plants (e.g., *Horkelia clevelandii* which is the host plant of the rare Laguna Mountains Skipper, *Pyrgus ruralis lagunae*). All populations of this grass in San Diego County should be protected. San Bernardino Blue Grass appears to be a relictual species associated with major climatic changes following the Pleistocene, that left a number of montane plant species isolated in pockets of suitable habitat, that may represent only a small fragment of the habitat area they once occupied. *Poa atropurpurea* typically has minute prickles on the somewhat angled flowering branches immediately subtending the spikelets, unlike *Poa pratensis* which is nearly smooth and un-angled. *Poa pratensis* also usually has a conspicuous cobwebby callous at the base of each spikelet; whereas *Poa atropurpurea* is glabrous.

SAN DIEGO MESA MINT [*Pogogyne abramsii* J. T. Howell]

LISTING: CNPS List 1B R-E-D Code 2-3-3
State/Fed. Status -- CE/FE LAMIACEAE Apr.-Jun.
Global Rank G2 State Rank S2.1

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: This small annual is restricted to Vernal Pools. Redding cobbly loams are the preferred soil type near Miramar. Oftentimes this mint blooms profusely following heavy inundation and

standing water in the pools; sometimes blanketing pool basins with flowers. Individual flowers may bloom late well into the summer. During drought years only sporadic portions of the pool basins may exhibit coverage with this mint. An unusually open Chamise Chaparral often occurs on the periphery of the pools and typically includes the Nuttall's Scrub Oak. Sometimes habitat can be identified from aerial photographs by searching for Mima Mound topography; on the surface these small mounds are quite distinctive and may harbor vernal pools in the low-lying, intervening areas between the mounds. Possible Associates: *Downingia cuspidata*, *Eryngium aristulatum* ssp. *parishii*, *Isoetes howellii*.

KNOWN SITES: E. Bauder's field work amply documents the rapid decline of this species in the vernal pools of Kearny Mesa. San Diego Mesa Mint is locally common at Miramar Mounds; growing in scattered pools westward to the eastern terminus of Eastgate Mall. The majority of the remaining San Diego Mesa Mint now grows in a block of land north of Highway 52, South of Miramar Road, west of Interstate 15, and east of Interstate 805. A second area of pools with this mint is west of Abing Avenue and north of Peñasquitos Canyon. An old report where no longer extant is from a mesa north of Talmadge Park (June 1941) now occupied by homes. The numerous CNDDDB reports are clustered within the limited mesalands already mentioned, with many of the locations merely peripheral extensions of the once cohesive and unfragmented, large populations. Sites are north of Miramar Road and one mile east of Interstate 805, at the south end of Santo Road, east of Montgomery Field between the airport and Ruffin Road, east of Highway 395 between Miramar Way and Miramar Road, east of Highway 395 and south of Rose Canyon, northeast of Interstate 15 near Clairemont Mesa Boulevard, just north of Shepherd Canyon and west of Mission Trails Park, just north of Interstate 15 and east of Kearny Villa Road, on the southeast side of Kearny Villa Road at its junction with San Clemente Canyon, one mile east of Kearny Villa Road between San Clemente Canyon and Murphy Canyon, one mile east of the junction of Murphy Canyon and Kearny Villa Road, east of the Miramar Marine Air Station runways, north of San Clemente Canyon between the mining area and Highway 163, northeast of the intersection of Highway 163 and Clairemont Mesa Boulevard, west of Highway 163 between San Clemente Canyon and Clairemont Mesa Boulevard, southeast of the junction of Clairemont Mesa Boulevard and the Cabrillo Freeway, between the west end of the Miramar Marine Air Station Runways and Rose Canyon, between these same runways and San Clemente Canyon, in Mira Mesa east of Montongo Street and north of Swansea Place, west of the junction of New Salem Street and Barbados Way, north and south of Mira Mesa Boulevard east of Mira Mesa, along both the north and south rims of Carroll Canyon, at the west gate of Miramar Marine Air Station, north of the junction of Carroll Canyon and Miramar Road, Lopez Mesa on the south side of Peñasquitos Canyon, Lopez Mesa adjacent to Carl Sandberg Elementary School, at the north end of Camino Ruiz, between Peñasquitos Canyon and Deer Canyon, the northwest side of Fletcher Parkway and Amaya Drive, south of the Miramar Marine Air Station runway and west of the Harris Sand Quarry, northwest of the junction of Clairemont Mesa Boulevard and Highway 163, and south of Miramar Road and one mile east of Interstate 805.

A plant closely related to San Diego Mesa Mint is locally common in the vernal pool complex north of Cerro Bola and west of the Tecate/Ensenada Highway in Valle de las Palmas, Baja California, on Rancho Esperanza near the power lines. This entity may warrant full species or subspecies status.

STATUS: San Diego Mesa Mint is slowly declining in San Diego County owing to a multitude of direct and secondary impacts from urban development pressures. Loss of watershed for individual pools, despite pool basin preservation, is a concern. Federally Endangered status has substantially slowed the continued loss of San Diego Mesa Mint. The strong minty odor of this species sometimes reveals its presence during the fall when it is partially decomposed and not readily identifiable. It may be difficult to adequately census for in late fall and winter, or during droughts. All populations should be protected. The related *Pogogyne nudiuscula* is a

sparsely hairy to glabrous plant, is more rigidly erect than *Pogogyne abramsii*, and it typically has a deeper purplish flower.

OTAY MESA MINT [*Pogogyne nudiuscula* Gray]

- LISTING:** CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status -- CE/FE LAMIACEAE May-Jun.
Global Rank G1 State Rank S1.1
- DISTRIBUTION:** Otay Mesa; northern Baja California, Mexico
- HABITAT:** This small annual is restricted to Vernal Pools. Stockpen gravelly clay loam is the preferred soil type. While some Chamise Chaparral is associated with Otay Mesa Mint in the extreme northeastern corner of Otay Mesa, most of the colonies occur in open grasslands with Mima Mound topography. A portion of the very limited range of this plant, east of Brown Field, was once a WW2 bombing range. A very few of the craters which resulted are interspersed with the vernal pool system, and may occasionally harbor vernal pool elements. Possible Associates: *Brodiaea orcuttii*, *Crassula aquatica*, *Eryngium aristulatum*.
- KNOWN SITES:** This mint is reported in the small Pool J14 which is within the alignment route of proposed Interstate 905. It is growing in the J23-J25 and J29-30 pools east of Brown Field which are being utilized as cow wallows and are cumulatively being degraded and rendered unsuitable as habitat. The somewhat more protected J26 Pools on northeastern Otay Mesa possess the only healthy, well-protected, and vigorous populations. A relatively thorough vernal pool report of this region found Loma Alta Mint in 17 pools from the J29-30 Series, 24 pools in the J23-24 Series, and 55 pools in the J25 Series. Otay Mesa Mint is present in fenced pools at the southern terminus of Dillon Road near the edge of Spring Canyon; the dirt road has been blocked off recently to through traffic. Most sites are now imperiled by urban development, particularly from the construction/expansion of new jails/prisons nearby. Several pools on the isolated finger mesa west of Heritage Road and south of Otay Mesa Road are reported to still retain this species. Old reported collection sites where no longer extant are from Mission Valley in the 1890's and a June 1930 specimen from Adobe Falls. The former extensive vernal pool complex that once occurred at San Diego State University and within surrounding residential areas may have had populations of this annual. No vestiges of this large pool complex remain. CNDDDB reports cover the locales already mentioned; a site near the El Camino Memorial Park (well north of the San Diego River) is a likely misidentification of *P. abramsii*.
- Only five specimens from Baja California are found at the San Diego Natural History Museum's herbarium; all from near the U.S. border. Sites near the Tijuana Airport may be extirpated; this facility is continually being expanded for international travel, and surrounding development is unhindered by significant environmental regulation.
- STATUS:** The Otay Mesa Mint is close to extinction. It is much rarer than the San Diego Mesa Mint, which also has Federally Endangered status. Most known sites are imperiled by development. This is one of San Diego County's most imperiled species. Airport expansion at Brown Field to the east could seriously impact this species. Free ranging cattle grazing was for decades a severe problem for this species on Otay Mesa. All populations should be fully protected with adequate buffers. Rarity of this species is due to cumulative human-associated impacts over the last one hundred years, in concert with the quite limited natural range of this species from the bluffs south of Mission Valley southward to Otay Mesa. A hypothetical origin for this species would be the isolation of a tiny founder population of ancestral *P. nudiuscula*/*P. abramsii* south of the San Diego River and Mission Valley (a broad, natural barrier to expansion), that had genetic tendencies toward stouter and straighter, more rigidly erect stems, few plant hairs with hairs more bristle-like, and a broader inflorescence (greater than 10 mm wide) than the general population already established in vernal pools north of the river.

FISH'S MILKWORT [*Polygala cornuta* Kell. var. *fishiae* (Parry) Jepson]

- LISTING:** CNPS List 4 R-E-D Code 1-1-2
State/Fed. Status -- None POLYGALACEAE May-Aug.
Global Rank G5T4 State Rank S3.3
- DISTRIBUTION:** San Diego County, Orange County, Los Angeles County, Riverside County, and Ventura County; Baja California, Mexico
- HABITAT:** Chaparral and Cismontane Woodland with Coast Live Oaks are utilized by this inconspicuous shrub. Curiously, Fish's Milkwort occurs in very xeric, open locales such as on McGinty Mountain (mapped as Las Posas fine sandy loam) and in the Santa Margarita Mountains (Blasingame stony loam) with Chamise Chaparral; conversely it sometimes occurs on mesic, north-facing slopes such as west of Fallbrook (Cieneba very rocky coarse sandy loam) where it grows beneath a tall tree canopy in heavy shade. Genetic variability may account for these very different habitat preferences. Possible Associates: *Quercus agrifolia*, *Toxicodendron diversilobum*, *Tetracoccus dioicus*.
- KNOWN SITES:** This shrub occurs on slopes above the Santa Margarita River near Fallbrook and in "Devil's Gorge" near the confluence of Devil Creek and San Mateo Creek. It was also seen on a ridge in Delta Sector of the Santa Margarita Mountains. All three of these sites are found on Camp Pendleton. Another population occurs near McGinty Peak. It is uncommon at the summit of Sequan Peak. A small population is in Fallbrook near Mil Soppresas Drive adjacent to oak riparian habitat in deep shade; another colony occurs in Moosa Canyon east of the large waterfall, 0.5 mile downstream of Turner Reservoir. A small population was found near Ricks Ranch Road east of Keys Canyon beneath oak riparian woodland. Old reports are from Pamo Valley, Viejas Mountain, Otay Mountain, Castro Canyon, Poser Mountain, and Barona. Old biological survey reports note sites north of Chief Mountain near Magee Creek, and 0.7 mile northeast of the junction of Archie Moore Road and Highway 67. Reported by Roberts for Orange County at Temple Hill in Laguna Beach, and at four locales in the Santa Ana Mountains: Lost Woman Canyon, Upper Hot Springs Canyon, Blue Jay Campground, and San Juan Canyon. It is occasional in Silverado Canyon east of the town near the Maple Springs Road. Reported by Raven for Triunfo Canyon, Topanga Canyon, Cold Creek Canyon, Tapia Creek, and Crater Camp in the Santa Monica Mountains. Reported by Munz on Mount Wilson. An old biological survey report notes a site north of Tenaja Road near the crest north of Mesa de Burro on the Santa Rosa Plateau in Riverside County.
- Six specimens are recorded at the San Diego Natural History Museum's herbarium for Baja California; south to 31° 37¼' South where collected by Moran (SD 97833) on the north slope of Cañada Maxaminos.
- STATUS:** Fish's Milkwort populations are presumed to be relatively stable at present. This nondescript shrub is easy to overlook when not in flower. It may be more widespread than suspected. Substantial portions of all sizeable populations should be protected; smaller populations should be placed into biological open space if possible. The paucity of reports for this species in Mexico provisionally underscores the importance of maintaining well-protected U.S. populations. Rarity of this species appears to be correlated with the dearth of suitable habitat with appropriate soil types, and further microhabitat requirements as yet poorly understood. This small, inconspicuous shrub is the only member of the Milkwort Family in southern California. The flowers are somewhat pea-like, with a curious beak to the "keel-petal." The outer sepals and wings are pink to red-purple and the leaves are a nondescript linear-ovate shape (2-4cm).

DESERT UNICORN PLANT [*Proboscidea althaeifolia* (Benth.) Dcne.]

- LISTING:** CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None MARTYNIACEAE May-Aug.
Global Rank G5 State Rank S3.3
- DISTRIBUTION:** San Diego County, Imperial County, Riverside County; Arizona; New Mexico; Baja California and Sonora, Mexico
- HABITAT:** Sonoran Desert Scrub is the general habitat of this very distinctive perennial with peculiar horn-like fruits. At Vallecitos it was found on deep, alluvial sands. Possible Associates: *Abronia villosa* var. *villosa*, *Hyptis emoryi*, *Justicia californica*.
- KNOWN SITES:** One large plant was found growing near Vallecitos close to Highway S-2. This conspicuously flowered and fruited species is undoubtedly rare in San Diego County deserts. Herbarium specimens were seen from east of June Wash, Agua Caliente Springs, and north of Sweeney Pass. Old reports include Bow Willow, Canebrake Canyon, and Carrizo Wash. Additional herbarium specimens are from the Chocolate Mountains Aerial Gunnery Range in Imperial County; Yuma, Tucson, Maricopa, Pinal, Yavapai, and Cochise counties in Arizona; Albuquerque, New Mexico; and Sonora, Mexico. Reported by Shreve and Wiggins south into Sinaloa, Mexico.

Seventeen specimens are found in the San Diego Natural History Museum for Baja California; south to 22° 52' North where collected by Moran (SD 50296) south of La Viga at Cape San Lucas.

- STATUS:** Desert Unicorn Plant is presumed stable on the southern deserts, given the limited habitat loss of sandy desert plains and washes. However, most populations apparently occur outside of California. All California populations are recommended for protection. San Diego County's deserts lie on the periphery of a much larger range for this species in which summer rainfall and generally more humid conditions than present locally, could provide better growing conditions. This plant is sometimes called "Devil's Claw" for its relatively massive fruit: a capsule whose body is approximately 5-6cm, and with two tusk-like horns that can be twice that length.

CEDROS ISLAND OAK [*Quercus cedrocensis* C. H. Muller]

- LISTING:** CNPS List 2 R-E-D Code 3-2-1
State/Fed. Status -- None FAGACEAE Mar.-May
Global Rank G2? State Rank S1.2
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** Growing in the chaparral on Otay Mountain. Soils for the site are mapped as San Miguel-Exchequer rocky silt loam and Metamorphic rock land. Possible Associates: *Adenostoma fasciculatum*, *Solanum tenuilobatum*, *Helianthemum scoparium*.
- KNOWN SITES:** Two small shrubby clusters of Cedros Island Oak are situated westward of a steep drainage in relatively dense chaparral on the southern flanks of Otay Mountain. A scraped dirt road utilized primarily by the border patrol lies immediately downslope; the border fence is not far to the south. A single shrub was found on a steep hillside north of Highway 94 at the top of the grade west of Barrett Junction. This shrub had almost all entire leaves and while possibly showing some introgressive traits with *Quercus cornelius-mulleri*, may key here. An additional report is from nearby to the east in proximity to Cottonwood Creek.

In unpublished notes Roberts reports it growing from just east of Tijuana south to Sierra San Borja west of Bahia de Los Angeles, and on Cedros Island.

STATUS: The U.S. populations of Cedros Island Oak occur in close proximity to the Mexican border and are within an area of frequent wildfires associated with illegal human migration. This species is not expected at more than a handful of additional sites in the United States. It is near its northernmost range limits on Otay Mountain; substantial similar habitat on metamorphic peaks lies across the border in Baja California. This scrub oak has entire leaves unlike the other members of this sometimes confusing group of shrubs. Hybridization can be a problem when identifying any individual scrub oak; one should look at a typical leaf and not any one isolated leaf on the shrub.

MULLER'S OAK [*Quercus cornelius-mulleri* K. Nixon & K. Steele]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None FAGACEAE Mar.-May
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Riverside County, San Bernardino County; Baja California, Mexico

HABITAT: Transmontane desert chaparral is the typical habitat of this tall, robust shrub. Sometimes it occurs at higher elevations in montane chaparral. Possible Associates: *Cercocarpus betuloides*, *Adenostoma fasciculatum*, *Zizyphus parryi*.

KNOWN SITES: Muller's Oak is locally common along McCain Valley Road south to the freeway; as well as east of Bankhead Springs. Herbarium specimens were examined from Sunrise Highway in the Laguna Mountains, Desert View in the Lagunas, Burnt Rancheria Campground, Jacumba, Dubber, Manzanita Indian Reservation, Lark Canyon, a peak near Boulder Park, Montezuma Lookout, between Shaw and Potreto Canyons, Oriflamme Canyon, the top of Pinyon Mountain, Culp Valley; as well as one collection westward to Lyons Peak. Sanders (unpublished) reports this as the common desert scrub oak of the San Bernardino Mountains and Little San Bernardino Mountains. Boyd (unpublished) reports this as the common desert scrub oak of the Santa Rosa and San Jacinto mountains.

No specimens from Baja California are found in the herbarium of the San Diego Natural History Museum. One potential hybrid (*Q. cornelius-mulleri* X *Q. turbinella*) from upper Canon Colorado southwest of Cerro Cipres at 31° 25' North was collected by Moran and Reveal (SD 100980).

STATUS: Muller's Oak is stable in its transmontane, San Diego County desert habitat. Occasional populations of scrubby oaks, such as east of Banner, appear to have introgressed with other species of scrub oaks and/or with *Quercus engelmannii*. Herbarium specimens from Tecate Mountain and Descanso have been annotated as likely hybrids. Shrubs growing on the small peak west of Campo also show hybrid traits but some plants may key here. Identification for these outlying populations can be difficult. Historical "lumping" of shrubby *Quercus* into one polymorphic species has limited the recent information available on Muller's Oak. It is considerably more common than once supposed on the desert flanks of the Peninsular Range. Muller's Oak has bi-colored leaves with the upper yellow or gray-green, and the lower surface whitish and densely fine tomentose. The leaf margin is entire or more typically 4-6 toothed; but not strongly almost "malevolently" twisted, and sharply toothed like *Quercus dumosa*.

NUTTALL'S SCRUB OAK [*Quercus dumosa* Nutt. in part]

LISTING: CNPS List 1B R-E-D Code 2-3-2
State/Fed. Status -- / Species of Concern FAGACEAE Feb.-Mar.
Global Rank G2 State Rank S1.1

DISTRIBUTION: San Diego County, Orange County, Santa Barbara County; Baja California, Mexico

HABITAT: Coastal chaparral with a relatively open canopy cover is the preferred habitat in flat terrain; on north-facing slopes this shrub may grow in dense monotypic stands. Chesterton fine sandy loams are mapped for the Miramar Marine Airbase population. Possible Associates: *Ceanothus verrucosus*, *Xylococcus bicolor*, *Arctostaphylos glandulosa* ssp. *crassifolia*.

KNOWN SITES: This coastal scrub oak occurs at a variety of locales such as Point Loma and Torrey Pines State Park along the immediate coast. Occasionally it occurs inland such as on the Miramar Marine Airbase where it grows in considerable numbers, in the hills at Camp Elliott, and on the northwestern slopes of Otay Mesa. A characteristic, low-growing colony is found on the peak east of Interstate 15 and south of Poway Road. Numerous populations are now isolated in the urban canyons of San Diego City neighborhoods north of Mission Valley such as Linda Vista and Clairemont (e.g., west of Mesa Junior College). This oak is locally common near Del Mar Heights Road and east of Torrey Pines High School, nearby south of Del Mar Road and east of El Camino Real, in the canyonlands east of Lundquist Drive in Encinitas, on the northern flanks of Soledad Mountain in La Jolla, in Torrey Pines State Reserve, in the chaparral northeast of the intersection of Palomar Airport Road and El Camino Real extending sporadically a considerable distance eastward within this canyon, 0.3 mile southeast of Evans Point above a recently constructed portion of Faraday Avenue, in a canyon south of La Fremontia in Rancho Santa Fe; as well as on north-facing slopes north of El Nido Road in Rancho Santa Fe. A few were found near the cul-de-sac of La Bella in Olivenhain. The largest population is within the Penasquitos Canyon Preserve where it is often a dominant shrub and occurs by the tens of thousands. Shrubs in the canyon south of Paseo del Lago in Carlsbad show some hybrid traits; while plants just west of I-5 in San Elijo County Park clearly show intermediate traits with *Q. berberidifolia*. It also comes into contact with *Q. berberidifolia* in the canyonlands south of Mount Marron. Nuttall's Scrub Oak grows at quite a few additional unreported isolated urban canyon sites near the coast. Herbarium specimens examined from San Diego County include sites in Mission Valley, on Kearny Mesa, near La Cencilla and Skyline Drive in Rancho Santa Fe, and near the University of California at San Diego campus. CNDDDB reports are from near the junction of Fairmont Avenue and Montezuma Road, east of Shaw Valley and northeast of Carmel Mountain, northeast of Miramar Road and Eastgate Mall, 1.4 mile ENE of the junction of Encinitas Creek and Santa Fe Road, northeast of Palomar Airport Road and El Camino Boulevard. One bush grows at Dana Point in Orange County, and a sizeable colony grows adjacent to Pacific Island Drive in Laguna Niguel. A small stand occurs on Pelican Hill, near Newport Beach, where some shrubs show hybrid tendencies; this may be to the northernmost colony. Also reported by Roberts for Orange County in Aliso-Wood Canyon Regional Park as well as Los Truncos Canyon.

Three voucher specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 31° 12' North at San Antonio de la Mesa where collected by Moran (SD 64723).

STATUS: Nuttall's Scrub Oak is substantially declining in San Diego County due to urban expansion along the coast. Taxonomic work is necessary to determine the frequency of intergradation between this species and the common *Quercus berberidifolia*. Presumed hybrids between the Nuttall's Scrub Oak and *Quercus engelmannii* are also found at several locales in coastal San Diego County; leaves tend to be relatively small, devoid of spines, with a curious violin-type shape. Sizeable portions of larger populations of Nuttall's Oak are recommended for protection; this species is still substantially more common than widely presumed. Typical Nuttall's Scrub Oak has a curious pruned, tangled look, as if it were sculpted above with few branches thrust well beyond the primary leaf mass. *Q. berberidifolia* typically has an erratic, taller and spindlier growth habit that is quite different. In addition, the leaves of *Q. dumosa* tend to be significantly smaller, more spinose, and much more undulate. In fact, *Q. berberidifolia* often has more elongated leaves which grow in a relatively flat plane; particularly in the foothills. Present rarity of Nuttall's Scrub Oak is directly related to urban development and loss of habitat along the coastal plain.

ENGELMANN OAK [*Quercus engelmannii* Greene]

- LISTING:** CNPS List 4 R-E-D Code 1-2-2
State/Fed. Status -- None FAGACEAE Apr.-May
Global Rank G3 State Rank S3.2
- DISTRIBUTION:** San Diego County, Orange County, and Riverside County, Santa Catalina Island; Baja California, Mexico
- HABITAT:** Oak Woodland and Southern Mixed Chaparral are both utilized by this tree. Larger oaks sometimes occur in vast savannah grasslands such as at Guejito (Fallbrook sandy loam), Ballena (Las Posas fine sandy loam), and near Santa Ysabel and Mesa Grande (Holland stony fine sandy loam, Crouch rocky coarse sandy loam). In the foothills the Engelmann Oak may also occur as a shrubby element within the chaparral. Typically in such a situation, the understory is relatively dense and the small oaks (even mature oaks in this habitat usually remain stunted) are concentrated on the periphery of watercourses or mesic slope aspects. Along larger creeks *Quercus agrifolia* usually predominates. Possible Associates: *Symphoricarpos mollis*, *Toxicodendron diversilobum*, *Solidago californica*.

KNOWN SITES: The Engelmann Oak is relatively abundant in the Echo military sector on Camp Pendleton, in the Santa Margarita Mountains, on Guejito Ranch, on Rancho Cuca, and near Mesa Grande. It is well represented in the vicinity of Alpine such as on slopes near South Grade Road, in Pamo Valley, east of Dulzura, and on the old Daley Ranch north of Escondido. In numerous other areas it is locally common. These include Japatul Valley, along Deerhorn Valley Road, near Cole Grade Road and Oak Glen Road, Tecolote Drive in the Pala Mesa area, off Clevenger Canyon Road, at Glen Lonely, at Stallion Oaks near Boulder Creek Road, in Lee Valley, east of Victoria Lane in Alpine, near Ramona View Drive in eastern Ramona, and in the hills south of Bonsall and the San Luis Rey River. Numerous isolated trees and small copses occur in north-coastal San Diego County such as Lux Canyon in Encinitas, and west of Ramblas de las Flores in Rancho Santa Fe. Often these trees show some introgression with *Quercus dumosa*, and apparent hybrids with this species are often common nearby. Also reported from Buckman Springs, Rancho Bernardo, Banner, Lost Valley, San Felipe, and the Vulcan Mountains. Herbarium specimens were examined from Monrovia in Los Angeles County and from Santa Catalina Island (one tree reported extant). Reported by Roberts in Orange County at Casper's Regional Park and Rancho Mission Viejo. This tree is abundant on the Santa Rosa Plateau in western Riverside County west to Tenaja Road.

Three specimens are found at the San Diego Natural History Museum south to 32° 31½' North; where collected by Moran (SD 104373) at the edge of a valley near El Pedregal. Such limited collection numbers underscore its rarity in Mexico.

STATUS: Engelmann Oak populations in southern California are still relatively abundant and stable. Poor reproduction success may be a problem with this oak. This could be due to a variety of reasons, foremost of which is cattle overgrazing. Other factors may include acorn herbivory from small mammals, birds, and insects; as well as browsing of saplings by deer, and a need for specific weather conditions to promote optimal seedling establishment. Infrequent Engelmann Oak hybrids with flatish violin-shaped leaves, presumably crossing with species of *Quercus berberidifolia*, are noted in the chaparral; typically these individuals are shrub-sized and exhibit much leaf variation. Other hybrids show intermediate traits with *Quercus agrifolia*. Engelmann Oak is much too common in San Diego County to warrant specific sensitive listing status, and should be de-listed by the CNPS. However, that does not remove the potential sensitivity of its oak woodland habitat.

HAIRY-LEAFED REDBERRY [*Rhamnus pilosa* (Trel.) Abrams]

LISTING: CNPS Unlisted R-E-D Code None
 State/Fed. Status -- None RHAMNACEAE Mar.-Jun.
 Global Rank None State Rank None

DISTRIBUTION: San Diego County

HABITAT: Hairy-leafed Redberry occupies typical Chamise Chaparral habitat in rugged hilly and mountainous terrain west of the higher peaks of the Peninsular Range. Possible Associates: *Adenostoma fasciculatum*, *Ceanothus tomentosus*, *Ceanothus cyaneus*.

KNOWN SITES: This redberry is locally common throughout much of its limited range. This includes much of the chaparral around Mount Woodson/Iron Mountain/San Vicente Reservoir, southeast to El Monte Park and El Cajon Mountain, and then further south to Harbison Canyon/Alpine/Peutz Valley. Herbarium specimens were examined on the periphery of this area from Barona Valley, four miles west of Ramona, Dehesa, Moosa Canyon two miles south of Lilac, and the old Viejas Grade. Reports are from Lakeside, Otay Mountain, and Poway. No specimens are known from Baja California.

STATUS: Much of the historic foothill habitat of this large shrub is still extant, and its populations are considered stable. Increasing clearance of land within its foothill strongholds for orchards and rural ranchette housing could pose a long-term threat. At present, no recommendations for protection of this species are made. This species is closely related to the common Holly-leaf Redberry, *Rhamnus ilicifolia*, which it replaces over most of its range. On the periphery of Hairy-leafed Redberry's range are found shrubs with a curious mix of traits that might indicate hybridization or introgression; particularly plants with sparsely hairy leaves and twigs, leaves that naturally fold back easily rather than retain some stiffness, and shrubs with indeterminately stiff to flexible branches. Typically, Holly-leaf Redberry is a more rigid shrub with a more compact growth habit. Rarity of this shrub is correlated with its limited range, that may be due to specific soil preferences for which it is particularly well suited. Holly-leafed Redberry may represent a relatively newly evolved species that is now outcompeting its "sister-species" *R. ilicifolia* at locations for which it has a subtle genetic advantage.

SINGLE-LEAF BASKETBUSH [*Rhus trilobata* Nutt. var. *simplicifolia* (Greene) Barkley]

LISTING: CNPS List 2 R-E-D Code 3-1-1
 State/Fed. Status -- None ANACARDIACEAE Mar.-Apr.
 Global Rank G5T? State Rank S1.3?

DISTRIBUTION: San Diego County; Arizona; Utah; Colorado; Oklahoma

HABITAT: Desert Basketbush occurs in open Sonoran Desert Scrub on Whale Peak. Possible Associates: *Pinus monophylla*, *Juniperus californicus*, *Nolina parryi*.

KNOWN SITES: This variety of the common Basketbush is reported by Shreve and Wiggins from the Sierra Juarez and Sierra San Pedro Martir of Baja California, eastward to southern Utah, Colorado, and Oklahoma. It grows in San Diego County in a drainage among the Pinyon Pines at about 4000 feet on a north-facing slope of Whale Peak.

STATUS: The isolated population of Single-leaf Basketbush is well defended on Whale Peak; this species is stable in San Diego County. This variety of basketbush is not addressed within the Jepson Manual (1993), although a note mentions that geographic variation for *Rhus trilobata* within western North America needs study. Provisionally, it is recommended that all southern California populations should be protected. Single-leaf Basketbush may warrant full species status; not coincidentally it is situated on the periphery of suitable *Rhus trilobata* habitat, at the transition between transmontane chaparral and true desert.

MORENO CURRENT [*Ribes canthariforme* Wiggins]

- LISTING:** CNPS List 1B R-E-D Code 3-1-3
State/Fed. Status -- / Species of Concern GROSSULARIACEAE Feb.-Apr.
Global Rank G1 State Rank S1.3
- DISTRIBUTION:** San Diego County
- HABITAT:** Chaparral in areas of Acid Igneous rock land, typically with massive, exposed boulders, is the typical habitat of this shrub. Water availability may be higher in the shadows of these boulders, even during the dry season, and in part help define the microhabitat requirements of the Moreno Current. Possible Associates: *Rhamnus ilicifolia*, *Senecio ganderi*, *Pedicularis densiflora*.
- KNOWN SITES:** Moreno Current grows in rocks near the dam at Lake Moreno. Herbarium specimens are from the summit of Lawson and Gaskill Peak, Lyon's Peak, Featherstone Creek near Barona, El Cajon Mountain, and Descanso Junction. These locales are all remote, lightly investigated areas. As yet, few extensive, sizeable populations are known. Old biological survey reports note sites on the slopes immediately south of Hidden Glen, west of the intersection of Kimball Grade and Skyline Drive, on the west slope of Gaskill Peak, and the north slope of Lawson Peak. This species has not yet been collected in Baja California. CNDDDB reports are for 0.75 mile southwest of Sequan Peak, west of Sequan Peak, and 0.75 mile north of Sequan Peak.
- STATUS:** Moreno Current populations in San Diego County are presently stable. This is one of the rarer shrubs in the County. It is a very distinctive, little-known endemic whose reported sites are generally remote from existing development. All populations should be protected. Moreno Currant would make an excellent horticultural addition; and when flowering has considerable aesthetic appeal. The range of this shrub does not closely correspond with other species in the region that are restricted to metavolcanic peaks. This shrub superficially lacks any obvious close relatives; and could be a relictual component of a floristic association now absent. Genetic studies within the genus might shed considerable light on its ancestry. Moreno Current lacks the nodal spines found on the fruits of the related gooseberries. It has a "pudgy" hypanthium that is wider than long, has styles free to the base, and a dense inflorescence unlike *Ribes indecorum* and *Ribes malvaceum*.

SANTA CATALINA ISLAND CURRANT [*Ribes viburnifolium* Gray]

- LISTING:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- None GROSSULARIACEAE Feb.-Apr.
Global Rank G3 State Rank S3.3
- DISTRIBUTION:** San Diego County, Santa Catalina Island; Baja California, Mexico
- HABITAT:** Sage scrub or low-growing chaparral exposed to ocean breezes and fogs are favored haunts for this shrub on Punta Banda in Baja California. Wiggins reports its Baja habitat as canyons and arroyos, usually in partial shade near the coast. This currant grows on one steep slope, mapped as Terrace Escarpments, in the Tijuana Hills. Possible Associates: *Rhus integrifolia*, *Ptelea aptera* (Mexico only), *Dudleya attenuata*.
- KNOWN SITES:** A small population was found near Smuggler's Canyon in 1989 in the Tijuana Hills, near the international boundary on the U.S side of the fence. The population grows well up the hillside near the summit of the mesa. Reported by Thorne as common on Santa Catalina Island.
- Twenty-nine Baja California specimens are found at the San Diego Natural History Museum's herbarium; south to 31° 2' North where collected by Moran (SD 101911) at Cañada la Matanza. Small populations of this currant were observed on Punta Banda Peak, as well as in dense chaparral in Guadalupe Valley.

STATUS: The small mainland U.S. colony is presently stable. Movement of illegal aliens through this area and the potential for fires creates some risk of endangerment. All mainland U.S. populations should be protected. Rarity of this species is due to political boundaries; most of its optimal habitat lies south of the Mexican border. The leaves of Santa Catalina Island Current are unlike the leaves of other members of the genus found in San Diego County. They are leathery and ovate, with very shallow or no teeth on the margin.

COULTER'S MATILIJA POPPY [*Romneya coulteri* Harvey]

LISTING: CNPS List 4 R-E-D Code 1-2-3
State/Fed. Status -- None PAPAVERACEAE May-Jul.
Global Rank G3 State Rank S3.2

DISTRIBUTION: San Diego County, Orange County, Los Angeles County, and Riverside County

HABITAT: This suffruticose perennial is a fire follower which may occur in areas of sage scrub; or more typically in chaparral or along rocky watercourses. Open or mildly disturbed terrain is sometimes favored and mature chaparral or sage scrub limits the expansion of this showy member of the Poppy Family. At the Chiquita Canyon site the soils are mapped as Capistrano series. Possible Associates: *Platanus racemosa*, *Quercus berberidifolia*, *Arctostaphylos glauca*.

KNOWN SITES: Specimens of Coulter's Matilija Poppy examined in the field from San Diego County were all of questionable (e.g., horticultural) origin except one. A small population of *Romneya coulteri* grows north of San Onofre Creek and south of Basilone Road not far from the nuclear power plant. This may be a washdown element from the eastern mountains. Sites examined in western Riverside County are at the confluence of Leach and Dickey Canyons, and by Mountain Avenue near Alberhill (as well as a number of other nearby locales in the hills southwest of the Alberhill claypits). It is also reported from washes in Fresno Canyon and Wardlow Canyon west of Corona, from south of Lee Lake near Interstate 15, and the mouth of Horsethief Canyon. This shrub was seen in one dense colony in Chiquita Canyon in Orange County. Roberts reports this matilija poppy in Orange County at Santa Ana Canyon, Rancho Mission Viejo along Highway 74, the Audubon Starr Ranch, and San Juan Canyon. It grows locally within Silverado Canyon, near the mouth of Holy Jim Trail, in the broad wash of Trabuco Canyon, and in Modjeska near the wildlife center. Herbarium specimens examined were from Temescal Canyon near Glen Eden and Hagador Canyon in Riverside County; as well as Lower Santiago Canyon in Orange County.

STATUS: This species is slowly declining in Orange and Riverside counties as the foothills of the Santa Ana Mountains are being developed. The status of Coulter's Matilija Poppy in San Diego County is unknown; it is presumed present in only very limited numbers. Substantial portions of all sizeable populations should be protected; smaller populations should be placed into biological open space whenever possible. Coulter's Matilija Poppy has glabrous sepals and somewhat larger leaves than Coast Matilija Poppy (*Romneya trichocalyx*). It appears to be a geographically isolated (*i.e.*, the Santa Ana Mountains) relative of the wider-ranging Coast Matilija Poppy.

COAST MATILIJA POPPY [*Romneya trichocalyx* Eastw.]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None PAPAVERACEAE May-Jul.
Global Rank None State Rank None

DISTRIBUTION: San Diego County, Ventura County, Santa Barbara County; Baja California, Mexico

HABITAT: The huge population in the Dulzura region occurs primarily on Friant fine and rocky sandy loams. Possible Associates: *Dicentra chrysantha*, *Eschscholzia californica*, *Platystemon californicus*.

KNOWN SITES: *Romneya trichocalyx* is abundant in canyons north of Dulzura and occasional to the south in sage scrub or chaparral. It also occurs sporadically on Otay Mountain (e.g., Cedar Creek) and in the Jamul Mountains. Sites examined include near Deerhorn Valley Road, in Johnson Canyon on northeastern Otay Mesa, and in Sycamore Canyon. Herbarium specimens record Mission Trails Park near Padre Dam, Barrett Junction, and the Espinosa Trail on Pine Creek. Numerous plants were found on a burn on Potrero Grade on the northwestern flanks of Tecate Mountain. Biological survey reports note sites south of Highway 94 between Tecate Road and Potrero, southwest of Bee Valley near Mother Grundy Truck Trail, and just east of Tecate Junction. Reported by Smith in Ventura County (herbarium specimen examined from the Maricopa Grade); and Santa Barbara County from Bee Rock south of Lake Cachuma, Mono Creek, Agua Caliente Canyon, Matilija Canyon, upper Sespe Creek along State Highway 33, on Pine Mountain, and the Ozena area of upper Cuyama Valley.

Twenty-two voucher specimens from Baja California are found at the San Diego Natural History Museum's herbarium; south to 30° 43' North; where collected by Moran (SD 91198) at Arroyo Nueva York below an old ranch site.

STATUS: *Romneya trichocalyx* is slowly declining in San Diego County with residential development expanding into the foothill zone where it is primarily established. Away from the southwestern region of San Diego County are occasional colonies that may or may not be native; the species was once a popular horticultural plant and is found near abandoned homesites where invasive vegetation can mimic native habitat. Genetic studies comparing the northern populations in Ventura County and Santa Barbara County with the southern populations in southern San Diego County and Baja California should be conducted; *Romneya coulteri* is situated in the intervening region between these two meta-population clusters. Provisionally, substantial portions of all sizeable populations of this poppy in San Diego County are recommended for protection. *Romneya coulteri* has glabrous sepals and somewhat larger leaves than *Romneya trichocalyx*.

GAMBEL'S WATER CRESS [*Rorippa gambellii* (S. Wats.) Roll. & Al-Shehbaz]

LISTING: CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status CT/FE BRASSICACEAE Apr.-Jun.
Global Rank G1 State Rank S1.1

DISTRIBUTION: San Diego County ?, San Luis Obispo County; Baja California, Mexico

HABITAT: Marshes, swamps, and the borders of lakes are the reported habitat of this herbaceous perennial. Possible Associates: More information needed.

KNOWN SITES: No recent San Diego County sightings are known. An odd historical report from near Pine Hills southwest of Julian should be relocated/reexamined to verify its occurrence. Hoover reports it as in San Luis Obispo County among the dunes from Oceano southward. Smith reports the type collection from near Santa Barbara; also Oso Flaco Lake in San Luis Obispo County. CNDDDB reports from San Luis Obispo County are for the southwest and northeast of the causeway and south edge of Oso Flaco Lake, near small twin lakes south of Arroyo Grande, on the south and north edge of Little Oso Flaco Lake, near Black Canyon Lake between Sheridan Road and the end of Callender Road; in San Bernardino County near Urbita Hot Springs in the San Bernardino Valley (likely extirpated); and a vague 1904 report from Cienaga in Los Angeles County.

STATUS: The status of Gambel's Water Cress in San Diego County is unknown. The lone report may be a misidentification, or mislabeled locality. Any legitimate native population in southern

California should be protected. Like the related common watercress (*Rorippa nasturtium-aquaticum*), this species has white petals. However, unlike that species, its lateral leaflets are prominently dentate, and the terminal leaflet is typically elongated and lanceolate (not broadly ovate).

SMALL-LEAVED ROSE [*Rosa minutifolia* Engelm. in Parry]

- LISTING:** CNPS List 2 R-E-D Code 3-3-1
State/Fed. Status -- CE/ Species of Concern ROSACEAE Jan.-Jun.
Global Rank G3 State Rank S1.1
- DISTRIBUTION:** San Diego County; Baja California, Mexico
- HABITAT:** The lone U.S. site was until recently found at the crest of a canyon drainage on the periphery of north-facing Diegan Coastal Sage Scrub (Olivenhain cobbly loam soils). Wiggins mentions mesas, hillsides, and arroyos within a few kilometers of the coast as being the preferred habitat. Possible Associates: *Ferocactus viridescens*, *Castilleja exserta*, *Eriogonum fasciculatum*.
- KNOWN SITES:** The only known U.S. occurrence was on northwestern Otay Mesa at the head of Dennery Canyon, northeast of Dillon Road and its intersection with Otay Mesa Road. The thicket was fairly substantial and was situated in an area recently proposed for residential development. Rather than maintain the site and revise the residential design, local jurisdictional agencies allowed the only native U.S. population of Small-leaved Rose to be displaced, with cuttings from the thicket taken for establishment in a nearby dedicated biological open space.

This species is well distributed in Baja California with 26 specimens found at the San Diego Natural History Museum's herbarium; south to 30° 4' North where collected by Moran (SD 77123) near La Turquesa. It is locally common in the hills near Colonet.

- STATUS:** Small-leaved Rose's only known native U.S. population on Otay Mesa was inexplicably approved for transplantation to a protected site nearby. The development site could have been redesigned to maintain this population in situ, but the U.S. Fish and Wildlife Service and the California Department of Fish and Game were unwilling to oppose the project until suitable design modifications were enacted. Fortunately, numerous cuttings from the parent material are now planted and growing well in a fenced area of restored mima mounds at the California Terraces Mitigation Project adjacent to Otay Mesa Road. Extreme range extensions are often important to maintain, insofar as they may represent an unusual variant. Much of the diversity within a population of plants is often found at the edge of its range, where atypical situations and less than optimal microhabitats may require genetic alterations to successfully compete for survival. The leaflets on Small-leaved Rose are less than one centimeter in length and toothed halfway to their base, with a densely prickly hypanthium; unlike the common *Rosa californica*.

CUYAMACA RASPBERRY [*Rubus glaucifolius* Kell var. *ganderi* (Bailey) Munz]

- LISTING:** CNPS List 1B R-E-D Code 3-1-3
State/Fed. Status -- / Species of Concern ROSACEAE June
Global Rank G5TH State Rank SH
- DISTRIBUTION:** San Diego County
- HABITAT:** Lower Montane Coniferous Forest, typically beneath a dense, shaded canopy, is the preferred habitat of this prickly shrub. Crouch stony fine sandy loam is mapped for one Palomar State Park site. Possible Associates: *Rubus parviflorus*, *Cornus sericea*, *Rosa gymnocarpa*.
- KNOWN SITES:** The Cuyamaca Raspberry was seen growing by a spring on Palomar Grade near Nellie. This site was burned during the massive 1988 fire on Palomar Mountain. It is also present in Palomar State Park near Boucher Hill on a trail leading downhill towards Doane's Pond. Little

information is available on the distribution of this scarce endemic shrub; a local study is needed. Old reports are from near Cuyamaca Lake, Middle Peak, and North Peak. CNDDDB reports are from near the border of Cuyamaca State Park along a fire road that circles Middle Peak, and in the Harrison Park area near Iron Springs Road between Birdsell Lane and Cuyamaca Ranch Road.

STATUS: The status of Cuyamaca Raspberry is presumed stable with most of the historical collections within existing state park lands. This variety of *Rubus glaucifolius* is not given distinct status in the Jepson Manual (1993); it is mentioned within a note that states barely glandular plants in the Peninsular Range have been referred to variety *ganderi*. *Rubus glaucifolius* otherwise ranges northward to the Sierra Nevada Mountains. It is not uncommon for isolated plants on the periphery of a historical range to develop individual traits somewhat different than the general population. The chances of newly evolving secondary traits being "swamped out" by the overwhelming majority of genetically similar plants in the middle of a population -- is not as great on the population fringe. Several related species of *Rubus* grow in the mountains. *Rubus glaucifolius* has three lobed leaves not five as found on *Rubus parvifolius*. In addition, unlike *Rubus ursinus*, the leaves of *R. glaucifolius* are white beneath. *Rubus glaucifolius* has pedicels and sepals with stipitate glands, while in *Rubus leucodermis* these features are relatively glandless. The latter therefore is quite similar to *R. g.* var. *ganderi* in this respect. Sepals are not deflexed in *R. glaucifolius* var. *ganderi*, but are reflexed in *R. leucodermis*.

PARISH'S RUPERTIA [*Rupertia rigida* (Parish) Grimes]

- LISTING:** CNPS List 4 R-E-D Code 1-1-2
State/Fed. Status -- None FABACEAE Jun.-Jul.
Global Rank G3 State Rank S3.3
- DISTRIBUTION:** San Diego County, Riverside County, San Bernardino County
- HABITAT:** Lower Montane Coniferous Forest and Montane Chaparral are utilized by this subshrub. At Horse Camp it grows in semi-shade beneath a coniferous canopy at the edge of montane meadows. The soil here is mapped as Holland stony fine sandy loam. Possible Associates: *Pteridium aquilinum*, *Pinus jeffreyi*, *Calocedrus decurrens*.
- KNOWN SITES:** Parish's *Rupertia* grows in shaded forest near Los Caballos Campground at Lake Cuyamaca. A small population is found peripheral to coniferous forest on Volcan Mountain near the road below a weather facility; as well as on the west flank of Wooded Hill in the Laguna Mountains. This is one of the County's rarer montane shrubs. Old reports are from Oak Grove, Julian, Pine Valley, Shrine Camp, east of Green Valley Campground, east of Oakzanita Peak, and Boulder Creek. Reported in Big Bear Valley and near Holcomb Creek in the San Bernardino Mountains; as well as in the mountains west of Anza in the San Jacinto Mountains of Riverside County. CNPS reports for Baja California cannot be confirmed.
- STATUS:** Parish's *Rupertia* is presumed stable within its montane habitat. More information is needed concerning its microhabitat preferences; as well as additional collection data. Provisionally, it is recommended that all substantial populations be protected; substantial portions of smaller populations should be placed into biological open space. This species has a larger calyx (9-10 mm versus 6-8 mm), larger banner (14-15 mm versus 10-14 mm), and a widely attached less than 3 mm fruit beak (rather than an abrupt small point at the tip) that distinguishes it from *Psoralea physodes* (which grows in the Santa Ana Mountains, including extreme northern San Diego County). Parish's *Rupertia* may be a relictual species given its few remaining scattered sites in the Peninsular Range and its shrub status (*i.e.*, shrubs are often inherently less "mobile" than many weedy annuals that are pre-disposed to invade newly available/suitable habitat).

BIGELOW'S GLASSWORT [*Salicornia bigelovii* Torrey]

- LISTING:** CNPS Unlisted R-E-D Code None
State/Fed. Status -- None CHENOPODIACEAE Jul.-Nov.
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Orange County, Los Angeles County; Louisiana; Baja California, Mexico
- HABITAT:** This succulent annual herb is restricted to higher quality coastal salt marsh habitat. Bigelow's Glasswort sometimes grows within the exposed tidal flats and channels that the three other local species of glasswort may not favor. Possible Associates: *Salicornia virginica*, *Spartina foliosa*, *Batis maritima*.
- KNOWN SITES:** This species grows in locally dense concentrations in the salt marshes at Imperial Beach, Gunpowder Point on San Diego Bay, the D Street Fill in National City, and at the Kendall-Frost Wildlife Preserve in Mission Bay. Herbarium specimens examined from San Diego County were for the west side of the Silver Strand as well as from the F Street Marsh on San Diego Bay. Orange County herbarium specimens examined were from Newport Bay, Surfside, and Bolsa Chica. Raven reports this glasswort from Mugu Lagoon in Los Angeles County. Also seen was a specimen from Tibalier Island in Louisiana.

Twenty specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 24° 11' North where collected by Mudie (SD 93980) at Baja de la Paz.

- STATUS:** Bigelow's Glasswort has historically been severely reduced in its available habitat within coastal salt marshes; however, at the present time most of this habitat is protected and populations in San Diego County are stable. No recommendations are made for protection at this time. Reports indicate that this annual species may experience substantial fluctuations in numbers at individual sites from year to year. Such fluctuations may be unrelated to human induced changes in the environment. In any event, population numbers at specific sites may have to be censused over several years to get an accurate representation of the population size. Care should be taken in the identification of this annual species, as one annual species and two perennial species of glassworts may mimic it during their juvenile development. Bigelow's Glasswort can be surprisingly robust for an annual in comparison to the perennials. Bigelow's Glasswort has the central flower of a node generally higher than the lateral flowers, the stems are usually branching only above the middle, and mature spikes are 4-6 mm wide.

DESERT SAGE [*Salvia eremostachya* Jeps.]

- LISTING:** CNPS List 4 R-E-D Code 1-1-1
State/Fed. Status -- None LAMIACEAE Mar.-May
Global Rank G5 State Rank S3.3
- DISTRIBUTION:** San Diego County, Riverside County; Baja California, Mexico
- HABITAT:** Sonoran Desert Scrub (oftentimes among granitic boulders) on the eastern flanks of the Peninsular Range is the preferred habitat of this sage. Acid Igneous rock lands are utilized in the canyons on Montezuma Grade. Possible Associates: *Fouquieria splendens*, *Astragalus palmeri*, *Agave deserti*.
- KNOWN SITES:** Several shrubs were seen in a remote canyon off Montezuma Grade frequented by Bighorn Sheep. Herbarium specimens examined are from Indian Canyon in the Collins Valley, Hellhole Canyon, Yucca Valley, and Rockhouse Canyon in San Diego County; also 4.9 miles northeast of Pinon Flats in Riverside County. Old reports are from the following desert locales: Horse Canyon, Coyote Canyon, Sheep Canyon, Cougar Canyon, Bennis Bowl, Alcoholic Pass, south of Villager Peak, and at Turkey Track. Old reports are from several locales along Highway 74 east of Pinyon Pines to west of Palm Desert, near the Santa Rosa Mountain Truck Trail, near

both Nance Canyon and Alder Canyon in the Santa Rosa Mountains, near Garnet Ridge in the San Jacinto Mountains, near Idyllwild, the Forbes Ranch, Garner Valley, Mountain Center, and Martinez Mountain. It is also reported from Deep Canyon in the Coachella Valley of Riverside County.

Twelve specimens from Baja California are found in the herbarium at the San Diego Natural History Museum; south to 28° 43' North where collected by Moran (SD 60725) on a rocky hillside near San Luis Mine.

STATUS: Desert Sage populations are presumed stable; little historical loss of habitat has occurred on the rocky and quite arid, desert slopes of the Peninsular Range. Substantial portions of all sizeable populations are recommended for protection. Presumed rarity of this species may be skewed by the absence of general collections from the steep rocky desert habitat in which it is found. There are a number of species of *Salvia* in San Diego County. Desert Sage is a perennial, erect growing shrub with conspicuously exerted stamens (unlike *Salvia munzii* and *Salvia mellifera*), and a long lower corolla lip that is greater than twice the length of the upper (unlike *Salvia leucophylla*, *Salvia clevelandii*, and *Salvia pachyphylla*). It has a relatively short inflorescence compared to *Salvia apiana* and *Salvia vaseyi* (< 5dm); moreover, the narrow, bristly leaves are somewhat greenish, unlike the conspicuously grayish velvety leaves of those two species.

MUNZ'S SAGE [*Salvia munzii* Epling]

LISTING: CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status -- None LAMIACEAE Feb.-Apr.
Global Rank G3 State Rank S2.2

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Chaparral and Diegan Coastal Sage Scrub are both utilized by this shrub which when found is often a dominant plant of the area. On Mount San Miguel and Mother Miguel Mountain it grows in San Miguel-Exchequer rocky silt loams; while near Lower Otay Lake it utilizes Olivenhain cobbly loam. Possible Associates: *Solanum tenuilobatum*, *Achnatherum diegoense*, *Adenostoma fasciculatum*.

KNOWN SITES: This is a dominant shrub north of the eastern arm of Lower Otay Lake, growing in the many thousands. It is locally common in the Jamul Mountains and on the slopes of San Miguel Mountain. It is uncommon near Ivanho Street on Dictionary Hill, its northernmost known locale, and in the hills east of Isham Springs and Jamacha Road. It is also found at various locales on Otay Mountain such as 0.5 mile east of Dulzura Creek and 0.75 mile north of Cedar Canyon. A concentrated population occurs west of Rolling Ridge Road and immediately south of Proctor Valley Road near Chula Vista. CNDDDB reports are from locales east and northeast of Upper Otay Reservoir, east of Telegraph Canyon and west of Salt Creek near Otay Lakes Road, 0.75 mile west of Lower Otay Reservoir and 1 mile south of the Fenton Ranch, 0.3 mile west of Lower Otay Reservoir, on the south side of Lower Otay Reservoir near Buschalaugh Cove, just west of Little Cedar Canyon, in the Jamul Mountains 3.1 miles northeast of the tip of Upper Otay Reservoir, various other locales in the Jamul Mountains near Proctor Valley Road, 0.7 mile due north of Otay Lakes Road where it crosses Dulzura Creek, just south of Horseshoe Bend about 1.7 miles south southwest of Mother Miguel Mountain, 1.25 miles due north of the summit of San Miguel Mountain, one mile north/northwest of this same summit, and on the south side of the Otay River Valley in the vicinity of Johnson Canyon 0.1 mile east of the Brown Field Range.

Thirty-seven collections of Munz' Sage from Baja are found at the San Diego Herbarium; south to 30° 3' North where collected by Moran (SD 77027) 12 miles east of El Rosario.

STATUS: The U.S. populations of Munz Sage are presently stable. Vigorous populations are imperiled by residential development in the Otay Lakes area. Substantial and cohesive portions of all sizeable populations are recommended for protection. This species is not truly rare, it is relatively common in northern Baja California. Locally it is restricted to metavolcanic soils that are uncommon in southern San Diego County. *Salvia munzii* is superficially similar looking to *Salvia mellifera*; however the corolla is dark blue (not pale blue to whitish), the flower clusters are 1-1.5cm wide not 1.6-4cm wide, and the leaf is oblanceolate to obovate not oblong-elliptic to obovate. The scent of the leaves is also distinctively different; however, that trait is difficult to define. *Salvia clevelandii* has a grayer leaf and the dark blue-violet flowers have long-exserted stamens.

SAN MIGUEL SAVORY [*Satureja chandleri* (Bdg.) Druce.]

- LISTING:** CNPS List 1B
Status/Fed. Status -- None
Global Rank G4 State Rank S3.2?
- DISTRIBUTION:** Orange County, Riverside County, San Diego County; Baja California, Mexico
- HABITAT:** This small herbaceous shrub is found in chaparral and oak woodland, and may be restricted to gabbroic or metavolcanic derived soils. On McGinty Peak the soils are mapped as Las Posas stony fine sandy loam; San Miguel-Exchequer rocky silt loam is found on San Miguel Mountain. In mesic, shaded locations on the latter site, San Miguel Savory becomes lanky; on nearby xeric slopes it is typically stunted. Open Chamise dominated slopes seem to be a preferred microhabitat in San Diego County and northern Baja California, while Santa Ana Mountain reports note more mesic situations. Possible Associates: *Chamaebatia australis*, *Lepechinia ganderi*, *Arctostaphylos otayensis*.
- KNOWN SITES:** *Satureja* occurs at scattered locales at the upper elevations of San Miguel Mountain. A report is from the north side of San Vicente Reservoir, in the chaparral north of Padre Barona Creek and well west of the Barona Casino. It was observed on the west side of Mussey Grade near a ranch home close to the San Vicente Reservoir. A second site is found on the nearby Boulder Oaks Ranch west of a large pond at the confluence of two watercourses. Old reports are from Sandia Creek, McGinty Mountain east of the summit, the Barona area, and Otay Mountain. An old biological survey report notes a site 0.5 mile west of Daily Road near the Riverside County line. CNDDDB reports for San Diego County note an area in Sandia Creek approximately one mile north of this creeks confluence with the Santa Margarita River, and three locales in the Jamul Mountains near Callahan Mountain: both 1.3 and 1.7 airmiles southeast of Indian Rock Coral, as well as 4 miles northeast of the Upper Otay Reservoir spillway; from Orange County at Hot Springs Canyon 1.5 miles north of San Juan Hot Springs, Lion Canyon 0.7 mile north northeast of Lower San Juan Picnic Area, one hundred yards upstream of Lower San Juan Picnic Area, Hot Spring Canyon downstream from Los Pinos Spring, the Potrero Los Pinos Area near Chiquita Spring and along Lion Canyon along trails south of Blue Jay Campground, 10 miles west of Murrieta approximately 1.1 mile south southeast of Tenaja Guard Station and outside the forest boundary, De Luz Road 3 miles southwest of Murrieta in the first canyon to the right, one mile west of Murrieta in the vicinity of Tenaja Road, and 3 airmiles south of Murrieta 1.8 miles south of the Junction of Del Luz Road and Guava Road; in Riverside County in St. Johns Canyon approximately 6 miles south of Hemet on Highway 79 (a site needing additional confirmation). An old biological survey report is from the hills west of Hayes Avenue on Mesa de Burro on the Santa Rosa Plateau.

Only three specimens from Baja California are found in the San Diego Natural History Museum's herbarium. It was collected by Moran on the north slope of Cerro Blanco at 32° 4' North (SD 73002).

STATUS: San Diego County populations of San Miguel Savory are stable; however, it is restricted to regionally uncommon metavolcanic and gabbro soils. Development is proposed near one of the larger Orange County populations in the Santa Ana Mountains. Studies should be conducted to compare genetic material in southern San Diego County with the disjunct populations in the Santa Ana Mountains. All populations in San Diego County should be protected. This species occurs in typically low numbers at County sites, and it is unclear what microhabitat requirements are limiting its sub-population sizes. The few sites known from Baja California and the available information from the U.S. underscores the true rarity of this shrub. This species is replaced not far south of the border by *Satureja ganderi* and it may be quite rare in Baja California. Several hundred shrubs were seen on Cerro Bolla in northern Baja California. *Satureja chandleri* has deltate to ovate-deltate, shallowly crenate leaves. In layman's terms they are somewhat egg-shaped and not typical of the leaves found on other Mint Family shrubs in the region (see line drawing in Jepson Manual). The small tubular flowers are white to pale lavender. This is a relatively small, compact shrub when found growing in direct sunlight, but it can become lanky with larger leaves when growing in the shade.

SOUTHERN SKULLCAP [*Scutellaria bolanderi* Gray ssp. *austromontanum* Epling]

- LISTING:** CNPS List 1B R-E-D Code 2-2-3
State/Fed. Status -- None LAMIACEAE Jun.-Aug.
Global Rank G4T2 State Rank S2.2?
- DISTRIBUTION:** San Diego County, Riverside County, San Bernardino County
- HABITAT:** The Southern Skullcap is a small herb typically growing on the moist embankments of montane creeks. At Pine Valley the soils are mapped as Riverwash, there is little canopy cover, and it occurs with a diverse assemblage of facultative wetland annuals and herbaceous perennials. Possible Associates: *Mimulus guttatus*, *Juncus* species, *Epilobium ciliatum*.
- KNOWN SITES:** This species is lightly distributed in Pine Valley Creek near the Noble Canyon trailhead. A vigorous population was found on Harper Creek and nearby on the Sweetwater River upstream from the ranger station in Cuyamaca Rancho State Park. Herbarium specimens are from 0.25 mile north of Green Valley Fire Road, at Viejas, below Cuyamaca Lake, at Japatul Valley near the school, on Witch Creek, Fry Creek, French Valley, Doane Creek, and near Palomar Observatory Road in a meadow. It is also reported from Carrizo Creek near Lake Henshaw, Deer Park, and at Morena. In western Riverside County is reported from the head of Cole Canyon near the Santa Rosa Plateau, on Strawberry Creek two miles southwest of Idyllwild, and in the upper May Valley/Hurkey Creek area. Munz reports this species at the Mohave River in Victorville. No herbarium collections for Baja California could be located.
- STATUS:** More collection information is needed about the distribution and population numbers of this species. It is presumed stable within the Peninsular Range portion of its habitat; but such an assessment needs further verification. In the mountains of San Diego County Southern Skullcap is potentially impacted by increases in recreational activities near creekbeds. All populations should be protected. The limited range of Southern Skullcap and the absence of Baja California specimens indicates this species could be much rarer than previously presumed. Other species of montane skullcaps associated with marshes and streams are also rare in California, and this sub-group may be somewhat relictual in general, and poorly adapted to the general drying conditions common since the close of the Pleistocene. The distinctive flowers of Southern Skullcap are white, tipped with a showy red to blue-mottled lower lip.

BLUISH SPIKE-MOSS [*Selaginella asprella* Maxon.]

- LISTING:** CNPS List 4 R-E-D Code 1-1-2
State/Fed. Status -- None SELAGINELLACEAE July

- Global Rank G5? State Rank S3.3
- DISTRIBUTION:** San Diego County, Riverside County, Los Angeles County, San Bernardino County, Kern County, Riverside County, Tulare County; Baja California, Mexico
- HABITAT:** This spike moss grows in granitic rock in coniferous forests and Pinyon Juniper Woodland. Possible Associates: *Juniperus californica*, *Ephedra viridis*, *Cheilanthes viscida*.
- KNOWN SITES:** Bluish Mossfern was found growing in small exposed rocky outcrops amid junipers west of Banner. Herbarium specimens were examined from Corte Madera, Desert View in the Laguna Mountains, and the northeastern corner of the Lucky Five Ranch in a canyon east of the headwaters of the Sweetwater River; also at Ontario Peak in the San Gabriel Mountains of San Bernardino County. A widespread population was observed in Riverside County just south of Morongo Valley near Dry Morongo Wash. In Kern County this species was found in a xeric locale, near scattered *Quercus douglasii*, growing in granitic crevices.
- Six voucher specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; south to 30° 59½' North where collected by Moran (SD 100273) on the summit of Picacho del Diablo.
- STATUS:** Bluish Mossfern is presumed stable in southern California, given the limited development in the montane/desert areas where it has been collected. This genus of primitive plant has been undercollected in general, and collection data may not reflect true rarity. This species has conspicuous soft bristles (0.5-1.5mm) at the distal end of the leaves resulting in conspicuous tufts of bristles at the stem tips.

ASHY SPIKE-MOSS [*Selaginella cinerascens* A. A. Eat.]

- LISTING:** CNPS Unlisted R-E-D Code None
 State/Fed. Status -- None SELAGINELLACEAE March
 Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Orange County; Baja California, Mexico
- HABITAT:** Undisturbed chaparral and Diegan Coastal Sage Scrub are often utilized by this prostrate perennial groundcover. It is a good indicator of site degradation as it rarely inhabits disturbed soils. Many soil types are utilized with Redding cobbly loam apparently an optimal soil type near Miramar. Possible Associates: *Ceanothus verrucosus*, *Jepsonia parryi*, *Artemisia californica*.
- KNOWN SITES:** This species is ubiquitous at many sites in coastal San Diego County, primarily south of Highway 78, with the populations heaviest around the periphery of the City of San Diego. It occurs by the many millions. It is a dominant ground cover at Miramar Air Station and innumerable other sites in open chaparral and sage scrub in this region. It is found northward to the Wire Mountain housing area on Camp Pendleton, near Seal Rock north of Escondido; eastward to Starvation Mountain, off Magnolia Road in Santee, by Ehman Road in Poway, on Iron Mountain as well as west of Daney Canyon near Ramona, and east of the Jamul Fire Station. Reported eastward to west of Rincon, the Poway Grade, on the Daley Ranch northeast of Escondido, at Alpine, and on a northeast slope by Lawson Creek in Sloane Canyon. This spike-moss is very common south into Baja California such as at Punta Banda. Reported by Roberts in Orange County at Rancho Mission Viejo west of Cristianitos Canyon and Shady Canyon in the San Joaquin Hills.

Eight specimens from Baja California are found at the San Diego Natural History Museum's herbarium; south to 32° 18½' North where collected by Moran (SD 101384) on a slope above the sea 4 km southeast of Punta Cabras. Despite the limited number of collections, the Ashy Spike-moss is abundant at many locales throughout northwestern Baja California, such as near Los Hormos along the highway to Ensenada.

STATUS: Ashy-footed Spike-moss is substantially declining due to urban expansion along the coast. Nevertheless, it still occurs at locations numbering in the thousands, and has recently been de-listed by C.N.P.S. In terms of sheer numbers, this may be one of the most common plants in the County, it does not warrant sensitivity status. The prostrate growth form of this spike-moss and ashy color during the late summer and fall make this species easily identifiable. It has substantially larger leaves than the true mosses.

DESERT MOSSFERN [*Selaginella eremophila* Maxon.]

LISTING: CNPS List 2
State/Fed. Status -- None
Global Rank G4 State Rank S2.2?

DISTRIBUTION: San Diego County, Riverside County, Imperial County; Arizona; New Mexico; Texas; Baja California, Mexico

HABITAT: Desert Mossfern grows in rocky terrain amid Sonoran desert scrub. Possible Associates: *Agave deserti*, *Ferocactus cylindraceus*, *Dudleya saxosa ssp. aloides*.

KNOWN SITES: This spike-moss is locally common in Sentenac Canyon. It was also seen in rocks on Pinyon Mountain and at Mountain Palm Springs. Herbarium specimens examined for San Diego County are from Hellhole Canyon, Vallecito Station, Oriflamme Creek, and Borrego Palm Canyon; also in Sonora, Mexico and on the Cabeza Prieta Game Reserve in Yuma County, Arizona. Reported from Deep Canyon in the Coachella Valley of Riverside County. Reported by Daniel & Butterwick as locally common in the South Mountains near Phoenix, Arizona.

Eleven voucher specimens from Baja California are deposited at the herbarium of the San Diego Natural History Museum; south to 28° 45' North where collected by Moran (SD 60053) at El Terminal 16 miles south of Los Angeles Bay.

STATUS: Desert Mossfern is presumed stable on the southern deserts. Most of its habitat is presently undeveloped. This species is likely substantially undercollected in the Anza-Borrego Desert, and ranges far to the east of our area. The leaves on *Selaginella eremophila* grow differently along the prostrate portion of the stem that faces the soil versus the portion facing the sun. The lower leaves are wider and larger than the upper leaves, with the growth pattern superficially appearing one-sided and ascending. In addition, prostrate portions of the stems of this species root at branch forks.

RAYLESS RAGWORT [*Senecio aphanactis* Greene]

LISTING: CNPS List 2
State/Fed. Status -- None
Global Rank G3? State Rank S1.2

DISTRIBUTION: San Diego County, Orange County, Los Angeles County, Riverside County, Santa Barbara County, Contra Costa County, Santa Clara County, Santa Cruz Island, San Luis Obispo County, Solano County, Ventura County, Santa Rosa Island; Baja California, Mexico

HABITAT: This annual occurs in open coastal sage scrub and is also reported from cismontane woodland and alkaline flats. Soils are mapped as Stockpen gravelly clay loam at the Otay Mesa site near Roll Reservoir. Possible Associates: *Dudleya edulis*, *Amblyopappus pusillus*, *Selaginella cinerascens*.

KNOWN SITES: In San Diego County a small colony is still extant on a south-facing slope on the north side of the Santa Margarita River east of the freeway. Here it is growing in an open sage scrub habitat. A large population of several thousand plants was found in the flat arid plain immediately northwest of Roll Reservoir on eastern Otay Mesa. Herbarium specimens were

examined from Pacific Beach, the Tijuana Hills, and the north side of San Miguel Mountain. It is reported from Kearney Mesa, Pacific Beach, the Silver Strand, San Diego, and Jacumba; most of these sites are likely no longer extant. Roberts reports this species for Orange County. Reported by Thomas from the hills south of the City of San Jose. Reported by Smith in the Santa Barbara region from the Santa Ynez Mountains to Jalama Beach; also on Santa Cruz and Santa Rosa islands. Reported by Hoover in San Luis Obispo County on sparsely vegetated clay soils around the City of San Luis Obispo, and east of Creston. Reported by Raven in the Santa Monica Mountains of Los Angeles County.

Fourteen specimens from Baja California are found at the herbarium of the San Diego Natural History Museum, south to 27° 32' North where collected by Moran at Cerro Azul (SD 92786)

STATUS: Rayless Ragwort is substantially declining in southern California. This inconspicuous annual has a relatively wide distribution, but is apparently quite uncommon to rare in any given region. It may not be able to compete well with invasive Eurasian grasses. All southern California populations should be protected. The Roll Reservoir site is almost devoid of perennials and has a very poorly developed soil; few annuals can compete with the Rayless Ragwort at this site. This species may be extraordinarily scarce and should be considered for increased levels of protection. The relatively wide range and paucity of reported sites indicates this species may be relictual in nature, and poorly adapted to changing climatic conditions. While this species looks somewhat similar to small forms of *Senecio vulgaris*, an introduced weed, the phyllaries are not conspicuously black-tipped, but rather green-tipped. In addition, the annual Rayless Ragwort has a distinctive, glossy, yellow-green hue -- particularly about the phyllaries.

GANDER'S RAGWORT [*Senecio ganderi* Barkley & Beauchamp]

- LISTING:** CNPS List 1B R-E-D Code 3-2-3
State/Fed. Status -- CR/ Species of Concern ASTERACEAE Apr.-May
Global Rank G2 State Rank S2.2
- DISTRIBUTION:** San Diego County, Riverside County
- HABITAT:** Chaparral understory, often beneath Chamise, is the preferred microhabitat of this very rare plant. Las Posas stony fine sandy loam is mapped for the Lawson and Sequan Peak sites; as well as the population well to the north near Magee Road. Possible Associates: *Calamagrostis koelerioides*, *Tetracoccus dioicus*, *Lotus grandiflorus*.
- KNOWN SITES:** This ragwort is a very localized endemic which is seen growing beneath chamise in a rich leaf litter on Lawson Peak. It is rare near the summit of Sequan Peak. A population was found in late spring 1991 north of Magee Road, immediately south of the Riverside County line; approximately 200 individual plants were seen growing in gabbroic soil beneath scrub oak, toyon, and chamise. The population appears to extend northward and downslope into Riverside County. This site is well north of all previously reported populations. CNDDDB reports are at the head of two adjacent canyons on a north-facing slope of Tecate Peak, along Rancho Heights Road 0.7 miles south of the Riverside County line, the northeastern slope of El Cajon Mountain, west of Magee Road above Trujillo Creek 2.5 miles east of Mount Olympus, Black Mountain/Lusardi extending along the ridge from north of the lookout, west of Black Mountain Lookout on an upper western slope along the truck trail, 1.2 mile southwest of Black Mountain Lookout along the truck trail, McGinty Mountain, the south side of Barber Mountain Road, and south of Barber Mountain Road at the north end of Barber Mountain. Another report is from Iron Mountain near the Methodist Christian camp.
- STATUS:** Gander's Ragwort populations are presently stable in San Diego County and Riverside County. All populations should be protected. Rarity of the plant is closely allied with its restriction to uncommon metavolcanic and gabbroic soil types. The comparatively large (4-8cm) and round-

cordate leaves with shallow teeth belonging to this herbaceous perennial are quite distinctive even when the plant is not in flower.

COVES' CASSIA [*Senna covesii* (Gray) Irwin & Barneby = *Cassia covesii* (Gray)]

- LISTING:** CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status -- None FABACEAE Apr.-Jun.
Global Rank G5? State Rank S2.2
- DISTRIBUTION:** San Diego County, Imperial County, Riverside County, San Bernardino County, Arizona; Baja California, Mexico
- HABITAT:** Sonoran Desert Scrub on washes and plains is the preferred habitat of Coves' Cassia. Locales where observed had relatively open, low-growing desert scrub cover; plants were unshaded and in full-day sun. Possible Associates: *Fouquieria splendens*, *Ambrosia dumosa*, *Lupinus arizonicus*.
- KNOWN SITES:** This showy herbaceous perennial grows at Box Canyon in Wagon Wash, and also on desert flatlands west of Ocotillo Wells. As the habitat does not appear unusual, it is difficult to account for the rarity of this species in San Diego County. One herbarium collection is from Mason Valley; others are from upper Blair Valley, Earthquake Valley, the extreme northeastern corner of the County, and in Box Canyon. An old report is from Sentenac Canyon. An old biological survey report comes from Mason Valley. Shreve and Wiggins report Coves' Cassia in southern Nevada, Arizona; and Sinaloa, Mexico. Herbarium specimens from Arizona include Congress Junction in Yavapai County, the Kofa Mountains in Yuma County, and Southeast of Growler Valley, at Rancho Bonito, and at Bates Fell in Pima County. Felger reports this species on Tiburon, San Esteban, and Datil Islands in the Gulf of California. It is also reported in Riverside County from Deep Canyon in the Coachella Valley, from the Chuckwalla Mountains west of Corn Springs, near Interstate 10 west of the Pinto Chiriaco Summit, near the Colorado River Aqueduct and the Eagle Mountains, Martinez Mountain, and in the vicinity of Big Horn Drive and Highway 74.

Twelve collections from Baja California are found in the San Diego Natural History Museum's herbarium; south to the southeast corner of the bay at Baja Concepcion where collected by Sanders (SD 125947).

- STATUS:** Coves' Cassia is rare, but its populations are presumed stable on the southern deserts where only limited potential habitat has been impacted. Quite a few plants from the Arizona deserts have managed to retain a slim foothold in the westernmost deserts of San Diego County. The rain shadow effect of the Peninsular Range has been worsening century by century as the mountains continue their uplift. There may also be a serious decline over the last ten thousand years in summer rainfall in Anza-Borrego; western Arizona now gets substantially more rain during the late summer and early fall than the western Colorado Desert. As less rain falls in Anza-Borrego, the acceptable growing conditions for some species undoubtedly decline. Cove's Cassia is a small sub-shrub that is densely white-hairy. There are 2-3 pairs of leaflets, and the large yellow petals (approximately 12mm) are prominently veined.

HAMMITT'S SIBAROPSIS [*Sibaropsis hammittii* Boyd & Ross]

- LISTING:** CNPS List 1B R-E-D Code 3-2-3
State/Fed. Status -- None BRASSICACEAE Mar.-Apr.
Global Rank G2 State Rank S2.2
- DISTRIBUTION:** San Diego County, Riverside County

HABITAT: Grows in mesic, grassy openings in chaparral on volcanic soils. Las Posas fine sandy loam is mapped for populations on both Poser Mountain and Viejas Mountain. Possible Associates: *Adenostoma fasciculatum*, *Acanthomintha ilicifolia*, *Nolina cismontana*.

KNOWN SITES: This small, showy annual with bright pink flowers was only recently discovered. It grows in distinctive balds or grassy openings on Poser Mountain (0.7 mile east of Red Oak Road and Viejas Grade on the north side of the road). It is reported from similar habitat on nearby Viejas Mountain (one mile NE of the intersection of Viejas Grade and Willow Road) in San Diego County. Its type locality is near Elsinore Peak in the San Mateo Wilderness Area of western Riverside County.

STATUS: Hammitt's *Sibaropsis* is only known from the three populations cited. Given its distinctive appearance and its 1990's discovery within the span of one year by three different botanists at three different, but rarely botanized locations; it must be presumed this species is extremely rare. Each site has similar microhabitat conditions, and this annual appears to have a very limited growing season. The lanky erect-growing plant is also relatively ephemeral with dried remnants quickly decomposing; perhaps accounting to some extent for the absence of prior collections. The sparsely distributed but showy pink flowers of *Sibaropsis* are reminiscent of small-petaled species of *Arabis*. It also somewhat resembles species of *Sibara*; hence the origin of its name. All populations should be fully protected. Recommended for Federally Endangered status. Hammitt's *Sibaropsis* is not closely related to other mustard species, and the few collections and separation of the Riverside County and San Diego County sites indicate this may be a relictual species which is close to natural extinction. Very restrictive microhabitat requirements and an inability to adapt to changing climatic conditions may be an important factor. Hammitt's *Sibaropsis* should be looked for at other locations where *Nolina cismontana* grows such as in the hills west of Pala.

NARROW-LEAVED NIGHTSHADE [*Solanum tenuilobatum* Parish]

LISTING: CNPS Unlisted R-E-D Code None
State/Fed. Status -- None SOLANACEAE Mar.-Apr.
Global Rank None State Rank None

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Open Chamise Chaparral or Diegan Coastal Sage Scrub is the typical habitat of the Narrow-leaved Nightshade. Oftentimes it occurs near broken surface rock on ridgelines; however, it also occurs well intermixed with sage scrub elements at xeric locales. Olivenhain cobbly loam is the soil type utilized at Lower Otay Lake and near Dillon Road. Possible Associates: *Eriogonum fasciculatum*, *Viguiera laciniata*, *Ferocactus viridescens*.

KNOWN SITES: Otay Mountain is a focus for populations of this species with scattered colonies found at low, medium, and higher elevations. Several dozen shrubs were noted at the periphery of grasslands on a large private inholding for Otay Mountain above the Minnewawa Campground; sizeable populations are uncommon due to the restricted rocky microhabitats preferred at these locales. Several hundred plants were found growing on the peak south of Donohoe Mountain constituting a major population. A few dozen were seen on a rocky ridge west of Donohoe Mountain. Small colonies grow adjacent to Montana Serena Truck Trail in Crest, west of Dillon Road on Otay Mesa, west of San Vicente Dam, by the Montiel Truck Trail near Lawson Valley, east of Roll Reservoir on Otay Mesa, in the Silverwood Wildlife Sanctuary, in the hills east of Isham Springs and Jamacha Road, along Proctor Valley Road near east H Street, and at the east end of Lower Otay Lake. Small populations occur on a rocky knoll on a south-facing slope of Dictionary Hill, at San Vicente Dam on the hills overlooking the dock, and near Deerhorn Valley Road in the chaparral. There are also old reports to the east from Potrero Grade on the flanks of Tecate Mountain, Barrett Dam, Lyons Valley, and Campo. Reports indicate extensive populations occur in the Jamul Mountains; a small population is reported

from Vista Sage Road in Jamul. Old biological survey reports note sites in Galloway Valley one mile southeast of the McClain Ranch, near Hidden Glen, on Mother Grundy Truck Trail, Mountain View Road northwest of Harbison Canyon, the Montiel Truck Trail south of Loveland Reservoir, Bullard Lane in Alpine, and at Hidden Glen. CNDDDB reports are for Woodwardia Canyon on Otay Mountain, five miles west of Campo, the north slope of Tecate Mountain, east of Proctor Valley Road in a side canyon at the north end of the valley, and four miles west of the junction of the Otay Mountain Truck Trail and the Marron Truck Trail on Otay Mountain; a CNDDDB report from 4.5 miles south of Oak Grove along Highway 79 is well northeast of the known range and needs to be confirmed.

Only two Baja specimens are found at the San Diego Herbarium; collected by Moran (SD 111178) one km southwest of Rancho de la Cruz at 31° 8' North. This apparent rarity in Baja California underscores the significance of San Diego County populations.

STATUS: Narrow-leaved Nightshade is slowly declining in San Diego County; primarily due to a variety of residential and industrial developments. The base of *Solanum tenuilobatum* leaves are only sometimes lobed -- more frequently the leaves are narrowly oblong, darkly colored, and quite distinct from the other, broader-leaved *Solanum* species found in this County. Some populations have been misidentified because obviously lobed leaves were not found on plants. The small populations which are typical for this species are being regularly accorded less significance than they merit, particularly given the species' present collection status in Baja California. Michael Nee's treatment of *Solanum* in the Jepson Manual (1993) places *S. tenuilobatum* in synonymy with *Solanum xanti*, but notes this species is part of a variable complex. Given the edaphic preference of *Solanum tenuilobatum* to metavolcanic derived soils, its geographic isolation from more typical hairier forms of *S. xanti*, and its distinctive leaf shape, a more detailed taxonomic analysis is needed. This seems to be a clear-cut and distinctive species. Provisionally, all substantial populations are recommended for protection; sizeable portions of smaller populations are recommended to be placed into biological open space.

SPERMOLEPIS [*Spermolepis echinata* (DC.) A.A. Heller]

- LISTING:** CNPS List 2 R-E-D Code 3-1-1
State/Fed. Status -- None APIACEAE March
Global Rank G5 State Rank S1.3
- DISTRIBUTION:** San Diego County; southeastern U.S.; northern Mexico
- HABITAT:** This small celery-like annual grows on rocky, desert terrain or on sandy flats. Possible Associates: *Mimulus bigelovii*, *Pectocarya* species, *Filago depressa*.
- KNOWN SITES:** Spermolepis was observed north of Plum Canyon in Anza-Borrego State Park growing at the foot of a rocky slope in relatively open, Sonoran Desert scrub. It is reported from south of Vallecitos Stage Station, as well as in lower Box Canyon near S-2.
- STATUS:** Spermolepis is presumed stable in its isolated desert environment. It may be more common than noted due to a short, early flowering season and its ephemeral nature. This species is of interest due to its disjunct and possibly relictual situation in San Diego County's deserts; all populations are recommended for protection. The leaves of this small annual are ternately dissected and somewhat glossy-green. The plant resembles a fleshier leaved version of *Apiastrum angustifolium*; however, *Spermolepis echinata* has alternate leaves, 2-24 rays not 2-3, and oblong-ovate not elliptic-cordate fruits.

BLUE STREAMWORT [*Stemodia durantifolia* (L.) Sw.]

- LISTING:** CNPS List 2 R-E-D Code 3-3-1
State/Fed. Status -- None SCROPHULARIACEAE Jan.-Dec.
Global Rank G5 State Rank S2.1?
- DISTRIBUTION:** San Diego County, Riverside County; Arizona; Texas; Sonora, Oaxaca, and Baja California, Mexico
- HABITAT:** This small perennial herb typically is found growing in wet sand along minor creeks and seasonal drainages. Possible Associates: *Epilobium ciliatum*, *Gnaphalium palustre*, *Veronica anagallis-aquatica*.
- KNOWN SITES:** Blue Streamwort was observed growing on the periphery of a drying streamcourse in steep and rugged terrain on Otay Mountain; as well as in a more extensive colony on the shallow, muddy, northern shoreline of Sweetwater Reservoir. Older herbarium specimens from the San Diego Natural History Museum are for Mission Dam, Otay Lake, and Witch Creek in San Diego County. Unpublished Riverside County reports by Sanders include older collections in the canyons near Palm Springs. He notes 16 herbarium records at the University of California at Riverside; all but one are from prior to 1943.

Seven voucher specimens from Baja California are found in the herbarium of the San Diego Natural History Museum; with several additional specimens from Sonora and Oaxaca.

- STATUS:** Blue Streamwort is apparently quite local and uncommon throughout its California range. Due to its apparent rarity, all southern California populations within relatively natural drainages should be considered for protection. Given its extensive historical range, this may be a relictual species which is only marginally maintaining a presence in southern California wetland circumstances. It may once have been much more widespread during a period of substantially greater annual rainfall and lush, perennial streams. This small herbaceous perennial has bluish to purplish, tubular flowers (7-10mm); with a 4-angled tube. The opposite, clasping, and serrated leaves are lanceolate, and not particularly distinctive. Blue Streamwort when not in flower can be overlooked, and may be under-reported.

LAGUNA MOUNTAINS JEWEL-FLOWER [*Streptanthus bernardinus* (Greene) Parish]

- LISTING:** CNPS 4 R-E-D Code 1-1-3
State/Fed. Status -- None BRASSICACEAE Jun.-Jul.
Global Rank G3 State Rank S3.3
- DISTRIBUTION:** San Diego County, Riverside County, and San
- HABITAT:** Lower Montane Coniferous Forest is the habitat of this inconspicuous annual. On Cuyamaca Peak it occurs in areas with partial shade or near seeps/springs on Boomer stony loams. All reports indicate populations occur in association with conifers. While typically in mesic situations, it can occupy drier embankments in granitic gravels and sand. Possible Associates: *Apocynum androsaemifolium*, *Pteridium aquilinum*, *Hulsea vestita*.
- KNOWN SITES:** A few plants are scattered in springy locales on Cuyamaca Peak in the Cuyamaca Mountains, including alongside the road to the summit. Apparently this species has a very limited distribution in San Diego County. On nearby Middle Peak a small colony was observed in a minor clearing among conifers. Old reports include North Peak and an area near the Laguna Lakes. CNDDDB reports for San Diego County include Escondido Ravine 0.7 mile southwest of Sunrise Highway near Mount Laguna; as well as nearby close to Escondido Ravine Road several hundred feet past the gate in the shade of conifers. CNDDDB reports for Riverside County are from a north-facing slope in Hall Canyon on the UC Riverside James Reserve, in the San Jacinto Mountains near a small stream 0.25 mile south of Dark Canyon Campground along Road 4S02; in San Bernardino County from Deer Lick Station at Running Springs, along

a streamside at Green Valley Road 0.25 mile from the junction with Highway 18, near Keller Peak Road in the San Bernardino Mountains, in the area of Green Valley Lake, as well as approximately 1.5 miles northeast of Running Springs and north of Green Valley Lake Road. It is reportedly locally common in this Green Valley area. CNPS reports of this species in Baja California cannot be verified.

STATUS: Laguna Mountains Jewel-flower is apparently stable within its limited montane range. However, it occurs in very low numbers in San Diego County, and may represent a relictual species from an era of substantially greater rainfall and more mesic conditions. The vegetation around its springs microhabitat on Cuyamaca Peak is often trampled by hikers investigating the source of the waters, and such activities could adversely impact this fragile annual. This species was recently de-listed due to the number of sub-populations found in Riverside and San Bernardino County. However, it is quite uncommon in San Diego County. Unlike *Streptanthus campestris*, this biennial species has light yellowish green petals (not rose to light purple). The fruits are strongly compressed rather than the cylindrical fruits found in the genus *Caulanthus*.

SOUTHERN JEWEL-FLOWER [*Streptanthus campestris* Wats.]

LISTING: CNPS List 1B R-E-D Code 2-1-2
Stat/Fed. Status -- None BRASSICACEAE May-Jul.
Global Rank G2 State Rank S2.3

DISTRIBUTION: San Diego County, Riverside County, San Bernardino County; Baja California, Mexico

HABITAT: This tall annual is found in Juniper Woodland or high desert transitional chaparral. Near Boulevard this species was found within large boulder fields in the partial shade of Western Junipers, while near Miller Valley it was noted in a more open Chamise Chaparral with Tollhouse rocky coarse sandy loam. Possible Associates: *Penstemon clevelandii*, *Phacelia affinis*, *Eucrypta micrantha*.

KNOWN SITES: Southern Jewel-flower is lightly distributed in chaparral west of Live Oak Springs and east of Miller Valley; as well as in rocks at Boulevard. It is reported from Oriflamme Canyon, Julian, and Whale Peak. Herbarium specimens are from Hauser Canyon Road near Campo Road, in the In-Koh-Pah Mountains, near Sunrise Highway, in Noble Canyon, and near Fred Canyon Road and Morris Ranch Road. A CNDDDB report is from Banner Grade. Several plants were observed in the chaparral near Santa Rosa Peak Road in Riverside County. It is reported at Pinyon Flats in the San Jacinto Mountains. Munz notes it in the San Bernardino Mountains and Little San Bernardino Mountains.

Twenty specimens from Baja California are found at the San Diego Natural History Museum's herbarium; south to 28° 43 minutes North where collected by Moran (SD 60705) on the north slope of Cerro de la Mina de San Juan.

STATUS: Given the limited development within its high desert habitat, Southern Jewel-flower is considered stable in the Peninsular Range. More field collection data is needed to more accurately determine the relative rarity of this species. Provisionally, all U.S. populations are recommended for protection. Transitional desert habitat once contained much more juniper woodland than present now. The decline of this vegetation type in the Peninsular Range due to changing climatic conditions may also have led to a decline in the populations of Southern Jewel-flower, and other species in this floristic association. Unlike *Streptanthus bernardinus*, this biennial species has rose to light purple petals (not light yellowish green). In addition, this species is relatively stout (6-15cm versus 3-6dm). The fruits are strongly compressed rather than the cylindrical fruits found in the genus *Caulanthus*.

OIL NESTSTRAW [*Stylocline citroleum* Morefield]

- LISTING:** CNPS List 1B R-E-D Code 3-3-3
Stat/Fed. Status -- / Species of Concern ASTERACEAE April
Global Rank G1 State Rank S1.1
- DISTRIBUTION:** San Diego County, Kern County
- HABITAT:** This annual is reported from coastal scrub and clay soils in the vicinity of oilfields. Possible Associates: More information needed.
- KNOWN SITES:** Oil Neststraw is reported from the San Joaquin Valley in Kern County, with only one collection since 1935.
- STATUS:** Given the paucity of collected specimens, all populations of this small annual should be protected. A reported 1883 specimen identified from the City of San Diego may represent a variant of *Stylocline gnaphaloides* which shares similarities with the Kern species. Similar oilfield habitat is largely absent in San Diego County and the substantial disjunction is suspect. Nevertheless, unusual specimens of *Stylocline* should be closely examined under a microscope for comparison with the published description by Morefield. Unlike *S. gnaphaloides*, this species has a wing of each chaff scale elliptic to obovate and not ovate; base acute not round or cordate, disk ovary 0.2-0.6mm not 0-0.2mm; pappus bristles generally 6-12 not 1-5, and receptacle club-shaped not cylindrical.

MOREFIELD'S NESTSTRAW [*Stylocline intertexta* Morefield]

- LISTING:** CNPS Unlisted R-E-D -- None
Stat/Fed. Status -- None ASTERACEAE March-May
Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Imperial County, Riverside County, Inyo County, Riverside County, San Bernardino County; Arizona; Nevada; Utah
- HABITAT:** This annual was observed growing on low, rocky hills just west of the San Diego County line near Ocotillo Wells in an area of hard packed sand and abundant but broken granitic rock fragments. Possible Associates: *Fouquieria splendens*, *Opuntia* species, *Chorizanthe brevicornu*.
- KNOWN SITES:** A small population was observed near Ocotillo Wells. A herbarium specimen was examined from Vallecito Stage Station. Another specimen was seen from Daggett in San Bernardino County. The original description by Morefield (Madrono, Volume 39, Number 2) lists one herbarium specimen re-annotated from Imperial County, twenty-three from Inyo County, seven from Riverside County, twenty-one from San Bernardino County; ten from Nevada and Lincoln counties in Nevada; two from Washington County in Utah; and six from Maricopa and Yuma counties in Arizona. Also mentioned is another San Diego County specimen not seen, Jepson 8569, which is deposited in the herbarium now named after him.
- STATUS:** Morefield's Neststraw may be substantially more common than collections indicate, as this tiny annual is inconspicuous. Given the paucity of collected specimens in San Diego County, substantial portions of all populations of this small annual in this region are provisionally recommended for protection. Other similar looking neststraw species occur on the Colorado Desert, and any unusual specimens of *Stylocline* should be closely examined under a microscope for comparison with the published description by James Morefield in the Jepson Manual. The uppermost leaves of Morefield's Neststraw are 4-11mm in length versus 11-18mm in *Stylocline micropoides*. The flowering heads are larger (5-6mm versus 1.5-4mm) than on *Stylocline psilocarphoides* and *Stylocline masonii*.

ESTUARY SEABLITE [*Suaeda esteroa* Ferren & Whitmore]

- LISTING:** CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- None CHENOPODIACEAE Jul.-Oct.
Global Rank G4 State Rank S3.2
- DISTRIBUTION:** San Diego County, Ventura County, Orange County, Los Angeles County, Santa Barbara County; Baja California, Mexico.
- HABITAT:** The periphery of Coastal Salt Marsh is the habitat of this fleshy shrub. Soils at such locales are usually mapped as Tidal Flats. Oftentimes, only a narrow band of terrain on the very periphery of the salt marsh is utilized by the Estuary Suaeda. Possible Associates: *Salicornia subterminalis*, *Frankenia salina*, *Distichlis spicata*.
- KNOWN SITES:** This species is found around the vestigial salt marshes of San Diego Bay, such as at the edge of the South Levee Road of the E Street Marsh in Chula Vista; as well as on both sides of Lagoon Drive near San Diego Bay. It also occurs within the Federal Wildlife Refuge at Imperial Beach east of Seacoast Drive; as well as along the slough north of 10th Street on San Diego Bay. Limited numbers occur at Famosa Slough near the San Diego River and at the Northern Wildlife Preserve in Mission Bay. A few plants grow at San Dieguito Lagoon south of Jimmy Durante Boulevard. It is occasional on Back Bay at Newport Beach in Orange County, and along the sea cliffs at San Clemente. Estuary Seablite is also reported by Roberts in Orange County at Anaheim Bay and Bolsa Chica Salt Marsh. Other reported sites are at the Goleta Slough in Santa Barbara County; Mugu Lagoon in Ventura County; San Pedro Bay, Long Beach, and San Pedro in Los Angeles County; Balboa Bay, Seal Beach, and Surfside in Orange County.

This plant has an extensive range into Baja California Sur as far south as Bahia Almejas; however, it is limited to estuarine habitats which are uncommon on the peninsula. It is also recorded at Bahia de los Angeles on the Gulf of California. Taxonomic revisions of *Suaeda* populations in Baja California could lead to the descriptions of several new species and revise the Baja attributions to Estuary Seablite.

- STATUS:** Estuary Seablite is substantially declining in coastal southern California. Since it typically grows on the periphery of salt marshes, it is often imperiled by high recreational use or "creeping" development which tends to build up to the very edges of the marsh, leaving no buffer. One large population in an isolated marsh north of H Street on the bayfront in Chula Vista was recently disked in Year 2000, ostensibly because a tractor driver could not distinguish between marshlands and weedy uplands. All substantial populations should be protected; sizeable portions of smaller populations should be placed into biological open space. Despite reports of *Suaeda moquinii* in San Diego Bay, there do not appear to be any extant populations; these reports may have preceded the taxonomic publication of the similar *Suaeda esteroa*. Estuary Seablite has slightly flattened upper leaves and these leaves are quite glabrous. It can vary subtly in appearance depending upon its situation in the marsh; some plants have very reddish-purple stems while others will be quite greenish. In addition, the growth habit of the plant can vary. Woolly Seablite (*Suaeda taxifolia*) can grow nearby; however, this species usually has terete leaves with very tiny hairs. Estuary Seablite appears to generally grow at higher elevations in the marsh than Woolly Seablite. In addition, Estuary Seablite has sigmas glabrous (versus pubescent in *S. taxifolia*), no ring below the stigma (versus a fleshy ring), reddish brown seeds (versus black), typically 3-5 flowers per axil (versus 3-9 per axil), leaves reduced in flower (versus not much reduced), a primarily single-stemmed habit (versus multi-stemmed), and in *Suaeda taxifolia* the stems have a knobby bases to the deciduous leaves. *Suaeda moquinii* from the interior has 1-3 flowers per axil and superficially looks closer to *S. esteroa*.

WOOLLY SEABLITE [*Suaeda taxifolia* (Standley) Standley]

- LISTING:** CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- None CHENOPODIACEAE Jan.-Dec.
Global Rank G3? State Rank S2S3
- DISTRIBUTION:** San Diego County, Orange County, Los Angeles County, Ventura County, Santa Barbara County, Anacapa Island, Santa Barbara Island, San Clemente Island, Santa Cruz Island, Santa Catalina Island, San Nicolas Island, Santa Rosa Island; Baja California, Mexico
- HABITAT:** This herbaceous perennial is usually restricted to Coastal Salt Marsh; rarely it grows in peripheral scrublands adjacent to salt marshes or as isolated plants along beaches. Possible Associates: *Salicornia virginica*, *Batis maritima*, *Jaumea carnosa*.
- KNOWN SITES:** This species is locally common in the vestigial salt marsh habitat still present along the southern California Coast. In San Diego County it occurs at Border Field State Park northward into the salt marsh sloughs at Imperial Beach, at the south end of San Diego Bay, the Northern Wildlife Preserve in Mission Bay, San Dieguito Lagoon, Batiquitos Lagoon, San Elijo Lagoon, Agua Hedionda Lagoon, the mouth of the Santa Margarita River, and at Las Flores Lagoon. Herbarium specimens were examined from the Silver Strand, Slaughterhouse Slough in National City, San Marcos Creek Slough, Point Loma, Cardiff, and the National City Salt Works. In Orange County it grows in Newport Back Bay; a few plants were observed near Dana Point, and along the sea cliffs at San Clemente State Beach. Smith reports this species about the tidal marsh at Goleta near Santa Barbara, as well as on all the Channel Islands. Raven reports Woolly Sea-blite as occasional in salt marshes and along beaches in Los Angeles County north of Santa Monica. Reported by Ross for San Clemente Island. Additional herbarium specimens were examined from Huntington Beach in Orange County, near the Santa Barbara and Ventura County line, all of the Channel Islands, near the Santa Barbara/Ventura county line, and near Guadalupe in Santa Barbara County.
- Twenty-eight specimens from Baja California were seen at the herbarium of the San Diego Natural History Museum, south to 25° 48' North where collected by Moran on Danzanita Island (SD 66505).
- STATUS:** Populations of Woolly Seablite are stable; it likely grows at a number of smaller creek mouths (not mentioned above) that empty into the Pacific Ocean, and is still a regular component of most larger stands of coastal salt marsh habitat. No specific recommendations are made for protection of specific populations, continued protection of salt marsh habitat should enable this species to sustain its current numbers despite several decades of substantial losses of such habitat to urban impacts. Woolly Seablite may have been much more common in southern California prior to intensive development pressures removed extensive blocks of coastal salt marsh. *Suaeda taxifolia* has hairs on the leaves unlike *Suaeda esteroa*, and generally grows at higher elevations in the salt marsh.

PARRY'S TETRACOCCLUS [*Tetracoccus dioicus* Parry]

- LISTING:** CNPS List 1B R-E-D Code 3-2-2
State/Fed. Status -- / Species of Concern EUPHORBIACEAE Apr.-May
Global Rank G3 State Rank S2.2
- DISTRIBUTION:** San Diego County, Riverside County; Baja California, Mexico
- HABITAT:** A low-growing Chamise Chaparral, with moderately dense canopy cover, is the typical habitat of this robust shrub. Usually conditions are quite xeric with only limited annual growth. This species shows a preference for Las Posas soils. Possible Associates: *Nolina cismontana*, *Senecio ganderi*, *Adenostoma fasciculatum*.

KNOWN SITES: Parry's *Tetracoccus* is rare in the southern portions of San Diego County such as on McGinty Peak. It is occasional on the slopes and hillsides west of Dehesa School, and on the dry, open slopes of Sequan Peak. A small population is found near Huntley Road south of Rainbow. Hundreds were seen growing in an extensive population north of Magee Road near the Riverside County line in open, chamise dominated chaparral. A substantial colony grows in taller chaparral south of Klondike Creek along Wildcat Canyon Road. Several scattered colonies occur in the San Marcos Hills west of Twin Oaks Valley Road. A large population occurs in the hills north of Gregory Canyon and Highway 76, west of Pala. Old reports are from the Agua Tibia Mountains, Monserate Mountain, De Luz, and Tecate Junction. Old biological survey reports note sites east of Spangler Peak in San Vicente Valley, near Vista Romero Road in San Vicente Valley, west of Trujillo Creek and southwest of the Magee Truck Trail near the peak, on The Mesa southeast of the Singing Hills Country Club and west of Sloane Canyon, northeast of Red Mountain and Rainbow Creek, near Rainbow Glen Road on the west side of Rainbow Creek and Highway 163, near Rainbow Crest Road in Rainbow, northwest of Gold Circle Drive in the Merriam Mountains, and on Mount Olympus. CNDDDB reports for San Diego County are from Sequan Peak, Skyline Road about Lyons Valley, Jacumba, Barona Valley, near Pala between the Harguemayo and McGee Ranches, Red Mountain Grade on Highway 395 near Fallbrook, north of Rainbow Creek at the end of Hill Haven Drive, 1 mile south of Mount Olympus, 0.9 mile south southwest of Mount Olympus, and near Lone Palm Spring on the road to De Luz. Reported by the CNDDDB for Orange County east of the Lower San Juan Picnic Area in San Juan Canyon in the Santa Ana Mountains.

Six voucher specimens are found at the herbarium of the San Diego Natural History Museum for Baja California; south to 31° 23' North where collected by Moran (SD 91545), two miles southeast of Santa Cruz.

STATUS: Parry's *Tetracoccus* is slowly declining. It is particularly susceptible to orchard expansion in the Pala Mesa region where clearance of chaparral for avocados and citrus has not historically required biological surveys to determine potential impacts to sensitive shrubs. All substantial populations should be protected; substantial portions of smaller populations should be placed into protected, biological open space. This shrub is restricted to uncommon gabbro derived soils, and was not until quite recently under substantial urban development pressure. However, during the last five years a number of residential construction projects (e.g., the San Marcos Hills) have heavily impacted sizeable populations. *Tetracoccus dioicus* has relatively large pumpkin shaped fruit capsules (7-9mm wide) typical of the Spurge Family. The leaves and general shrubby appearance of Parry's *Tetracoccus* look somewhat similar to *Cneoridium dumosum* in the Rue Family. However, upon close examination of that species the leaves are gland-dotted; and the fruits, if present, are like tiny oranges.

VELVETY FALSE LUPINE [*Thermopsis californica* Wats. var. *semota* (Jeps.) Chen & Turner]

LISTING: CNPS List 1B R-E-D Code 2-2-3
 State/Fed. Status -- / Species of Concern FABACEAE Mar.-Jun.
 Global Rank G4T2Q State Rank S2.1

DISTRIBUTION: San Diego County

HABITAT: Lower Montane Coniferous Forest and Montane Meadows are sometimes frequented by this stout perennial herb. Around Cuyamaca Lake, it is found on Boomer stony loams, usually in exposed situations which are vernal moist. Possible Associates: *Pinus jeffreyi*, *Elymus elymoides*, *Eriogonum wrightii*.

KNOWN SITES: This San Diego County endemic is locally common in wet, open meadows around Cuyamaca Lake; as well as near Pine Creek Road and the Laguna Meadows. Old reports are from Pine Hills, and Wynola. An old biological survey report notes a site north of Julian along Farmer

Road. CNDDDB reports are from Laguna Meadow on the east side of Water-in-the-Woods Lake, southwest of Wooded Hill near Verde Ravine, south of a horse meadow near Thing Valley Road, the El Centro Ravine near Los Juecos Road and the Sunrise Highway, both sides of Sunrise Highway just west of the junction with Filaree Flat Road, near Filaree Flat Road 0.75 mile southwest of the Sunrise Highway, near Flathead Flats on the east side of Sunrise Highway, the southwest corner of the junction of Sunrise Highway and the road into the Laguna Campground, 0.5 mile west of Big Laguna Lake and 0.25 mile northwest of Water-in-the-Woods Lake, southwest of Los Juecos Road and 0.1 mile northwest of the Boiling Springs Pump, at the northeast edge of Big Laguna Lake, near Sunrise Highway northeast of Garnet Peak, at the Al-Bahr Shrine Camp near Mount Laguna, the east side of Black Mountain (i.e., Lusardi) Truck Trail near Simpson's Ranch, along Highway 78 near Julian, the northwest facing slope of North Peak, north of Cuyamaca Dam along Highway 79 and Engineers Road, Middle Peak along the Middle Peak Loop Fire Trail, south of Lake Cuyamaca near Stonewall Mine, 0.3-0.8 mile northeast of Little Stonewall Peak along Little Stonewall Creek, near Camp Hual-Cu-Cuish close to Cuyamaca Lake, Fern Flat about 0.1 mile south of Lookout Road and 0.1 mile north of Fern Flat Road, East Mesa about 0.8 mile northeast of Dyer Spring and 0.3 mile north of East Mesa Fire Road, the east side of Highway 79 near the Sweetwater River and about 0.6 mile northwest of Green River Falls, West Mesa about 0.7 mile east of Japacha Peak, West Mesa about 0.3 mile due east of Japacha Peak, and West Mesa 0.5 mile south and slightly east of Japacha Peak. An old report is from the vicinity of Corte Madera.

STATUS: Velvety False Lupine is slowly declining in San Diego County. It is being impacted by increasing recreational use of Cuyamaca Lake, and overuse of the Laguna Meadows by humans and cattle. Given its extremely limited range, all substantial populations are recommended for protection. This species appears to be a relictual component of a Pleistocene assemblage of plants that was likely more widespread in the mountains and foothills of San Diego County prior to significant climatic changes occurring during the last ten thousand years. A number of the rarest County plants appear to be acclimated to optimal environmental conditions that may not have been common for from 10,000 to 100,000 years. Even during the cooler and wetter Pleistocene period there were supposedly extensive periods of warming and dry weather. Under these varying conditions, plant populations may have been geographically much more mobile than generally presumed; trying to optimize their success. Current ranges and population sizes represent only one moment on this vast time continuum. Velvety False Lupine is a relatively distinctive herbaceous perennial. The plant is densely canescent and the large pea-like flowers are yellow.

MINT-LEAVED VERVAIN [*Verbena menthifolia* Benth.]

LISTING: CNPS Unlisted R-E-D Code None
 Stat/Fed. Status -- None VERBENACEAE Apr.-Jun.
 Global Rank None State Rank None

DISTRIBUTION: San Diego County, Los Angeles County, Riverside County; Arizona; Texas; Baja California, Mexico

HABITAT: This herbaceous perennial grows in open areas with sage scrub. It is occasionally seen with facultative wetland weeds in somewhat disturbed drainages. Possible Associates: *Ambrosia psilostachya*, *Sambucus caerulea*, *Cordylanthus orcuttianus*.

KNOWN SITES: Mint-leaved Vervain can occur in mildly disturbed drainages such as near Greg Rogers Park in eastern Chula Vista. A few plants were seen near the bicycle racing track in Balboa Park; as well as in a canyon drainage east of Bonita Drive in Encinitas. A small population was observed in the drainage east of Roll Reservoir on Otay Mesa; another small population was found along a substantial drainage in the Lynwood Hills of eastern Chula Vista near the Rice Aqueduct and well west of Paseo Ladera. It is reported east of Woodman Drive near a drainage in Paradise Hills in southern San Diego. A larger population occurs in the Otay River

east of the Otay Valley Road Bridge. Herbarium specimens examined were from National City Ranch, Adobe Falls near San Diego State University, Murphy Canyon, Sweetwater Valley, Pauma Valley, the north end of Point Loma, two miles east of San Ysidro, as well as Nate Harrison Grade on Palomar Mountain (presumed to be at a lower elevation). Herbarium specimens were also seen from Arizona including the Olberg Spillway on the Gila River, the lower Yaqui River, and east of Casa Blanca.

Thirteen specimens are found at the herbarium of the San Diego Natural History Museum for Baja California; south to 30° 32' North where collected by Moran (SD 91272), three miles northeast of San Quentin.

STATUS: This biennial species is severely declining in San Diego County with development occurring throughout most of the range where it has been historically collected. All substantial populations of more than a handful of plants are considered significant as most recent sightings are of just a few plants at widely scattered locales. Significant portions of all larger County populations should be protected. The microhabitat where this herb has been found in San Diego County is not particularly uncommon, and it is difficult to account for its present rarity in the region. If it is an inhabitant of coastal floodplain periphery, these areas were heavily impacted from the earliest years of the Mission period. The Otay River Valley population is threatened by tamarisk removal plans which might not include transplantation or maintenance of this species in situ. Mint-leaved Vervain should be given significant CNPS status. Its decline appears to be closely associated with human associated impacts along the immediate coast. The herbage on *Verbena menthifolia* is sparsely strigose, while on the much more common *Verbena lasiostachys* it is soft-spreading hairy. In addition, the cauline leaves on the former are typically much narrower and less substantial. *Verbena scabra* has unlobed cauline leaves, while *Verbena bracteata* is a substantially smaller plant when in flower (8-30cm versus 30-75cm).

SAN DIEGO COUNTY VIGUIERA [*Viguiera laciniata* Gray in Torr.]

- LISTING:** CNPS List 4 R-E-D Code 1-2-1
State/Fed. Status -- None ASTERACEAE Feb.-Jun.
Global Rank G4 State Rank S3.2
- DISTRIBUTION:** San Diego County, Orange County, Baja California, Mexico
- HABITAT:** An arid Diegan Coastal Sage Scrub is typically the preferred habitat of this species. Generally the shrub cover is more open than at mesic, coastal locales supporting sage scrub. This species occurs on a variety of soil types. Olivenhain cobbly loam is mapped for the large populations of *Viguiera* at Lower Otay Lake and Sweetwater Lake; Las Posas fine sandy loam and Cienega very rocky coarse sandy loam are utilized at some sites further inland such as near Sequan Indian Reservation. Possible Associates: *Selaginella cinerascens*, *Ferocactus viridescens*, *Artemisia californica*.
- KNOWN SITES:** This is a dominant shrub in southern San Diego County in Diegan Coastal Sage Scrub habitat away from the immediate coast. It is very common in areas of the Jamul Mountains, and found by the thousands east of Upper Otay Lake and along the north shore of Lower Otay Lake. It is also abundant near Jamul Butte, Dehesa, Donohoe Mountain, at the south end of Dillon Road on Otay Mesa, in the hills east of Isham Springs and Jamacha Road, as well as near the Sequan Indian Reservation and Sloane Canyon. San Diego *Viguiera* is occasional northeast of Magnolia Avenue in Santee, in Murphy Canyon north of Clairemont Mesa Boulevard, at Tim Street in Bonita, by Lynndale Lane east of Interstate 805 in Chula Vista, around Lake Murray such as near Navajo Road, at Hidden Mountain Drive near El Cajon, on the north-facing slopes overlooking the Otay River near Bayer Boulevard, at the terminus of Halifax Street in the Mission Gorge area, off Valley View Truck Trail in El Cajon, near Serena Road in the Eucalyptus Hills area, by Farrell Lane in Crest, by Fuerte Valley Road in the Calavo Gardens area, near Ivanho Street on Dictionary Hill, off Vista de Chaparros Drive in Jamul, near

Chester Grade Road in La Mesa, between Imperial Avenue and 59th Street in Encanto, in Johnson Canyon on northeastern Otay Mesa, and in La Zanja Canyon near Rancho Santa Fe. It is rare north of Highway 78 and progressively more common as one travels south. It is found in open sage scrub in Military Sector Charlie on Camp Pendleton overlooking San Mateo Creek, its northernmost known locale. Old reports include east to Potrero, at Tecate, and near Barrett. Well inland it becomes uncommon north of Poway. Reported for Orange County near the Anaheim Hills Golf Course, where questionably native.

Forty-two collections are found at the San Diego Natural History Museum's herbarium from Baja California; south to 28° 6' North; where collected by Moran (SD 65229) approximately 5.5 miles southwest of Rancho el Canon. It is common immediately south of San Diego County into Baja California. At many locales it is the dominant shrub, such as at Baja Del Mar.

STATUS: San Diego County *Viguiera* is declining but still found at many hundreds of locales where sometimes it is a dominant shrub. This species shows some ability to colonize areas of mild disturbance and is readily grown from seed. It may be a pest species if introduced elsewhere in California. This shrub is recommended for de-listing by the CNPS; it is much too common and wide-ranging in San Diego County to warrant such a listing status. This shrub has a varnish like resin throughout and the upper surface of the dark green leaves is deeply fissured. The large sunflower-like flowers are present for extended periods.

CAMP PENDLETON VIGUIERA [*Viguiera purissima*]

LISTING: CNPS Unlisted R-E-D Code None
 State/Fed. Status -- None ASTERACEAE Feb.-June
 Global Rank None State Rank None

DISTRIBUTION: San Diego County; Baja California, Mexico

HABITAT: Diegan Coastal Sage Scrub and Southern Mixed Chaparral. Possible Associates: *Artemisia californica*.

KNOWN SITES: Reported growing in a single extended population of several thousand plants in a spur of San Mateo Canyon on Camp Joseph Pendleton near the Orange County line.

STATUS: This unusual disjunct population of a more common Baja California shrub is isolated on a military base where the lone population is primarily threatened by repeated fires associated with Base artillery activities. Given its location near Camp Pendleton's northern boundary, it is less likely to be utilized for military maneuvers. This population in northern San Diego County represents a substantial disjunction from its closest known populations in Baja California. It is difficult to account for such a leap without intervening populations. A number of hypothetical circumstances may be considered. This species may have been a rare natural introduction based on avian transport, it could have been introduced by indigenous peoples in the region, or it could be relictual in nature and representative of a once more commonly distributed species. The last mentioned seems difficult to support given the unremarkable location where it persists. One would expect some distinct soil type or microhabitat to support an otherwise long extirpated species.

GOLDEN VIOLET [*Viola aurea* Kellogg]

LISTING: CNPS List 2 R-E-D Code 2-2-1
 State/Fed. Status -- None VIOLACEAE Apr.-Jun.
 Global Rank G3G4 State Rank S2S3

DISTRIBUTION: San Diego County, San Bernardino County, Kern County, Mono County; Nevada

- HABITAT:** This small, perennial herb is reported to grow in Great Basin Scrub and Pinyon/Juniper Woodland on sandy slopes. Possible Associates: More information needed.
- KNOWN SITES:** In San Diego County a few plants keying roughly to this species based on leaf morphology were observed in arid, sandy openings at the edge of coniferous forest in Palomar State Park. These plants with deeply and regularly toothed leaves may represent forms of the wide-ranging and variable *Viola purpurea*. Reported by Twisselmann as rare on the eastern slope of the Tehachapi Mountains southwest to Mount Pinos; also an isolated population one mile north of the McKittrick Highway along the summit of the Temblor Range. Golden Violet is also reported from Cajon Pass in San Bernardino County.
- STATUS:** More information on this species is needed; present status is unknown for southern California. Additional taxonomic work is recommended to more adequately differentiate this species from other related violets which may grow within its reputed range.

CALIFORNIA FAN PALM [*Washingtonia filifera* (Lindl.) Wendl.]

- LISTING:** CNPS Unlisted R-E-D Code - None
 State/Fed. Status -- None ARECACEAE June
 Global Rank None State Rank None
- DISTRIBUTION:** San Diego County, Riverside County, San Bernardino County, Inyo County, Imperial County; Arizona; Nevada; Baja California, Mexico
- HABITAT:** Desert Riparian washes are preferred by the California Fan Palm. The larger canyons can often focus substantial rainfall runoff into the palm oases. Mature trees live to approximately 150 years. This palm is a phreatophyte whose roots seek the water table. Seeds are reportedly disseminated primarily by coyote. The seeds of this palm pass through the digestive tract of coyotes (and foxes) removing the pericarp of the seed and allowing for a much higher germination rate. Apparently the seeds are subsequently dispersed by these mammals at locations potentially well away from their origin. The tree itself is insect or self-pollinated. Up to 10,000 fruits can occur on a single palm tree, but fruiting does not occur on each tree each year. Seedlings show a preference for moist mineral soils and partial shade. Possible Associates: *Bebbia juncea*, *Salix exigua*, *Justicia californica*.
- KNOWN SITES:** This is the infrequent palm of canyons along the western border of the Colorado Desert. Groves occur at Borrego Palm Canyon, Myers Creek, Mountain Springs, Palm Spring, Indian Gorge, Bow Willow Canyon, and Carrizo Gorge. It is also reported from a number of other similar oases in the desert. Colonies of trees such as at Biskra Palms and Macomber Palms in the Indio Hills of Riverside County sometimes grow perched on hillside seeps. Dedecker reports this palm as introduced at springs in Death Valley. Reported by Shreve and Wiggins in Whitewater Creek in Riverside County, and in small canyons of the Kofa Mountains in Yuma County, Arizona.
- This palm is lightly collected in Baja California, perhaps owing to the large fronds and floral parts necessary to provide a valid specimen; hence true abundance is difficult to assess. One specimen at the San Diego Natural History Museum was collected by Gander (SD 16488) at Gaskill's Tank on the eastern slope of the Sierra Juarez. It is reported growing at Valle de las Palmas southwest of Tecate, Mexico in a "coastal" canyon. Reported on the eastern slopes of the desert mountains of Baja California south to near Bahia de los Angeles.
- STATUS:** The California Fan Palm population is relatively stable in the desert foothill oases of San Diego County. Occasionally, some trees are lost during flash floods or killed when their fan "skirts" are burned by vandals. All native stands devoid of substantial historical impacts are recommended for protection. The desert palms in San Diego County and areas to the north are often found at fault zones where limited water resources are concentrated in shaded canyon

locations along seasonal creeks. A dearth of such habitat appears to be the primary reason for its present rarity.

ORCUTT'S WOODY-ASTER [*Xylorhiza orcuttii* (Vasey & Rose) Greene]

LISTING: CNPS List 1B R-E-D Code 2-2-2
State/Fed. Status -- / Species of Concern ASTERACEAE Mar.-Apr.
Global Rank G3 State Rank S2.2

DISTRIBUTION: San Diego County, Imperial County, Riverside County; Baja California, Mexico

HABITAT: Sonoran Desert Scrub in rocky canyons and sandy washes is the habitat of this lanky, herbaceous shrub. Observed locales were relatively devoid of substantial shrub cover. Possible Associates: *Chaenactis carphoclinia*, *Fouquieria splendens*, *Larrea divericata*.

KNOWN SITES: This striking perennial species is found along the Salton Seaway in the mud hills east of Palo Verde Canyon Wash near the eastern boundary of the County, and occurs at scattered locales in Canyon Sin Nombre. Herbarium specimens examined are from Font's Point, Carrizo Station, Benson's Dry Lake, Borrego Springs, Split Mountain, Vallecitos, Banner Grade, Arroyo Tapiado, and the Borrego Salton Seaway. Old reports are from Short Wash and at Benson's Dry Lake. One old biological survey notes a site north of Box Canyon near Mecca Hills Park in Riverside County. CNDDDB reports for Imperial County are from the south fork of Arroyo Salada, between Arroyo Salada and Tule Wash, 2 miles east of Carrizo Stage Station, near Basin Wash Road and into Tule Wash, Bank Wash about 1 mile northeast of Squaw Peak, in Red Rock Canyon, and the Carrizo Impact Area 0.5 mile northeast of Old Carrizo Stage Station; from San Diego County 0.5 mile northeast of Squaw Peak, San Felipe Creek 1.25 miles southeast of Squaw Peak, east of Bank Wash, Palo Verde Wash in Ocotillo Wells State Vehicular Recreational Area, near Ocotillo Wells, Fish Creek Wash Road 2.3 miles southwest of the paved portion of Split Mountain Road, the north fork of Fish Creek Wash from 4.2 miles west of the Lycium Creek Wash turnoff to the end of the north fork, 0.5 mile east of Font's Point Wash, Coachwhip Canyon in the Santa Rosa Mountains, Truckhaven Trail near Seventeen Palms, Arroyo Seco Del Diablo 0.2 mile northwest of Fish Creek Turnoff, Arroyo Tapiado 0.5 mile south of the road crossing to Arroyo Seco Del Diablo, Loop Wash and Fish Creek Wash to 2.7 miles up Sandstone Canyon, 1.3 miles west of Mesquite Oasis in the Carrizo Badlands, and Arroyo Tapiado about 2 miles north of Vallecito Creek.

Orcutt's Woody Aster is reported by Wiggins along the northern desert slopes of the Sierra Juarez.

STATUS: Orcutt's Woody Aster populations are presumed stable on the southern deserts; a number of the known populations lie within Anza-Borrego State Park boundaries and are well protected. It is difficult to account for the relative rarity of this shrub; field work is necessary to further define its precise ecological requirements. All populations are recommended for protection. The leaves (2-6cm) on Orcutt's Woody Aster are shallowly spiny. This shrub can reach 1.5 meters in height and has sizeable flowering heads with large (1.2-3.2cm), numerous (25-40), light blue ray flowers.

NOTES: *Hesperex caulescens*: Several annual plants roughly corresponding to this species were observed circa 1980 at the edge of a vernal pool on Otay Mesa in an area subsequently developed. This species is on CNPS List 4, R-E-D Code 1-2-3, Global Rank G3, State Rank S3.2.

Lycium brevipes var. *hassei*: A shrub with the long calyx lobes ascribed to this variety was observed and photographed in flower near Palo Street in Bonita growing on a mildly disturbed sage scrub hillside. It may have been introduced or native. This species is CNPS List 1B, R-E-D Code 3-3-3, Global Rank G4T1, State Rank S1.1.

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APPENDIX 1. PLANT SENSITIVITY GUIDELINES

Listings by USFWS and CDFG carry regulatory authority, while other listings herein are generally advisory in nature and serve to monitor and inform.

Federally and State Listed Categories

FE	Federal Endangered Species	Listed as Endangered by the federal government under the Endangered Species Act of 1973. Taxa that are in danger of becoming extinct throughout all or a significant portion of their range.
FT	Federal Threatened Species	Listed as Threatened by the federal government under the Endangered Species Act of 1973. Taxa which are likely to become Endangered in the foreseeable future in the absence of special protection
CE	California Endangered Species	A native California taxa which is in serious danger of becoming extinct throughout all or a significant portion of its range (Fish & Game Code 2062).
CT	California Threatened Species	A native California taxa which, although not presently threatened with extinction, is likely to become an Endangered species in the foreseeable future in the absence of special protection and management efforts (Fish & Game Code 2067).

California Native Plant Society R-E-D Code

R (Rarity)

- 1 Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
- 2 Occurrence confined to several populations or to one extended population.
- 3 Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

E (Endangerment)

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

D (Distribution)

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

List 1A: Plants presumed extinct in California.

List 1B: Plants rare, threatened or endangered in California and elsewhere.

List 2: Plants rare or endangered in California, but more common elsewhere.

List 3: Plants about which more information is needed.

List 4: Plants of limited distribution.

Global Ranking

Species or Natural Community Level

G1 = Less than 6 viable element occurrences (EO) OR less than 1000 individuals OR less than 2000 acres.

G2 = 6-20 EOs OR 1000-3000 individuals OR 2000-10000 acres.

G3 = 21-100 EOs OR 3000-10000 individuals OR 10000-50000 acres.

G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern (i.e., there is some threat, or somewhat narrow habitat).

G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world

Subspecies Level

Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species; whereas, the T-rank reflects the global situation of just the subspecies.

State Ranking

S1 = Less than 6 EOs OR less than 100 individuals OR less than 2000 acres

S1.1 = very threatened

S1.2 = threatened

S1.3 = no current threats known

S2 = 6-20 EOs OR 1000-3000 individuals OR 2000-10000 acres

S2.1 = very threatened

S2.2 = threatened

S2.3 = no current threats known

S3 = 21-100 EOs OR 3000-10000 individuals OR 10000-50000 acres

S3.1 = very threatened

S3.2 = threatened

S3.3 = no current threats known

S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern (i.e., there is some threat, or somewhat narrow habitat. NO THREAT RANK.

S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.

NOTES: 1) Rank may be expressed as a range of values; hence S2S3 means the rank is somewhere between S2 and S3. 2) Adding ? to the rank, such as in S2?, represents more certainty than S2S3, but less than S2. 3) "GH" indicates that all sites are historical; the element has not been seen for at least 20 years but suitable habitat still exists. 4) "SH" indicates that all California sites are historical. 5) "GX" indicates that all sites are extirpated and this element is extinct in the wild. 6) "SX" indicates all California sites are extirpated. 7) "GXC" indicates this element is extinct in the wild but exists in cultivation. 8) "G1Q" indicates this element is very rare, but there is a taxonomic question associated with it.