MARIN MUNICIPAL WATER DISTRICT
RARE PLANT INVENTORY UPDATE

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ANDREA WILLIAMS, VEGETATION ECOLOGIST
MARIN MUNICIPAL WATER DISTRICT
awilliams@marinwater.org

MICHELLE O'HERRON, COMMUNICATIONS CONSULTANT
O'HERRON & COMPANY
michelle@oherron.co

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COVER PHOTO: The rare Sargent cypress-Mt. Tamalpais manzanita plant community, is also dominated by the rare endemic Mt. Tamalpais manzanita. Andrea Williams/MMWD

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Introduction

Marin Municipal Water District Resources Overview

First set aside in 1912 to provide clean, reliable, and affordable drinking water to local citizens, Marin Municipal Water District (MMWD) watershed lands have expanded over the last century to encompass the roughly 22,000 acres MMWD manages today. While the majority of these lands are around the summit of Mount Tamalpais, they are also a part of a 150,000-acre network of protected areas and open spaces managed by the National Park Service, California State Parks, Marin County, individual cities, homeowner groups, agricultural interests, and nonprofit entities.

Watershed lands are managed to provide clean, safe drinking water to nearly 200,000 nearby residents, as well as for passive recreational uses. The reservoirs on Mount Tamalpais, along with the Nicasio Reservoir to the north, provide about 75 percent of the water MMWD supplies to its customers. The balance is imported from the Russian River. Soulajule Reservoir, also to the north of Mount Tamalpais, is not regularly used for water supply but is available in the case of a severe drought. MMWD also conducts numerous environmental restoration, stewardship, science, educational, and volunteer programs to help meet their mission to manage their natural resources in a sustainable manner.

The following provides an overview of the built and natural environments as they relate to rare plant species on Mount Tamalpais. More information on each of these topics can be found in the sources listed in the references section.

Infrastructure and Land Use

Because watershed lands were protected relatively early in Marin County's history, they were never as fully developed as adjacent residential and commercial areas have been. However, some signs of past land uses are still evident on the landscape in the form of old logging skid roads and stumps, dilapidated barbed wire fence lines, and certain plant species introduced for grazing or gardening.

The numerous creeks on MMWD's land flow in all directions down from Mount Tamalpais into San Francisco Bay, Tomales Bay, or the Pacific Ocean. The Lagunitas Creek Watershed alone is home to four of the five reservoirs on the mountain: Lagunitas, Bon Tempe, Alpine, and Kent lakes. The fifth, Phoenix Lake, is on Ross Creek (a tributary of Corte Madera Creek) and is primarily used to supply water in the case of severe drought.

Water supply infrastructure includes the Bon Tempe treatment plant, dams, tanks and other facilities for potable water storage, water pumps, compressors, aerators, pipelines, tunnels, water intake and overflow structures, and the buildings associated with this infrastructure.

MMWD lands also encompass nearly 100 miles of service roads and over 60 miles of maintained trails. All trails are open to hikers, and a small number are also open to horses. Bikes are restricted to service roads. All reservoir shorelines are accessible for fishing, but swimming is not allowed.

Visitor, administrative, operational, and historic facilities include Sky Oaks Watershed Headquarters, five ranger residences, buildings for storage and communication, boat ramps, picnic and parking areas, convenience stations, the Porteous Ranch log cabin, West Point Inn, and Marin Stables. The Federal Aviation Administration also has telecommunication buildings and lines, and there are power lines owned by Pacific Gas and Electric.

Most of land surrounding the Nicasio and Soulajule reservoirs to the north is privately owned and includes farms, ranches, and scattered rural residential development. Water supply infrastructure includes dams, pump stations, compressors, service roads, electrical lines, and one parking area at Soulajule Reservoir.

Access to these sites includes a mix of roads and trails. Not all of the roads that serve these two reservoirs are owned or managed by MMWD. At Nicasio Reservoir, the service roads located on MMWD lands are not accessible for public use, except for Point Reyes Petaluma Road. Some hiking trails are located on MMWD-owned lands adjacent to Nicasio Reservoir. The service roads adjacent to Soulajule Reservoir are used as hiking trails; however, no other official hiking trails are located on MMWD-owned land adjacent to Soulajule Reservoir.

Biodiversity and Resource Values

The San Francisco Bay Area is part of both nationally and internationally recognized biodiversity hotspots thanks to the region's Mediterranean climate, topographic diversity, and coastal and bay influences on its climate. Likewise, Mount Tamalpais' varied topography, elevations, and location near the coast in an important marine upwelling and convergence zone create a huge array of microclimates in a relatively small area.

Remarkably high levels of biological diversity are found across MMWD's lands on the mountain, and in particular among its plant communities. A wide range of soils, including harshly metallic serpentine, create unique niches for different plant communities and the wildlife that depend upon them. These plant communities support the many endemic, rare, and/or special-status species that are the focus of this report.

The total number of species within MMWD lands is unknown, but it includes over 1,000 species of vascular plants, over 200 species of lichens, and at least 400 species of vertebrate animals. Many more species of fungi, non-vascular plants, and invertebrates such as insects and other arthropods also live here.

Habitats within the watershed include (acreages are approximate):

- Hardwood forests - 5,500 acres
- Conifer forests (non-redwood) - 4,500 acres
- Redwood forests - 3,500 acres
- Serpentine chaparral - 2,000 acres
- Grasslands - 2,000 acres
- Oak woodland - 1,200 acres
- Chaparral (non-serpentine) - 500 acres
- Riparian woodland - 500 acres
- Shrubland (non-chaparral) - 500 acres
- Wetland - 40 acres

MMWD's knowledge of its natural resources comes from a combination of historic records, museum specimens, and field data from their extensive inventory and monitoring programs, which are conducted by a mix of researchers, consultants, MMWD staff, and skilled volunteers. To date, MMWD has systematically inventoried and described its terrestrial vascular flora (both at species and community scales), aquatic vegetation, lichens, and weeds. Monitoring programs are in place to detect changing conditions for resources of particular interest, including vegetation community structure and forest health.

Ecological Threats and Stressors

Mount Tamalpais' plant and animal communities are threatened by global climate change, altered fire regimes, invasive, non-native plants and animals, habitat fragmentation, plant diseases, noise, light, and air pollution, and other human impacts. These ecological stressors can directly result in the loss and degradation of habitats and negatively affect the size, range, and reproductive capacity of plants and wildlife. Interactions among these stressors (e.g., between climate change and fire frequency, or between fire and plant diseases) further compound their effects and make managing them much more challenging.

In general, altered fire regimes, climate change, and invasive plants are the primary threats to rare plant populations on MMWD lands.

Fire

Some plant species prefer open areas and/or depend on fire to reproduce; however, fire is difficult to implement as a management tool on MMWD lands. For some species, mechanical clearing is sufficient to stimulate germination, but others need the "cues" from a burn such as smoke or heat to sprout. Mount Tamalpais has not seen a large, stand-replacing fire for over 70 years due to fire suppression policies and practices. This lack of fire is resulting, in part, in the succession of grasslands to shrublands and woodlands, and of shrublands and woodlands to Douglas-fir (*Pseudotsuga menziesii*) dominated stands. Fire suppression is also hindering the regeneration of fire-dependent species such as Sargent cypress (*Cupressus sargentii*) and the rare Marin manzanita (*Arctostaphylos virgata*) (Edson et al., 2016).

Climate Change

Changes in temperature, precipitation, fog, and soil moisture may make future conditions inhospitable for certain plant species or even entire plant communities. In the long term, climate change will alter the basic physical conditions under which native plant communities on Mount Tamalpais evolved, forcing a gradual shift in their composition and distribution. This shift will likely be accelerated by short-term (episodic) disturbances such as fires and floods, which will become more frequent in a changing climate. The sensitivity of vegetation to climate change is heterogeneous and somewhat difficult to predict, but models for Marin County suggest an expansion of climate conditions suitable for more drought-tolerant species and communities, such as coastal sage scrub and chamise chaparral, as climatic water deficit increases (Ackerly et al., 2012; Micheli et al., 2016). Although increasing drought stress will affect some species more than others, it is still likely to become a major driver of plant populations. In particular, locally rare and extirpated species tend to favor to wet habitats and may be more impacted by drought stress. Changes in (i.e., reduction of) fog may likewise be detrimental to maritime chaparral species.

Invasive Species

The major threats posed by invasive species include changes in fire frequency or intensity, groundwater depletion, changes to soil chemistry, competition with native species, and a loss of native species diversity. Currently, about 30% of the known plant species on Mount Tamalpais are non-native (Edson et al., 2016). While all watershed lands face some degree of threat from invasive plant species, some are more resistant to invasion than others due to varying soil types, moisture levels, and canopy density. The harshly metallic soils found in serpentine habitats are particularly unwelcoming to many other plant species; however, goatgrass (*Aegilops triuncialis*) and purple false brome (*Brachypodium distachyon*) have invaded some areas. Dense stands of chaparral are relatively weed free as well. Nevertheless, most other plant communities, including those that support rare plant species, have been highly impacted by invasive weeds.

Other Threats

Depending on their location, some rare plant populations may also be threatened by trampling and by fuel break or road and trail maintenance or construction. Best management practices can help prevent damage to plants and habitat from this kind of work, but additional management and enforcement efforts are required to prevent visitors from constructing illegal trails and hiking off-trail through rare plant habitats. Sudden Oak Death (SOD) is another localized threat. Rare plants in forest habitats can be crushed by fallen SOD-killed trees, and their response to microclimate shifts (e.g., shade, water availability) caused by the resulting changes in the forest structure is unknown.

Specific threats to each rare plant species are further described in the individual species accounts in this report.

Marin Municipal Water District Rare Plants

Mount Tamalpais and its surrounding lands have been long recognized for their botanical uniqueness and numerous rare plant species. A rare plant survey for MMWD published in 1990 (Patterson) provided a thorough inventory of the locations, vulnerabilities, and needs of the watershed's rare, endangered, or sensitive species. It included a compilation of historic records, coordinated with available data and field surveys, and also offered insights on ecological relationships and potential management concerns.

Almost 30 years on, much more has been learned about the watershed's rare plants. Additional taxa and populations have been found and listed by the California Native Plant Society (CNPS), while others have winked out. Better tools for searching, gathering, and displaying data have been developed, and emerging threats such as SOD and climate change add stress to habitats and species already burdened by fire exclusion and invasive species.

The years since the 1990 report have also seen many efforts to restore and protect these precious populations. MMWD has conducted regular vegetation mapping and plant surveys—including a series of botanical "bioblitzes" (Williams et al., 2017)—to document the mountain's flora. They also do regular invasive species survey and management activities and have undertaken numerous projects to help protect and restore all of their important plant communities—and their rare plants in particular. These have included weed removal in priority grasslands, planting rare species, social trail rehabilitation, and targeted Douglas-fir removal.

This document serves to update the 1990 Patterson report with what has been learned through all of this work, providing a summary of each rare plant species' status, biology, and locations, as well as specific threats, data gaps, and management considerations. This updated inventory, based on data mining and five-plus field seasons of searches, aims to provide more current information as well as a comprehensive look at rare plants and their habitats on all of the lands MMWD stewards—including Nicasio and Soulajule. While borrowing heavily from the 1990 Patterson report, this document represents a fresh jumping-off point to direct management, monitoring, and additional research.

Rare Plants on Watershed Lands Today

MMWD lands contain up to 50 special status plant species within approximately 88 distinct plant assemblages as defined by the National Vegetation Classification System (Evens & Kentner, 2006). These communities include endemic species found nowhere else in the world such as the Mt. Tamalpais thistle (*Cirsium hydrophilum* var. *vaseyi*), Mt. Tamalpais manzanita (*Arctostaphylos montana* ssp. *montana*), Tamalpais and Mt. Tamalpais bristly jewel flowers (*Streptanthus batrachopus* and *S. glandulosus* ssp. *pulchellus*), and Tamalpais lessingia (*Lessingia micradenia* var. *micradenia*). Upwards of 20 of these assemblages are considered sensitive natural communities by the state.

Approximately 140 taxa were listed in the 1990 report as CNPS-listed rare species or of local concern. Of these, 36 of the 77 plants deemed "possible" have been found: 18 are currently locally rare, and one is a CNPS List 4.2 species. Only two of the 44 plants found in 1990 are no longer present: snowbrush (*Ceanothus velutinus*) and showy milkweed (*Asclepias speciosa*). All 24 of the listed plants present in 1990 are still present; 18 others of concern are not currently listed by CNPS or MMWD.

Rare plants are not evenly distributed across MMWD lands. Rather, they tend to be clustered in certain locations or habitat types—particularly serpentine areas, which contain approximately half of the watershed's rare species and 80 percent of sensitive species occurrences. Other areas that provide sensitive plant habitat include forests [for Napa false indigo (*Amorpha californica* var. *napensis*), California bottlebrush grass (*Elymus californicus*), and several non-green plants], moist shaded rocks [for coast rockcress (*Arabis blepharophylla*) and western leatherwood (*Dirca occidentalis*)], and meadows and grasslands [for Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*), harlequin lotus (*Hosackia gracilis*), johnny-nip (*Castilleja ambigua* var. *ambigua*), and fritillaries].

Locally rare plants cluster as well, although water is more of a driver for where these species live than serpentine soil is. Wet meadows and vernally moist sites (including reservoir drawdown zones), redwood-riparian, and coastally or fog-influenced forests and grasslands support over 90% of MMWD's locally rare plant populations. Rock outcrops support most of the others. Some rare plant clustering may be due to the relatively small total area of these habitat types, which are further shrinking as a result of succession and climate change impacts.

Rare natural communities, or sensitive communities, are ranked globally by NatureServe (Master et al., 2012) and sub-nationally (for the United States, at the state level) following the same methodology used by each respective region's Natural Heritage Division. The California Department of Fish and Wildlife serves this function for California, and maintains lists of Sensitive Natural Communities (https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities). This methodology has changed since MMWD's 2009 Biodiversity Report (LCA) was written, and so ranking categories differ between that report and this one.

The vegetation communities listed in Table 1 below are based on landscape-scale vegetation mapping from 2004–2014 (acreages have not changed since 2004). This type of vegetation mapping lacks the precision necessary to delineate or characterize different herbaceous communities such as specific types of wetlands and grasslands, so they are not included in the table. In addition to the vegetation communities listed below, native grasslands and sedge-dominated wetlands (as described in the CNPS Manual of California Vegetation Online, http://vegetation.cnps.org/keys/herbs) also qualify as rare, and are treated as such in project and restoration planning. In particular, wet meadows are being targeted for additional weed removal and larger-scale restoration efforts. Grassland, wetland, seep, and riparian habitat inventories and mapping, as well as identification of restoration projects, are slated for within two years of the adoption of the District Biodiversity, Fire, and Fuels Integrated Plan (Panorama Environmental, 2019).

Table 1. Non-Herbaceous Rare Vegetation Communities

Note: Acreages may include multiple types (e.g., redwood forest)

Community	Mount Tamalpais Watershed Acreage	Soulajule Watershed Acreage	Nicasio Watershed Acreage	State Rank
Bishop Pine Forest	30	0	0	Vulnerable
California Buckeye Groves	12	0	0	Vulnerable
Douglas-fir-Tanoak Forest	47	0	0	Vulnerable
Golden Chinquapin Thickets (shrub alliance)	49	0	0	Imperiled
Mount Tamalpais Manzanita Chaparral	682	0	0.3	Imperiled
Oregon White Oak Woodland	6	0	0	Vulnerable
Redwood Forest	3,839	0	0	Vulnerable
Sargent Cypress Woodlands and Forests	338	0	0	Vulnerable
Sensitive Manzanita Alliance	87	0	0	Imperiled-Vulnerable

Some of these vegetation types overlap with, are proxy for, or are dominated by rare species. Maritime chaparral grows within the climatic influence of the coast and is dominated by manzanitas and ceanothus. It contains several vegetation types in addition to the Sensitive Manzanita Alliance, and includes rare Marin manzanita, glory brush (*Ceanothus gloriosus* var. *exaltatus*), and Mason's ceanothus (*Ceanothus masonii*). The combination of rare species and rare alliance mapping should be sufficient to fully encompass and protect these more broadly described vegetation types such as maritime chaparral and wet meadow.

Methods

Making the List

Any rare plant survey must begin with a comprehensive review of known, expected, potential, reported, and unlikely but possible species for the survey area. Mount Tamalpais is an exceptionally well-botanized area, with a long history easily explored through voucher specimens and literature (particularly Howell's *Marin Flora* 1970 and subsequent updates).

The CNPS's Inventory of Rare and Endangered Plants of California (http://www.rareplants.cnps.org) is the current recognized authority on rare plants in the state, and MMWD's list is based on these, as well as other sources and individual expertise. Additional casual observations, area lists, and directed searches have also been compiled by Calflora (https://www.calflora.org/), where one may easily obtain a documented list of all rare species growing in a particular county, watershed, public land parcel, or named location. Over the past several years, visitors, volunteers and staff have also compiled additional photo-supported observations in iNaturalist (https://www.inaturalist.org/).

Records from these websites were compared and combined with prior lists from the Patterson 1990 report, the Biodiversity Management Plan (LCA, 2009), and the Biodiversity, Fire, and Fuels Integrated Plan (Panorama Environmental, 2019) to form a 78-species list. This list was divided into: known present; suspected but unconfirmed; formerly present but extirpated; recorded but unlikely; and nearby but possible. The first two categories were the target of directed searches in likely habitats, as well as some of the historic sites, based on age and quality of the sighting (see Field Surveys section below). Additional species were excluded based on taxonomic clarification. See Tables 2 and 3 for the final list of 35 known and 30 potential rare plants on MMWD lands. Each of the 35 known rare plant species is further described in the Species Accounts section of this report.

While not the focus of this report, a separate list of locally rare plants was compiled to help target management and conservation. Also using Calflora and its accessory functionality through the California Native Plant Exchange (http://www.cnplx.info/nplx/nplx?page=rangelimit&cc=MRN), native species growing in one or fewer adjacent counties were selected. After screening the 272 resulting taxa for rare species, synonyms and unrecognized varieties, statewide distribution, and species not known or thought to be present on watershed lands, 19 known and 21 probable species remained.

Additional species were added after further examination, the primary criterion being three or fewer known populations on watershed lands. Species will be removed from the list as additional populations are found; as of this report, 206 taxa (including 15 CNPS-listed species) are thought to be locally rare (see Table 4).

Field Surveys

A blooming calendar, known and historic locations, and habitat preferences from the CNPS online inventory for likely or suspected species guided the timing and location of field surveys between 2012 and 2018. Surveyors used identification materials, maps, reel measuring tapes, notetaking materials, a GPS-enabled camera or mapping device, and binoculars to aid in searching and recording.

Depending on the species and population size and accessibility, the number of individuals were either counted or estimated and patch size was measured or estimated. Associated species and exposure were also recorded. Noticeable threats and disturbances were noted, and search areas were noted on a map or by GPS. Later surveys (2016–present) used the Avenza Maps app on iPads to take georeferenced PDF maps into the field and log survey tracks, annotate existing polygons, and take geotagged photos of species and locations.

Population Delineation and Enumeration

Enumerating and mapping occurrences in the field and in the office can lead to very different population estimates, depending on how sites are defined and characterized. For weed mapping, a standard "interpatch distance" has been employed: if two patches of the same species are more than 20 meters apart, they are considered separate occurrences and mapped separately. The California Natural Diversity Database (CNDDB) uses a quarter-mile distance: if two populations are more than a quarter-mile from each other, they are distinct element occurrences and tracked separately. If the number of occurrences (an appropriate metric for annuals and clonal species) is being tracked, the use of one standard over another may over- or under-estimate the abundance of the species.

The CNDDB standard was used to count occurrences for these surveys, but the interpatch distance of 20 meters was generally used for mapping, so a single occurrence could encompass multiple patches. When remapping existing populations, preference was given to conserving existing polygons rather than shrinking them, but expansions were always incorporated.

Rare Plant Species and Ranges

The 1990 Patterson Report represented the state of the knowledge of rare plants at the time; however, understanding of species' ranges and taxonomy have changed. The publication of *The Jepson Manual: Higher Plants of California* (Hickman, 1993) provided comprehensive accounts of taxa, their ranges, and identifying characteristics. Changing understanding of relationships provided by genetic studies drove much of the renaming and reordering of genera and families in the Second Edition (Baldwin et al., 2012) and subsequent alterations to the Jepson eFlora (http://ucjeps.berkeley.edu/eflora).

The Sixth Edition of the *California Native Plant Society's Inventory of Rare and Endangered Plants of California* (Tibor, 2001) added over 300 taxa to the list of CNPS-ranked rare plants, expanding the number of known species considered rare from 19 to 35 (not counting possibly present species). CNPS has also moved their inventory online to respond to continual changes in available information. The habitat preferences in the table below are taken from CNPS Inventory information and edited down to region-specific types in some cases.

While this report represents the state of the knowledge of rare plants on MMWD watershed lands in 2018, and in particular summarizes field work from 2012–2018, MMWD is also moving toward keeping much of its rare plant data digitally. Lists in the below tables are maintained for public use in Calflora, and site-specific information is maintained in a shared internal server system for MMWD staff and cooperators. However, periodic summary reports have utility even in a digital world, as a time to review status, trends, and habitat quality for rare plants in the watershed.

Please note that North Coast semaphore grass (*Pleuropogon hooverianus*), not recorded on district land since 1943 and thought to be extirpated, was re-found on June 28, 2019 and has been moved from Table 3 to Table 2.

Table 2. Rare Plants Known to Occur on MMWD Lands

Notes: Scientific names, common names, and habitat notes from CNPS (http://rareplants.cnps.org, 2019).

Common Name Scientific Name	Listing Status			Life Form	Habitat Preferences
	Federal	State	California Rare Plant Rank		
Napa false indigo *Amorpha californica* var. *napensis*	-	-	1B.2	Perennial deciduous shrub	Broadleaved upland forest, chaparral, cismontane woodland; moist sites

Common Name Scientific Name	Listing Status Federal	 State	 California Rare Plant Rank	Life Form	Habitat Preferences
Coast rockcress *Arabis blepharophylla*	-	-	4.3	Perennial herb	Broadleaved upland forest, coastal bluff scrub, coastal prairie, coastal scrub, rocky outcrops, serpentine barrens
Mt. Tamalpais manzanita *Arctostaphylos montana* ssp. *montana*	-	-	1B.3	Perennial evergreen shrub	Chaparral, valley and foothill grassland, rocky serpentine slopes
Marin manzanita *Arctostaphylos virgata*	-	-	1B.2	Perennial evergreen shrub	Broadleaved upland forest, closed-cone conifer forest, chaparral, North Coast conifer forest; on sandstone or granitic soils
Carlotta Hall's lace fern *Aspidotis carlotta-halliae*	-	-	4.2	Perennial herb	Chaparral, cismontane woodland; generally on serpentine outcrops
Brewer's milk-vetch *Astragalus breweri*	-	-	4.2	Annual herb	Cismontane woodland, chaparral, valley and foothill grassland; usually associated with serpentinite or volcanic substrate
Serpentine reed grass *Calamagrostis ophitidis*	-	-	4.3	Perennial herb	Chaparral, lower montane conifer forest, meadows and seeps, valley and foothill grassland; on serpentine balds and in serpentine grasslands
Brewer's calandrinia *Calandrinia breweri*	-	-	4.2	Annual herb	Chaparral, coastal scrub; sandy or loamy soils; seen on disturbed sites and after fire
Oakland star-tulip *Calochortus umbellatus*	-	-	4.2	Perennial bulbiferous herb	Broadleaved upland forest, chaparral, cismontane woodland, lower montane conifer forest, valley and foothill grassland; often on serpentine
Pink star-tulip *Calochortus uniflorus*	-	-	4.2	Perennial bulbiferous herb	Coastal prairie, coastal scrub, meadows and seeps, North Coast coniferous forest

Common Name Scientific Name	Listing Status Federal	 State	 California Rare Plant Rank	Life Form	Habitat Preferences
Mt. Saint Helena morning glory *Calystegia collina* ssp. *oxyphylla*	-	-	4.2	Perennial rhizomatous herb	Chaparral, lower montane conifer forest, valley and foothill grassland; on open serpentine slopes
Johnny-nip *Castilleja ambigua* var. *ambigua*	-	-	4.2	Annual herb (hemiparasitic)	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pool margins
Glory brush *Ceanothus gloriosus* var. *exaltatus*	-	-	4.3	Perennial evergreen shrub	Chaparral; sandy or rocky substrates
Mason's ceanothus *Ceanothus masonii*	-	Rare	1B.2	Perennial evergreen shrub	Chaparral; on rocky serpentine ridges or slopes in chaparral or transition zone between chaparral and woodland
Mt. Tamalpais thistle *Cirsium hydrophilum* var. *vaseyi*	-	-	1B.2	Perennial herb	Broadleaved upland forest, chaparral, cismontane woodland, meadows and seeps; in serpentine seeps
Baker's larkspur *Delphinium bakeri*	Endangered	Endangered	1B.1	Perennial herb	Broadleaved upland forest, coastal scrub, valley and foothill grassland; on decomposed shale, often mesic sites
Western leatherwood *Dirca occidentalis*	-	-	1B.2	Perennial deciduous shrub	Broadleaved upland forest, closed-cone conifer forest, chaparral, cismontane woodland, North Coast conifer forest, riparian forest and woodland; brushy slopes in mesic sites
California bottle-brush grass *Elymus californicus*	-	-	4.3	Perennial herb	Broadleaved upland forest, cismontane woodland, North Coast coniferous forest, riparian woodland
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	-	-	1B.2	Annual herb	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland; sandy to gravelly serpentine slopes

Common Name Scientific Name	Listing Status Federal	 State	 California Rare Plant Rank	Life Form	Habitat Preferences
Marin checker lily *Fritillaria lanceolata* var. *tristulis*	-	-	1B.1	Perennial bulbiferous herb	Coastal bluff scrub, coastal prairie, coastal scrub
Fragrant fritillary *Fritillaria liliacea*	-	-	1B.2	Perennial bulbiferous herb	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland; often on serpentine
Marin western flax *Hesperolinon congestum*	Threatened	Threatened	1B.1	Annual herb	Chaparral, valley and valley and foothill grassland; serpentine
Thin-lobed horkelia *Horkelia tenuiloba*	-	-	1B.2	Perennial herb	Broadleaved upland forest, chaparral, valley and foothill grassland; in sandy soils, mesic openings
Harlequin lotus *Hosackia gracilis*	-	-	4.2	Perennial rhizomatous herb	Moist/wet soils within numerous vegetation types
Coast iris *Iris longipetala*	-	-	4.2	Perennial rhizomatous herb	Coastal prairie, lower montane conifer forest, meadows and seeps
Small groundcone *Kopsiopsis hookeri*	-	-	2B.3	Perennial rhizomatous herb	North Coast coniferous forest, open woodland
Bristly leptosiphon *Leptosiphon acicularis*	-	-	4.2	Annual herb	Chaparral, cismontane woodland, coastal prairie, valley and foothill grasslands
Tamalpais lessingia *Lessingia micradenia* var. *micradenia*	-	-	1B.2	Annual herb	Chaparral, valley and foothill grassland; usually on serpentine, often roadsides
Marin County navarettia *Navarretia rosulata*	-	-	1B.2	Annual herb	Closed-cone conifer forest, chaparral; open, dry rocky slopes and grassy areas; rocky or serpentine soils
Gairdner's yampah *Perideridia gairdneri* ssp. *gairdneri*	-	-	4.2	Perennial herb	Broadleaved upland forest, chaparral, grasslands, vernal pools; vernally mesic soils

Common Name Scientific Name	Listing Status Federal	 State	 California Rare Plant Rank	Life Form	Habitat Preferences
North Coast semaphore grass *Pleuropogon hooverianus*	-	Threatened	1B.1	Perennial rhizomatous herb	Broadleafed upland forest, meadows and seeps, North Coast coniferous forest
Tamalpais oak *Quercus parvula* var. *tamalpaisensis*	-	-	1B.3	Perennial evergreen shrub	Lower montane conifer forest understory
Sanford's arrowhead *Sagittaria sanfordii*	-	-	1B.2	perennial rhizomatous herb (emergent)	Marshes and swamps (assorted shallow freshwater)
Tamalpais jewel flower *Streptanthus batrachopus*	-	-	1B.3	Annual herb	Closed-cone conifer forest, chaparral; serpentinite barrens
Mt. Tamalpais bristly jewel flower *Streptanthus glandulosus* var. *pulchellus*	-	-	1B.2	Annual herb	Chaparral, valley and foothill grassland; serpentinite
Marsh zigadenus *Toxicoscordion fontanum*	-	-	4.2	Perennial bulbiferous herb	Chaparral, cismontane woodland, lower montane conifer forest, meadows and seeps, marshes and swamps; in wet meadows and along streams, often on serpentinite

Rare plants with "potential to occur" on MMWD lands are a mix of historically present and regionally possible taxa. Some of these species are also on the "likely extirpated" list and may still be present in the soil seedbank but barring a wildfire or other major disturbance need not be on active search lists; others may simply be in difficult-to-search (deep forest) areas or ephemerally present in rarely searched spots. The current list of MMWD's extirpated species can be found at http://www.calflora.org/entry/plantlist.html#vrid=px557. Please note that North Coast semaphore grass, not recorded on district land since 1943 and thought to be extirpated, was re-found on June 28, 2019 and has been moved from Table 3 to Table 2.

Table 3. Rare Plants with Potential to Occur on MMWD Lands

Common Name Scientific Name	Listing Status			Life Form	Habitat Preferences
	Federal	State	California Rare Plant Rank		
Bent-flowered fiddleneck *Amsinckia lunaris*	-	-	1B.2	Annual herb	Grasslands and woodlands
Thurber's reed grass *Calamagrostis crassiglumis*	-	-	2B.1	Perennial rhizomatous herb	Chaparral, lower montane conifer forest, meadows and seeps, valley and foothill grassland; on serpentine balds and in serpentine grasslands
Nicasio ceanothus *Ceanothus decornutus*	-	-	1B.2	Perennial evergreen shrub	Chaparral; on rocky serpentine ridges or slopes in chaparral or transition zone between chaparral and woodland
Glory brush *Ceanothus gloriosus* var. *gloriosus*	-	-	4.3	Perennial evergreen shrub	Chaparral; sandy or rocky substrates
California lady's-slipper *Cypripedium californicum*	-	-	4.2	Perennial rhizomatous herb	Broadleaved upland forest, chaparral, cismontane woodland, meadows and seeps; in serpentine seeps
Bluff wallflower *Erysimum concinnum*	-	-	1B.2	Annual or perennial herb	Coastal bluff scrub, coastal dunes, coastal prairie
San Francisco wallflower *Erysimum franciscanum*	-	-	4B.2	Perennial herb	Chaparral, coastal scrub, coastal dunes, valley and foothill grassland; on serpentinite or granitic soils

Common Name Scientific Name	Listing Status Federal	 State	 California Rare Plant Rank	Life Form	Habitat Preferences
Large-flowered leptosiphon *Leptosiphon grandiflorus*	-	-	4.2	Annual herb	Cismontane woodland, coastal dunes and prairie, coastal scrub, valley and foothill grassland; often sandy areas
Blue coast gilia *Gilia capitata* ssp. *chamissonis*	-	-	1B.1	Annual herb	Coastal dunes, coastal scrub
Woolly-headed gilia *Gilia capitata* ssp. *tomentosa*	-	-	1B.1	Annual herb	Coastal bluff scrub, valley and foothill grassland
San Francisco gumplant *Grindelia hirsutula* var. *maritima*	-	-	3.2	Perennial herb	Coastal bluff scrub, coastal scrub, valley and foothill grassland
Diablo helianthella *Helianthella castanea*	-	-	1B.2	Perennial herb	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland
Congested-headed hayfield tarplant *Hemizonia congesta* ssp. *congesta*	-	-	1B.2	Annual herb	Valley and foothill grassland
Santa Cruz tarplant *Holocarpha macradenia*	Threatened	Endangered	1B.1	Annual herb	Coastal prairie, coastal scrub, valley and foothill grassland
Large-flowered leptosiphon *Leptosiphon grandiflorus*	-	-	4.2	Annual herb	Coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland
Woolly-headed lessingia *Lessingia hololeuca*	-	-	3	Annual herb	Broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland

Common Name Scientific Name	Listing Status Federal	 State	 California Rare Plant Rank	 Life Form	 Habitat Preferences
Point Reyes meadowfoam *Limnanthes douglasii* ssp. *sulphurea*	-	Endangered	1B.2	Annual herb	Coastal prairie, meadows and seeps (mesic), marshes and swamps (freshwater), vernal pools
Mt. Diablo cottonweed *Micropus amphibolus*	-	-	3.2	Annual herb	Broadleafed upland forest, chaparral, cismontane woodland, valley and foothill grassland
Marsh microseris *Microseris paludosa*	-	-	1B.2	Perennial herb	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland
Baker's navarretia *Navarretia leucocephala* ssp. *bakeri*	-	-	1B.1	Annual herb	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools
White-rayed pentachaeta *Pentachaeta bellidiflora*	Endangered	Endangered	1B.1	Annual herb	Cismontane woodland, valley and foothill grassland (often serpentinite)
California pinefoot *Pityopus californicus*	-	-	4.2	Perennial herb (achlorophyllous)	Broadleafed upland forest, lower montane coniferous forest, North Coast coniferous forest, upper montane coniferous forest
Nodding semaphore grass *Pleuropogon refractus*	-	-	4.2	Perennial rhizomatous herb	Lower montane coniferous forest, meadows and seeps, North Coast coniferous forest, riparian forest
Lobb's aquatic buttercup *Ranunculus lobbii*	-	-	4.2	Annual herb (aquatic)	Cismontane woodland, North Coast coniferous forest, valley and foothill grassland, vernal pools
Victor's gooseberry *Ribes victoris*	-	-	4.3	Perennial deciduous shrub	Broadleafed upland forest, chaparral
Point Reyes checkerbloom *Sidalcea calycosa* ssp. *rhizomata*	-	-	1B.2	Perennial rhizomatous herb	Marshes and swamps (freshwater, near coast)

Common Name Scientific Name	Listing Status			Life Form	Habitat Preferences
	Federal	State	California Rare Plant Rank		
Marin checkerbloom *Sidalcea hickmanii* ssp. *viridis*	-	-	1B.1	Perennial herb	Chaparral (serpentinite)
Santa Cruz microseris *Stebbinsoseris decipiens*	-	-	1B.2	Annual herb	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland
Two-fork clover *Trifolium amoenum*	Endangered	-	1B.1	Annual herb	coastal bluff scrub, valley and foothill grassland (sometimes serpentinite)

Species Accounts

The following species accounts detail the life history, status, trends, distribution, threats, and management concerns for each of the rare species listed in Table 2. They may be used as a quick reference for managers, pulled out as fact sheets or training aids in the field, or utilized to guide research needs.

General References for the Following Species Accounts

Calflora: Information on California plants for education, research and conservation. [web application]. Berkeley, California. The Calflora Database [a nonprofit organization]. Retrieved June 20–July 17, 2018, from https://www.calflora.org

California Native Plant Society (CNPS) online inventory. Retrieved March 2019 from https://www.cnps.org/

Jepson Flora Project (Eds.) *Jepson eFlora.* Retrieved June 20–July 17, 2018, from http://ucjeps.berkeley.edu/eflora/

iNaturalist. Retrieved June–July 17, 2018, from https://www.inaturalist.org/

Note: There are additional specific references listed within some of the following species accounts. A comprehensive list of all references used in this document is available at the end of this report.

FABACEAE

Photo by MMWD, CC BY-NC 3.0

NAME

Scientific Name	*Amorpha californica* Nutt. var. *napensis* Jeps.
Common Name	Napa false indigo
Synonyms	*Amorpha californica* var. *hispidula*
CNDDB Element Code	PDFAB08012
USDA PLANTS Symbol	AMCAN

http://www.rareplants.cnps.org/detail/1812.html

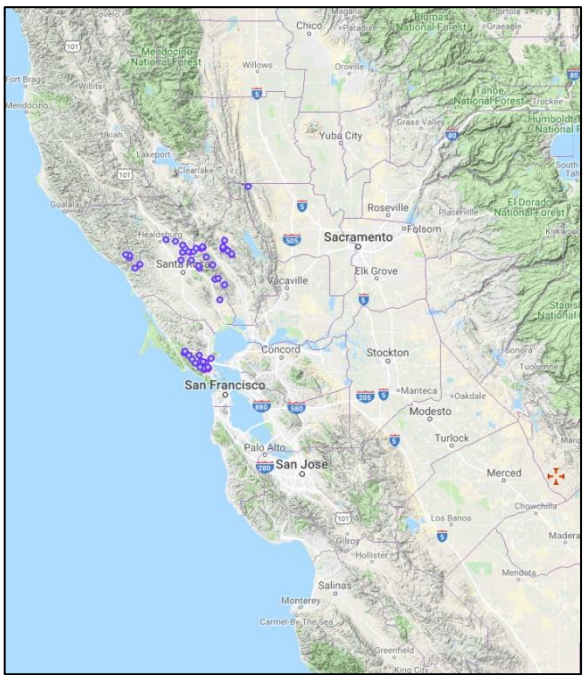
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2.** S2: Imperiled
Global Rank	**G4T2** T2: Imperiled. G4: (species) Apparently secure, considering populations outside California
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management

BIOLOGY

Lifeform	Perennial deciduous shrub, 1–3 m tall
Blooming Period	April–July
Habitat	Broadleafed upland forest (openings), chaparral, cismontane woodland

California distribution of Napa false indigo

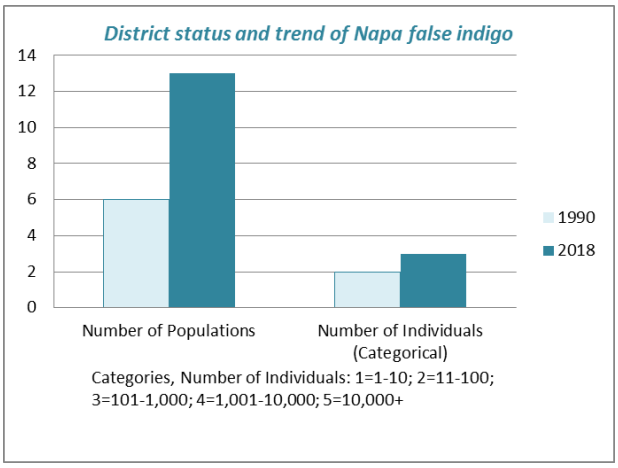


Global Distribution: This subspecies, while not as widely distributed as ssp. *californica*, can be found from Marin, Sonoma, and Napa to Santa Cruz counties.

Global Status: **Secure**. In 1990, Napa false indigo was not yet listed as a species of concern; it was placed on List 1B.2 in 2001. Its listing spurred additional mapping and nearly 70 populations are known, although some are threatened by the conversion of land to vineyards or other human use.

Local Distribution: The bulk of the populations occur around Kent Lake, but the plant may be found sporadically throughout watershed lands.

Local Status: **Secure.** This species appears to be relatively widespread, with patch sizes ranging from one to several dozen plants of various ages. It tolerates shade and sun, as well as some disturbance, and appears to do well in locations as disparate as the redwoods of Bolinas-Fairfax Road to the sunny hardwood forests of Eldridge Grade and Kent Lake's shore.



Data Gaps: Their tolerance to mowing at certain times of year is unknown. This should be explored as the abundance of roadside plants may create access issues.

Specific Threats and Management Recommendations: Roadside populations may be threatened by mowing. No management recommendations.

NAME

BRASSICACEAE

Scientific Name	*Arabis blepharophylla* H. & A.
Common Name	Coast rockcress
Synonyms	*Erysimum blepharophylla* Kuntze
CNDDB Element Code	PDBRA06040
USDA PLANTS Symbol	ARBL

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/182.html

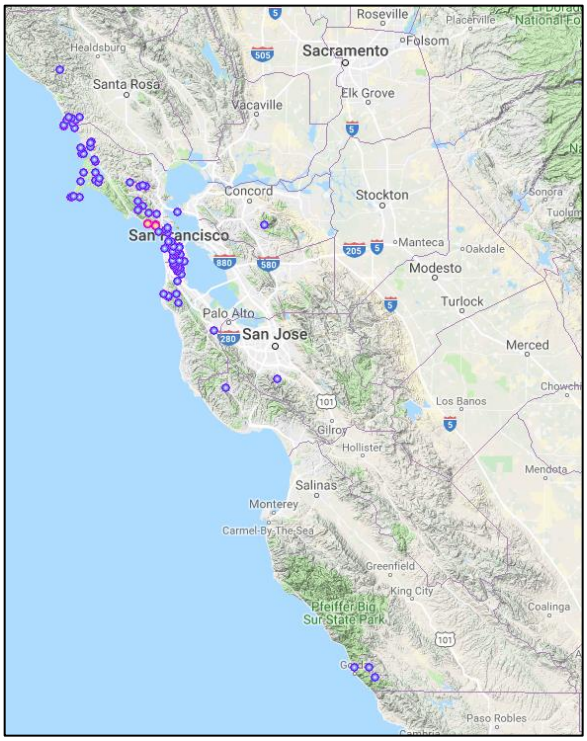
STATUS

Rare Plant Rank	**4.3**	**4:** Limited distribution in California **.3:** Not very endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S4**	S4: Apparently secure within California
Global Rank	**G4**	G4: Apparently secure, considering populations outside California
Watershed	**Vulnerable:** Populations are few but well-dispersed, not imminently threatened	

BIOLOGY

Lifeform	Perennial herb, 0.1–0.3 m tall
Blooming Period	February–May
Habitat	Rocky areas in broadleafed upland forest; coastal bluff, prairie, or scrub

California distribution of coast rock cress

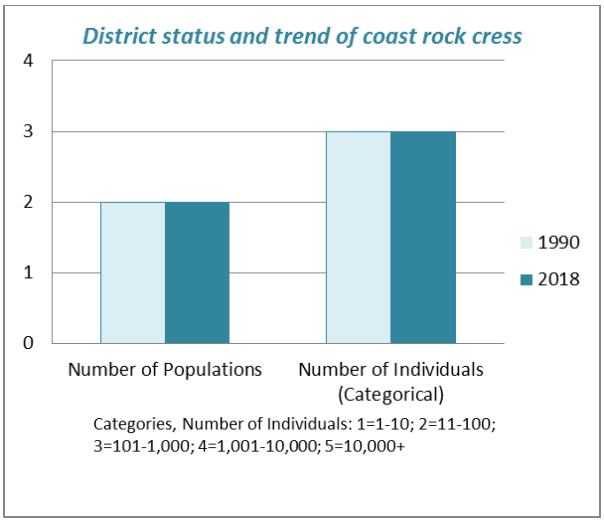


Global Distribution: This species is limited to the San Francisco Bay Area, except where it has been planted (cultivars are available from specialty growers).

Global Status: **Secure?** Because its ranking is at the lowest level of concern, populations are not tracked in a shared database such as the CNDDB. An estimated 50 populations have been found since 2000, and a dozen have been surveyed in Marin County, ranging in size from fewer than 10 to nearly 100 (Calflora, 2018).

Local Distribution: Only one historic population is extant on the watershed, downstream from Alpine Dam. Two others are extirpated, but an additional population was recently found.

Local Status: **Vulnerable.** Only two known populations exist, although they are not threatened by management. Additional searches of historic locations found no plants.



Data Gaps: Additional searches should be made in likely areas, and research should be done into propagation methods to establish new populations.

Specific Threats and Management Recommendations: Trampling and weed invasion may threaten the western population, and trail maintenance is a threat in the east. Climate change and Sudden Oak Death may also alter their habitat. MMWD should consider establishing additional populations at historic sites, as well as potentially on the slope north of Bullfrog Quarry or near the end of Alpine-Bon Tempe Pump Road.

NAME

ERICACEAE

Photo by MMWD, CC BY-NC 3.0

Scientific Name	*Arctostaphylos montana* Eastw. ssp. *montana*
Common Name	Mt. Tamalpais manzanita
Synonyms	*Arctostaphylos hookeri* ssp. *montana*, *Arctostaphylos montana*
CNDDB Element Code	PDERI040J5
USDA PLANTS Symbol	ARHOM

http://www.rareplants.cnps.org/detail/102.html

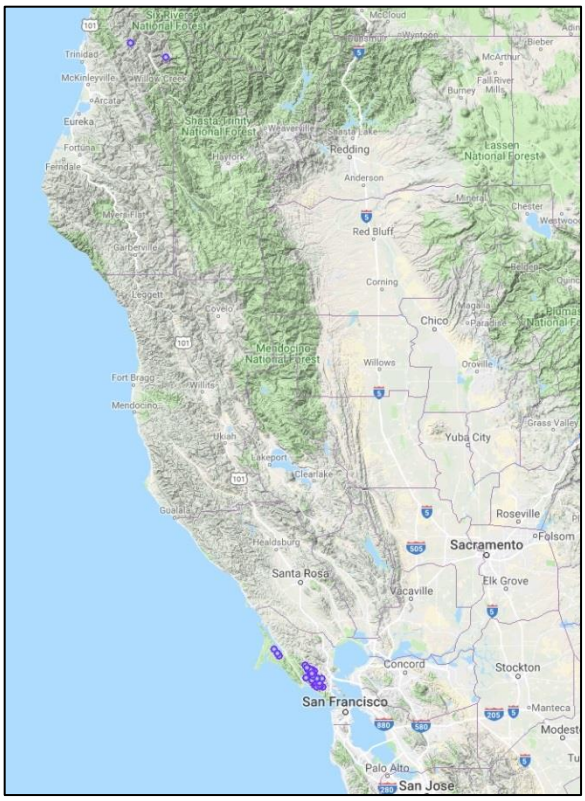
STATUS

Rare Plant Rank	**1B.3**	**1B:** Rare, threatened, or endangered in California and elsewhere **.3:** Not very endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S3**	S3: Vulnerable
Global Rank	**G3T3**	G3 (species): Vulnerable. T3: Vulnerable
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management	

BIOLOGY

Lifeform	Perennial evergreen shrub, 1–2 m tall
Blooming Period	February–April
Habitat	Chaparral, valley and foothill grassland; usually on serpentine

California distribution of Mt. Tamalpais manzanita



Global Distribution:

This species is primarily found on watershed lands, although isolated patches are purported to grow along Inverness Ridge, in Lake County, and near French Camp Ridge and Trinity Summit in Humboldt County. While unlikely, the out-of-range populations are supported by herbarium specimens with recent determinations.

Global Status:

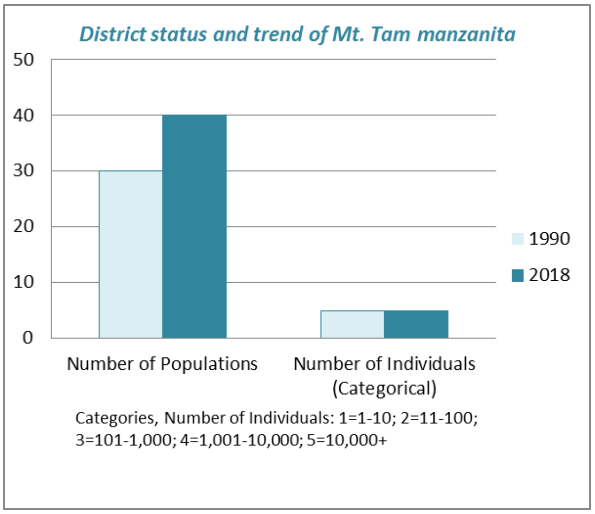
Vulnerable. While often the dominant shrub where found, nearly the entire global population grows within a few thousand acres in Marin County.

Local Distribution:

Common wherever serpentine is found on Mount Tamalpais watershed lands.

Local Status:

Secure. This species is often the dominant shrub on serpentine. Its clonal, mounding nature makes counting individuals difficult, but populations are estimated at over 10,000 plants total on 2,400 acres.



Data Gaps:

It is not known whether this species' physiological tolerances will be exceeded in a hotter and/or drier climate. DNA analysis of out-of-range plants would also help determine their relationship to "true" plants.

Specific Threats and Management Recommendations:

Avoid mowing and road/trail grading through existing populations. Shrubs are low and can be passed over by regular fuel reduction work.

ERICACEAE

NAME

Scientific Name	*Arctostaphylos virgata* Eastw.
Common Name	Marin manzanita
Synonyms	*Arctostaphylos glandulosa* var. *virgata*, *Arctostaphylos columbiana* var. *virgata*
CNDDB Element Code	PDERI041K0
USDA PLANTS Symbol	ARVI3

Photo by David Greenberger, CC BY-NC-ND 4.0, via iNaturalist

http://www.rareplants.cnps.org/detail/110.html

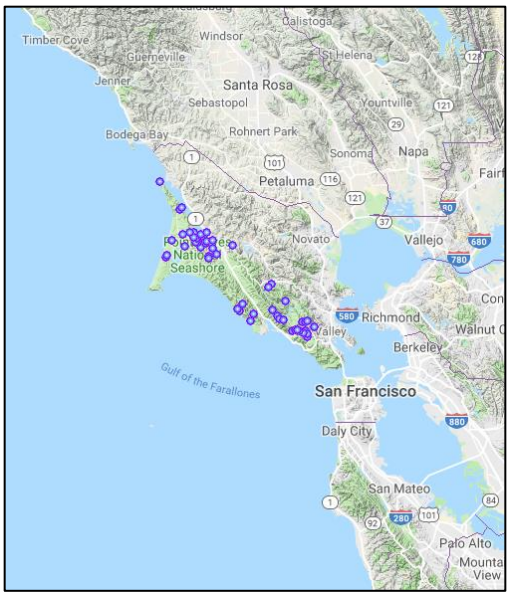
STATUS

Rare Plant Rank	**1B.2**	**1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S2**	S2: Imperiled
Global Rank	**G2**	G2: Imperiled
Watershed	**Imperiled:** This plant is close to extirpation on watershed lands	

BIOLOGY

Lifeform	Perennial evergreen shrub, 2–3 (5) m tall
Blooming Period	January–March
Habitat	Broadleafed upland forest, closed-cone coniferous forest, chaparral, North Coast coniferous forest

California distribution of Marin manzanita

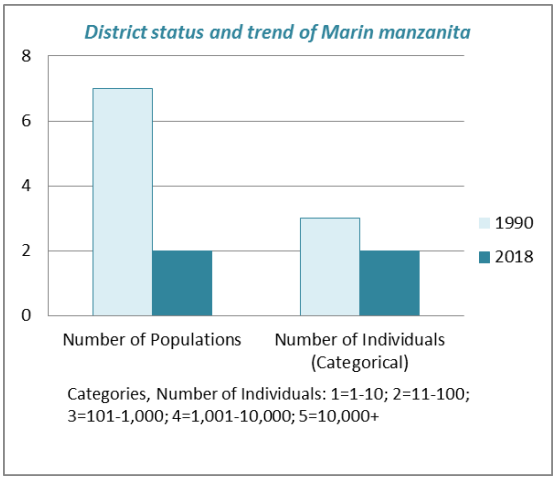


Global Distribution: This species is only found in Marin County, generally in forest gaps and chaparral within areas receiving four or more hours of fog on a regular basis (M. Vasey, personal communication, October 29 2016).

Global Status: **Declining.** Marin manzanita needs fire to reproduce and to keep Douglas-fir from shading out populations. Most of Marin has not burned in over 70 years, and many patches have disappeared. Populations that have burned, such as within the Vision Fire footprint, support many thousands of plants.

Local Distribution: Only two populations remain, both along a roadside where shading from Douglas-fir is not complete.

Local Status: **Imperiled.** Only two known population exist, and both are declining. Seeds from the Bolinas Ridge population were collected and banked with the Rancho Santa Ana Botanical Garden in 2015 as part of CNPS' Rare Plant Rescue Program for *ex situ* conservation of rare plants with few populations/restricted ranges.



Data Gaps: Research into propagation methods and techniques other than prescribed fire is needed.

Specific Threats and Management Recommendations: Shading and SOD are major concerns (Rooney-Latham et al. 2016). MMWD should consider applying prescribed fire to current or historic locations, reducing SOD spore load, removing competing Douglas-fir, and protecting plants from mowing.

Additional References:

Rooney-Latham, S., Blomquist, C. L., Williams, A., Gunnison, E., & Pastalka, T. (2016, June). *Identification of Five New Hosts of* Phytophthora ramorum *in an Infested Forest in California.* Proceedings of the Sixth Sudden Oak Death Science Symposium, San Francisco, California. Retrieved from https://www.fs.fed.us/psw/publications/documents/psw_gtr255/psw_gtr255_083.pdf

NAME

PTERIDACEAE

Scientific Name	*Aspidotis carlotta-halliae* (Wagn. & Gilb.) Lellinger
Common Name	Carlotta Hall's lace fern
Synonyms	*Cheilanthes carlotta-halliae*
CNDDB Element Code	PPADI07020
USDA PLANTS Symbol	ASCA17

Photo by John Game, CC BY-NC 3.0, via CalPhotos

http://www.rareplants.cnps.org/detail/1576.html

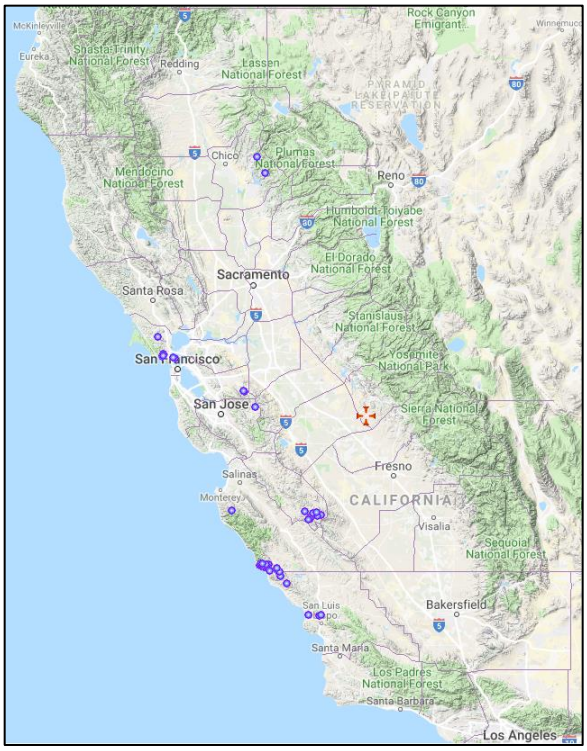
STATUS

Rare Plant Rank	**4.2**	**4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S3**	S3: Vulnerable
Global Rank	**G3**	G3: Vulnerable
Watershed	**Unknown:** Populations are not well-mapped; plants difficult to tell from closely related species	

BIOLOGY

Lifeform	Perennial rhizomatous herb, 0.04–0.1 m tall
Blooming Period	January–December
Habitat	Chaparral, cismontane woodland

California distribution of Carlotta Hall's lace fern



Global Distribution: This species has a fairly broad but sparse distribution and can be presumed to occur where the parent species (*Aspidotis densa, A. californica*) overlap.

Global Status: **Secure?** Carlotta Hall's lace fern is not tracked in CNDDB, but records from Calflora show nearly 100 populations, 27 of which are from within the last 20 years.

Local Distribution: As with the Global Distribution, this taxon can be presumed to occur where the parent species overlap. However, *A. californica* has only been found in three locations on watershed lands.

Local Status: **Unknown.** Plants are difficult to tell from closely related species, and exhaustive searches have not been made.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: Additional populations, if any, should be located and mapped. Likely spore travel distance in this or related ferns should be further researched.

Specific Threats and Management Recommendations: Protect known sites from damage by mowers or climbers.

NAME

FABACEAE

Scientific Name	*Astragalus breweri* Gray
Common Name	Brewer's milk-vetch
Synonyms	*Tragacantha breweri* Kuntze
CNDDB Element Code	PDFAB0F1J0
USDA PLANTS Symbol	ASBR8

Photo by David Greenberger, CC BY-NC-ND 4.0, via iNaturalist

http://www.rareplants.cnps.org/detail/297.html

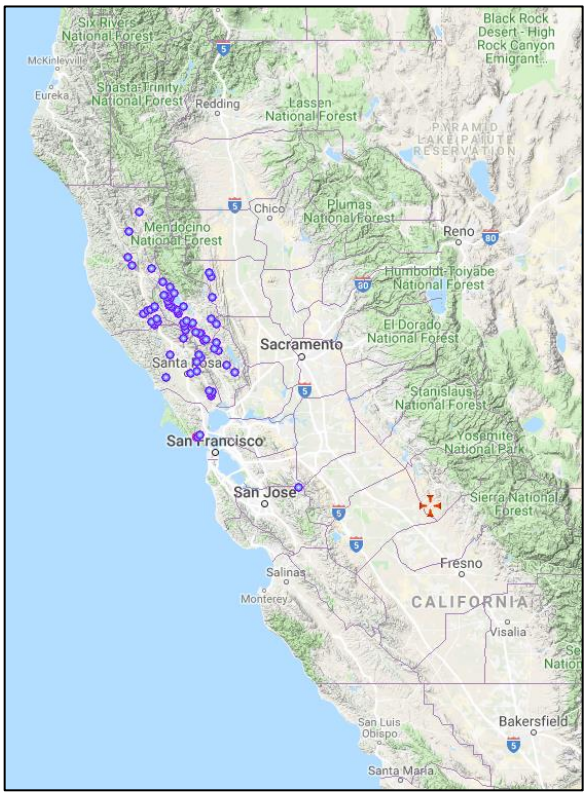
STATUS

Rare Plant Rank	**4.2**	**4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S3**	S3: Vulnerable
Global Rank	**G3**	G3: Vulnerable
Watershed	**Vulnerable:** Populations are not well-dispersed, not imminently threatened	

BIOLOGY

Lifeform	Annual herb, 0.1–0.3 m tall
Blooming Period	April–June
Habitat	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (open, often gravelly)

California distribution of Brewer's milk-vetch

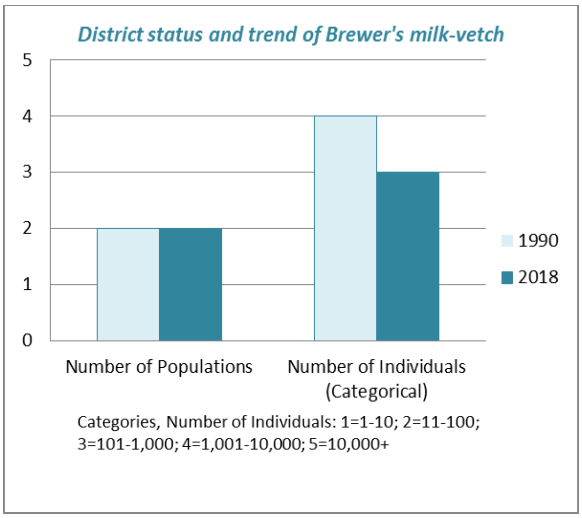


Global Distribution: This species can be found in the North Coast Ranges from Mendocino County south to the San Francisco Bay Area.

Global Status: **Vulnerable?** Brewer's milk-vetch is not tracked in CNDDB, but records from Calflora show well over 100 populations. Only 14 of these are from within the last 20 years, and many on private property are vulnerable to development and other land use changes.

Local Distribution: Known populations are limited to the Rock Spring area; a population from Pine Mountain found in the 1990 Patterson report was not rediscovered, but an additional site was found between Rock Spring and Laurel Dell.

Local Status: **Vulnerable.** Populations are not well-dispersed, but they are not imminently threatened; their serpentine habitat keeps them buffered from most non-native species invasions.



Data Gaps: Plants in Marin County are more purple-flowered than the cream-colored varieties found elsewhere; genetic testing would help determine the relationship between disjunct Marin populations and those up north as well as closely related *A. gambelianus'* purported variety "var. *elmeri*." Pine Mountain and other populations should be searched for again.

Specific Threats and Management Recommendations: Remove any encroaching Douglas-fir and any invading plant species. Also avoid constructing firelines through populations.

POACEAE

Photo by MMWD, CC BY-NC 3.0

NAME

Scientific Name	*Calamagrostis ophitidis* (J.T. Howell) Nygren
Common Name	Serpentine reed grass
Synonyms	*Calamagrostis purpurascens* R. Br. var. *ophitidis* J.T. Howell *Calamagrostis foliosa* var. *ophitidis* J.T. Howell
CNDDB Element Code	PMPOA170V0
USDA PLANTS Symbol	CAOP2

http://www.rareplants.cnps.org/detail/372.html

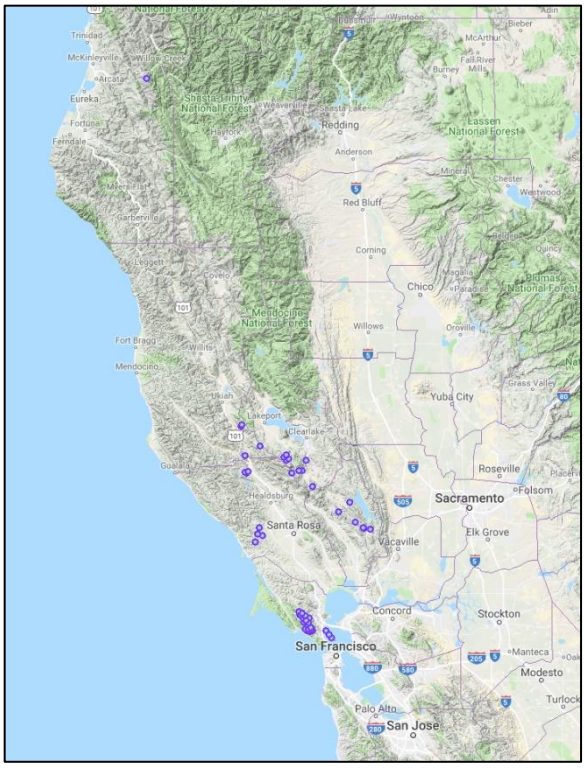
STATUS

Rare Plant Rank	**4.3**	**4:** Limited distribution in California **.3:** Not very endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S3**	S3: Vulnerable
Global Rank	**G3**	G3: Vulnerable
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management	

BIOLOGY

Lifeform	Perennial herb, 1–2 m tall
Blooming Period	April–July
Habitat	Chaparral (open, often north-facing slopes), lower montane coniferous forest, meadows and seeps, valley and foothill grassland

California distribution of serpentine reed grass

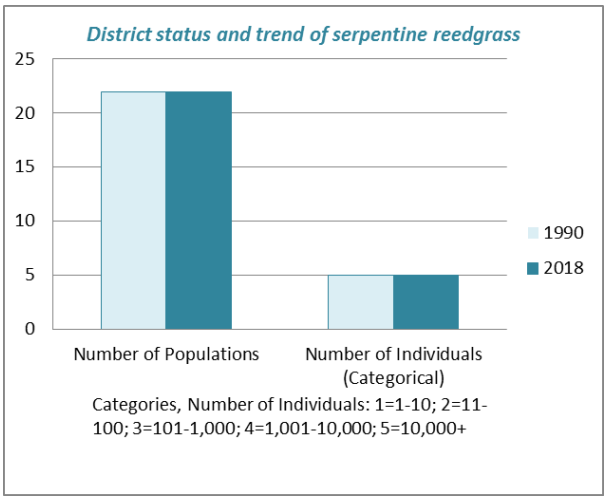


Global Distribution: Serpentine reedgrass can be found outside Marin County in Sonoma, Mendocino, Napa and Lake counties, although the most concentrated numbers can be found on watershed lands.

Global Status: **Vulnerable?** Serpentine reedgrass is not tracked in CNDDB, but records from Calflora show around 80 populations. Only eight of the populations outside of Marin are from within the last 20 years, and many on private property are vulnerable to development and other land use changes.

Local Distribution: Common along the ecotone between serpentine grassland and chaparral on watershed lands, occasionally in interstices of shrubs.

Local Status: **Secure.** This species is common on serpentine. Its clumping nature makes counting individuals difficult, and its abundance makes it unnecessary, but the total population is estimated at over 10,000 plants.



Data Gaps: Populations are not well-mapped due to its lower rarity ranking and local abundance. Areas of serpentine reedgrass grassland—the rare plant community, not just the species—should be mapped and submitted to CNDDB. MMWD should monitor long-term successional changes to assess impact on populations.

Specific Threats and Management Recommendations: Avoid constructing trails, roads, or firelines through populations.

NAME

MONTIACEAE

Scientific Name	*Calandrinia breweri* Wats.
Common Name	Brewer's calandrinia
Synonyms	None
CNDDB Element Code	PDPOR01020
USDA PLANTS Symbol	CABR3

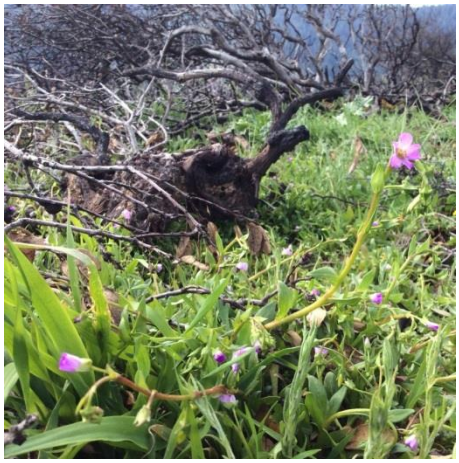


Photo by 2018 Hunter Breck, used by permission, via Calflora

http://www.rareplants.cnps.org/detail/1800.html

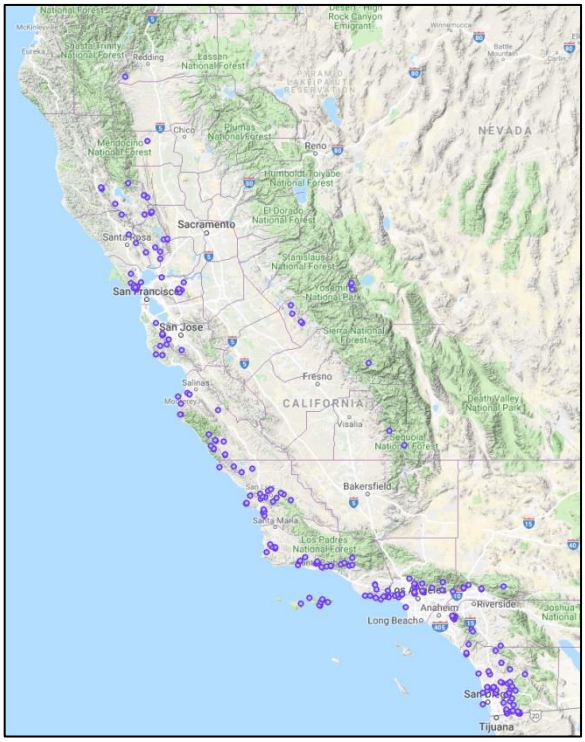
STATUS

Rare Plant Rank	**4.2**	**4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S4**	S4: Apparently secure in California
Global Rank	**G4**	G4: Apparently secure, considering populations outside California
Watershed	**Vulnerable:** Populations are few in number, but not imminently threatened	

BIOLOGY

Lifeform	Annual herb, 0.03–0.3 m tall
Blooming Period	(January) March–June
Habitat	Chaparral, coastal scrub

California distribution of Brewer's calandrinia



Global Distribution: Brewer's calandrinia can be found throughout California and into Mexico, generally on sandstone chaparral and in areas that have been recently burned.

Global Status: **Secure.** This species is common in burned areas, and burns are becoming more frequent. Of the hundreds of observations, about half are from within the past 20 years.

Local Distribution: This species was documented from herbarium specimens until the late 1940s, but other than one sighting near or on Blithedale Open Space Preserve, it was not found until 2013. In the last five years it has been seen around the peaks, on Rocky Ridge, and within the 2017 Pine Fire burn on Pine Mountain.

Local Status: **Vulnerable.** Populations are few in number, but not imminently threatened. If fire activity increases, more plants will likely emerge from the seed bank.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: Population locations are not well known and are not likely to be seen unless fire or major disturbance occurs.

Specific Threats and Management Recommendations: If populations do emerge, they should be allowed to set seed. Postfire recovery should avoid mulching unless there is strong erosion potential from high fire severity and steep slopes.

NAME

LILIACEAE

Scientific Name	*Calochortus umbellatus* A.W. Wood
Common Name	Oakland star-tulip
Synonyms	*Calochortus collinus* Lemmon
CNDDB Element Code	PMLIL0D1E0
USDA PLANTS Symbol	CAUM

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/55.html

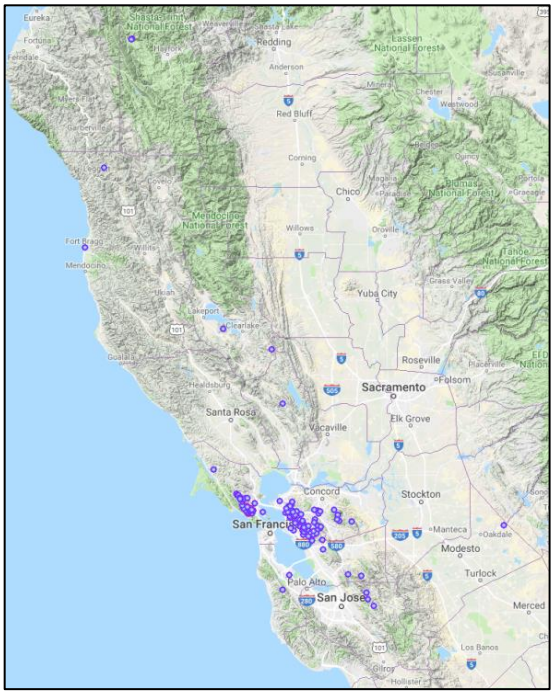
STATUS

Rare Plant Rank	**4.2**	**4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S3?**	S3: Vulnerable
Global Rank	**G3?**	G3: Vulnerable
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management	

BIOLOGY

Lifeform	Perennial bulbiferous herb, 0.06–0.3 m tall
Blooming Period	March–May
Habitat	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland

California distribution of Oakland star-tulip

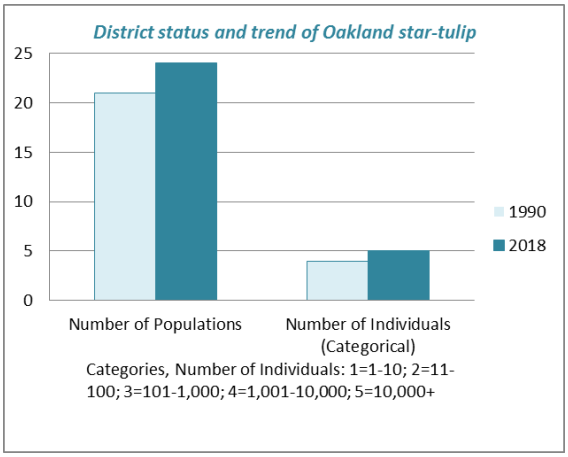


Global Distribution: Oakland star-tulip is generally found in Marin County and the East Bay Area, but also south to Santa Clara and San Mateo counties. Scattered plants have been reported from Lake and Mendocino counties as well. This bulbiferous herb grows mainly on serpentine, from barrens and grasslands to chaparral edges and interstices.

Global Status: **Vulnerable.** The core of this species' population is on MMWD and East Bay Regional Park protected lands, where it is common, but outside these areas populations are isolated and could be extirpated. Of the hundreds of observations, about 50 are from within the past 20 years.

Local Distribution: Common in serpentine grassland, barrens, and chaparral, often at chaparral ecotone or in interstices of shrubs, on watershed lands.

Local Status: **Secure.** This species is common on serpentine. Its variability in emergence—whole populations failed to emerge in 2014–2015 but were in the hundreds to thousands in 2017–2018—can make tracking numbers difficult. However, the total population is estimated at over 10,000 plants in a couple dozen locations.



Data Gaps: Varying emergence would be interesting to study, but not essential.

Specific Threats and Management Recommendations: Trails should not be routed through populations.

NAME

LILIACEAE

Scientific Name	*Calochortus uniflorus* Hook & Arn.
Common Name	Pink star-tulip
Synonyms	None
CNDDB Element Code	PMLIL0D1F0
USDA PLANTS Symbol	CAUN

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/3394.html

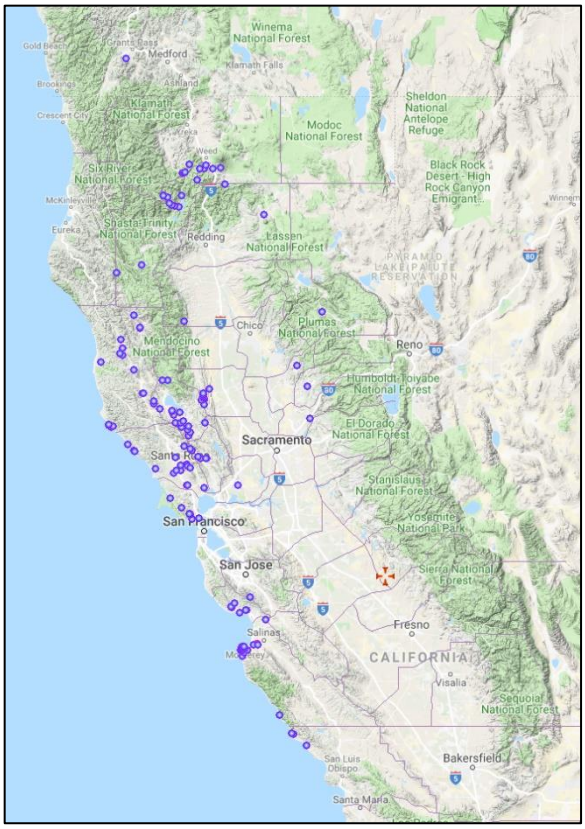
STATUS

Rare Plant Rank	**4.2**	**4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S4**	S4: Apparently secure within California
Global Rank	**G4**	G4: Apparently secure, considering populations outside California
Watershed	**Vulnerable:** Populations are not well-dispersed, not imminently threatened	

BIOLOGY

Lifeform	Perennial bulbiferous herb, 0.05–0.1 m tall
Blooming Period	April–June
Habitat	Coastal prairie, coastal scrub, meadows and seeps, North Coast coniferous forest

California and Oregon distribution of pink star-tulip

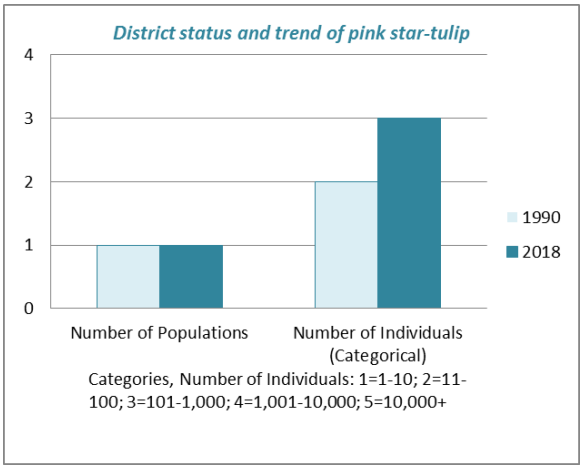


Global Distribution: Pink star-tulip can be found throughout California and into Oregon, generally in wet grasslands and meadows.

Global Status: **Secure?** This species is broadly distributed, and its bulbiferous nature allows it to wait out bad years underground, but overall water availability and grassland habitat are declining. Of the hundreds of observations, about 30 are from within the past 20 years.

Local Distribution: This species only grows at one location; a purported second population has not been found.

Local Status: **Vulnerable.** Only one population is known to occur in the watershed, but it is not imminently threatened.



Data Gaps: Propagation or transplant methods would be useful to know for establishing additional populations.

Specific Threats and Management Recommendations: Protect the existing site and establish additional populations at the two other major wet meadows.

CONVOLVULACEAE

Photo by MMWD, CC BY-NC 3.0

NAME

Scientific Name	*Calystegia collina* (Greene) *Brummitt* ssp. *oxyphylla* Brummitt
Common Name	Mt. Saint Helena morning glory
Synonyms	None
CNDDB Element Code	PDCON04032
USDA PLANTS Symbol	CACOO

http://www.rareplants.cnps.org/detail/63.html

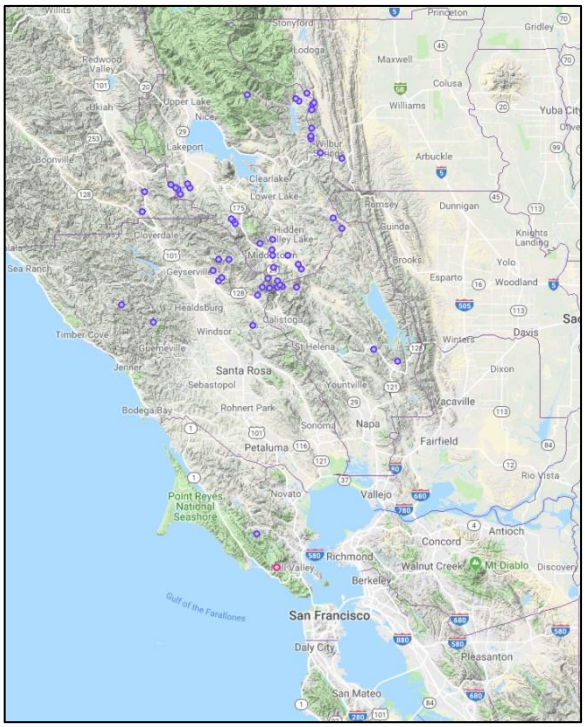
STATUS

Rare Plant Rank	**4.2** **4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S3** S3: Vulnerable
Global Rank	**G4T3** T3: Vulnerable G4: (species) Apparently secure, considering populations outside California
Watershed	**Unknown:** Populations are not well-mapped; plants are difficult to tell from closely related species

BIOLOGY

Lifeform	Perennial rhizomatous herb, 0.05–0.1 m tall
Blooming Period	April–June
Habitat	Chaparral, lower montane coniferous forest, valley and foothill grassland

California distribution of Mt. Saint Helena morning glory



Global Distribution:

Mt. Saint Helena morning glory can be found outside Marin County in Sonoma, Mendocino, Napa and Lake counties, with the main population in Lake County.

Global Status:

Vulnerable. While many populations exist, most have been found roadside and on unprotected lands, where they are susceptible to damage. Of the dozens of observations, about 20 are from within the past 20 years.

Local Distribution:

This species may grow on several areas of serpentine, and purported populations have been mapped across watershed lands.

Local Status:

Unknown. A few populations have been noted from watershed lands, but it is difficult to separate this subspecies from the more common subspecies.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps:

Genetic studies along with morphological data are needed to determine the taxonomy of the *Calystegia collina* complex (Namoff, 2018). The current key separates these by leaf morphology, which varies in the field depending on site conditions.

Specific Threats and Management Recommendations:

Genetic study to understand the subspecies and potential hybrid relationships will help guide management. Current populations will be protected by existing mechanisms along with the suite of serpentine endemics.

Additional References:

Namoff, S. (2018, February). *Taxonomic realignment of* Calystegia *(Convolvulaceae) in California.* Presented at the CNPS Conservation Conference, Los Angeles, CA.

NAME

OROBANCHACEAE

Scientific Name	*Castilleja ambigua* Hook. & Arn. var. *ambigua*
Common Name	Johnny-nip
Synonyms	*Castilleja ambigua* ssp. *ambigua*
CNDDB Element Code	PDSCR0D401
USDA PLANTS Symbol	CAAMA3

Photo by Vernon Smith, CC BY-NC 3.0, via CalPhotos

http://www.rareplants.cnps.org/detail/3361.html

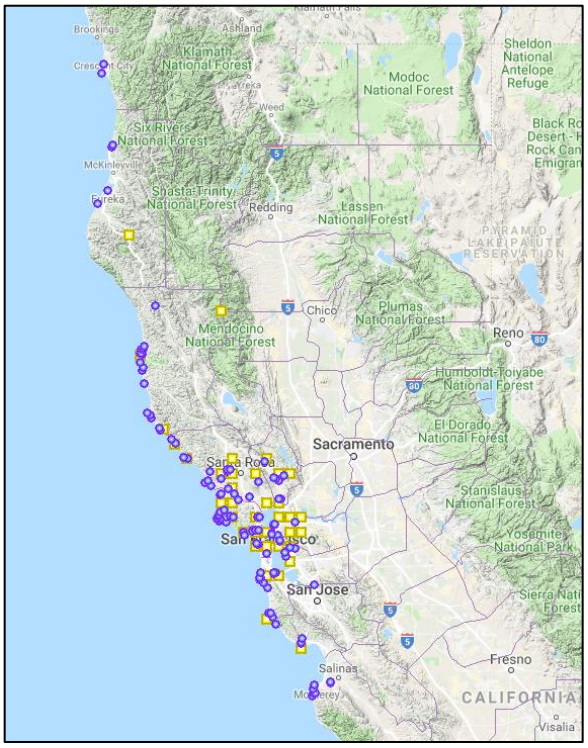
STATUS

Rare Plant Rank	**4.2** **4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S3S4** S4: Apparently secure in California S3: Vulnerable
Global Rank	**G4T5** T5: Secure, considering populations outside California G4: (species) Apparently secure, considering populations outside California
Watershed	**Vulnerable:** Populations are not well-dispersed, not imminently threatened

BIOLOGY

Lifeform	Annual herb (hemiparasitic), 0.05–0.2 m tall
Blooming Period	March–August
Habitat	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools margins

California distribution of johnny-nip



Global Distribution: Johnny-nip can be found throughout coastal California, and into the Sacramento Delta, generally in wet grasslands and marshes.

Global Status: **Secure?** This species is broadly distributed, but its wet-area habitats are declining and vulnerable to climate change. Of the hundred-plus observations, about 30 are from within the past 20 years.

Local Distribution: This species only grows at one location in the watershed.

Local Status: **Vulnerable.** Only one population is known from watershed lands. While individuals in this population number in the hundreds, there is annual variation. Nevertheless, it is not imminently threatened.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: Johnny-nip is hemiparasitic; more knowledge about its host may help guide management and potential introductions at other wet meadow areas.

Specific Threats and Management Recommendations: Protect existing population site and consider introductions at other wet meadow areas.

NAME

RHAMNACEAE

Scientific Name	*Ceanothus gloriosus* J. Howell var. *exaltatus* J. Howell
Common Name	Glory brush
Synonyms	None
CNDDB Element Code	PDRHA040F4
USDA PLANTS Symbol	CEGLE

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/1867.html

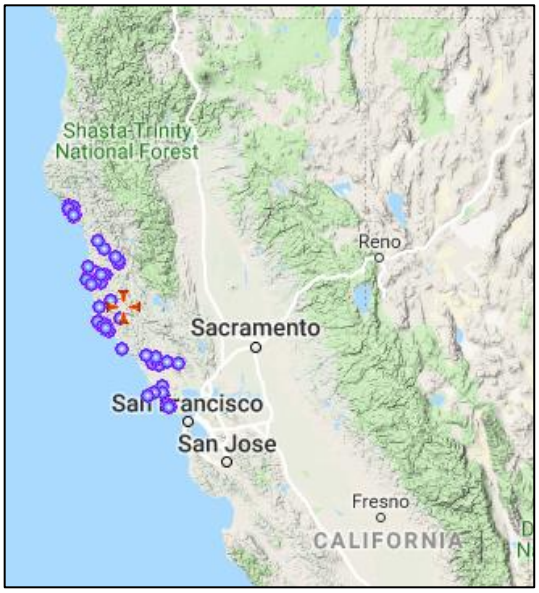
STATUS

Rare Plant Rank	**4.3** **4:** Limited distribution in California **.3:** Not very endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S4** S4: Apparently secure within California
Global Rank	**G4T4** T4: Apparently secure, considering populations outside California. G4: (species) Apparently secure, considering populations outside California
Watershed	**Imperiled:** This plant is close to extirpation on watershed lands

BIOLOGY

Lifeform	Perennial evergreen shrub, <2 m tall
Blooming Period	March–June (August)
Habitat	Chaparral

California distribution of glory brush



INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Global Distribution: This species can be found from Marin County north to Humboldt County, mainly in coastal areas in sandstone chaparral.

Global Status: **Secure.** Glory brush has a fairly broad range, with many populations on protected lands. Of the hundred-plus observations, about 10 are from within the past 20 years.

Local Distribution: This species only grows at one location on watershed lands.

Local Status: **Imperiled.** This plant is close to extirpation on watershed lands. Glory brush needs fire to germinate, and the last fire was over 70 years ago, which is close to the lifespan of individual plants.

Data Gaps: More information is needed on the genetic relationship to Mason's ceanothus (Hardig et al., 2000) and on germination requirements in the absence of fire.

Specific Threats and Management Recommendations: The lack of fire is a major concern for all maritime chaparral species. In addition, road maintenance may impact populations, but the current practice of flagging plants and training mowing staff to recognize rare ceanothus appears sufficient to prevent accidental cutting.

Additional References:

Hardig, T. M., Soltis, P. S., & Soltis, D. E. (2000). Diversification of the North American shrub genus *Ceanothus* (Rhamnaceae): Conflicting phylogenies from nuclear ribosomal DNA and chloroplast DNA. *American Journal of Botany, 87*(1), 108–123.

RHAMNACEAE

NAME

Scientific Name	*Ceanothus masonii* McMinn
Common Name	Mason's ceanothus
Synonyms	*Ceanothus rigidus* Nutt.
CNDDB Element Code	PDRHA04200
USDA PLANTS Symbol	CEMA3

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/214.html

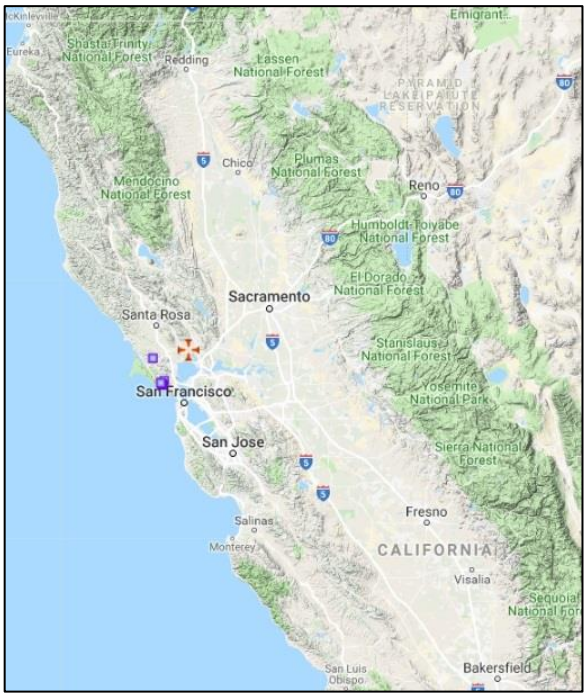
STATUS

Rare Plant Rank	**1B.2**	**1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**CR**	CR: Rare
Federal Listing Status	**Not Listed**	
State Rank	**S1**	S1: Critically Imperiled
Global Rank	**G1**	G1: Critically Imperiled
Watershed	**Imperiled:** This plant is close to extirpation on watershed lands	

BIOLOGY

Lifeform	Perennial evergreen shrub, <2 m tall
Blooming Period	March–April
Habitat	Chaparral (openings, rocky)

California distribution of Mason's ceanothus

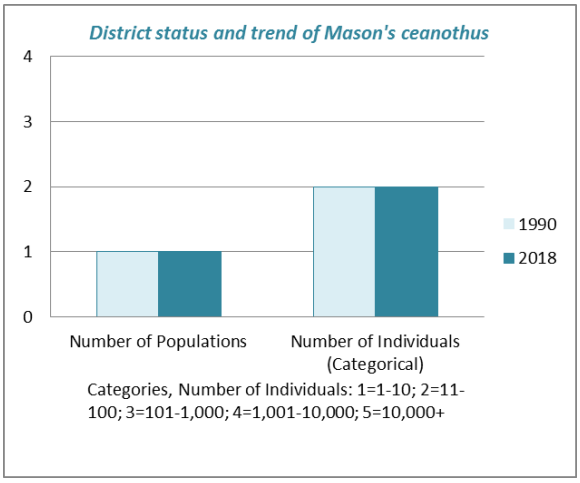


Global Distribution: This species can only be found in Marin County, mainly in sandstone chaparral.

Global Status: **Imperiled.** This plant is close to extirpation; its two main populations (southern and northern Marin) suffer from fire suppression.

Local Distribution: This species only grows at one location in the watershed.

Local Status: **Imperiled.** This plant is close to extirpation on watershed lands. Mason's ceanothus needs fire to germinate, and the last fire was over 70 years ago—approaching the lifespan of individual plants. The taxon, likely of hybrid origin, may also become less of a distinct entity due to back-crossing with one or both of the parent taxa (probably glory brush and buckbrush [*C. ramulosus*]).



Data Gaps: More information is needed on the genetic relationship of Mason's ceanothus to glory brush and other ceanothus to determine hybridization (Hardig et al. 2000). Additional research is also needed on the germination requirements in the absence of fire.

Specific Threats and Management Recommendations: The lack of fire is a major concern for all maritime chaparral species. Road maintenance may impact populations, but the current practice of flagging plants and training mowing staff to recognize rare ceanothus appears sufficient to prevent accidental cutting.

Additional References:

Hardig, T. M., Soltis, P. S., & Soltis, D. E. (2000). Diversification of the North American shrub genus *Ceanothus* (Rhamnaceae): Conflicting phylogenies from nuclear ribosomal DNA and chloroplast DNA. *American Journal of Botany*, *87*(1), 108–123.

NAME

ASTERACEAE

Scientific Name	*Cirsium hydrophilum* (Greene) Jeps. var. *vaseyi* (Gray) J.T. Howell
Common Name	Mt. Tamalpais thistle
Synonyms	*Cirsium vaseyi* Jeps. var. *hydrophilum* Jeps.
CNDDB Element Code	PDAST2E1G2
USDA PLANTS Symbol	CIHYV

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/486.html

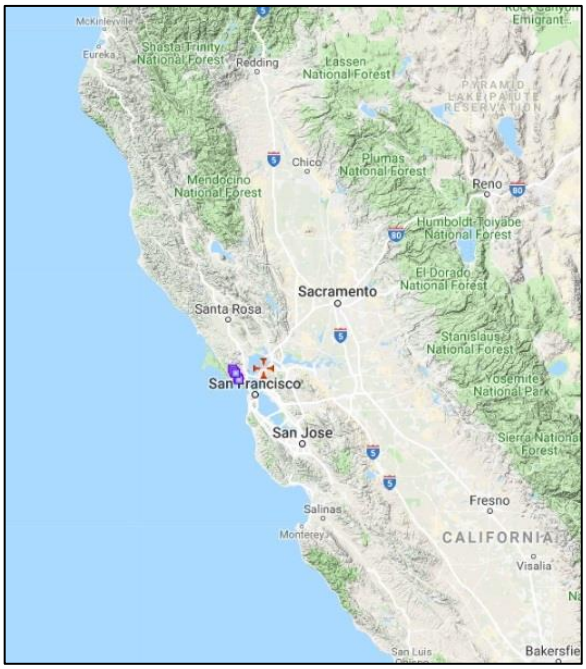
STATUS

Rare Plant Rank	**1B.2**	**1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S1**	S1: Critically Imperiled
Global Rank	**G2T1**	T1: Critically Imperiled. G2: (species) Imperiled
Watershed	**Threatened:** Populations are in decline and will disappear without intervention	

BIOLOGY

Lifeform	Perennial herb, 1–3 m tall
Blooming Period	May–August
Habitat	Broadleafed upland forest, chaparral, meadows and seeps

California distribution of Mt. Tamalpais thistle

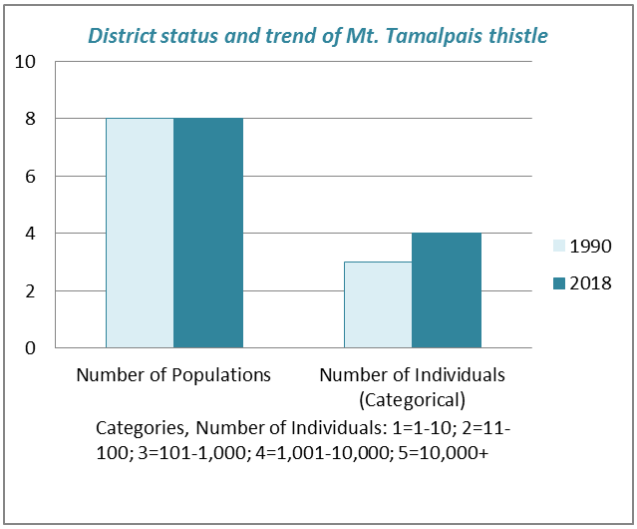


Global Distribution: This species can only be found in Marin County, mainly in serpentine seeps and wetlands.

Global Status: **Imperiled.** This plant can only be found in southern Marin County. While nearly all the populations are on protected lands, its habitat requirements for moisture and disturbed ground for establishment put it at risk from climate change, invasive species, and natural vegetation succession.

Local Distribution: This species grows along the northwest-southeast seam of serpentine in the watershed.

Local Status: **Threatened.** While the total number of populations has remained steady, two populations from the 1990 report are extirpated and two additional populations have been found. Two recently outplanted sites are not included in numbers reported here.



Data Gaps: Further explore relationship to Suisun thistle to see if research on this more well-studied subspecies can be applied. Also do additional research into dispersal mechanisms, including whether this thistle has metapopulation dynamics, and under what circumstances population changes occur.

Specific Threats and Management Recommendations: This species should continue to be protected from mowing and road work, and habitat maintained (Douglas-fir and weeds removed). Two introduced populations should continue to be monitored, with lessons learned applied to additional plantings.

NAME

RANUNCULACEAE

Scientific Name	*Delphinium bakeri* Ewan
Common Name	Baker's larkspur
Synonyms	None
CNDDB Element Code	PDRAN0B050
USDA PLANTS Symbol	DEBA

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/550.html

STATUS

Rare Plant Rank	**1B.1**	**1B:** Rare, threatened, or endangered in California and elsewhere **.1:** Seriously endangered in California
State Listing Status	**CE**	CE: Endangered
Federal Listing Status	**FE**	FE: Endangered
State Rank	**S1**	S1: Critically Imperiled
Global Rank	**G1**	G1: Critically Imperiled
Watershed	**Imperiled:** This plant is close to extirpation on watershed lands	

BIOLOGY

Lifeform	Perennial herb, 0.2–1 m tall
Blooming Period	March–May
Habitat	Broadleafed upland forest, coastal scrub, valley and foothill grassland

California distribution of Baker's larkspur

Global Distribution: This species can only be found in Marin County. Sonoma populations are extirpated, and the populations thought to be present in Southern California were misidentifications.

Global Status: **Imperiled.** This plant is close to extinction; the single wild roadside population has fewer than a dozen plants. Outplanting at sites near the wild population has not been very successful, with few plants surviving and even fewer reproducing.

Local Distribution: Three populations were planted around Soulajule Reservoir in 2010–2011.

Local Status: **Imperiled.** This plant is close to extirpation. Although three populations were planted, one site has failed and the others have few plants. Additional plants will be introduced to the first site to boost population levels (Holly Forbes, email July 18, 2018 with Andrea Williams).

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: With only one wild population, the ideal habitat and survival requirements for this plant can only be poorly inferred. Additional work on preventing herbivory—particularly when the plants are reproducing—may be needed.

Specific Threats and Management Recommendations: Dead trees from SOD or other impacts have fallen in the Soulajule sites, but herbivory and climate variability seem the greatest threats. Continue to work on exclosure methods to prevent herbivory.

NAME

THYMELAEACEAE

Scientific Name	*Dirca occidentalis* Gray
Common Name	Western leatherwood
Synonyms	None
CNDDB Element Code	PDTHY03010
USDA PLANTS Symbol	DIOC3

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/567.html

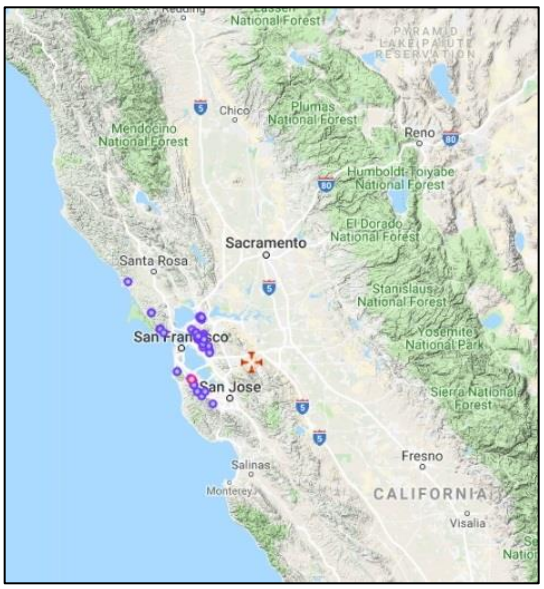
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2** S2: Imperiled
Global Rank	**G2** G2: Imperiled
Watershed	**Threatened:** Populations are in decline and will disappear without intervention

BIOLOGY

Lifeform	Perennial deciduous shrub 1–4 m tall
Blooming Period	January–March (April)
Habitat	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, riparian woodland

California distribution of western leatherwood



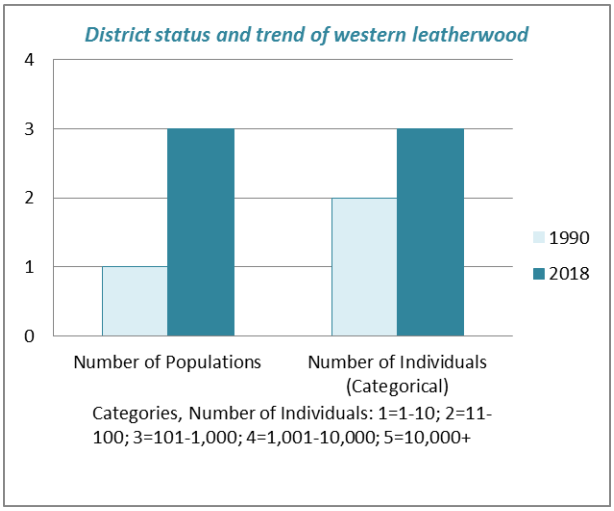
Global Distribution: This species is found almost exclusively in the San Francisco Bay Area, often in mesic sites on rocky greenstone-derived soils in partial shade.

Global Status: **Threatened.** Populations are in decline. In 1990 this plant was a CNPS List 4 (watchlist) species and has since been downgraded to a 1B.2 (fairly endangered), indicating its worsening status.

Local Distribution: Populations in the watershed grow in lower Lagunitas Creek, between Alpine and Peters Dams. More plants can be found below Seeger Dam in Nicasio.

Local Status: **Threatened.** Populations are in decline. Although the total number of populations has increased due to additional searches, one population is extirpated and remaining populations have fewer plants than when monitored in 2004 (internal data).

In 2016, under staff direction, intern Nate Phoravourek analyzed existing population site characteristics and searched likely drainages on watershed lands to find additional populations. While none were found, two excellent potential reintroduction sites were located.



Data Gaps: Research into germination/transplant requirements would help reveal if establishing additional populations is feasible.

Specific Threats and Management Recommendations: SOD is altering at least one site, and invasive French broom is altering another. Continue to remove broom, monitor populations, and explore introductions.

POACEAE

NAME

Scientific Name	*Elymus californicus* (Bol.) Gould
Common Name	California bottle-brush grass
Synonyms	*Hystrix californica*
CNDDB Element Code	PMPOA2H0W0
USDA PLANTS Symbol	ELCA10

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/589.html

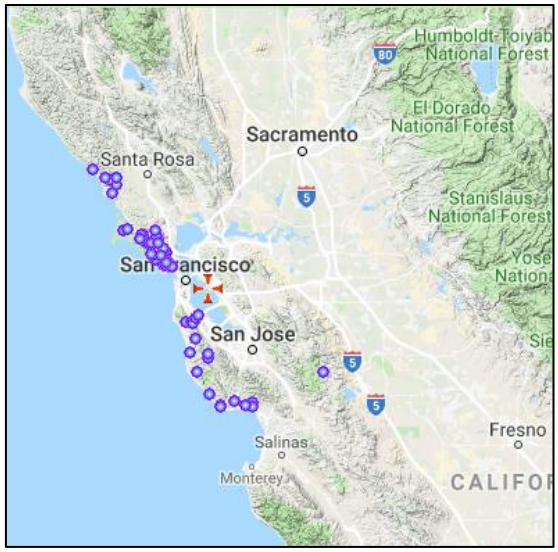
STATUS

Rare Plant Rank	**4.3** **4:** Limited distribution in California **.3:** Not very endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S4** S4: Apparently secure within California
Global Rank	**G4** G4: (species) Apparently secure, considering populations outside California
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management

BIOLOGY

Lifeform	Perennial herb, 1–3 m tall
Blooming Period	May–August (November)
Habitat	Broadleafed upland forest, cismontane woodland, North Coast coniferous forest, riparian woodland

California distribution of California bottle-brush grass

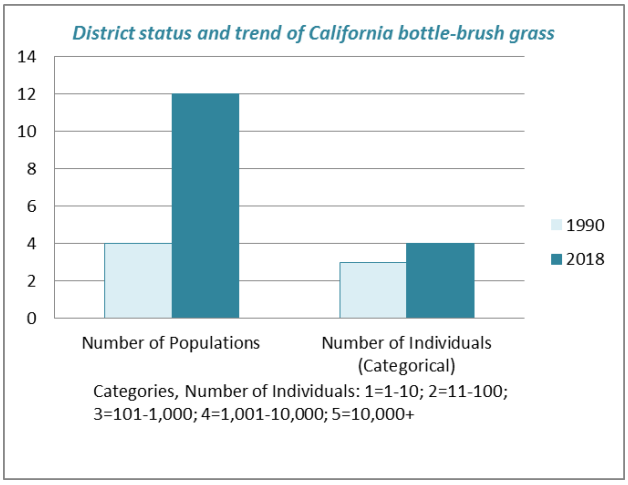


Global Distribution: Populations of California bottle-brush grass can be found throughout the San Francisco Bay Area, mainly in the coastal forests of Marin and San Mateo counties.

Global Status: **Secure.** California bottle-brush grass has a broad and probably under-reported distribution.

Local Distribution: Found across the watershed north of the peaks of Mount Tamalpais. Also found at Nicasio Reservoir.

Local Status: **Secure.** Populations are numerous and well-dispersed.



Data Gaps: The full distribution is unknown; it likely occurs in the impenetrable forests of lower Bolinas Ridge. Its tolerance to mowing and response to SOD (are more gaps good or is too much sun bad?) are also unknown.

Specific Threats and Management Recommendations: Climate change and SOD may alter habitats, and invasive broom species may invade and crowd it out. MMWD should continue to pull broom and map populations when found.

POLYGONACEAE

Photo by MMWD, CC BY-NC 3.0

NAME

Scientific Name	*Eriogonum luteolum* Greene var. *caninum* (Greene) Rev.
Common Name	Tiburon buckwheat
Synonyms	*Eriogonum vimineum* var. *caninum*, *Eriogonum vimineum* var. *californicum*, *Eriogonum caninum*
CNDDB Element Code	PDPGN083S1
USDA PLANTS Symbol	ERLUC

http://www.rareplants.cnps.org/detail/733.html

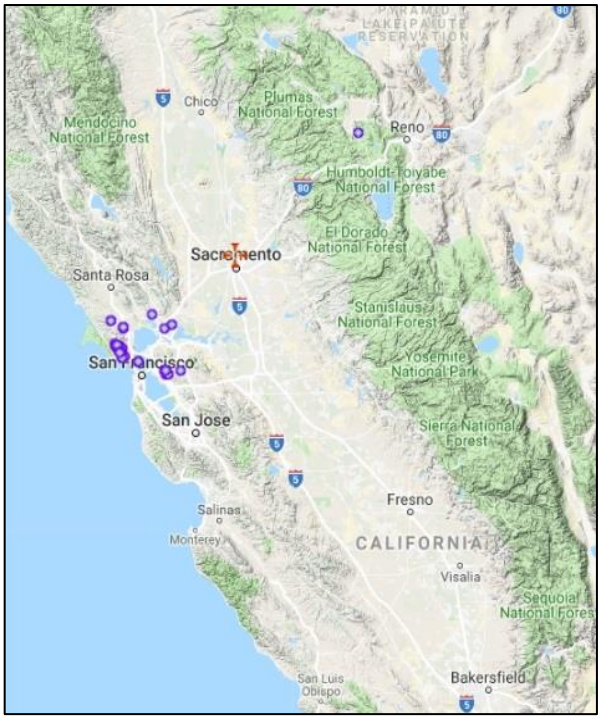
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2** S2: Imperiled
Global Rank	**G5T2** T2: Imperiled G5: (species) Secure, considering populations outside California
Watershed	**Secure**: Populations are numerous and well-dispersed, not threatened by management

BIOLOGY

Lifeform	Annual herb, 0.5–3 m tall
Blooming Period	May–September
Habitat	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland

California distribution of Tiburon buckwheat

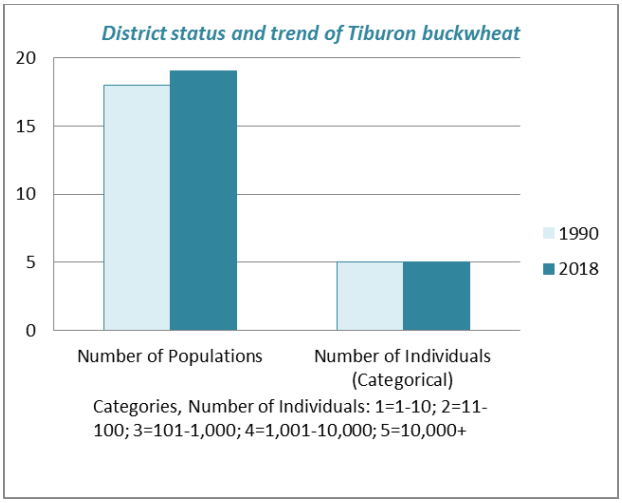


Global Distribution: This species can be found throughout Northern California, but the subspecies is limited to the San Francisco Bay Area.

Global Status: **Secure.** Populations appear healthy and, given their serpentine habitat, are unlikely to be converted to land uses incompatible with their survival. The major question with the taxon is where the subspecies boundary is, as it intergrades with ssp. *caninum* to the north.

Local Distribution: Common in serpentine barrens on Mount Tamalpais watershed lands.

Local Status: **Secure.** This species is common on serpentine barrens. Although its population fluctuations as an annual make tracking numbers difficult, the total population is estimated at over 10,000 plants in over a dozen locations.



Data Gaps: Delineating the subspecies boundary with ssp. *caninum* may help clarify population numbers.

Specific Threats and Management Recommendations: Trampling on serpentine barrens has negatively affected some populations (for example, Little Carson); however, placement of barriers and/or signs may help reduce these impacts.

NAME

LILIACEAE

Scientific Name	*Fritillaria lanceolata* Pursh. var. *tristulis* A.L. Grant
Common Name	Marin checker lily
Synonyms	*Fritillaria affinis* var. *tristulis*
CNDDB Element Code	PMLIL0V0P1
USDA PLANTS Symbol	FRAFT2

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/1681.html

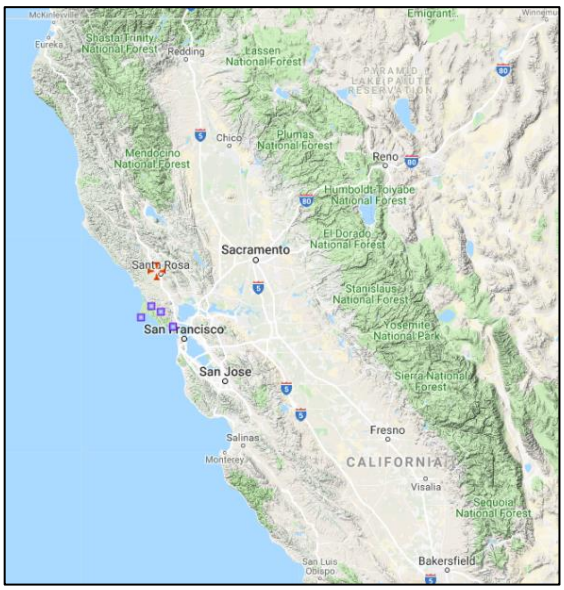
STATUS

Rare Plant Rank	**1B.1** **1B:** Rare, threatened, or endangered in California and elsewhere **.1:** Seriously endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2** S2: Imperiled
Global Rank	**G5T2** T2: Imperiled G5: (species) Secure, considering populations outside California
Watershed	**Imperiled:** This plant is close to extirpation on watershed lands

BIOLOGY

Lifeform	Perennial bulbiferous herb, 1–2 m tall
Blooming Period	February–May
Habitat	Coastal bluff scrub, coastal prairie, coastal scrub

California distribution of Marin checker lily



Global Distribution: This species is only found in Marin County, although there is a record of a population in San Mateo County that may be extirpated.

Global Status: **Imperiled.** This plant is known from only a handful of sites. Plants may only reproduce by offsets (asexually) or arise spontaneously as triploids (Marchant & Macfarlane 1980); however, triploid pollen is usually sterile.

Local Distribution: One population grows around Nicasio Reservoir.

Local Status: **Imperiled.** This plant is known from only a single site, consisting of a few plants. This taxon was not included in the 1990 Patterson report as non-Tamalpais areas were excluded.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: The taxonomy, derivation, and relationship of this plant to other *Fritillaria* need more study to determine the Marin checker lily's taxonomic relationship to these species.

Specific Threats and Management Recommendations: The habitat on Nicasio Island is converting from grassland to scrub and should be burned or grazed to reduce coyote brush and thatch, which would otherwise smother this species and prevent vegetative reproduction.

Additional References:

Marchant, C. J., & Macfarlane, R. M. (1980). Chromosome polymorphism in triploid populations of *Fritillaria lanceolata* Pursh (Liliaceae) in California. *Botanical Journal of the Linnean Society*, *81*(2), 135–154.

NAME

LILIACEAE

Scientific Name	*Fritillaria liliacea* Lindl.
Common Name	Fragrant fritillary
Synonyms	*Fritillaria recurva*
CNDDB Element Code	PMLIL0V0C0
USDA PLANTS Symbol	FRLI3 (FRRE)

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/824.html

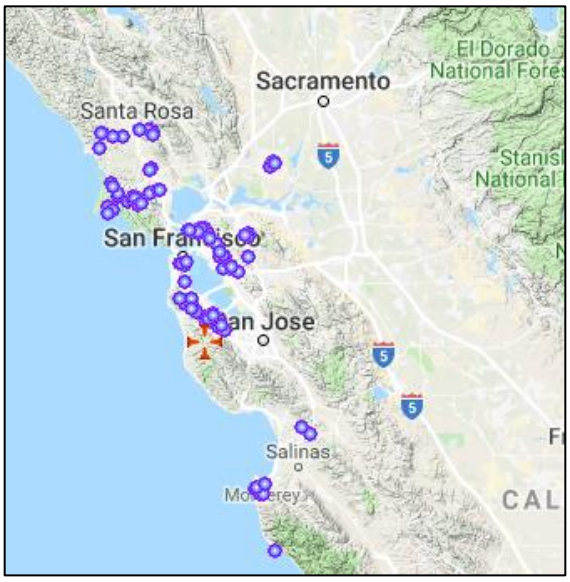
STATUS

Rare Plant Rank	**1B.2**	**1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S2**	S2: Imperiled
Global Rank	**G2**	G2: Imperiled
Watershed	**Threatened:** Populations are in decline and will disappear without intervention	

BIOLOGY

Lifeform	Perennial bulbiferous herb, 0.3–1(2)m tall
Blooming Period	February – April
Habitat	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland

California distribution of fragrant fritillary



Global Distribution: This species can be found throughout the greater San Francisco Bay Area.

Global Status: **Threatened?** Populations appear to be in decline and may disappear without intervention.

Local Distribution: One population grows around Nicasio Reservoir.

Local Status: **Threatened.** This plant is known from only a single site, although there are five patches and several hundred plants in total. Habitat succession from grassland to scrub, as well as invasion by non-native species, threaten these patches. Roadside (non-MMWD) patches are in further decline.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: The taxonomy, derivation, and relationship of this plant to other *Fritillaria* need more study to reveal whether this is a valid taxon.

Specific Threats and Management Recommendations: The habitat on Nicasio Island is converting from grassland to scrub and should be burned or grazed to reduce coyote brush and thatch, which would otherwise smother this species and prevent vegetative reproduction.

NAME

LINACEAE

Scientific Name	*Hesperolinon congestum* (Gray) Small
Common Name	Marin western flax
Synonyms	*Linum congestum* Gray; *Linum californicum* var. *congestum* Jeps.
CNDDB Element Code	PDLIN01060
USDA PLANTS Symbol	HECO12

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/405.html

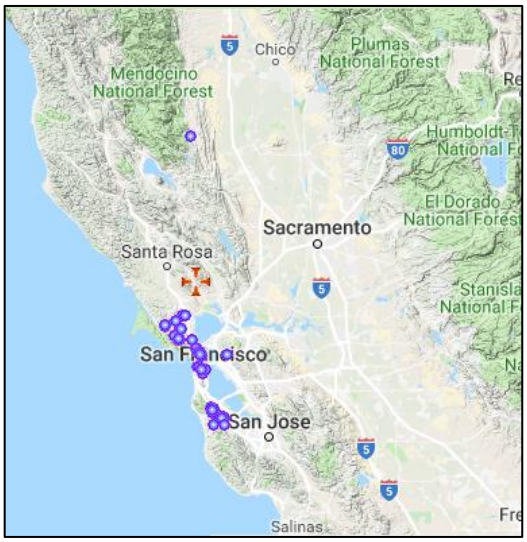
STATUS

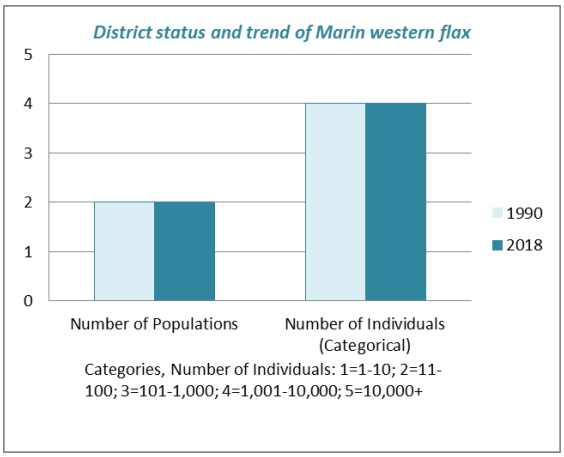
Rare Plant Rank	**1B.1**	**1B:** Rare, threatened, or endangered in California and elsewhere **.1:** Seriously endangered in California
State Listing Status	**CT**	G1: Threatened
Federal Listing Status	**FT**	FT: Threatened
State Rank	**S1**	S1: Critically Imperiled
Global Rank	**G1**	G1: Critically Imperiled
Watershed	**Threatened:** Populations are in decline and will disappear without intervention	

BIOLOGY

Lifeform	Annual herb, 0.05–0.15 m tall
Blooming Period	April–July (May–June on MMWD lands)
Habitat	Chaparral, valley and foothill grassland

California distribution of Marin western flax





Global Distribution: This species is limited to Marin, San Francisco, and San Mateo counties.

Global Status: **Imperiled**. Fewer than 30 populations are known, and many of these are threatened.

Local Distribution: In serpentine areas from Carson Ridge to Azalea Hill.

Local Status: **Threatened.** Populations are in decline and will disappear without intervention. Although populations were estimated at "a few thousand" in the 1990s, they total just over a thousand today.

Data Gaps: It is not known if populations near Pine Mountain Fire Road consist of one or two different populations, and whether both are extant. Seed bank dynamics and interannual fluctuations are also not understood. Lastly, it is not clear why more serpentine grassland areas are not occupied by this species.

Specific Threats and Management Recommendations: Protect populations at Azalea Hill from trampling and trail work and explore introducing additional populations as well as an appropriate disturbance regime for all populations.

NAME

ROSACEAE

Scientific Name	*Horkelia tenuiloba* (Torr.) Gray
Common Name	Thin-lobed horkelia
Synonyms	*Potentilla micheneri* Greene
CNDDB Element Code	PDROS0W0E0
USDA PLANTS Symbol	HOTE2

Photo by Vernon Smith, CC BY-NC 3.0, via CalPhotos

http://www.rareplants.cnps.org/detail/916.html

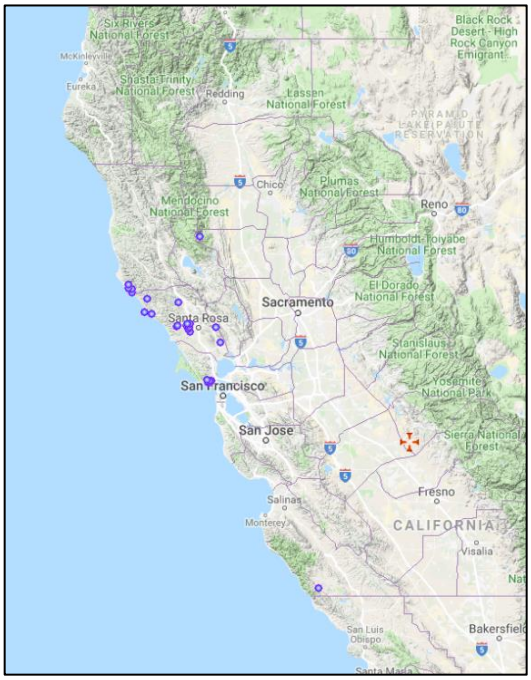
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2** S2: Imperiled
Global Rank	**G2** G2: Imperiled
Watershed	**Threatened:** Populations are in decline and will disappear without intervention

BIOLOGY

Lifeform	Perennial herb, 0.05–0.4 m tall
Blooming Period	April–July (August)
Habitat	Broadleafed upland forest, chaparral, valley and foothill grassland; mesic openings, sandy

California distribution of thin-lobed horkelia

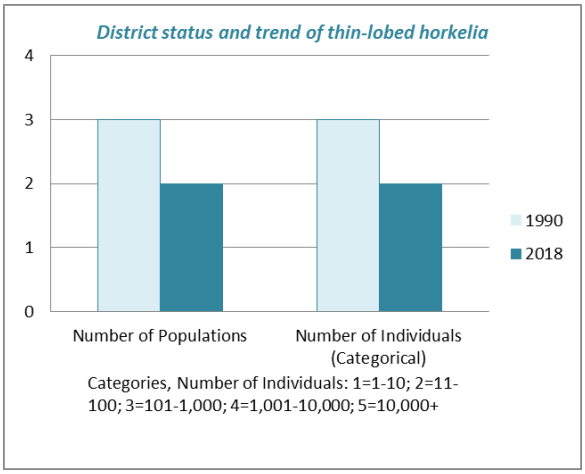


Global Distribution: Limited to Marin, Mendocino, and Sonoma counties.

Global Status: **Imperiled.** This plant is known from only a couple dozen sites, only 11 of which have recent information.

Local Distribution: Populations have been found across watershed lands. While the distribution is broad, these populations are isolated.

Local Status: **Imperiled.** This plant is known from only two sites in the watershed; two of the three sites from the 1990 inventory are extirpated, but an additional small population was found near Lake Lagunitas. The absent populations may have been lost due to shading from Douglas-fir.



Data Gaps: The metapopulation dynamics of this species are unknown, as well as the ideal disturbance regime—both of which would be important for making management decisions to support this species.

Specific Threats and Management Recommendations: The one large population is roadside and must be protected from being parked on and having materials or dirt spoil piles stacked on it. The smaller population is near a social trail and should be monitored for trampling and other impacts.

NAME

FABACEAE

Scientific Name	*Hosackia gracilis* Benth.
Common Name	Harlequin lotus
Synonyms	*Lotus formosissimus*
CNDDB Element Code	PDFAB2A0D0
USDA PLANTS Symbol	LOFO2

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/2089.html

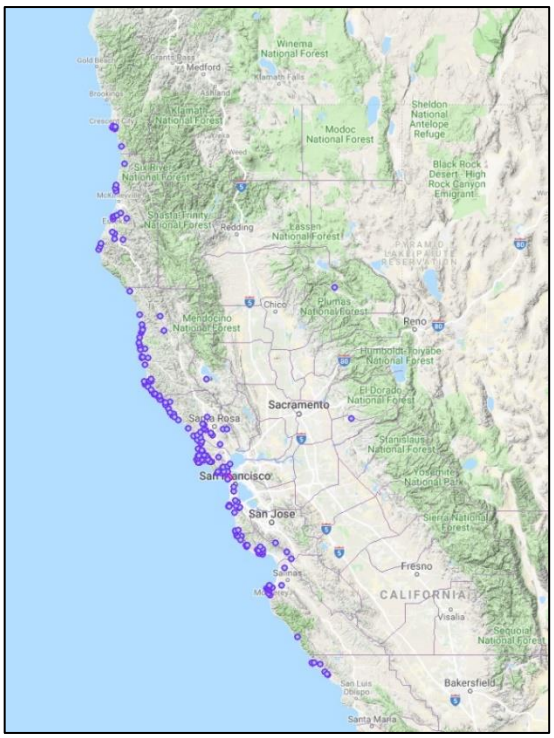
STATUS

Rare Plant Rank	**4.2** **4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S3** S3: Vulnerable
Global Rank	**G4** G4: (species) Apparently secure, considering populations outside California
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management

BIOLOGY

Lifeform	Perennial rhizomatous herb, 0.1–0.5 m tall
Blooming Period	March–July
Habitat	Broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, North Coast coniferous forest, valley and foothill grassland

California distribution of harlequin lotus



Global Distribution: Found in California, Oregon, and Washington. Endangered in Canada.

Global Status: **Secure?** Harlequin lotus is broadly distributed, but its wet-area habitats are declining and vulnerable to climate change. This species is not tracked in a shared database such as CNDDB, so quality information is difficult to find, but there appear to be several hundred locations, sixty of which have recent information.

Local Distribution: This species has been found in most of the large wet meadow complexes on Mount Tamalpais, with more populations possible.

Local Status: **Secure:** The five known populations are away from most road and trail work. While most are fewer than 100 plants, one contains over 1,000 individuals.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: Other mesic sites should be searched for additional populations during flowering season in May.

Specific Threats and Management Recommendations: Continue improving wet meadow habitat through woody species and weed removal.

NAME

IRIDACEAE

Scientific Name	*Iris longipetala* Herbert
Common Name	Coast iris
Synonyms	*Iris missouriensis*
CNDDB Element Code	PMIRI092E0
USDA PLANTS Symbol	IRMI

Photo by Vernon Smith, CC BY-NC 3.0, via CalPhotos

http://www.rareplants.cnps.org/detail/3169.html

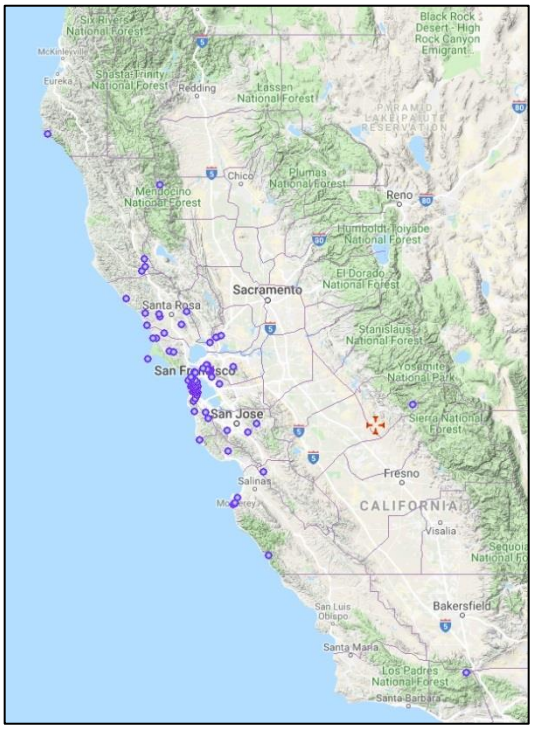
STATUS

Rare Plant Rank	**4.2**	**4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S3**	S3: Vulnerable
Global Rank	**G3**	G3: Vulnerable
Watershed	**Vulnerable:** Populations are not well-dispersed, not imminently threatened	

BIOLOGY

Lifeform	Perennial rhizomatous herb, 0.3–1 m tall
Blooming Period	March–May
Habitat	Coastal prairie, lower montane coniferous forest, meadows and seeps

California distribution of coast iris



Global Distribution: The majority of observations have been made along the Pacific Coast, as far north as King Range National Conservation Area, and as far south as Los Padres National Forest.

Global Status: **Vulnerable?** Coast iris is broadly distributed, but its wet-area habitats are declining and vulnerable to climate change. This species is not tracked in a shared database such as CNDDB, so quality information is difficult to find, but over 100 locations are known.

Local Distribution: A single population, consisting of several clonal patches, can be found on MMWD lands at Nicasio Reservoir.

Local Status: **Vulnerable.** Coast iris is not currently threatened by management; however, its habitat may eventually be impacted by coyote brush or invasive plant incursions. Single populations are always vulnerable to perturbations.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: The relationship of coast iris to blue flag (*I. missouriensis*) is not well understood, and some taxonomists believe they are the same species. If that is the case, then its status as a rare species would need to be revaluated.

Specific Threats and Management Recommendations: The habitat on Nicasio Island is converting from grassland to scrub, which will crowd out coast iris there. The site should be burned or grazed to reduce coyote brush and thatch.

NAME

OROBANCHACEAE

Scientific Name	*Kopsiopsis hookeri* (Walp.) Govaerts
Common Name	Small groundcone
Synonyms	*Boschniakia hookeri*
CNDDB Element Code	PDORO01010
USDA PLANTS Symbol	BOHO

Photo by Vernon Smith,
CC BY-NC-ND 3.0, via CalPhotos

http://www.rareplants.cnps.org/detail/1590.html

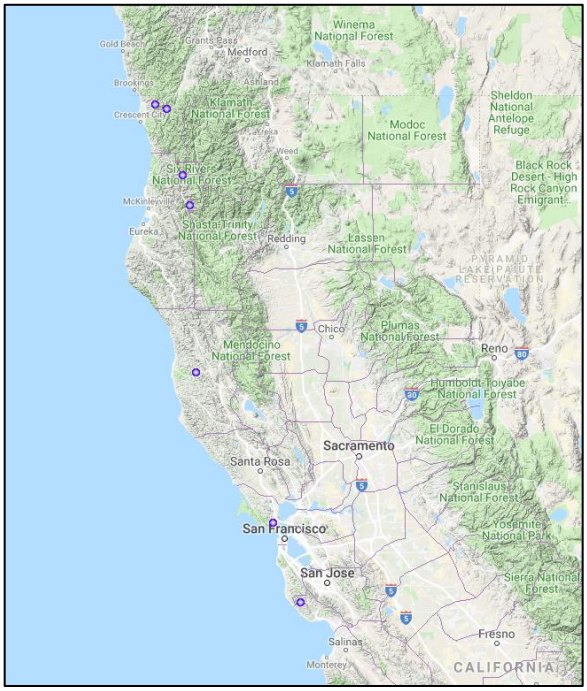
STATUS

Rare Plant Rank	**2B.3** **2B:** Rare or Endangered in California, common elsewhere **.3:** Not very endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S1S2** S1: Critically imperiled S2: Imperiled
Global Rank	**G4?** G4: (species) Apparently secure, considering populations outside California
Watershed	**Vulnerable:** Populations are not well-dispersed, not imminently threatened

BIOLOGY

Lifeform	Perennial rhizomatous herb (parasitic), 0.07–0.2 m tall
Blooming Period	April–August
Habitat	North Coast coniferous forest; parasitic on Ericaceae (usually salal, madrone, huckleberry)

California-Oregon distribution of small groundcone



Global Distribution: Found from Northern California coniferous forests to Oregon and Washington coastal forests

Global Status: **Secure?** Small groundcone is found north into Canada but has been ranked as rare in the four state/provinces it inhabits with the exception of Oregon, where it is under review.

Local Distribution: A single population is confirmed adjacent to MMWD watershed lands; a second population along Swede George may be California groundcone. The two species can be difficult to tell apart even when fresh.

Local Status: **Vulnerable.** Small groundcone is not currently threatened by management; however, its habitat may be impacted by climate change or SOD.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: It is not known if additional populations exist in remote mixed-conifer forests.

Specific Threats and Management Recommendations: Search for additional populations where host plants are present.

Additional References:

NatureServe. (2018). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. Retrieved July 26, 2018, from http://explorer.natureserve.org

NAME

POLEMONIACEAE

Scientific Name	*Leptosiphon acicularis* (Greene) Jeps.
Common Name	Bristly leptosiphon
Synonyms	*Linanthus acicularis*
CNDDB Element Code	PDPLM09010
USDA PLANTS Symbol	LEAC11

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/1716.html

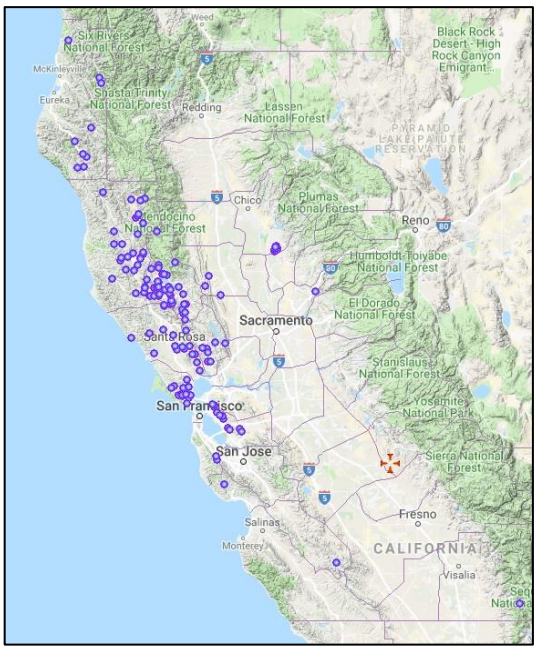
STATUS

Rare Plant Rank	**4.2**	**4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S4?**	S4: Apparently secure within California
Global Rank	**G4?**	G4: Apparently secure, considering populations outside California
Watershed	**Imperiled:** This plant is close to extirpation on watershed lands	

BIOLOGY

Lifeform	Annual herb, 0.03–0.15 m tall
Blooming Period	April–July
Habitat	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland

California distribution of bristly leptosiphon



Global Distribution: This species is primarily found in the North Coast Range and San Francisco Bay Area.

Global Status: **Secure?** Bristly leptosiphon has over 100 recorded locations, but fewer than 20 have recent information available.

Local Distribution: Two locations have been found along Pine Mountain-Carson Ridge; there is an additional location just off MMWD property in Cascade Canyon and White Hill Open Space Preserves.

Local Status: **Imperiled.** This annual plant has only been seen sporadically and in low numbers. Its preference for open, rocky soil may mean it will appear in larger numbers after disturbances.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: Seed bank dynamics are unknown, and populations may be "hiding" underground. Additional populations of this diminutive annual are possible but would be easy to miss during surveys.

Specific Threats and Management Recommendations: Protect known (roadside) populations and search for other populations on watershed lands.

ASTERACEAE

Photo by Vernon Smith, CC BY-NC-ND 3.0, via CalPhotos

NAME

Scientific Name	*Lessingia micradenia* Greene var. *micradenia*
Common Name	Tamalpais lessingia
Synonyms	*Lessingia ramulosa* var. *micradenia*
CNDDB Element Code	PDAST5S063
USDA PLANTS Symbol	LEMIM

http://www.rareplants.cnps.org/detail/1327.html

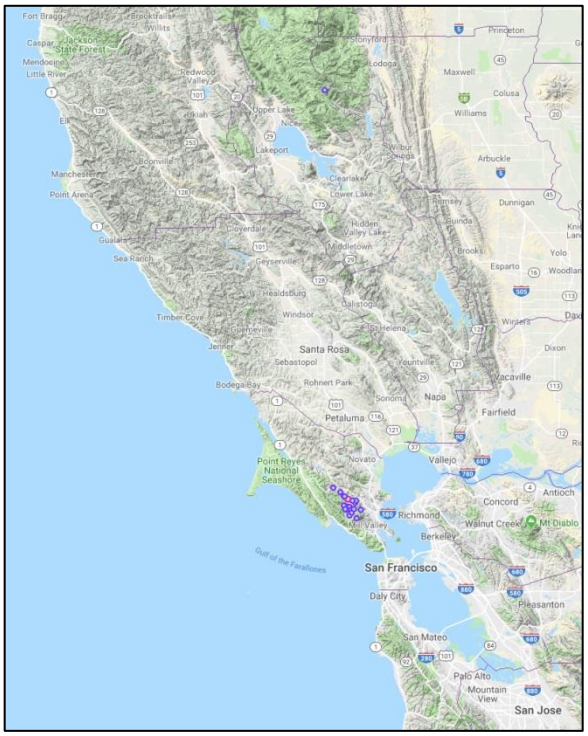
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2** S2: Imperiled
Global Rank	**G2T2** T2: Imperiled G2: (species) Imperiled
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management

BIOLOGY

Lifeform	Annual herb, 0.05–0.6 m tall
Blooming Period	(June) July–October
Habitat	Usually serpentinite, often roadside; chaparral, valley and foothill grassland

California distribution of Tamalpais lessingia



Global Distribution: This species is found almost exclusively in the Mount Tamalpais area.

Global Status: **Imperiled.** This annual grows almost entirely on MMWD lands, and species with such restricted ranges are in danger of disappearing. Seeds from MMWD populations were collected and banked with the Rancho Santa Ana Botanical Garden in 2015 as part of the CNPS Rare Plant Rescue Program for *ex situ* conservation of rare plants with few populations/restricted ranges.

Local Distribution: Common in serpentine barrens on Mount Tamalpais watershed lands.

Local Status: **Secure.** This species is common on serpentine barrens. Its population fluctuations as an annual make tracking numbers difficult, but the total population is estimated at over 1,000,000 plants in a couple dozen locations.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: Seed bank dynamics are unknown, which limits knowledge about how the numbers of aboveground plants relate to the abundance of seeds.

Specific Threats and Management Recommendations: Protect known populations that are vulnerable to trampling.

NAME

POLEMONIACEAE

Scientific Name	*Navarretia rosulata* Brand
Common Name	Marin County navarretia
Synonyms	*Navarretia heterodoxa* ssp. *rosulata*
CNDDB Element Code	PDPLM0C0Z0
USDA PLANTS Symbol	NARO2

Photo by Vernon Smith, CC BY-NC-ND 3.0, via CalPhotos

http://www.rareplants.cnps.org/detail/1163.html

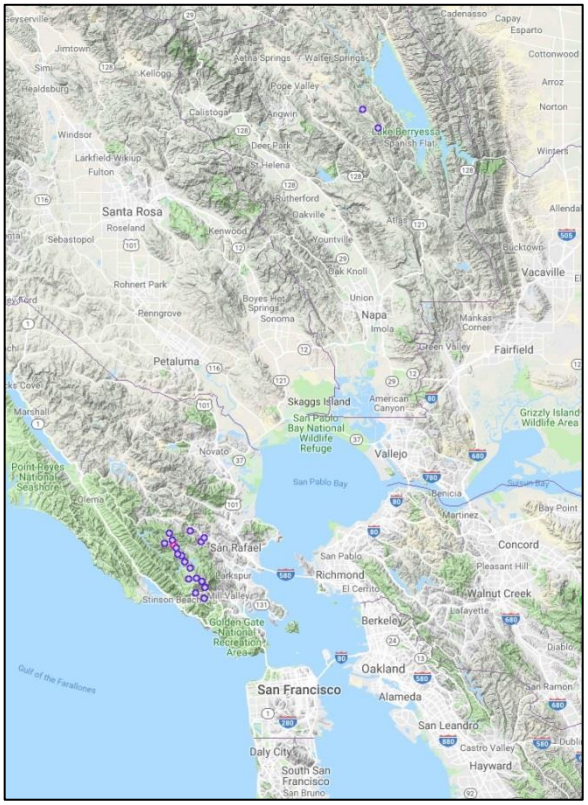
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2** S2: Imperiled
Global Rank	**G2** G2: Imperiled
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management

BIOLOGY

Lifeform	Annual herb, 0.05–0.15 m tall
Blooming Period	May–July
Habitat	Closed-cone coniferous forest, chaparral; serpentinite, rocky

California distribution of Marin County navarretia

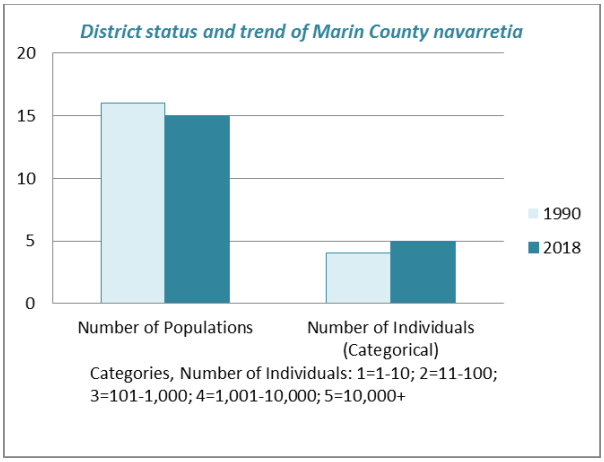


Global Distribution: Limited to Marin and Napa counties.

Global Status: **Imperiled.** This annual grows almost entirely on MMWD lands, and species with such restricted ranges are in danger of disappearing.

Local Distribution: Common in serpentine barrens on Mount Tamalpais watershed lands.

Local Status: **Secure.** This species is common on serpentine barrens. Its population fluctuations as an annual make tracking numbers difficult, but the total population is estimated at just over 100,000 plants in a couple dozen locations.



Data Gaps: Seed bank dynamics are unknown, and populations may be "hiding" underground. Additional populations of this diminutive annual are possible but would be easy to miss during surveys.

Specific Threats and Management Recommendations: None.

NAME

APIACEAE

Scientific Name	*Perideridia gairdneri (*H. & A.) Math. ssp. *gairdneri*
Common Name	Gairdner's yampah
Synonyms	*Carum gairdneri*
CNDDB Element Code	PDAPI1N062
USDA PLANTS Symbol	PEGAG

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/1316.html

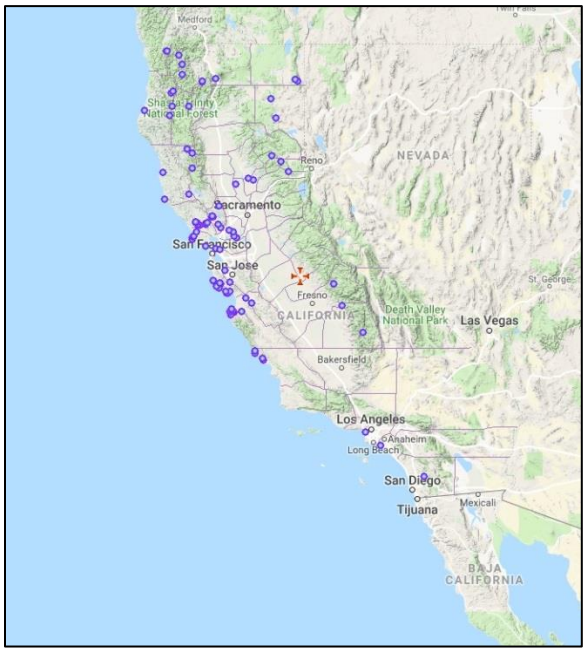
STATUS

Rare Plant Rank	**4.2** **4:** Limited distribution in California **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S3S4** S3: Vulnerable S4: Apparently secure within California
Global Rank	**G5T3T4** T3: Vulnerable T4: Apparently secure, considering populations outside California G5: (species) Secure, considering populations outside California
Watershed	**Vulnerable:** Populations are not well-dispersed, not imminently threatened

BIOLOGY

Lifeform	Perennial herb, 0.3–1.4 m tall
Blooming Period	June–October
Habitat	Broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools; vernally mesic

California distribution of Gairdner's yampah

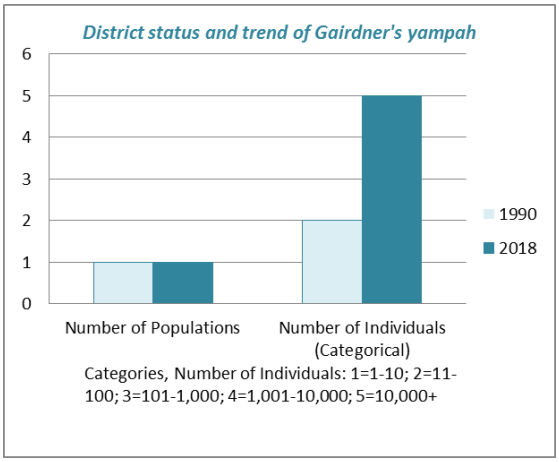


Global Distribution: California endemic, but distributed across state.

Global Status: **Secure?** Gairdner's yampah is broadly distributed, but its wet-area habitats are declining and vulnerable to climate change. This species is not tracked in a shared database such as CNDDB, so quality information is difficult to find. Over 100 locations are known, but only 13 of these are recent records.

Local Distribution: A single population is known on MMWD watershed lands.

Local Status: **Vulnerable.** Gairdner's yampah is not currently threatened by management, but its habitat may be impacted by climate change or woody species invasion.



Data Gaps: Tolerance to mowing and transplanting would help guide habitat management and establishment of additional populations.

Specific Threats and Management Recommendations: Avoid impacts from Sludge Pond operations, continue woody species removal in habitat, and consider establishing additional population(s).

NAME

FAGACEAE

Scientific Name	*Quercus parvula* Greene var. *tamalpaisensis* S.K. Langer
Common Name	Tamalpais oak
Synonyms	None
CNDDB Element Code	PDFAG051Q3
USDA PLANTS Symbol	QUPAT

Photo by Al Keuter, used with permission

http://www.rareplants.cnps.org/detail/1348.html

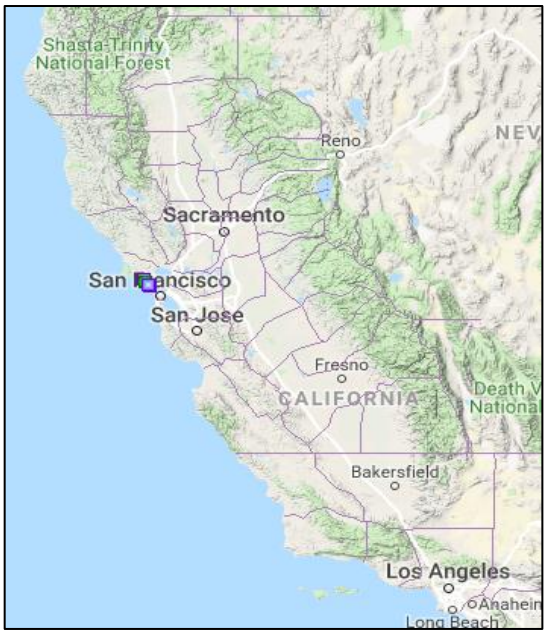
STATUS

Rare Plant Rank	**1B.3** **1B:** Rare, threatened, or endangered in California and elsewhere **.3:** Not very endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2** S2: Imperiled
Global Rank	**G4T2** T2: Imperiled. G4: (species) Apparently secure, considering populations outside California
Watershed	**Unknown:** Populations are not well-mapped; plants difficult to tell from closely related species

BIOLOGY

Lifeform	Perennial evergreen shrub, 1–6 m tall
Blooming Period	March–April
Habitat	Lower montane coniferous forest

California distribution of Tamalpais oak



Global Distribution: This species is limited to Marin County.

Global Status: **Imperiled?** This taxon grows almost entirely on MMWD lands, and species with such restricted ranges are in danger of disappearing. There is no recent population information in CNDDB.

Local Distribution: Grows across watershed lands in mixed hardwood forests.

Local Status: **Unknown:** Populations are not well-mapped. Furthermore, this subspecies is difficult to tell from closely related species and is purported to be of hybrid origin.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: Whether this taxon is valid or becomes a named hybrid needs to be resolved. In a 2017 paper, Hauser et al. proposed invalidating varieties of *Q. parvula* (only recognizing the species) and showing Tamalpais oak as a hybrid of shreve oak and interior live oak. Further study is needed to show if hybrid offspring are fertile and the hybrid a nameable entity.

Specific Threats and Management Recommendations: Populations may be vulnerable to SOD, but if this is a hybrid the parent species are not mortally susceptible. Shading from Douglas-fir encroachment may be negatively affecting some populations. Tamalpais oak resprouts after mowing, but most populations are not roadside. Further hybrid generation may be threatened if phenology of parents shifts away from co-flowering.

Additional References:

Hauser, D. A., Keuter, A., McVay, J. D., Hipp, A. L., and Manos, P. S. (2017). The evolution and diversification of the red oaks of the California Floristic Province (*Quercus* section *Lobatae,* series *Agrifoliae*). *American Journal of Botany, 104*(10), 1-15.

ALISMATACEAE

NAME

Scientific Name	*Sagittaria sanfordii* Greene
Common Name	Sanford's arrowhead
Synonyms	None
CNDDB Element Code	PMALI040Q0
USDA PLANTS Symbol	SASA2

Photo by Todd Plummer, CC BY-NC 4.0, via Calflora

http://www.rareplants.cnps.org/detail/710.html

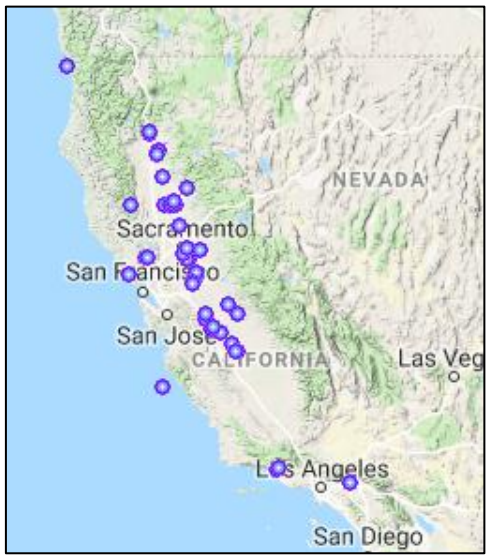
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S3** S3: Vulnerable
Global Rank	**G3** G3: Vulnerable
Watershed	**Unknown:** Populations are not well-mapped; plants difficult to tell from closely related species

BIOLOGY

Lifeform	Perennial rhizomatous herb (emergent), 0.1–1.3 m tall
Blooming Period	May–October (November)
Habitat	Marshes and swamps (assorted shallow freshwater)

California distribution of Sanford's arrowhead



Global Distribution: California endemic, but distributed across state.

Global Status: **Vulnerable.** Sanford's arrowhead is broadly distributed, but its wet-area habitats are declining and vulnerable to climate change. This species is thought to be extirpated from Southern California and parts of the Central Valley, but over 100 locations are known from elsewhere in the state. Over 60 of these are recent records.

Local Distribution: A single population is known from Nicasio Reservoir.

Local Status: **Vulnerable.** Sanford's arrowhead is not currently threatened by management; however, its habitat may change with climate shifts.

INSUFFICIENT INFORMATION TO GENERATE STATUS AND TRENDS GRAPH

Data Gaps: It is not known how this species arrived on watershed lands, or if the species identification is correct. If it is not a natural population, and was introduced via equipment, more detailed aquatic surveys of Nicasio should be performed to check for introductions of other species.

Specific Threats and Management Recommendations: Avoid impacts from alterations to management of Nicasio Reservoir (e.g., level shifts, dredging).

NAME

BRASSICACEAE

Scientific Name	*Streptanthus batrachopus* Morrison
Common Name	Tamalpais jewel flower
Synonyms	None
CNDDB Element Code	PDBRA2G050
USDA PLANTS Symbol	STBA4

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/1491.html

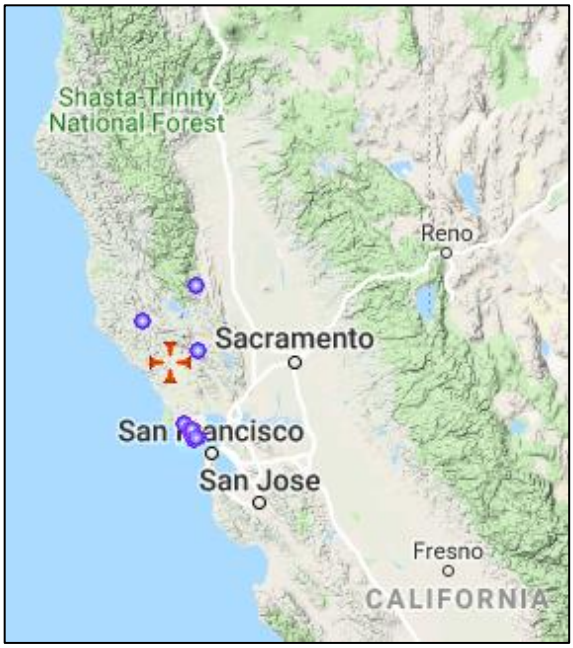
STATUS

Rare Plant Rank	**1B.3**	**1B:** Rare, threatened, or endangered in California and elsewhere **.3:** Not very endangered in California
State Listing Status	**Not Listed**	
Federal Listing Status	**Not Listed**	
State Rank	**S2**	S2: Imperiled
Global Rank	**G2**	G2: Imperiled
Watershed	**Vulnerable:** Populations are not well-dispersed, not imminently threatened	

BIOLOGY

Lifeform	Annual herb, 0.03–0.3 m tall
Blooming Period	April–July
Habitat	Closed-cone coniferous forest, chaparral; serpentine barrens

California distribution of Tamalpais jewel flower

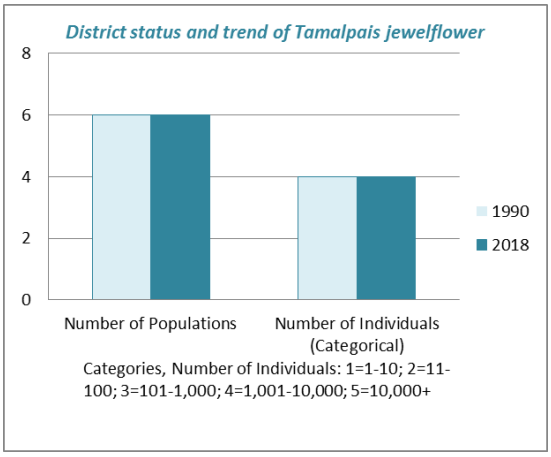


Global Distribution: Limited to Marin County; northern points may be separate species.

Global Status: **Imperiled**. This species is limited to fewer than ten total populations, and numbers appear to be declining.

Local Distribution: Bulk of observations are found east of Pine Mountain Ridge; two are near Barth's Retreat/Middle Peak.

Local Status: **Vulnerable.** Populations are not abundant, but not imminently threatened. One population is apparently extirpated, but another was found. Overall, populations numbers are down—from an estimated 5,000 individuals in the 1990s to about one-quarter of that today.



Data Gaps: Unlike its relative, *S. glandulosus*, populations of this species appear to be declining. Understanding why would help inform future management efforts.

Specific Threats and Management Recommendations: Some populations are threatened by trampling and rock-stacking. Education, barriers, or trail re-routing should be explored as ways to help prevent these impacts.

BRASSICACEAE

NAME

Scientific Name	*Streptanthus glandulosus* Hook. ssp. *pulchellus* (Greene) Kruckeberg
Common Name	Mt. Tamalpais bristly jewelflower
Synonyms	*Streptanthus pulchellus*
CNDDB Element Code	PDBRA2G0J2
USDA PLANTS Symbol	STGLP

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/1499.html

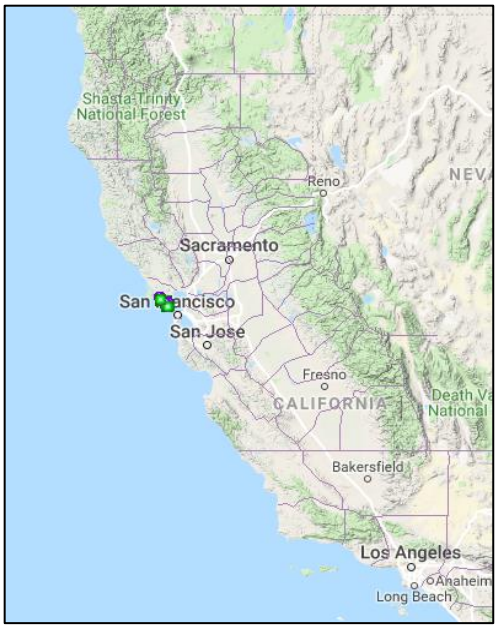
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S2** S2: Imperiled
Global Rank	**G4T2** T2: Imperiled. G4: (species) Apparently secure, considering populations outside California
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management

BIOLOGY

Lifeform	Annual herb, 0.1–0.4 m tall
Blooming Period	May–July (August)
Habitat	Chaparral, valley and foothill grassland

California distribution of Mt. Tamalpais bristly jewelflower



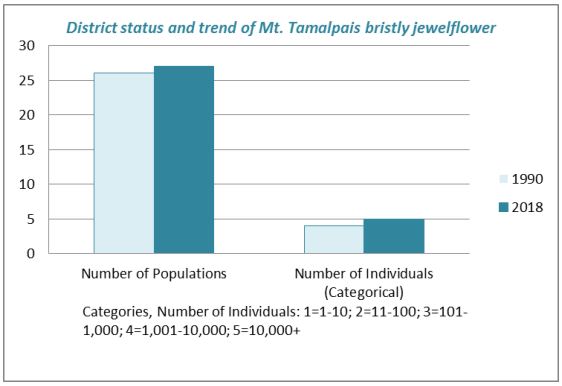
Global Distribution: This species' range is limited to Marin County.

Global Status: **Imperiled.** This taxon grows almost entirely on MMWD lands, and species with such restricted ranges are in danger of disappearing.

Local Distribution: This taxon can be found in serpentine barrens across Mount Tamalpais watershed lands.

Local Status: **Secure.** Although populations fluctuate, the total number of individuals is estimated to be over 10,000.

Seven populations from the 1990 report are presumed to be extirpated, but an additional eight populations were recently found.



Data Gaps: Understanding the subspecies relationships with ssp. *secundus* and a possibly new non-serpentine type could help clarify rarity and population numbers.

Specific Threats and Management Recommendations: Some populations are threatened by trampling and invasive species. Continue pulling weeds and explore whether education, barriers, or trail re-routing would help reduce trampling.

NAME

MELANTHIACEAE

Scientific Name	*Toxicoscordion fontanum* (Eastw.) Zomlefer & Judd
Common Name	Marsh zigandenus
Synonyms	*Zigadenus micranthus* var. *fontanus*, *Zigadenus fontanus*
CNDDB Element Code	PMLIL28050
USDA PLANTS Symbol	TOFO3 (ZIMIF2)

Photo by MMWD, CC BY-NC 3.0

http://www.rareplants.cnps.org/detail/2058.html

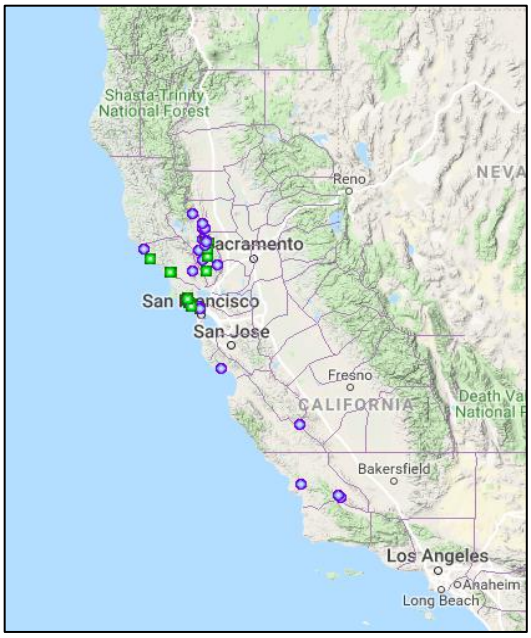
STATUS

Rare Plant Rank	**1B.2** **1B:** Rare, threatened, or endangered in California and elsewhere **.2:** Fairly endangered in California
State Listing Status	**Not Listed**
Federal Listing Status	**Not Listed**
State Rank	**S3** S3: Vulnerable
Global Rank	**G3** G3: Vulnerable
Watershed	**Secure:** Populations are numerous and well-dispersed, not threatened by management

BIOLOGY

Lifeform	Perennial bubiferous herb, 0.6–1 m tall
Blooming Period	April–July
Habitat	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, marshes and swamps; often serpentine

California distribution of marsh zigadenus



Global Distribution:

Most observations of small-flowered death camas are found north of the San Francisco Bay Area, with a few in Monterey and San Luis Obispo counties.

Global Status:

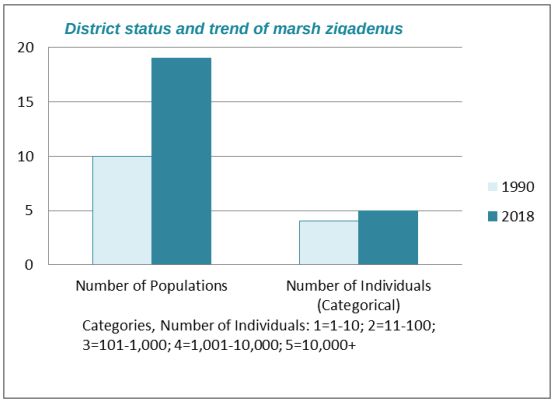
Vulnerable. Small-flowered death camas is broadly distributed, but its wet-area habitats are declining and vulnerable to climate change. Because its ranking is at the lowest level of concern, populations are not tracked in a shared database such as the CNDDB, but between approximately 50 and 100 populations are reported statewide.

Local Distribution:

This taxon can be found in wet areas, often with serpentine influence, across Mount Tamalpais watershed lands.

Local Status:

Secure. Although populations fluctuate, the total number of individuals is estimated to be nearly 20,000. This species was not listed in the 1990 report, but *Marin Flora* (Howell, 1949) has location information, and once the taxon was recognized as rare, additional populations were found in the mid-1990s. Concerted searching and mapping through the efforts summarized earlier in this document yielded a dozen more sites.



Data Gaps:

This taxon is likely under-reported statewide; its status may be more secure than what current data indicates.

Specific Threats and Management Recommendations:

Continue recording new populations as found.

Additional References:

Howell, J. T. (1949). *Marin flora.* Berkeley, CA: University of California Press.

Extirpated Species

Marin is a well-botanized area with a comprehensively documented local flora. Forays by botanists such as Alice Eastwood, Katherine Brandegee, and Willis Lynn Jepson in the late 1800s to early 1900s were followed by John Thomas Howell's surveys and publication of *Marin Flora* in 1949. Supplements in 1970, 1981, and 2007 show taxonomic changes, revisions, and advancements as well as flora expansions largely due to the introduction of non-native species.

Using Howell's descriptive locations in the 1970 version, as well as a search of herbarium specimens from the area, author Andrea Williams compared the list of plants found around Mount Tamalpais to species believed to be present in 2016 after several years of searching and documentation of the local flora (Williams et al., 2017). A draft list was passed around to local experts, as "Tamalpais" includes non-MMWD lands, resulting in a finalized list of 71 plants. Three species have since been found and the taxa are now considered locally rare (see Table 4). Twelve of the species considered extirpated are CNPS-listed taxa, and none were found in 1990.

The current list of MMWD's extirpated species can be found at https://www.calflora.org/entry/plantlist.html#vrid=px557.

The habitat requirements of extirpated species are similar to those of locally rare plants: half the species prefer wet areas; nearly one-third grow in wetlands (primarily perennial species); and one third grow in grasslands (primarily annual species). This was an interesting finding, as so much focus has been put on the effects of changed fire regimes, and not as much on the importance of wet habitats to rare plant species. Surprisingly, just over 10% are fire-followers and 16% are found in chaparral.

Plants are considered "likely extirpated," as species may remain in a belowground seedbank—probable for many fire-followers and annuals—or emerge only occasionally well outside areas normally searched, as is possible for some forest-dwelling or small, annual plants.

Another possible source of error in the list could be plants thought to have grown on MMWD lands that never did. These may be due to a lack of precision in location information [probable for Durango root (*Datisca glomerata*) and large-flowered collomia (*Collomia grandiflora*)] or an identification error (thought to be the case for Franciscan thistle, *Cirsium andrewsii*).

Even given these sources of error, the list serves as an important tool for understanding what may be driving changes to the flora, and a reminder to continue searching for these species (except bitterroot, which is under Alpine Lake).

Locally Rare Species and Habitat Types

"Local rarity" is gaining attention as an important concept in light of range shifts, climate change, and local genetics work. No hard-and-fast rules or guidelines for determining local rarity are prevalent at the time of this writing, but few populations in an area is generally the first threshold. MMWD uses three or fewer populations, but further decisions need to be made around the security/long-term viability of populations. For example, species such as alkali heliotrope (*Heliotropium curassavicum* var. *oculatum*), which reliably emerge in the reservoir drawdown zones, are less vulnerable than stipulate lotus (*Hosackia stipularis*), which has only been found along a single fire road.

Some species may be locally rare due to habitat rarity, and certainly many of the below-listed plants grow in wetlands and wet meadows—creating "hotspots" of rarity at sites such as Potrero Meadow and Lagunitas Meadow. Seeps with serpentine-influenced chemistry, large tracts of redwood and redwood-riparian forests, rock outcrops, and reservoirs (including drawdown areas) account for the habitat preference of approximately 75% of the species on this list.

The current list of MMWD's locally rare species can be found at https://www.calflora.org/entry/plantlist.html#vrid=px456.

Table 4. Locally Rare or Threatened Plants

Scientific Name	Common Name(s)
Acmispon grandiflorus var. grandiflorus	Chaparral lotus
Adiantum aleuticum	Five finger fern, Five finger maidenhair
Agoseris retrorsa	Spearleaf mountain dandelion
Allium unifolium	One leaf onion, Oneleaf onion
Alnus rubra	Oregon alder, Red alder
Amaranthus californicus	California amaranth, California pigweed
Amsinckia intermedia	Common fiddleneck
Amsinckia menziesii	Menzies' fiddleneck, Small flowered fiddleneck
Anaphalis margaritacea	Pearly everlasting
Angelica californica	California angelica
Antirrhinum kelloggii	Climbing snapdragon, Kellogg's snapdragon
Arabis blepharophylla	Coast rock cress

Scientific Name	Common Name(s)
Arctostaphylos virgata	Bolinas manzanita, Marin manzanita
Asarum caudatum	Creeping wild ginger, Longtail wild ginger
Asclepias fascicularis	Mexican whorled milkweed, Narrow leaf milkweed
Astragalus breweri	Brewer's milk vetch, Brewer's milkvetch
Azolla filiculoides	Mosquito fern, Pacific mosquitofern
Beckmannia syzigachne	American sloughgrass, Slough grass
Berberis aquifolium	Mountain grape, Mountaingrape, Oregon grape
Berberis nervosa	Cascades oregon grape, Oregongrape
Boykinia occidentalis	Brook foam, Coastal brookfoam, Western boykinia
Brodiaea terrestris ssp. terrestris	Dwarf brodiaea
Calandrinia breweri	Brewer's calandrinia, Brewer's redmaids
Calochortus amabilis	Golden fairy lantern, Golden globelily, Short lily
Calochortus uniflorus	Large flowered star tulip
Carex amplifolia	Ample leaved sedge, Big leaf sedge
Carex brevicaulis	Short stem sedge
Carex cusickii	Cusick's sedge
Carex exsiccata	Western inflated sedge
Carex harfordii	Harford's sedge, Monterey sedge
Carex praegracilis	Clustered field sedge, Field sedge
Carex subbracteata	Small bract sedge
Carex subfusca	Brown sedge, Rusty slender sedge
Carex utriculata	Beaked sedge, Northwest territory sedge
Castilleja affinis ssp. affinis	Coast indian paintbrush, Wight's indian paint brush
Castilleja ambigua ssp. ambigua	Johnny nip
Castilleja minor ssp. spiralis	Lesser indian paintbrush, Lesser paintbrush
Castilleja subinclusa ssp. franciscana	Franciscan paintbrush, Longleaf indian paintbrush
Castilleja wightii	Wight's indian paint brush, Wight's paintbrush
Caulanthus lasiophyllus	California mustard

Scientific Name	Common Name(s)
Ceanothus gloriosus var. exaltatus	Glory brush, Point Reyes ceanothus
Ceanothus masonii	Bolinas ceanothus, Mason's ceanothus
Chorizanthe membranacea	Pink spineflower
Cicuta douglasii	Western water hemlock
Cirsium quercetorum	Alameda county thistle, Brownie thistle
Clarkia amoena	Farewell to spring
Clarkia unguiculata	Elegant clarkia
Claytonia sibirica	Indian lettuce or candy flower
Cordylanthus pilosus ssp. pilosus	Hairy bird's beak
Cornus sericea ssp. occidentalis	Western dogwood
Cryptantha flaccida	Beaked cryptantha, Flaccid cryptantha
Cryptantha torreyana	Torrey's cryptantha
Drymocallis glandulosa var. wrangelliana	Sticky cinquefoil
Dryopteris expansa	Common wood fern, Spreading wood fern
Elatine brachysperma	Short seed waterwort
Eleocharis rostellata	Beaked spikerush, Walking sedge
Elymus triticoides	Beardless wild rye
Epilobium campestre	Smooth boisduvalia
Epilobium foliosum	California willowherb
Epilobium torreyi	Narrow leaved boisduvalia, Torrey's willowherb
Epipactis gigantea	Giant helleborine, Stream orchid, Stream orchis
Equisetum hyemale ssp. affine	Giant scouring rush
Ericameria ericoides	California goldenbush, Mock heather
Erigeron petrophilus var. petrophilus	Cliff fleabane, Rockloving erigeron
Eryngium aristulatum var. aristulatum	California eryngo, Jepson's button celery
Erysimum capitatum	Sanddune wallflower, Western wallflower
Erysimum franciscanum	Franciscan wallflower, San Francisco wallflower
Euonymus occidentalis var. occidentalis	Western burning bush, Western wahoo

Scientific Name	Common Name(s)
Euphorbia spathulata	Reticulate seeded spurge, Warty spurge
Fremontodendron californicum	California flannelbush, California fremontia
Garrya fremontii	Bearbrush, Fremont's silk tassel
Gaultheria shallon	Salal
Gentiana affinis var. ovata	Gentian, Pleated gentian
Glyceria elata	Fowl mannagrass, Tall mannagrass
Glyceria leptostachya	Davy mannagrass, Manna grass
Gnaphalium palustre	Lowland cudweed, Western marsh cudweed
Heliotropium curassavicum var. oculatum	Alkali heliotrope, Seaside heliotrope
Hemitomes congestum	Coneplant, Gnome plant
Heracleum maximum	Common cowparsnip
Hesperocnide tenella	Western nettle, Western stinging nettle
Hesperolinon congestum	Marin dwarf flax, Marin western flax
Heterocodon rariflorum	Few flowered heterocodon, Western pear flower
Hoita orbicularis	Creeping leather root, Roundleaf leather root
Holozonia filipes	Greene's white crown, Holozonia, Whitecrown
Hordeum brachyantherum	Meadow barley
Horkelia tenuiloba	Santa rosa horkelia, Thin lobed horkelia
Hosackia pinnata	Pinnate lotus
Hosackia stipularis var. stipularis	Stipulate lotus
Hypericum anagalloides	Creeping st. john's wort, Tinker's penny
Hypericum scouleri	Scouler's st john's wort
Isolepis carinata	Keeled bulrush
Isolepis cernua	Low bulrush
Juncus balticus ssp. ater	Baltic rush
Juncus bolanderi	Bolander's rush
Juncus covillei	Coville's rush
Juncus mexicanus	Mexican rush

Scientific Name	Common Name(s)
Juncus phaeocephalus var. phaeocephalus	Brown headed rush, Brownhead rush
Juncus xiphioides	Iris leaved rush, Irisleaf rush
Kopsiopsis hookeri	Small groundcone
Lathyrus torreyi	Redwood pea, Torrey's pea
Layia gaillardioides	Woodland layia, Woodland tidytips
Leptosiphon acicularis	Bristly leptosiphon
Lessingia hololeuca	Woolly headed lessingia
Ligusticum apiifolium	Celery-leaved lovage
Limosella acaulis	Broad leaved mudwort, Owyhee mudwort
Lindernia dubia	False pimpernel
Lomatium californicum	California lomatium, Celery weed
Lupinus formosus var. formosus	Summer lupine, Western lupine
Lupinus microcarpus var. densiflorus	Chick lupine, Whitewhorl lupine
Madia anomala	Plump seeded madia, Tarweed
Maianthemum dilatatum	False lily of the valley, Pacific may lily
Marsilea vestita	Hairy waterclover
Melica geyeri	Geyer's onion grass
Microseris bigelovii	Coast microseris, Coastal silverpuffs
Mimulus congdonii	Congdon's monkeyflower
Mimulus douglasii	Brownies, Purple mouse ears
Mimulus rattanii	Rattan's monkeyflower
Minuartia pusilla	Annual sandwort
Moehringia macrophylla	Large leaved sandwort, Largeleaf sandwort
Montia fontana	Annual water minerslettuce, Water chickweed
Montia parvifolia	Littleleaf minerslettuce, Showy rock montia
Najas guadalupensis	Guadalupe water nymph, Southern waternymph
Navarretia intertexta ssp. intertexta	Interwoven navarretia, Needle leaved navarretia
Nuphar polysepala	Rocky mountain pond-lily

Scientific Name	Common Name(s)
Oemleria cerasiformis	Indian plum, Oso berry
Oenanthe sarmentosa	Pacific oenanthe, Water parsley
Orobanche uniflora	Broomrape, Naked broom rape
Panicum acuminatum var. fasciculatum	Pacific panic grass
Papaver californicum	Fire poppy, Western poppy
Parnassia palustris	Marsh grass of parnassus
Paspalum distichum	Knot grass, Knotgrass
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah
Petasites frigidus var. palmatus	Arctic sweet coltsfoot, Western coltsfoot
Phalaris lemmonii	Lemmon's canarygrass
Philadelphus lewisii	Lewis' mock orange, Wild mock orange
Pilularia americana	American pillwort
Pinus muricata	Bishop pine, Bull pine, Prickle cone pine
Piperia elongata	Dense flowered rein orchid
Plagiobothrys reticulatus	Netted popcornflower, Reticulate popcorn flower
Plagiobothrys tenellus	Pacific popcornflower, Popcorn flower
Plagiobothrys undulatus	Coast allocarya
Platanthera dilatata var. leucostachys	Sierra bog orchid
Plectritis ciliosa	Long spurred plectritis, Longspur seablush
Plectritis macrocera	Long horn plectritis, White plectritis
Polypodium scouleri	Leather fern, Leather leaf fern, Leathery polypody
Polystichum imbricans	Cliff sword fern, Narrow leaved sword fern
Potamogeton nodosus	Long leaved pondweed, Pondweed
Potamogeton pusillus	Small pondweed
Prosartes smithii	Largeflower fairybells
Prunella vulgaris	Common selfheal, Self heal, Selfheal
Prunus emarginata	Bitter cherry
Pseudognaphalium ramosissimum	Pink cudweed

Scientific Name	Common Name(s)
Quercus douglasii	Blue oak
Rafinesquia californica	California chicory, California plumeseed
Ranunculus aquatilis	Whitewater crowfoot
Ranunculus flammula var. ovalis	Greater creeping spearwort
Rhododendron macrophyllum	Coast rhododendron, Pacific rhododendron
Ribes californicum	California gooseberry, Hillside gooseberry
Ribes divaricatum var. pubiflorum	Spreading gooseberry, Straggly gooseberry
Ribes sanguineum var. glutinosum	Blood currant, Flowering currant
Rosa californica	California wild rose, California wildrose
Rubus spectabilis	Salmon berry, Salmonberry
Rumex salicifolius	Willow dock, Willow leaved dock
Ruppia maritima	Ditchgrass or wigeon grass
Sagina decumbens ssp. occidentalis	Western pearlwort
Salix scouleriana	Nuttall willow, Scouler willow
Salix sitchensis	Coulter willow, Sitka willow
Salvia columbariae	Chia sage
Sambucus racemosa	Red elderberry
Sanicula arctopoides	Footsteps of spring, Yellow mats
Scutellaria californica	California skullcap
Scutellaria tuberosa	Danny's skullcap, Scullcap
Setaria parviflora	Marsh bristlegrass
Sidalcea calycosa ssp. calycosa	Annual checkerbloom, Checker mallow
Silene antirrhina	Sleepy catch fly, Sleepy catchfly, Sleepy silene
Silene coniflora	Fire following campion
Solanum xanti	Chaparral nightshade, Purple nightshade
Solidago elongata	West coast canada goldenrod
Stebbinsoseris decipiens	Santa Cruz microseris
Stephanomeria exigua ssp. coronaria	Milk aster, White plume wirelettuce

Scientific Name	Common Name(s)
Stephanomeria virgata	Rod wirelettuce, Tall stephanomeria
Stuckenia pectinata	Sago pondweed
Symphyotrichum subulatum	Eastern annual saltmarsh aster
Synthyris reniformis	Snow queen, Snowqueen
Trifolium barbigerum	Bearded clover
Trifolium ciliolatum	Foothill clover, Tree clover
Trifolium gracilentum	Graceful clover, Pin point clover, Pinpoint clover
Trifolium macraei	Chilean clover, Macrae's clover
Trifolium obtusiflorum	Clammy clover, Creek clover
Trifolium oliganthum	Few flowered clover, Minitomcat clover
Trifolium variegatum var. geminiflorum	Small-flowered variegated clover
Trifolium variegatum var. major	Large variegated clover
Trifolium variegatum var. variegatum	Variegated clover
Trifolium wormskioldii	Coast clover, Cow clover, Cows clover
Triglochin scilloides	Flowering-quillwort
Trillium chloropetalum	Common trillium, Giant wakerobin, Trillium
Triodanis biflora	Venus looking glass, Venus' looking glass
Triteleia peduncularis	Long rayed brodiaea, Marsh triteleia
Veronica americana	American brooklime, American speedwell
Veronica peregrina ssp. xalapensis	Hairy purslane speedwell, Neckweed
Vicia hassei	Hasse's vetch
Viola adunca	Blue violet, Dog violet, Hookedspur violet
Viola glabella	Pioneer violet, Stream violet
Yabea microcarpa	California hedge parsley, False carrot

Bloom Period

Table 5. Bloom Period for Locally Rare or Threatened Plants

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Acmispon grandiflorus var. grandiflorus	Chaparral lotus				X	X	X	X					
Adiantum aleuticum	Five finger fern, Five finger maidenhair			X	X	X	X	X	X	X	X		
Agoseris retrorsa	Spearleaf mountain dandelion				X	X	X						
Allium unifolium	One leaf onion, Oneleaf onion					X	X						
Alnus rubra	Oregon alder, Red alder		X	X									
Amaranthus californicus	California amaranth, California pigweed						X	X	X				
Amsinckia intermedia	Common fiddleneck		X	X	X	X	X						
Amsinckia menziesii	Menzies' fiddleneck, Small flowered fiddleneck			X	X	X							
Anaphalis margaritacea	Pearly everlasting						X	X	X				
Angelica californica	California angelica						X	X					
Antirrhinum kelloggii	Climbing snapdragon, Kellogg's snapdragon			X	X	X							
Arabis blepharophylla	Coast rock cress		X	X	X	X							
Arctostaphylos virgata	Bolinas manzanita, Marin manzanita		X	X									
Asarum caudatum	Creeping wild ginger, Longtail wild ginger			X	X	X							
Asclepias fascicularis	Mexican whorled milkweed, Narrow leaf milkweed						X	X	X	X			
Astragalus breweri	Brewer's milk vetch, Brewer's milkvetch				X	X	X						
Azolla filiculoides	Mosquito fern, Pacific mosquitofern				X	X	X	X	X	X			
Beckmannia syzigachne	American sloughgrass, Slough grass					X	X	X					
Berberis aquifolium	Mountain grape, Mountaingrape, Oregon grape		X	X	X								
Berberis nervosa	Cascades oregon grape, Oregongrape				X	X							
Boykinia occidentalis	Brook foam, Coastal brookfoam,						X	X	X				

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Western boykinia												
Brodiaea terrestris ssp. terrestris	Dwarf brodiaea				X	X	X	X					
Calandrinia breweri	Brewer's calandrinia, Brewer's redmaids			X	X	X	X						
Calochortus amabilis	Golden fairy lantern, Golden globelily, Short lily				X	X	X						
Calochortus uniflorus	Large flowered star tulip				X	X	X						
Carex amplifolia	Ample leaved sedge, Big leaf sedge				X	X	X	X	X	X			
Carex brevicaulis	Short stem sedge			X	X	X	X						
Carex cusickii	Cusick's sedge					X	X	X					
Carex exsiccata	Western inflated sedge					X	X						
Carex harfordii	Harford's sedge, Monterey sedge					X	X	X					
Carex praegracilis	Clustered field sedge, Field sedge					X	X						
Carex subbracteata	Small bract sedge				X	X	X						
Carex subfusca	Brown sedge, Rusty slender sedge			X	X	X	X	X					
Carex utriculata	Beaked sedge, Northwest territory sedge						X	X	X	X			
Castilleja affinis ssp. affinis	Coast indian paintbrush, Wight's indian paint brush						X						
Castilleja ambigua ssp. ambigua	Johnny nip			X	X	X	X	X	X				
Castilleja minor ssp. spiralis	Lesser indian paintbrush, Lesser paintbrush						X	X	X	X	X		
Castilleja subinclusa ssp. franciscana	Franciscan paintbrush, Longleaf indian paintbrush			X	X	X	X	X	X	X			
Castilleja wightii	Wight's indian paint brush, Wight's paintbrush			X	X	X	X	X	X				
Caulanthus lasiophyllus	California mustard			X	X	X	X						
Ceanothus gloriosus var. exaltatus	Glory brush, Point Reyes ceanothus			X	X	X	X						
Ceanothus masonii	Bolinas ceanothus, Mason's ceanothus			X	X								

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ceratophyllum demersum	Coon's tail, Hornwort						X	X	X				
Chorizanthe membranacea	Pink spineflower				X	X	X						
Cicuta douglasii	Western water hemlock					X	X						
Cirsium quercetorum	Alameda county thistle, Brownie thistle					X	X	X					
Clarkia amoena	Farewell to spring						X	X	X				
Clarkia unguiculata	Elegant clarkia						X	X	X	X			
Claytonia sibirica	Indian lettuce or candy flower				X	X							
Cordylanthus pilosus ssp. pilosus	Hairy bird's beak							X	X	X			
Cornus sericea ssp. occidentalis	Western dogwood						X	X	X				
Cryptantha flaccida	Beaked cryptantha, Flaccid cryptantha			X	X	X							
Cryptantha torreyana	Torrey's cryptantha				X	X	X						
Drymocallis glandulosa var. wrangelliana	Sticky cinquefoil				X	X	X	X	X	X			
Dryopteris expansa	Common wood fern, Spreading wood fern			X	X	X	X	X	X				
Elatine brachysperma	Short seed waterwort				X	X	X	X	X	X			
Eleocharis rostellata	Beaked spikerush, Walking sedge					X	X						
Elymus triticoides	Beardless wild rye						X	X					
Epilobium campestre	Smooth boisduvalia						X	X	X				
Epilobium foliosum	California willowherb				X	X	X	X	X				
Epilobium torreyi	Narrow leaved boisduvalia, Torrey's willowherb				X	X	X	X					
Epipactis gigantea	Giant helleborine, Stream orchid, Stream orchis					X	X	X					
Equisetum hyemale ssp. affine	Giant scouring rush			X	X	X	X	X	X	X			
Ericameria ericoides	California goldenbush, Mock heather									X	X	X	
Erigeron petrophilus var. petrophilus	Cliff fleabane, Rockloving erigeron							X	X				

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Eryngium aristulatum var. aristulatum	California eryngo, Jepson's button celery							X					
Erysimum capitatum	Sanddune wallflower, Western wallflower			X	X	X	X	X					
Erysimum franciscanum	Franciscan wallflower, San francisco wallflower			X	X	X	X						
Euonymus occidentalis var. occidentalis	Western burning bush, Western wahoo				X	X	X						
Euphorbia spathulata	Reticulate seeded spurge, Warty spurge			X	X	X							
Fremontodendron californicum	California flannelbush, California fremontia				X	X	X						
Garrya fremontii	Bearbrush, Fremont's silk tassel	X	X	X	X								
Gaultheria shallon	Salal				X	X							
Gentiana affinis var. ovata	Gentian, Pleated gentian							X	X	X			
Glyceria elata	Fowl mannagrass, Tall mannagrass							X	X				
Glyceria leptostachya	Davy mannagrass, Manna grass					X	X						
Gnaphalium palustre	Lowland cudweed, Western marsh cudweed					X	X	X	X	X			
Heliotropium curassavicum var. oculatum	Alkali heliotrope, Seaside heliotrope					X	X	X					
Hemitomes congestum	Coneplant, Gnome plant					X	X	X	X				
Heracleum maximum	Common cowparsnip						X	X					
Hesperocnide tenella	Western nettle, Western stinging nettle		X	X	X	X	X						
Hesperolinon congestum	Marin dwarf flax, Marin western flax				X	X	X	X					
Heterocodon rariflorum	Few flowered heterocodon, Western pear flower					X	X	X					
Hoita orbicularis	Creeping leather root, Roundleaf leather root				X	X	X	X	X				
Holozonia filipes	Greene's white crown, Holozonia, Whitecrown								X	X	X		
Hordeum brachyantherum	Meadow barley						X	X					

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Horkelia tenuiloba	Santa rosa horkelia, Thin lobed horkelia					X	X	X					
Hosackia pinnata	Pinnate lotus						X	X	X				
Hosackia stipularis var. stipularis	Stipulate lotus				X	X	X						
Hypericum anagalloides	Creeping st. john's wort, Tinker's penny						X	X					
Hypericum scouleri	Scouler's st john's wort						X	X	X	X			
Isolepis carinata	Keeled bulrush				X	X	X						
Isolepis cernua	Low bulrush				X	X	X	X	X	X			
Juncus balticus ssp. ater	Baltic rush					X	X						
Juncus bolanderi	Bolander's rush						X	X	X	X			
Juncus covillei	Coville's rush						X	X	X	X			
Juncus mexicanus	Mexican rush			X	X	X							
Juncus phaeocephalus var. phaeocephalus	Brown headed rush, Brownhead rush				X	X	X						
Juncus xiphioides	Iris leaved rush, Irisleaf rush					X	X	X					
Kopsiopsis hookeri	Small groundcone				X	X	X	X	X				
Lathyrus torreyi	Redwood pea, Torrey's pea				X	X	X	X					
Layia gaillardioides	Woodland layia, Woodland tidytips				X	X							
Leptosiphon acicularis	Bristly leptosiphon				X	X	X	X					
Lessingia hololeuca	Woolly headed lessingia						X	X	X	X	X		
Ligusticum apiifolium	Celery-leaved lovage						X	X					
Limosella acaulis	Broad leaved mudwort, Owyhee mudwort					X	X	X	X	X	X		
Lindernia dubia	False pimpernel							X	X				
Lomatium californicum	California lomatium, Celery weed			X	X								
Lupinus formosus var. formosus	Summer lupine, Western lupine						X	X	X	X	X		
Lupinus microcarpus var. densiflorus	Chick lupine, Whitewhorl lupine					X	X						
Madia anomala	Plump seeded madia, Tarweed				X	X	X						
Maianthemum dilatatum	False lily of the valley, Pacific may lily					X	X						

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Marsilea vestita	Hairy waterclover				X	X	X	X	X				
Melica geyeri	Geyer's onion grass				X	X	X	X					
Microseris bigelovii	Coast microseris, Coastal silverpuffs				X	X	X	X					
Mimulus congdonii	Congdon's monkeyflower			X	X	X							
Mimulus douglasii	Brownies, Purple mouse ears		X	X	X								
Mimulus rattanii	Rattan's monkeyflower					X	X	X					
Minuartia pusilla	Annual sandwort			X	X								
Moehringia macrophylla	Large leaved sandwort, Largeleaf sandwort				X	X	X						
Montia fontana	Annual water minerslettuce, Water chickweed			X	X	X	X						
Montia parvifolia	Littleleaf minerslettuce, Showy rock montia					X	X	X	X				
Najas guadalupensis	Guadalupe water nymph, Southern waternymph						X	X	X				
Navarretia intertexta ssp. intertexta	Interwoven navarretia, Needle leaved navarretia				X	X	X	X					
Nuphar polysepala	Rocky mountain pond-lily			X	X	X							
Oemleria cerasiformis	Indian plum, Oso berry			X	X	X							
Oenanthe sarmentosa	Pacific oenanthe, Water parsley					X	X	X					
Orobanche uniflora	Broomrape, Naked broom rape				X	X	X	X					
Panicum acuminatum var. fasciculatum	Pacific panic grass					X	X	X	X	X	X		
Papaver californicum	Fire poppy, Western poppy				X	X							
Parnassia palustris	Marsh grass of parnassus							X	X				
Paspalum distichum	Knot grass, Knotgrass								X	X			
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah						X	X	X	X	X		
Petasites frigidus var. palmatus	Arctic sweet coltsfoot, Western coltsfoot			X	X	X							
Phalaris lemmonii	Lemmon's canarygrass				X	X	X						
Philadelphus lewisii	Lewis' mock orange, Wild mock orange					X	X						

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pilularia americana	American pillwort			X	X	X	X						
Pinus muricata	Bishop pine, Bull pine, Prickle cone pine				X	X							
Piperia elongata	Dense flowered rein orchid					X	X	X					
Plagiobothrys reticulatus	Netted popcornflower, Reticulate popcorn flower					X	X	X					
Plagiobothrys tenellus	Pacific popcornflower, Popcorn flower			X	X	X							
Plagiobothrys undulatus	Coast allocarya				X	X							
Platanthera dilatata var. leucostachys	Sierra bog orchid						X	X	X				
Plectritis ciliosa	Long spurred plectritis, Longspur seablush			X	X								
Plectritis macrocera	Long horn plectritis, White plectritis			X	X	X							
Polypodium scouleri	Leather fern, Leather leaf fern, Leathery polypody		X	X	X	X	X	X	X	X	X		
Polystichum imbricans	Cliff sword fern, Narrow leaved sword fern				X	X	X	X	X	X	X		
Potamogeton nodosus	Long leaved pondweed, Pondweed							X	X				
Potamogeton pusillus	Small pondweed					X	X						
Prosartes smithii	Largeflower fairybells		X	X									
Prunella vulgaris	Common selfheal, Self heal, Selfheal							X	X				
Prunus emarginata	Bitter cherry				X	X							
Pseudognaphalium ramosissimum	Pink cudweed						X	X	X				
Quercus douglasii	Blue oak			X	X	X							
Rafinesquia californica	California chicory, California plumseed				X	X	X	X					
Ranunculus aquatilis	Whitewater crowfoot				X	X	X	X					
Ranunculus flammula var. ovalis	Greater creeping spearwort							X	X				
Rhododendron macrophyllum	Coast rhododendron, Pacific rhododendron			X	X	X							
Ribes californicum	California gooseberry, Hillside gooseberry	X	X	X									

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ribes divaricatum var. pubiflorum	Spreading gooseberry, Straggly gooseberry			X	X	X							
Ribes sanguineum var. glutinosum	Blood currant, Flowering currant	X	X	X									
Rosa californica	California wild rose, California wildrose					X	X	X	X				
Rubus spectabilis	Salmon berry, Salmonberry		X	X									
Rumex salicifolius	Willow dock, Willow leaved dock						X	X	X	X			
Ruppia maritima	Ditchgrass or wigeon grass				X	X							
Sagina decumbens ssp. occidentalis	Western pearlwort			X	X								
Salix scouleriana	Nuttall willow, Scouler willow		X	X									
Salix sitchensis	Coulter willow, Sitka willow			X									
Salvia columbariae	Chia sage			X	X	X	X						
Sambucus racemosa	Red elderberry							X	X				
Sanicula arctopoides	Footsteps of spring, Yellow mats		X	X	X	X							
Scutellaria californica	California skullcap						X	X					
Scutellaria tuberosa	Danny's skullcap, Scullcap			X	X	X	X	X					
Setaria parviflora	Marsh bristlegrass					X	X	X	X	X			
Sidalcea calycosa ssp. calycosa	Annual checkerbloom, Checker mallow				X	X	X	X	X	X			
Silene antirrhina	Sleepy catch fly, Sleepy catchfly, Sleepy silene				X	X	X	X	X				
Silene coniflora	Fire following campion				X	X	X						
Solanum xanti	Chaparral nightshade, Purple nightshade		X	X	X	X	X	X					
Solidago elongata	West coast canada goldenrod							X	X	X			
Stebbinsoseris decipiens	Santa Cruz microseris				X	X							
Stephanomeria exigua ssp. coronaria	Milk aster, White plume wirelettuce						X	X	X	X	X	X	
Stephanomeria virgata	Rod wirelettuce, Tall stephanomeria							X	X	X	X		
Stuckenia pectinata	Sago pondweed					X	X	X					
Symphyotrichum	Eastern annual saltmarsh aster							X	X	X	X		

Scientific Name	Common Name(s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
subulatum													
Synthyris reniformis	Snow queen, Snowqueen		X	X	X	X	X						
Trifolium barbigerum	Bearded clover		X	X	X	X							
Trifolium ciliolatum	Foothill clover, Tree clover				X	X							
Trifolium gracilentum	Graceful clover, Pin point clover, Pinpoint clover				X	X	X						
Trifolium macraei	Chilean clover, Macrae's clover			X	X	X							
Trifolium obtusiflorum	Clammy clover, Creek clover				X	X	X	X					
Trifolium oliganthum	Few flowered clover, Minitomcat clover				X	X							
Trifolium variegatum var. geminiflorum	Small-flowered variegated clover			X	X	X	X	X					
Trifolium variegatum var. major	Large variegated clover			X	X	X	X	X					
Trifolium variegatum var. variegatum	Variegated clover			X	X	X	X	X					
Trifolium wormskioldii	Coast clover, Cow clover, Cows clover					X	X						
Triglochin scilloides	Flowering-quillwort			X	X	X	X	X	X	X	X		
Trillium chloropetalum	Common trillium, Giant wakerobin, Trillium		X	X	X	X	X						
Triodanis biflora	Venus looking glass, Venus' looking glass				X	X	X						
Triteleia peduncularis	Long rayed brodiaea, Marsh triteleia					X	X	X					
Veronica americana	American brooklime, American speedwell							X	X				
Veronica peregrina ssp. xalapensis	Hairy purslane speedwell, Neckweed			X	X	X	X	X					
Vicia hassei	Hasse's vetch			X	X	X							
Viola adunca	Blue violet, Dog violet, Hookedspur violet				X	X	X	X	X				
Viola glabella	Pioneer violet, Stream violet				X	X	X	X					
Yabea microcarpa	California hedge parsley, False carrot				X	X	X						

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Appendix 1 - Detailed Species and Population Accounts

This appendix is included as a separate document as it contains detailed accounts by species, including sensitive information, such as population locations and background on searches or plantings.