1. Species: *Calochortus greenei* S. Watson, Greene's mariposa lily

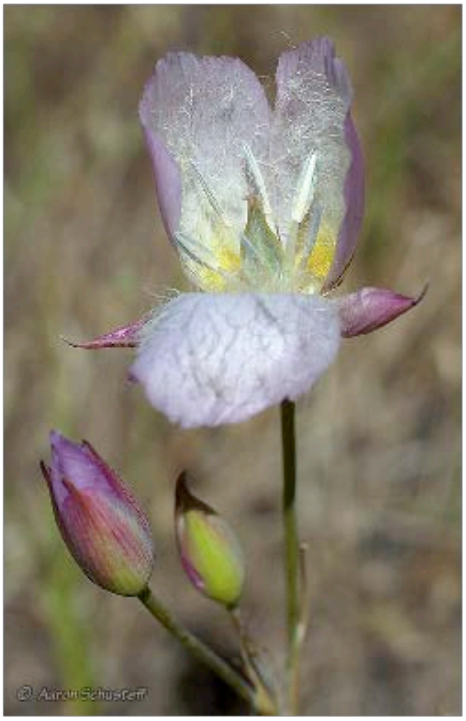


Photo Source: Clockwise from top left: Scott Loring 2013; Aaron Schusteff 2008; Scott Loring 2013; Scott Loring 2013.

2. Status: Table 1 summarizes the current status of this species or subspecies/variety by various ranking entities and defines the meaning of the status.

Table 1. Current status of Greene's mariposa lily

Entity	Status	Status Definition
NatureServe CA (CNDDB[a])	G3	Global Rank: Vulnerable—At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
	S2S3	State Rank: Imperiled (S2) — Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state. Vulnerable (S3) — Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
California Rare Plant Rank (CNPS[b])	1B.2	Plants rare, threatened, or endangered in California and elsewhere. Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat).
California State Listing (CDFW[c])	Not Listed	
USDA Forest Service	S	Sensitive.
USDI FWS[d]	Not listed	
USDI BLM[e]	S	Sensitive.
NatureServe OR (ORBIC[f])	1	Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences.
Oregon State Listing (ODA[g])	C	Candidate for listing as Threatened or Endangered.
NatureServe NV (NNHP[h])	Not present	
Nevada State Listing (NDF[i])	Not present	

[a] California Natural Diversity Database, California Dept. of Fish & Wildlife.
[b] California Native Plant Society.
[c] California Department of Fish and Wildlife.
[d] US Department of Interior Fish and Wildlife Service.
[e] US Department of Interior Bureau of Land Management.
[f] Oregon Biological Information Center.
[g] Oregon Department of Agriculture.
[h] Nevada Natural Heritage Program.
[i] Nevada Division of Forestry.
Note: Individual State Heritage Programs (CNDDB, ORBIC, NNHP) represent NatureServe and contain more up-to-date ranks for their state than NatureServe Explorer.

Status updates: There have been no changes in this taxon's CRPR status since the time it was added to the first CNPS Inventory in 1974.

3. Taxonomy: Table 2 summarizes this species or subspecies/variety's name status in key literature.

Table 2. Name status of Greene's mariposa lily	
Entity	**Name Status**
CNDDB and CNPS	*Calochortus greenei* Wats.
Jepson eFlora	*Calochortus greenei* S. Watson
Jepson Manual (1993)	*Calochortus greenei* S. Watson
Flora of North America	*Calochortus greenei* S. Watson
USDA NRCS[a] PLANTS	*Calochortus greenei* S. Watson
[a] Natural Resources Conservation Service	

Synonymy: *Calochortus greenei* was described by Watson (1879) on the basis of specimens from Siskiyou County, California and Multnomah County, Oregon. Henderson (1931) proposed the taxon *C. greenei* var. *calvus* Hend., but the variety is not accepted and should be regarded as a synonym (IPNI 2019).

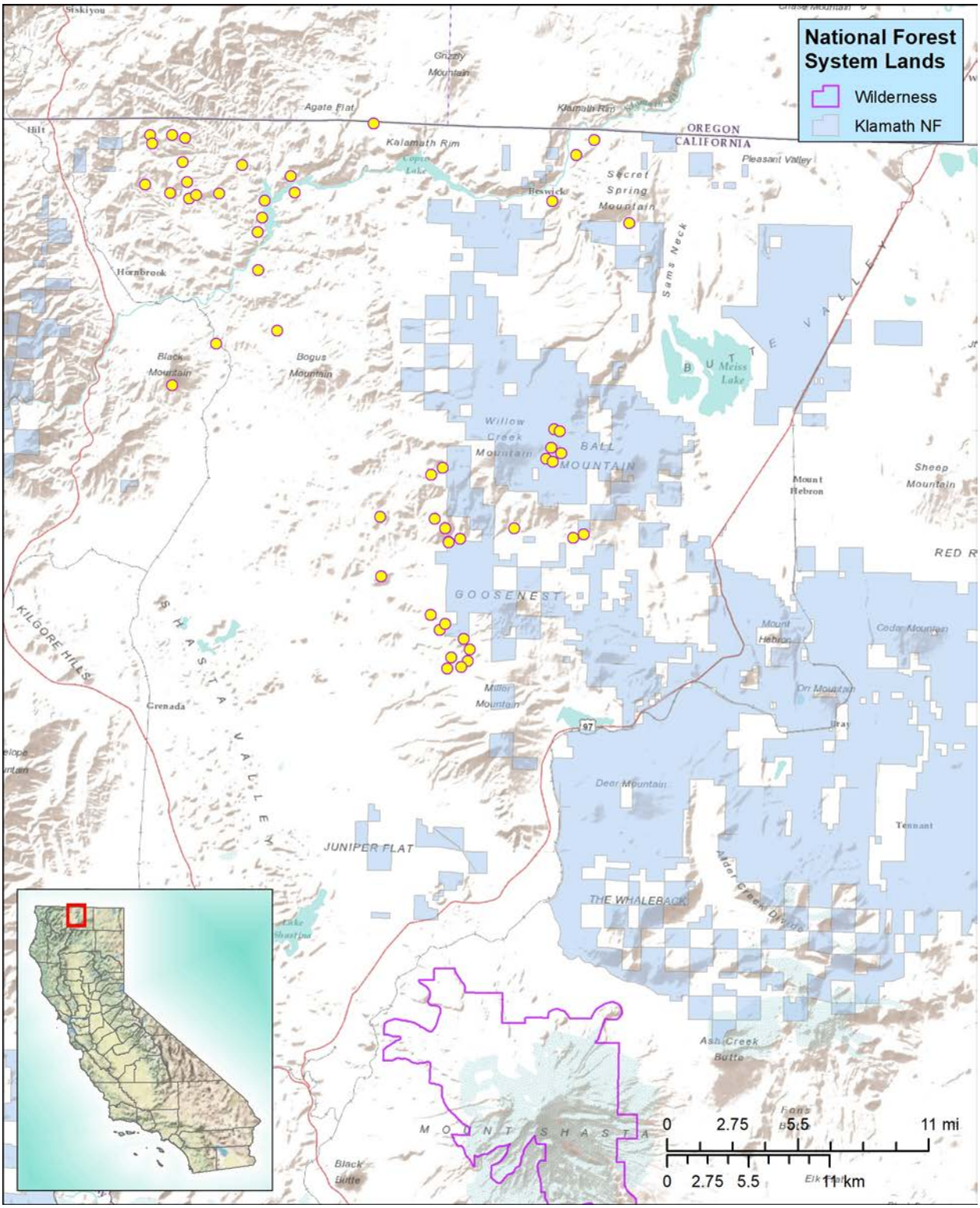
Jepson eFlora link: http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=16729

Type locality: There are two syntypes for this taxon, collected in Siskiyou County, California and Multnomah County, Oregon (Watson 1879). The type in California is from "Top of Table Rock, Little Shasta River" (EO 2, CNDDB 2019).

4. Distribution, abundance, and population trend on the planning unit [12.53.2,3,4]:
Table 3 summarizes the distribution and frequency of this species or subspecies/variety within National Forest System Lands in California. Table 4 lists all known occurrences of this species or subspecies/variety within California. Individual occurrences are defined as sites that contain an individual, population, or groups of populations of the plant that are located more than 0.25 mile apart from each other as defined by the CNDDB.

Table 3. Known Occurrence Frequency of Greene's mariposa lily within the Planning Area (NRIS, CNDDB, Calflora/CCH databases)							
National Forest System (NFS) lands	**Record #s (from Locations table below)**	**CNDDB EOs**	**Non-CNDDB Records**	**Recent (seen in past 20 years)**	**Historic (not seen in past 20 years)**	**Most Recent Observation Date**	**Total Records on NFS lands**
Klamath:	3, 4, 7, 8, 13, 14, 50, 51, 52, 53	6	4	5	5	7-Jul-2016	10
Totals:	N/A	6	4	5	5	N/A	10

TABLE 4 REDACTED FOR CONSERVATION PURPOSES



Sources: *Distribution*: Calflora 2019, CCH 2019, CNDDB 2019, NRIS 2019. *Baselayers*: 2013 National Geographic Society, i-cubed, Esri, Garmin, NOAA, NPS, USGS.

Calochortus greenei is found in southwest Oregon (Jackson County) and California (CPNWH 2019, NRCS 2019). Within California, it occurs in the eastern Klamath Ranges (KR) and northwestern Cascade Range (CaR) bioregions, with its range falling entirely within Siskiyou County. Of the approximately 54 occurrences on record, 24 are on BLM lands, seven are on lands controlled by California state agencies, 12 are in privately held areas, and 10 are on National Forest lands (Klamath NF). There are no occurrences known from designated Wilderness areas (Calflora 2019, CCH 2019, CNDDB 2019, NRIS 2019).

5. Brief description of natural history and key ecological functions [basis for other 12.53 components]:

Greene's mariposa lily is a perennial herb that emerges from a subterranean bulb; the plant typically reaches a height of 10-40 cm. It favors volcanic soils, and has been observed at elevations from 1,035 m to 1,890 m. This species is found in a variety of habitats, including cismontane woodlands, upper montane coniferous forest, pinyon-juniper woodland, and meadows. Blooming typically occurs between June and August (CNPS 2019, Fiedler 2012). While the pollination biology of *Calochortus greenei* is not well described, the genus hosts a wide range of pollinators, including twenty-six genera of bees and wasps, 17 genera of beetles, nine genera of flies, and an assortment of moths and butterflies (CPC 2019). Seeds in this genus tend to be large and unadorned, without obvious adaptations to maximize dispersal distance. Dispersal typically occurs via gravity and local surface flow, as well as by vegetative means (Fiedler 2012).

Woody plant species frequently co-occurring with Greene's mariposa lily include: *Abies concolor, Arctostaphylos patula, Artemisia tridentata, Calocedrus decurrens, Ceanothus cuneatus, Juniperus occidentalis, Pinus contorta, Pinus jeffreyi, Pinus ponderosa, Pseudotsuga menziesii, Quercus garryana* and *Rhus trilobata*. Often-cited herbaceous associates include: *Chrysothamnus* spp., *Eriogonum* spp., *Eriophyllum lanatum, Festuca idahoensis, Madia* spp., *Perideridia* spp., *Poa bulbosa*, and *Triteleia* spp. (CNDDB 2019).

6. Overview of ecological conditions for recovery, conservation, and viability [12.53 7, 9, 10, 11, 12] including Threats and Risk Factors:

Threats to the persistence of this taxon at local and regional scales include development, horticultural collecting, grazing, vehicle use and competition from invasive species (CNPS 2019). About half the species in *Calochortus* exhibit a pattern of rarity across the range, paired with local abundance, that is, populations are patchy at a large scale, but individual occurrences can be dense (Fiedler 1986). As a result, species persistence depends strongly upon metapopulation dynamics that are sensitive to local impacts. In addition, *C. greenei*, like many of its congeners, has narrow edaphic requirements, making it less resilient to displacement from an existing habitat (Fiedler 2012). Occurrences in the plan area require active monitoring and protection to ensure that local-scale perturbations do not result in extirpation across a wider area. Documented direct threats include invasion by medusahead (*Taeniatherum caput-medusae*), the rooting behavior of feral pigs, and mechanical disturbance during timber extraction (CNDDB 2019).

7. Key literature:

Fiedler, P.L. 1986. Concepts of rarity in vascular plant species, with special reference to the genus *Calochortus* Pursh (Liliaceae). *Taxon* 35(3): 502-518.

Watson, S. 1879. Contributions to American botany: revision of the North American Liliaceae: descriptions of some new species of North American plants. *Proceedings of the American Academy of Arts and Sciences* 14: 213-303.

8. Literature cited:

[BLM] Bureau of Land Management. 2010. Special Status Plants in California, Including BLM Designated Sensitive Species. February 8, 2010. Available at: https://www.blm.gov/ca/dir/pdfs/2010/im/CAIM2010-008ATT2B.pdf [accessed 25 May 2017].

Calflora. 2019. Information on wild California plants for conservation, education, and appreciation. Website http://www.calflora.org/ [accessed June 2019].

[CDFW] California Department of Fish and Wildlife, Natural Diversity Database. 2019. State and Federally Listed Endangered, Threatened, and Rare Plants of California. Last updated April 22, 2019. 10 pp. Available at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109390&inline [accessed June 2019].

[CNDDB] California Department of Fish and Wildlife, Natural Diversity Database. 2019. RareFind 5 [Internet application] and CNDDB Maps and Data. Available at: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data [Government Version, June 2019].

____. 2019a. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication, March 2019. 140 pp. Available at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109383&inline [accessed June 2019].

[CNPS] California Native Plant Society, Rare Plant Program. 2019. *Inventory of Rare and Endangered Plants of California* (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed June 2019].

[CCH] Consortium of California Herbaria. 2019. Data provided by the participants of the Consortium of California Herbaria. Regents of the University of California, Berkeley. Website http://ucjeps.berkeley.edu/consortium/ [accessed June 2019].

[CPC] Center for Plant Conservation. 2017. CPC National Collection Rare Plant Database. Website https://saveplants.org/national-collection/pollinator-search/ [19 August 2019].

[CPNWH] Consortium of Pacific Northwest Herbaria. 2019. Data provided by the participants of the Consortium of Pacific Northwest Herbaria. University of Washington Herbarium. Website http://www.pnwherbaria.org/data/search.php [accessed June 2019].

Fiedler, P.L. 2012. *Calochortus greenei,* in Jepson Flora Project (eds.) *Jepson eFlora,* http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=16729 [accessed on August 20, 2019].

Fiedler, P.L. 1986. Concepts of rarity in vascular plant species, with special reference to the genus *Calochortus* Pursh (Liliaceae). *Taxon* 35(3): 502-518.

Henderson, L.F. 1931. New plants from Oregon. *Rhodera* 33(394): 203-206.

[IPNI] The International Plant Names Index. 2019. Website http://www.ipni.org [accessed 22 August 2019].

[IUCN] International Union for Conservation of Nature. 2019. The IUCN Red List of Threatened Species. Website http://www.iucnredlist.org/ [accessed June 2019].

[NRCS] U.S. Department of Agriculture, Natural Resources Conservation Service. 2019. PLANTS Database. Website http://plants.usda.gov/ [accessed June 2019].

[NRIS] U.S. Department of Agriculture Forest Service, Natural Resource Information System. 2019. Natural Resource Information System; Threatened, Endangered and Sensitive Plants—Invasive Plants [accessed March 2019].

NatureServe. 2019. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Website http://explorer.natureserve.org [accessed June 2019].

[NDF] Nevada Division of Forestry. 2012. NAC 527.010 List of fully protected species of native flora. April 2012. Available at: https://www.leg.state.nv.us/NAC/NAC-527.html#NAC527Sec010 [accessed June 2019].

[NNHP] Nevada Natural Heritage Program. 2019. Species Lists. Department of Conservation and Natural Resources. Available at: http://heritage.nv.gov/species/lists.php [accessed June 2019].

[ODA] Oregon Department of Agriculture. 2018. Oregon listed and candidate plants - complete list. Native Plant Conservation Program. October 12, 2018. Available at: https://data.oregon.gov/Natural-Resources/Oregon-listed-and-candidate-plants-complete-list/8s3k-ygh2 [accessed 17 June 2019].

[ORBIC] Oregon Biodiversity Information Center. 2019. Rare, Threatened and Endangered Vascular Plant Species of Oregon. April 2019. Institute for Natural Resources, Portland State University, Portland, OR. 49 pp. Available at https://inr.oregonstate.edu/sites/inr.oregonstate.edu/files/2019-rte-vascs.pdf [accessed 17 June 2019].

[ORBIC] Oregon Biodiversity Information Center. 2019. Rare, Threatened and Endangered Non-Vascular Plants, Algae, Lichen, and Fungi Species of Oregon. May 2019. Institute for Natural Resources, Portland State University, Portland, OR. 30 pp. Available at https://inr.oregonstate.edu/sites/inr.oregonstate.edu/files/2019-rte-nonvascs.pdf [accessed 17 June 2019].

[USDA] U.S. Department of Agriculture Forest Service, Pacific Southwest Region. 2013. Regional Forester Sensitive Species List. Available at: http://www.fs.usda.gov/main/r5/plants-animals/plants [accessed June 2019].

[USDA] U.S. Department of Agriculture Forest Service and U.S. Department of Interior Bureau of Land Management. 2001. List of Survey and Manage Species in Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures; as amended by Annual Species Reviews 2001-2003. Available at: https://www.blm.gov/or/plans/surveyandmanage/files/sm-fs-enc3-table1-1-dec2003wrtv.pdf [accessed June 2019].

Watson, S. 1879. Contributions to American botany: revision of the North American Liliaceae: descriptions of some new species of North American plants. *Proceedings of the American Academy of Arts and Sciences* 14: 213-303.

Persons Contacted: None

Author(s) and Date: Seth Kauppinen, CNPS, 2019-12-13. Revised to incorporate reviewer comments 2022-02-09.

Reviewer(s) and Date: Aaron Sims, CNPS, 2020-02-21; David Magney, CNPS, 2020-02-21; Julie A. Kierstead, USFS R5, 2020-08-25.