Species: *Cypripedium montanum* Lindl., mountain lady's-slipper

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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 mountain lady's-slipper

Entity	Status	Status Definition
NatureServe CA[a]	G4	G4: Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
	S4	S4: Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
California Rare Plant Rank[b]	4.2	4: Watch List: Plants of limited distribution

		0.2: Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat) Added to CNPS Inventory in 1980, moved to Appendix 1 (Plants Considered, But Not Included) in 1982, reinstated to List 4 in 1984; no recent change in status.
California State Listing[c]	Not listed	
USDA Forest Service[d]	S	Sensitive
USDI FWS[e]	Not listed	
USDI BLM[f]	S	Sensitive
NatureServe OR[g]	S3S4 4	S3: Rare, uncommon or threatened in Oregon, but not immediately imperiled, typically with 21-100 occurrences. S4: Not rare in Oregon and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences. Range Rank: A numeric range rank (i.e., S3S4) is used to indicate any range of uncertainty about the status of the species. List 4: contains taxa that are of conservation concern but currently do not meet the criteria for being considered threatened or endangered. This includes taxa that are very rare but are currently secure, as well as taxa that are declining in numbers or habitat but are still too abundant to be proposed as threatened or endangered. While these taxa currently may not need the same active management attention as threatened or endangered taxa, they do require continued monitoring.
Oregon State Listing[h]	Not listed	
NatureServe NV[i]	Not present	Not present
Nevada State Listing[j]	Not present	

[a] California Natural Diversity Database, California Dept. of Fish & Wildlife [CNDDB 2020, 2020a]
[b] California Native Plant Society [CNPS 2020]
[c] California Department of Fish and Wildlife [CDFW 2020]
[d] US Forest Service Region 5 Forester's List [USDA 2013] and Pacific NW Survey and Manage [USDA & BLM 2014]
[e] US Department of Interior Fish and Wildlife Service [USFWS 2020]
[f] US Department of Interior Bureau of Land Management [BLM 2020]
[g] Oregon Biodiversity Information Center [ORBIC 2019]
[h] Oregon Department of Agriculture [ODA 2018]
[i] Nevada Natural Heritage Program [NNHP 2020]
[j] Nevada Division of Forestry [NDF 2012]

Note: Individual State Heritage Programs (CNDDB, ORBIC, NNHP) represent NatureServe and contain more up-to-date ranks for their state than NatureServe Explorer.

Distribution, abundance, and population trend on the planning unit[1]

Table 2 summarizes the distribution and frequency of this species or subspecies/variety within National Forest System Lands in California. Table 4 in Appendix 1 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 1/4 (0.25) of a mile apart from each other as defined by the CNDDB.

Table 2. Known occurrence frequency of mountain lady's-slipper within the Planning Area (NRIS, CNDDB, Calflora/CCH databases).

National Forest System (NFS) lands in California	Record #s (from Table 4)	CNDDB Eos	Non-CNDDB Records	Recent (seen in past 20 years)	Historical (not seen in past 20 years)	Most Recent Obs. Date	Total Records on NFS lands
Eldorado:	47	-	1	1	-	19-Sep-2013	1
Klamath:	163, 164, 167, 168, 169, 170, 171, 172, 173, 174, 177, 178, 180, 184, 186, 187, 188, 189, 190, 193, 198, 199, 200, 201, 203, 204, 205, 206, 207, 208, 211, 212, 214, 217. 222, 225, 229, 231, 234, 235, 244, 245, 247, 248, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 262, 263, 264, 265, 266, 267, 268, 269, 270,	-	79	57	22	30-Jul-2019	79

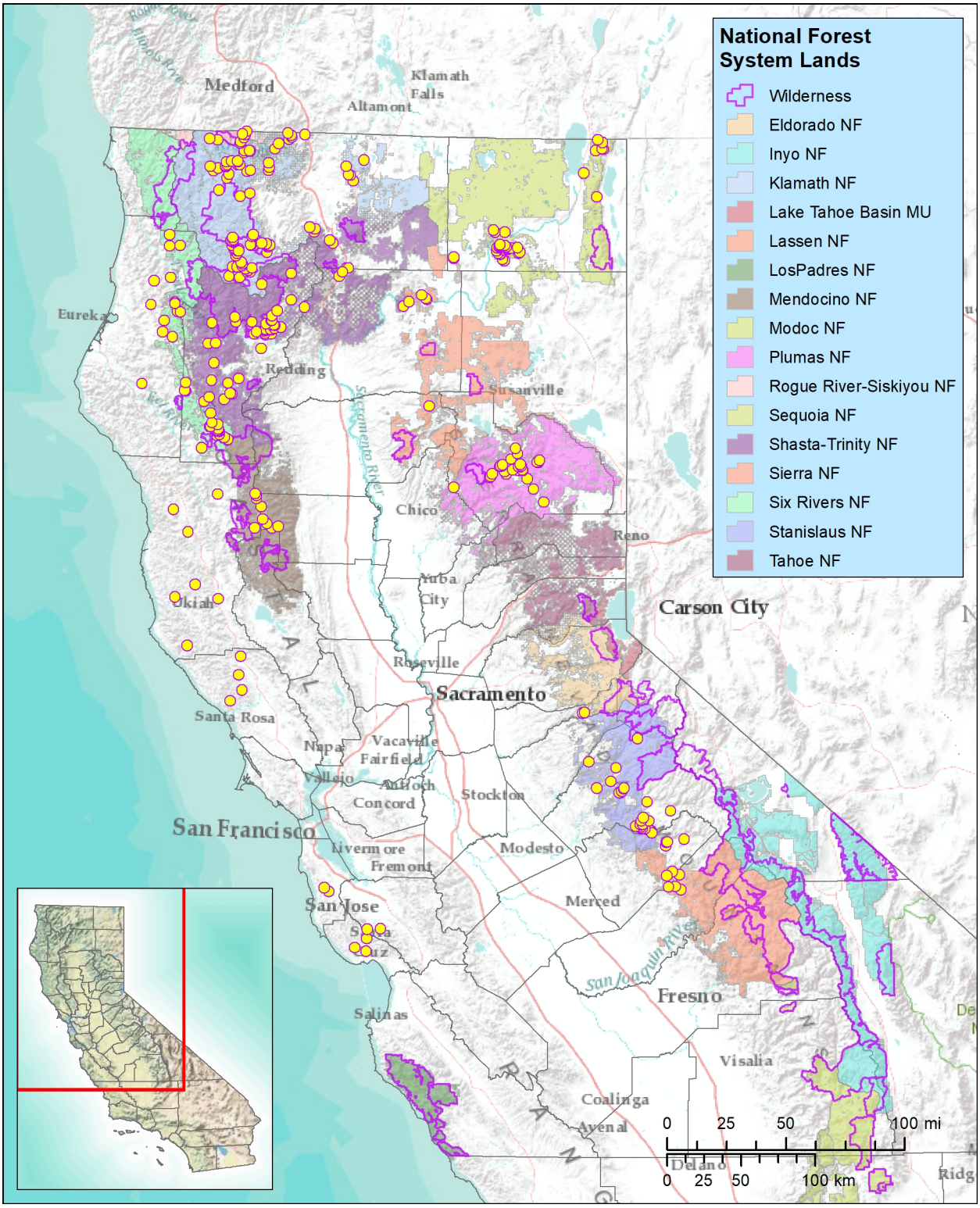
[1] 1909.12 Chapter 10, Section 12.53, components 2, 3, and 4.

Table 2. Known occurrence frequency of mountain lady's-slipper within the Planning Area (NRIS, CNDDB, Calflora/CCH databases).

National Forest System (NFS) lands in California	Record #s (from Table 4)	CNDDB Eos	Non-CNDDB Records	Recent (seen in past 20 years)	Historical (not seen in past 20 years)	Most Recent Obs. Date	Total Records on NFS lands
	271, 272, 273, 274, 275, 276, 277, 279, 281, 283, 284, 285, 287, 290, 293						
Lassen:	107	-	1	-	1	21-Jun-1927	1
Mendocino:	54, 55, 56, 57, 58, 60, 61, 64, 302	-	9	4	5	19-Jun-2018	9
Modoc:	181, 182, 183, 185, 191, 192, 195, 196, 197, 202, 209, 210, 213, 215, 216, 218, 219, 220, 221, 223, 224, 226, 228, 230, 236, 240, 241, 243, 246, 261, 278, 280, 288, 291	-	34	27	7	8-Jun-2016	34
Plumas:	62, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 87, 88, 90, 295	-	26	19	7	7-Jun-2018	26
Shasta-Trinity:	109, 110, 111, 112, 116, 117, 118, 119, 121, 122, 124, 126, 127, 128, 129, 130, 131, 132,	-	48	30	18	27-Jun-2018	48

Table 2. Known occurrence frequency of mountain lady's-slipper within the Planning Area (NRIS, CNDDB, Calflora/CCH databases).

National Forest System (NFS) lands in California	Record #s (from Table 4)	CNDDB Eos	Non-CNDDB Records	Recent (seen in past 20 years)	Historical (not seen in past 20 years)	Most Recent Obs. Date	Total Records on NFS lands
	133, 134, 135, 136, 137, 138, 139, 140, 142, 143, 144, 145, 146, 147, 148, 151, 153, 155, 156, 157, 166, 175, 176, 227, 232, 237, 238, 239, 242, 296						
Sierra:	8, 9, 10, 13	-	4	1	3	14-Jun-2020	4.
Six Rivers:	89, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 108, 113, 114, 115, 123, 141, 149, 154, 179, 194, 233	-	27	20	7	28-Aug-2019	27
Stanislaus:	21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 34, 35, 36, 37, 39, 40, 41, 42, 43	-	19	19	-	14-Jun-2016	19
Rogue River-Siskiyou:	282, 286, 289, 294, 303	-	5	-	5	3-Jul-1997	5
Totals:	N/A	0	253	178	75	N/A	253



Sources: *Distribution*: Calflora (2020), CCH1 (2020), CCH2 (2021), NRIS (2019), T. Boomer (2021, personal communication). *Baselayers*: 2013 National Geographic Society, i-cubed, Esri, Garmin, NOAA, NPS, USGS.

Mountain lady's-slipper is not currently tracked by the CNDDB (2020), hence the occurrences for this species were estimated using GIS tools and methods described by Green and Sims (2018).

Mountain lady's-slipper is endemic to western North America, ranging from southeastern Alaska through British Columbia, Washington state, and Oregon to northern California, and eastward to Alberta, Saskatchewan, Idaho, Montana, and Wyoming (Sheviak 2002, NatureServe 2021). The species has also been recorded in the Black Hills of South Dakota (Gabel and Tackett 2008). The extent of occurrence (EOO) is estimated at greater than 1 million mi^2, and the area of occupancy (AOO) at 270 mi^2 (Rankou 2014).

In California, it is found in the Northwestern (NW), Cascade Range (CaR), and Modoc Plateau (MP) bioregions (JEPS 2020), southward in the Coast Ranges to Sonoma County, and in the northern Sierra Nevada (SN) bioregion of Plumas County (see map). Outlying populations are in the Santa Cruz Mountains [southwestern San Francisco Bay (SnFrB) bioregion] of San Mateo, Santa Cruz, and Santa Clara counties; and in the central Sierra Nevada of Amador, Tuolumne, Mariposa, and Madera counties.

Of the estimated 303 occurrences of mountain lady's-slipper in California, 253 (83 %) are located on National Forest lands (Table 2). This estimate is in fairly close agreement with an earlier one compiled by Forest Botanists in Region 5 (Hoover et al. 2012). No occurrences are located within federally designated Wilderness Areas, but *C. montanum* receives protection within the Butterfly Valley Botanical Area, Plumas NF (record # 81; see Knight et al. 1970, Cheatham 1976, USDA Forest Service 2021), Yosemite National Park (record #s 11–12, 14–20, 22, and 32–33), Castle Crags State Park (record # 300), McArthur-Burney Falls State Park (record # 159), Montgomery Woods State Natural Reserve (record # 52), the Lake Sonoma Recreation Area (US Army Corps of Engineers; record # 45), and the Sierra Azul Open Space Preserve (Midpeninsula Regional Open Space District; record # 5).

Most of the sites for mountain lady's-slipper on National Forest land were discovered during pre-disturbance surveys for proposed projects, primarily timber sales (Kaye and Cramer 2005, Kierstead Nelson 2012). Populations of this and other *Cypripedium* species are known to experience natural fluctuations from year to year and to undergo vegetative dormancy (failure to emerge above-ground) when growing conditions are unfavorable (Kaye 1999, Kaye and Cramer 2005, Shefferson et al. 2018). Based on NRIS (2020) data, the abundance of this species at any given site ranges from one to 1,000 individuals, with the average population size being 23 individuals (Kaye and Cramer 2005). Over half of the populations in California had fewer than 10 stems, and over 90% had under 100 stems (Kaye and Cramer 2005). Because of its generally small population size, this species has a high probability of local extinction, yet seed dispersal and colonization of new sites might also occur. Based on repeated observations at known sites, Kaye and Cramer (2005) estimated that 67% of mountain lady's-slipper populations had declined and 44% had completely disappeared (most of these being small populations with fewer than 10 plants). Roughly one-third of the known occurrences on USFS lands have not been revisited in the last 20 years; see Table 2).

Brief description of natural history and key ecological functions[2]

Mountain lady's-slipper belongs to the Orchidaceae (orchid family) and is a perennial herb from a short rhizome. The stems generally measure 25–60 cm tall and bear 1–2 (–3) flowers; the blooming season at lower elevations is in April, continuing from May to early July in the higher mountains (Coleman 1989, Kaye and Cramer 2005). Its habitat is mainly on north-facing slopes in dense, mid- to late-seral stages of lower montane mixed coniferous forest, mostly at elevations of 500–1800 m (Kaye and Cramer 2005). It can be found both on relatively dry slopes and in moist microsites (e.g., near a stream or sometimes on the banks of small streams) (Coleman 1989). *Pseudotsuga menziesii* (Douglas-fir) is the most frequently associated coniferous tree, with others including *Abies concolor* (white fir), *Pinus ponderosa* (ponderosa pine), *P. lambertiana* (sugar pine), and *Calocedrus decurrens* (incense cedar). The species is often noted as growing in forest openings directly under (and in the shade of) *Cornus nuttallii* (mountain dogwood) or *Corylus cornuta* (California hazelnut). Other frequently associated hardwoods include *Arbutus menziesii* (madrone), *Acer macrophyllum* (bigleaf maple), and *Quercus kelloggii* (California black oak). Associated herbs may include *Cypripedium fasciculatum* (clustered lady's-slipper), *Lathyrus* spp. (wild pea), *Lysimachia latifolia* (starflower), *Veratrum californicum* (corn-lily), *Achlys triphylla* (vanilla leaf), *Lupinus* spp. (lupine), *Maianthemum racemosum* (false Solomon's seal), *Adenocaulon bicolor* (trail plant), *Lilium* spp. (lily), *Cephalanthera austiniae* (phantom orchid), *Corallorhiza* spp. (coralroot), *Goodyera oblongifolia* (rattlesnake plantain), *Piperia* spp. (rein orchid) and *Platanthera* spp. (bog orchid) (Coleman 1989, CCH2 2021, NRIS 2020).

The genus *Cypripedium* holds about 50 species with an overall distribution in the subtropical to temperate latitudes of the Northern Hemisphere and centers of diversity in eastern Asia and North America (Cribb and Sandison 1998, Sheviak 2002, Li et al. 2011). Mountain lady's-slipper is one of three *Cypripedium* species native to western North America, but it is evidently not very closely related to the other two (*C. californicum*, *C. fasciculatum*). It is instead closely related to *C. parviflorum*, *C. candidum*, and *C. kentuckiense* in section *Cypripedium* (Fatihah et al. 2011, Li et al. 2011, Szlachetko et al. 2020). It has the largest flowers of our native lady's-slippers and is unmistakeable by its alternate leaves, spirally twisted and greenish to brownish purple petals, and lower lip white or sometimes suffused with magenta (Coleman 1989, Sheviak 2002, JEPS 2020). The population genetics of this species have not been studied.

Mountain lady's slipper plants appear to be long-lived; of 80 individuals documented in southwestern Oregon in 1990, 71% remained in 1998 (Kaye 1999). The major life-history stages are (1) seedling-protocorm, (2) vegetative (green shoots above ground but no flowering stalk), (3) reproductive (flowering), and (4) dormancy. Orchids in general have very small seeds that contain almost no energy resources; they thus require mycorrhizal fungi for germination and seedling nutrition. The mountain lady's-slipper, like most other members of genus *Cypripedium*, has been found to associate almost exclusively with the fungal species *Tulasnella cystidiophora* of the family Tulasnellaceae (Shefferson et al. 2005, 2007, 2019). The presence of mycorrhizal fungi may determine where and in which specific habitats this orchid can grow and how it

[2] Basis for other 1909.12 Chapter 10, Section 12.53 components.

responds to habitat disturbance (McCormick et al. 2004, McCormick and Jacquemyn 2014). For a discussion of necessary conditions for seedling establishment, see Huber (2002).

Reproduction of the mountain lady's-slipper takes place both sexually (by insect pollination) and asexually (by clonal propagation from buds on rhizomes). Clonal propagation often produces tightly-grouped clumps of stems (ramets) (Kaye and Cramer 2005). The flowers are self-compatible but require an insect vector for successful pollination (Edens-Meier et al. 2010). Visiting insects are offered no nectar or pollen reward; the lower lip is instead modified into a pouch that traps the visitor and guides it to an exit (small opening) where the pollinium (sticky pollen packet) is deposited or transferred to the stigma. Known pollinators are small to medium-sized bees, most frequently of the genus *Lasioglossum* (family Halictidae) (Luer 1975, cited by Kaye and Cramer 2005; Bernhardt et al. 2014).

Low rates of reproductive success are an important concern in orchid conservation, particularly for *Cypripedium* and other genera lacking pollinator rewards (Tremblay et al. 2005, Bernhardt and Edens-Meier 2010). Fruit set among North American nectarless orchid species averages about 20%, the implication being that reproduction is generally pollinator-limited (Neiland and Wilcock 1998). The mountain lady's-slipper has a relatively high rate of fruit set. In three large Californian populations, fruit production averaged 61% (Coleman 1995, cited by Kaye and Cramer 2005), and at a site in southwestern Oregon it ranged from 30%–50% over a ten-year period (Kaye 1999). At two other sites in Oregon, the conversion rate of flowers into fruit was 52–85% over four years (Bernhardt et al. 2014). The high rates of pollinator visitation and fruit set in this non-rewarding orchid is possibly explained by the diversity and density of other, co-occurring species of flowering plants that do offer pollen and/or pollen and nectar rewards (Bernhardt et al. 2014). The unpublished thesis of Kipping (1971) may contain additional data but was unavailable for review.

Orchid seeds are dust-like and often very numerous, a property that may compensate for the often low levels of fruit production. The seeds also have large internal air spaces that may facilitate long-distance dispersal by wind (Arditti et al. 1979, Arditti and Ghani 2000). The large internal air spaces and difficult-to-wet surface of the testa (outer seed coat) also enable orchid seeds to float on water for prolonged periods (Arditti and Ghani 2000), suggesting that seeds of mountain lady's-slipper might be dispersed by surface water flow.

Forest canopy and ground disturbance are expected to have adverse effects on populations of mountain lady's-slipper. For example, a pre-logging survey in Siskiyou County, California, found two populations of 260 and 300 *C. montanum* plants in an area scheduled to be clear-cut; a search of the area several years after timber harvest revealed that only five plants survived at the edge of the clear-cut (Coleman 1995, cited by Seevers and Lang 1998). On BLM land in southwestern Oregon, a 14-year study monitored populations in clear-cuts, shelterwood cuts, second-growth, and unmanaged forests (Kaye 1999). In clear-cut habitat, the population declined by 85% in the seven years after harvest and had poor plant health. On the other hand, populations in a shelterwood cut (forest thinning to an average 23% tree cover) generally remained steady or increased in size, and plant health was generally highest compared to all other sites.

Wildfire effects on populations of this species are evidently complex and varied. For example, a 1981 population of 50 plants on the Shasta-Trinity National Forest was reduced to three individuals after a 1987 fire (Pappalardo 1997, cited by Seevers and Lang 1999). In contrast, strong recolonization by C. *montanum* was seen in a 30-year old tree plantation on the Umatilla National Forest (northeastern Oregon), following site preparation that used fire (Urban 1997, cited by Seevers and Lang 1999). A post-fire study of *Cypripedium fasciculatum* in the North Fork Feather River Watershed found large declines in both population size and density (Belsher-Howe and Garcia 2017). According to these authors, "[h]igh severity burn extirpated populations while low severity burns had mixed impacts on populations but an overall decline." A 2016 effort by the Shasta-Trinity NF to find historical populations of *C. montanum* found that only 7 of 16 historical locations still supported *C. montanum* individuals (J. Kierstead 2021, personal communication).

Because of the large fire footprints in Northern California forests in recent years, with many acres burning at high severity, it is likely that occurrence records of *C. montanum* on National Forest lands do not reflect the current reality on the ground. Occurrences that experienced high severity wildfire should be assumed to be extirpated. Occurrences that experienced moderate severity wildfire should be assumed to have fewer individuals than before the fire. Occurrences that experienced low severity fire are likely still extant. There is a need to return to the known *C. montanum* locations that have burned recently to assess their current condition (J. Kierstead 2021, personal communication).

Overview of ecological conditions for recovery, conservation, and viability[3] including Threats and Risk Factors

Mountain lady's-slipper has an estimated 303 occurrences in northern California, and its overall distribution extends to seven other western states and three Canadian provinces. An overwhelming majority of Californian occurrences are on National Forest lands. Although none of these occurrences are in Wilderness Areas, the species is protected in 18 sites (12 of them in Yosemite National Park). It was placed on the USFS Region 5 Sensitive list in 1979–1980 but was removed in 1982 (Barker 1984). It was later added back to the Regional list as part of the 2004 Record of Decision on "Survey and Manage" species under the *Northwest Forest Plan* (Kaye and Cramer 2005, BLM 2021). Conservation assessments have been prepared for USFS Regions 2, 5 and 10 (Kaye and Cramer 2005, Vance 2007, Fulkerson et al. 2017).

This orchid has been considered "not particularly rare in California" (Coleman 1989), but there is an evident downward trend (in terms of both individuals and populations) such that it may become rare and endangered in the foreseeable future. The IUCN has assessed mountain lady's-slipper as Vulnerable (VU) based on its limited AOO, declining trend and "numerous threats" (Rankou 2014).

Threats to the species on National Forest lands include timber harvest and other actions causing soil disturbance or removal of the forest canopy, e.g., construction of fire lines, construction and

[3] 1909.12 Chapter 10, Section 12.53, components 7, 9, 10, 11 and 12, as appropriate.

maintenance of roads or power/gas transmission lines, and fuel reduction treatments (Hoover et al. 2012, Kierstead Nelson 2012). High-intensity wildfire is another important threat, but so is ongoing fire suppression, not only because it increases the risk of high-intensity wildfire but also the indirect effect of increased conifer stand density on reducing microsite quality. Overcollecting by horticulturists and orchid fanciers is also of concern. Global trade in wild orchid species is significant, and lady's-slippers are actively exported but generally do not survive for long in cultivation (Coleman 1989, Kaye and Cramer 2005). Mountain lady's-slipper is listed in Appendix II of the Convention on International Trade in Endangered Species (CITES), the aim of which is to control and monitor trade in orchids and other threatened or potentially threatened taxa (Cribb and Sandison 1998, Fatihah et al. 2011). Factors increasing extinction risk at the population level include the generally small numbers of individuals, low rate of seedling recruitment, and specialized mycorrhizal and pollinator associations. Due to long-term climate change, the frequency and severity of wildfires is expected to increase in northern California (Fried et al. 2004, Jones et al. 2020, Smith et al. 2020), with potentially adverse effects on mountain lady's-slipper and other fire-sensitive species. Even low-to moderate-severity wildfire significantly reduced population size in *Cypripedium fasciculatum* following the 2013 Chips Fire on the Plumas NF (Belsher-Howe and Garcia 2017), although at least one population that experienced low severity fire increased from 13 plants in 2009 to 34 in 2015.

Taxonomy[4]

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

Table 3. Name status of mountain lady's-slipper

Entity	Name Status
CNDDB and CNPS	*Cypripedium montanum* Lindl.
Jepson eFlora	*Cypripedium montanum* Lindl.
Jepson Manual (1993)	*Cypripedium montanum* Lindl.
Flora of North America	*Cypripedium montanum* Douglas ex Lindley
USDA NRCS[a] PLANTS	*Cypripedium montanum* Douglas ex Lindl.

[a] Natural Resources Conservation Service [NRCS 2020]

Synonymy: *Cypripedium montanum* f. *praetertinctum* Sheviak, *Cypripedium montanum* f. *welchii* P.M.Br., *Cypripedium occidentale* S.Watson (POWO 2020)

Jepson eFlora link (JEPS 2020): https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=21987

Type locality: "Habitat in America boreali occidentali, *Douglas*" (Lindley 1840). According to *TL-2*, Lindley's orchid herbarium (including types and drawings) is in K. The Douglas collections of *C. montanum* in K are mounted on two sheets (barcodes K000363733 & K000718631). The first of these sheets gives the locality as "Junction of Lewis R[iver] & the Columbia" (evidently in what is now Washington state). The second sheet is labeled "Columbia River, North West America." On JSTOR (2020), two additional sheets of Douglas material were found in BM (barcodes 000009996 & 000026001). The first of these sheets is simply labeled

[4] 1909.12, Chapter 10, Section 12.53, component 1.

"America boreali-occidentali." The second sheet gives the locality as "Subalpine range of the Blue Mountains" [largely in northeastern Oregon but also in extreme southeastern Washington]. It is unclear which of the above-mentioned sheets might be the lectotype.

Key literature

Belsher-Howe, J. and H. Garcia. 2017. Wildfire Effects on Populations of *Cypripedium fasciculatum.* Poster presented at Northern California Botanists symposium, Chico CA. http://www.norcalbotanists.org/files/NCB_2017Poster_4_Belsher-Howe.pdf.

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Formatting: Form is set up as 508 compliant. Please use the "styles" if further formatting is necessary.

Purpose: This is to maintain the best available science on a species that could be used by the Forest Service in a variety of functions. Specifically, there would be additional steps and evaluations to determine whether or not this species would be considered a Species of Conservation Concern under the 2012 Planning Rule or a Sensitive Species under the 1982 Planning Rule.

Appendix 1: Known Occurrences

Table 4. Known Occurrences of mountain lady's-slipper within California (NRIS, CNDDB, Calflora/CCH databases).

REDACTED FOR CONSERVATION PURPOSES

Appendix 2: Additional Considerations at the Forest Level

<This section, including the next 5 subheadings, would be filled out by **Forest Service botanists**.>

<Forest Name>

Geographic distribution within the Forest

A. Scarce or isolated
B. Patchy or gaps
C. Contiguous

<Select a geographic distribution rank and provide references or cite 'specialist expertise, <name>' where appropriate.>

Abundance of the species on the Forest

A. Rare – current abundance is low enough that stochastic and other factors could lead to potential imperilment.
B. Uncommon – current abundance is large enough that demographic stochasticity is not likely to lead to rapid local extinction, but, in combination with highly variable environmental factors, could pose a threat.
C. Common – current abundance is large enough that species persistence is not threatened by demographic stochasticity in combination with environmental variation.
D. Insufficient information to draw inferences about criterion.

<Select a species abundance rank and provide references or cite 'specialist expertise, <name>' where appropriate.>

Population trend on the Forest

A. Significant downward or suspected downward population trend.
B. Stable population.
C. Upward population trend.
D. Insufficient information to draw inferences about criterion.

<Select a population trend rank and provide references or cite 'specialist expertise, <name>' where appropriate.>

Habitat trend on the Forest

A. Decline in habitat quality or quantity.
B. Stable amounts of suitable or potential habitat, relatively unchanged habitat quality.
C. Improving habitat quality or increasing amounts of suitable or potential habitat.
D. Insufficient information to draw inferences about criterion.

<Select a habitat trend rank and provide references or cite 'specialist expertise, <name>'where appropriate.>

Vulnerability of habitat on the Forest

A. Substantial modification of habitat has occurred or is anticipated with conditions departing from expectations based on NRV, and/or habitat is impacted by modern stressors such as drought, climate change, high intensity wildfire and wildfire suppression disturbances, loss of natural openings due to historical wildfire suppression, nonnative invasive species, water impoundments and diversions, and recreation, etc.
B. Habitat modification is likely to result in ecological patterns similar to the range of historical conditions, but is being impacted by modern stressors.
C. Habitat resilient, changes are similar in frequency and intensity to those expected from NRV, and modern stressors not significant.
D. Insufficient information to draw inferences about criterion.

<Select a habitat vulnerability rank and provide references or cite 'specialist expertise, <name>'where appropriate.>

Additional Forest specific information related to the SCC determination

<This section is provided for Forest botanists to add additional Forest specific information that is not captured in the section above, if necessary. Provide a narrative description here of the additional relevant information. State "No additional information" if this section is not used.>