Species: *Primula pauciflora* (Greene) A. R. Mast & Reveal, beautiful shootingstar

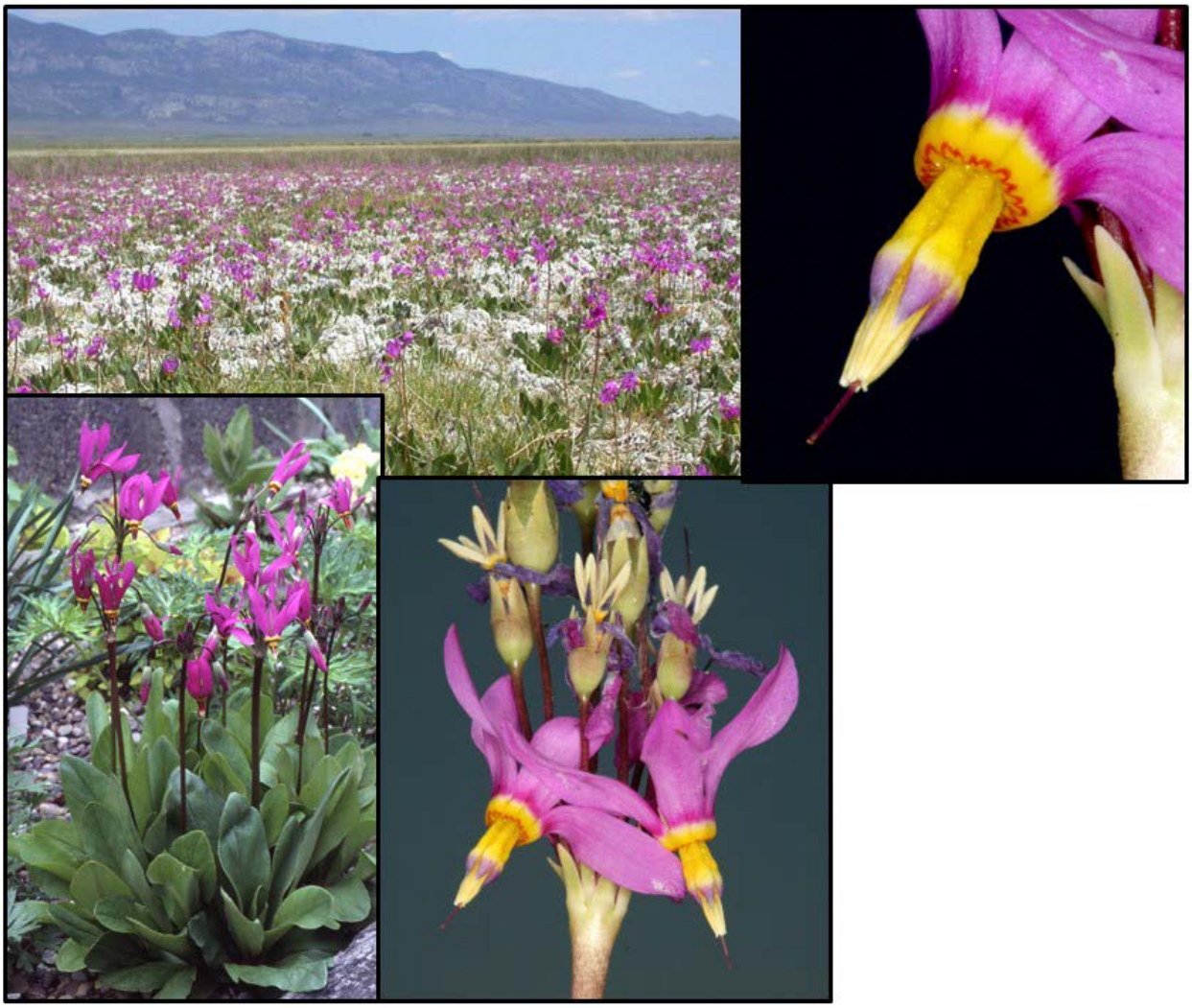


Photo Source: CalPhotos 2023

Photo Credits: Top left: James Andre; top and bottom right: Steve Matson; bottom left: Mike Ireland.

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 beautiful shootingstar		
Entity	**Status**	**Status Definition**

NatureServe CA[a]	G5, S3	G5: Demonstrably Secure — Common; widespread and abundant. S3: Vulnerable — 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 from the nation or state/province.
California Rare Plant Rank[b]	4.2	4: Plants of limited distribution – a watch list. 0.2: Moderately threatened in California (20-80% of occurrences threatened / moderate degree and immediacy of threat) This taxon was added to the *CNPS Inventory of Rare and Endangered Plants of California* in 2001 (as *Dodecatheon pulchellum*) and underwent a name change to *Primula pauciflora* in 2015 (Sims and Bittman 2015, CNPS 2023).
California State Listing[c]	Not listed	
USDA Forest Service[d]	Not listed	
USDI FWS[e]	Not listed	
USDI BLM[f]	Not listed	
NatureServe OR[g]	HP List 2 S2	Listed as *Dodecatheon pulchellum* var. *shoshonense* HP List 2: Taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon. These are often peripheral or disjunct species which are of concern when considering species diversity within Oregon's borders. S2: Imperiled in Oregon because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences.
Oregon State Listing[h]	Not listed	
NatureServe NV[i]	Not listed	
Nevada State Listing[j]	Not listed	

[a] California Natural Diversity Database, California Dept. of Fish & Wildlife [CNDDB 2023, 2023a]
[b] California Native Plant Society [CNPS 2023]
[c] California Department of Fish and Wildlife [CDFW 2023]
[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 2023]
[f] US Department of Interior Bureau of Land Management [BLM 2022]
[g] Oregon Biodiversity Information Center [ORBIC 2023]
[h] Oregon Department of Agriculture [ODA 2018]
[i] Nevada Division of Natural Heritage [NDNH 2022]
[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.

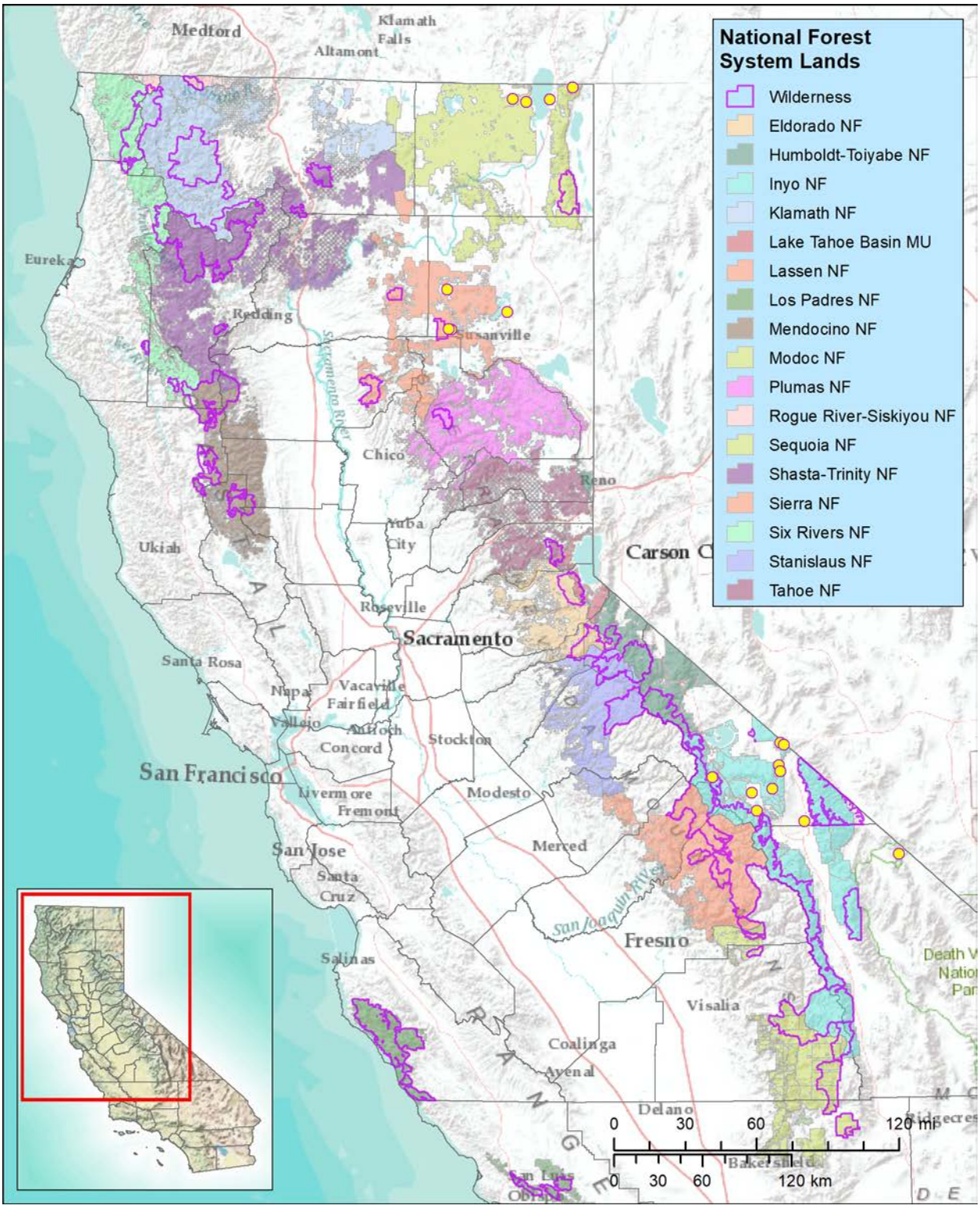
Distribution, abundance, and population trend on the planning unit[1]

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 beautiful shootingstar 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
Inyo:	12, 13, 14, 15, 18	0	5	1	4	10-Jun-2017	5
Lassen:	3, 4, 5	0	3	0	3	14-Jul-1967	3
Modoc:	6, 7, 8	0	3	1	2	18-May-2016	3
Totals:	N/A	0	11	2	9	N/A	11

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



Sources: *Distribution*: Calflora 2023, CCH2 2023, Green 2023 pers. comm. *Baselayers*: 2013 National Geographic Society, i-cubed, Esri, Garmin, NOAA, NPS, USGS.

As a CRPR 4.2 plant, beautiful shootingstar is not tracked by the CNDDB (2023). After searches of many different data sources, occurrence data were obtained from Calflora (2023), the CCH2 (2023), and by examining one unprocessed CNDDB survey form (Green 2023 pers. comm.). Records from iNaturalist were not included in this analysis, due to obscured location data.

Outside of California, beautiful shootingstar is found in North America from Mexico to Alaska and east to Nunavut, Manitoba, Nebraska, North Dakota, South Dakota, Colorado and New Mexico (NRCS 2023). In California (Table 4), it is known to occur in the High Cascade Range (CaRH), Modoc Plateau (MP), Warner Mountains (WR), East of the Sierra Nevada (SNE), and Desert Mountains (DMtns) bioregions in Inyo, Lassen, Modoc, and Mono counties (Calflora 2023, CCH2 2023, Green 2023 pers. comm., JEPS 2023). Eleven of the 18 California records of beautiful shootingstar are located on U.S. National Forest lands (Table 2): Inyo NF (5 records), Lassen NF (3), and Modoc NF (3). None of the locations are in Wilderness Areas. The remaining seven records are in Death Valley National Park (1 record), on land managed by the Bureau of Land Management (4), or on lands of unknown ownership (2). Eleven of 18 records are historical (not visited in over 20 years); the other seven are recent. None of the populations have been censused. Therefore, there is no information on population trends for this species.

At the bottom of Table 4 there are ten rows highlighted in pink that are not included in this distribution analysis. These specimens either have locations that are too vague to be georeferenced, or their identification as beautiful shootingstar is in doubt.

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

Beautiful shootingstar is a perennial, scapose herb with a basal rosette of ovate to oblanceolate leaves and an umbellate inflorescence 10–40 cm tall (JEPS 2023). In California, it can be found in flower from May through August (CCH2 2023, JEPS 2023, Green 2023 pers. comm.). The plants inhabit seasonally moist to wet alkaline flats and meadows within upper montane coniferous forest, Great Basin scrub, and pinyon and juniper woodland at elevations of 4096 to 7980 ft (FNA 1993+, CCH2 2023, CNPS 2023, Green 2023 pers. comm., JEPS 2023). Associates include *Pinus contorta* subsp. *murrayana*, *P. ponderosa*, *P. monophylla*, *Juniperus* sp., *Purshia tridentata*, *Artemisia* spp., *Eriogonum umbellatum*, *Ericameria nauseosa*, *Helianthus nuttallii*, *Sisyrinchium idahoense*, *Erythranthe guttata*, *Senecio hydrophilus*, *Hesperochiron californicus*, *Penstemon rydbergii*, *Juncus* spp., and *Carex* spp. (CCH2 2023, Green 2023 pers. comm.).

Primula is a genus of approximately 470 species worldwide (Mast and Reveal 2007, JEPS 2023). Previously placed in the genus *Dodecatheon*, beautiful shootingstar is now a member of *Primula* section *Dodecatheon*, a group of approximately 17 buzz-pollinated species with nodding flowers, reflexed perianth, and poricidal connivent anthers (Mast 2004, Reveal 2006, Mast and Reveal 2007). Beautiful shootingstar is a variable polyploid complex that has sometimes been treated as a species with seven varieties, three of which occur in California (FNA 1993+, Reveal 2006).

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

These varieties are not recognized in the current *Jepson eFlora* treatment (JEPS 2023). In addition, this species (with varieties) is treated under the now outdated name *Dodecatheon pulchellum* in the treatment in the *Flora of North America* (FNA 1993+). In California, beautiful shootingstar is most similar to *P. subalpina.* Both taxa have stigmas that are more-or-less as wide as the style (not enlarged) and filaments that are fused into a tube with a smooth anther connective (Bainbridge 2017, JEPS 2023). *Primula pauciflora* differs from *P. subalpina* in having longer corolla lobes (9 to 14 versus 5 to 9 mm long), white roots without bulblets (versus red roots with bulblets), and fruiting capsules with valves (versus capsules circumscissile) (Bainbridge 2017, JEPS 2023). Shootingstars, in general, are known to display morphological plasticity in vegetative growth depending on moisture availability and season. In addition, more than one species may be present at a particular location, and hybrids can form (FNA 1993+). Careful observation of living material at the time of collection is necessary, as some critical characteristics, such as anther connective texture, may be difficult to see on dried specimens (FNA 1993+).

Beautiful shootingstar emerges in the spring from a short underground caudex (Reveal 2006). The flowers are pollinated by bumblebees which use wing vibrations to extract the pollen out of the poricidal anthers (Macior 1971, Gould 2013). It is possible that flowers not visited by a pollinator are able to self-pollinate (FNA 1993+). The fruits are capsules that dehisce by five valves to release numerous, tiny, unwinged, brown seeds that most likely fall close to the parent plant (Gould 2013, JEPS 2023). Seed germination benefits from moist, cold stratification (Gould 2013, Krock et al. 2016). No information was found on the response of this species to fire, but depending on the temperature of the fire, it is likely that the caudex could survive, and the leaves would emerge the following growing season.

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

Beautiful shootingstar (as *Dodecatheon pulchellum*) is considered secure or apparently secure (or is unranked) throughout most of its range; it is considered vulnerable in California as well as Manitoba and Yukon provinces in Canada (NatureServe 2023). The only threats recorded for this species (grazing and road construction) are from record #15 in Mono County; the same location, which has a road traversing the center of the population, has the only site quality ranking for this species, and it is a ranking of Fair (Green 2023 pers. comm.). In general, beautiful shootingstar would be threatened by any action that alters hydrology and microclimate, including drought due to climate change. The taxonomic confusion that currently exists in the classification of this plant makes conservation of infraspecific taxa challenging. The populations in California are on the western edge of the species distribution, and more research is needed to understand their significance. Seed collection of this species for *ex situ* conservation has not yet been undertaken and is not planned (CPC 2023).

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

Taxonomy[4]

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

Table 3. Name status of beautiful shootingstar	
Entity	**Name Status**
CNDDB and CNPS	*Primula pauciflora* (Greene) Mast & Reveal
Jepson eFlora	*Primula pauciflora* (Greene) Mast & Reveal
Jepson Manual (1993)	*Dodecatheon pulchellum* (Raf.) Merr.
Flora of North America	*Dodecatheon pulchellum* (Rafinesque) Merrill multiple vars.
USDA NRCS[a] PLANTS	*Dodecatheon pulchellum* (Raf.) Merr.
[a] Natural Resources Conservation Service [NRCS 2023]	

Synonymy: *Dodecatheon cusickii* Greene, *D. macrocarpum* (A. Gray) R. Knuth var. *alaskanum* Hultén, *D. meadia* L. var. *macrocarpum* A. Gray, *D. meadia* L. var. *puberulum* Nutt. (priority rejected), *D. pauciflorum* Greene var. *alaskanum* (Hultén) C. L. Hitchcock, *D. pauciflorum* var. *monanthum* Greene, *D. radicatum* Greene subsp. *monanthum* (Greene) H. J. Thompson, *Dodecatheon pauciflorum* Greene, *D. pauciflorum* var. *shoshonense* A. Nelson, *D. pauciflorum* var. *watsonii* (Tidestrom) C. L. Hitchcock, *D. pulchellum* (Raf.) Merr., *D. pulchellum* subsp. *alaskanum* (Hultén) Hultén, *D. pulchellum* subsp. *cusickii* (Greene) Roy L. Taylor, *D. pulchellum* subsp. *macrocarpum* (A. Gray) Roy L. Taylor & MacBryde, *D. pulchellum* subsp. *monanthum* (Greene) H. J. Thompson ex Munz, *D. pulchellum* subsp. *pauciflorum* (Greene) Hultén, *D. pulchellum* subsp. *watsonii* (Tidestrom) H. J. Thompson, *D. pulchellum* subsp. *superbum* (Pennell &Stair) Hultén, *D. pulchellum* var. *alaskanum* (Hultén) B. Boivin, *D. pulchellum* var. *cusickii* (Greene) Reveal, *D. pulchellum* var. *distolum* Reveal, *D. pulchellum* var. *macrocarpum* (A. Gray) Reveal, *D. pulchellum* var. *monanthum* (Greene ex R. Knuth) B. Boivin, *D. pulchellum* var. *pulchellum*, *D. pulchellum* var. *shoshonense* (A. Nelson) Reveal, *D. pulchellum* var. *zionense* (Rafinesque) Merrill, *D. radicatum* Greene, *D. radicatum* subsp. *watsonii* (Tidestrom) H. J. Thompson, *D. spilantherum* Eastwood, *D. zionense* Eastwood, *Exinia pulchella* Raf., *Meadia pauciflora* (Greene) Kuntze, *Primula pauciflora* (Greene) Mast & Reveal var. *cusickii* (Greene) Mast & Reveal, *P. pauciflora* var. *distola* (Reveal) Mast & Reveal, *P. pauciflora* var. *macrocarpa* (A. Gray) Mast & Reveal, *P. pauciflora* var. *monantha* (Greene) Mast & Reveal, *P. pauciflora* var. *shoshonensis* (A. Nelson) Mast & Reveal, *P. pauciflora* var. *zionensis* (Eastwood) Mast & Reveal (FNA 1993+, Reveal and Gandhi 2008, Brummitt 2011, JEPS 2023, Tropicos 2023).

Jepson eFlora link (JEPS 2023): https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=98396

Type locality: Four specimens (syntypes) were cited by Greene when he published the name *Primula pauciflora*, and a lectotype has not been chosen. All four specimens are in the Greene herbarium (NDG). They are as follows: Eastern Oregon, 1889 (*Cusick s.n.*); Canada, British Columbia, Vancouver Island, Cedar Hill, May 26, 1887 (*Macoun s.n.*); Canada, British

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

Columbia, Vancouver Island, Mt. Arrowsmith, July 17, 1887 (*Macoun s.n.*); Canada, Alberta Province, Morley, June 12, 1885 (*Macoun s.n.*) (Greene 1890, Hellenthal 2023 pers. comm.).

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Reviewer(s) and Date:

Adam J. Searcy, California Native Plant Society, Rare Plant Scientific Coordinator, 17 August 2023; R. Douglas Stone, California Native Plant Society, Associate Rare Plant Botanist, 17 August 2023

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 beautiful shootingstar within California (NRIS, CNDDB, Calflora/CCH databases).

Duplicate records from the same site are given the same record number and are included in red. Rows containing questionable records are highlighted in pink.

Rec. #	Locality	County	Quad	Ref. (Source)	Date Last Obs'd	Population Info	Threats	Land Mgr.	Elev. (ft.)
1	Last Chance Spring -- Death Valley NP	Inyo	Last Chance Mtn. (3711736)	Calflora, Aug. 2023 (wb1337-313)	25-May-2014			Death Valley NP	5860
1	w Last Chance Springs (e side Last Chance Mountains); Last Chance Mountains, e side, w Last Chance Springs. Coordinates Continue: "T8S R39E SW1/4 S2"	Inyo	Last Chance Mtn. (3711736)	CCH2, Aug. 2023 (UC1442718, RSA Accession number 623456)	24-Apr-1978	seepage on slope of gully, limestone, Pinyon-Juniper Woodland		Death Valley NP	5998
1	Canyon WSW above Last Chance Spring, E slope Last Chance Range. T8S R39E S2	Inyo	Last Chance Mtn. (3711736)	CCH2, Aug. 2023 (RSA accession: 297043)	27-May-1974	Pinyon-Juniper Wd.; Seep on side of wash, right fork of cyn.		Death Valley NP	6000
1	Last Chance Mountains, east side, north Death Valley drainage, small seep area in canyon, .1 mi west of Last Chance Spring. T8SR39ES2	Inyo	Last Chance Mtn. (3711736)	CCH2, Aug. 2023 (UNLV11838)	24-May-1978	Nevada Test Site collection; petals magenta, anther connective yellow with orange wavy line. Artemisia, pinyon, juniper		Death Valley NP	5600

Duplicate records from the same site are given the same record number and are included in red. Rows containing questionable records are highlighted in pink.									
Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
2	NE corner Murrers Meadow, 3 mi. SE of Eagle Lake.	Lassen	Gallatin Peak (4012056)	CCH2, Aug. 2023 (CHSC009089)	24-Jun-1970	NE corner Murrer's Meadow.		Unknown	
2	Upper Murrer's Meadows.	Lassen	Gallatin Peak (4012056)	CCH2, Aug. 2023 (CHSC023412)	24-Jun-1970	Upper Murrer's Meadows in dry shady area.		Unknown	
3	4.4 mi sse of B.M. 7310 on Blacks Mtn; Lassen National Forest, Halls Flat Quad.	Lassen	Poison Lake (4012162)	CCH2, Aug. 2023 (UC1137648)	10-May-1940	Veg. Type: Y Atr Hp (Ap?) Gr (Gr underlined, unclear whether it is Hp or Ap); 5% sw slope		Lassen NF	5798
4	One mi e of Silver Lake.	Lassen	Red Cinder (4012142)	CCH2, Aug. 2023 (CHSC006281)	14-Jul-1967	Lodge Pole Pine area. Corolla-ture marron, yellow above.		Lassen NF	6401
5	Immediate vicinity of Silver Lake.	Lassen	Red Cinder (4012142)	CCH2, Aug. 2023 (CHSC004919)	14-Jul-1967	Damp, rocky soil. Corolla tube maroon, yellow above. Anthers more or less united.		Lassen NF	6480
6	Island meadow on Devils Garden area. T47N R11E S24	Modoc	Beaver Mountain (4112086)	CCH2, Aug. 2023 (CHSC077227, ELH00719)	4-Jun-1998	Habitat: Weast Meadow. Flower color magenta.		Modoc NF	5299
6	Island meadow on Devils Garden area., T47N R11 E sec24	Modoc	Beaver Mountain (4112086)	Calflora, Aug. 2023 (xr86633)	4-Jun-1998	1+ individuals. Weast Meadow		Modoc NF	5240

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
6	Modoc Plateau. Devils Garden area; Island Meadow, along Road 47N08 2.1 road-km north of Road 73/181/47N09. T47N R11E S24 NW1/4 USGS Quadrangle: Beaver Mtn 1:24,000	Modoc	Beaver Mountain (4112086)	CCH2, Aug. 2023 (CHSC118306)	18-May-2016	Broad flat meadow in rolling terrain of yellow pine and juniper. Soggy, close to the edge of a small channel of water.		Modoc NF	5269
7	Warner Mountains, Mt. Bidwell, ca. 0.5 miles E of Moonlite Mines. TRS: T47N, R16E, Sec 06, SE1/4 NE1/4	Modoc	Mount Bidwell (4112082)	CCH2, Aug. 2023 (JEPS101744)	8-May-1992	Open ridgetop in scrub dominated by Purshia tridentata, Artemisia arbuscula, Eriogonum umbellatum.		Modoc NF	7980
7	Mt. Bidwell Mt. Bidwell (north-eastern Modoc County)	Modoc	Mount Bidwell (4112082)	CCH2, Aug. 2023 (UC71816)	16-Jul-1904			Modoc NF	
8	5.1 km W of Goose Lake on Forest Service Road 73 between Goose Lake and Crowder Flat Road.	Modoc	Pease Flat (4112085)	CCH2, Aug. 2023 (CAS:BOT-BC:218300)	Jun 1995	Wet meadow in a ponderosa pine forest. Annual herb. Petals pink, anthers yellow at base.		Modoc NF	5184
9	Creek Bottom, Willow Ranch.	Modoc	Willow Ranch (4112083)	CCH2, Aug. 2023 (CAS:BOT-BC:218299)	May 1940			Unknown	

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
10	Eastern Sierra Land Trust. In wetlands north of Black Lake.	Mono	Benton Hot Springs (3711875)	CCH2, Aug. 2023 (JEPS129976, RSA accession: 892286, RENO103057)	23-May-2017	Heavily disturbed by grazing. Sisyrinchium idahoensis var. occidentale, Taraxacum officinale, Lepidium montanum, Gilia sp., Potentilla gracilis var. elmerii, Iris missouriensis		BLM	6371
10	Eastern Sierra Land Trust. Around the shore of Black Lake, on the northwestern side of the lake.	Mono	Benton Hot Springs (3711875)	CCH2, Aug. 2023 (RSA accession: 892318)	19-Jun-2017	Grassy, slightly disturbed soil from cattle. Calochortus excavatus, Equisetum laevigatum, Caulanthus pilosus, Ivesia kingii var. kingii, Cirsium scariosum, Primula pauciflora		BLM	6436
11	Just west of fence and north of BLM spring; Fish Slough: a desert wetland system 4.5 mi. N of Bishop at the northern end of Owens Valley; study site includes 14 sq. mi. along a 7 mi. drainage axis	Mono	Fish Slough (3711844)	CCH2, Aug. 2023 (UCSB015410)	2-Jun-1984	Common in moist alkaline area with Helianthus nuttallii and Erigeron lonchophyllus.		BLM	
11	just w of fence and n BLM spring (Fish Slough, 4.5 mi w of Bishop, at the n end of Owens Valley); Owens Valley, Fish Slough: desert wetland sys..along 7 mi drainage axis.	Mono	Fish Slough (3711844)	CCH2, Aug. 2023 (UC1548597)	2-Jun-1984	in moist alkaline area w/Helianthus nuttallii and Erigeron lonchophyllus; just w of fence n spring. corolla pink		BLM	4180 to 4400 ft

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
11	Fish Slough: Just west of fence and north of BLM Spring; a desert wetland system 4.5 miles north of Bishop at the northern end of Owens Valley; study site includes 14 sq. miles along a 7 mile drainage axis.	Mono	Fish Slough (3711844)	CCH2, Aug. 2023 (RSA accession #: 492451)	2-Jun-1984	In moist alkaline area with Helianthus nuttallii and Erigeron loncholphyllus. Perennial herb; corolla pink		BLM	4180 to 4400 ft
11	Fish Slough, east of creek, north of of pupfish ponds, north of Bishop [Fish Slough Ecological Reserve, Fish Slough Area of Critical Environmental Concern (ACEC)]	Mono [label says Inyo, but georefere nced in Mono]	Fish Slough (3711844)	CCH2, Aug. 2023 (CDA no accession number)	25-May-2018			BLM	4096
11	Fish Slough, nw. of Bishop north of BLM Spring.	Mono	Fish Slough (3711844)	CCH2, Aug. 2023 (RSA accession: 250202, INF03714)	14-May-1974	on moist, alkali flat near slough		BLM	4200
12	Hwy. 158, June Mtn. ski lift, 1 mi. S of June Lake city limits	Mono	June Lake (3711971)	CCH2, Aug. 2023 (HSC-12448)	11-Jul-1970	Meadow		Inyo NF	7002

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
13	Inyo National Forest. Pizona homestead, riparian area next to old house.	Mono	River Spring (3711885)	CCH2, Aug. 2023 (JEPS129975, RSA accession: 892541)	10-Jun-2017	Wetlands. Near road, fairly disturbed. Nasturtium officinale, Aquilegia formosa, Erythranthe guttata, Lemna minuta, Veronica americana, Trifolium longipes, Boechera sp.		Inyo NF	6694
13	Inyo National Forest. Along the Pizona road between Pizona homestead and Upper Pizona Spring.	Mono	River Spring (3711885)	CCH2, Aug. 2023 (RSA accession: 892285)	2-Jul-2017	Dry salt flat. Hesperochiron californicus, Spartina gracilis, Senecio hydrophilus, Elymus cinereus, Eriastrum wilcoxii, Castilleja chromosa, Eriogonum umbellatum var. nevadense, Orobanche corymbosa, Ranunculus cymbalaria		Inyo NF	7020
14	Upper Pizona Spring [Original herbarium coordinates 37.950832, -118.51806. CNPS remapped at upper pizona spring]	Mono	River Spring (3711885)	CCH2, Aug. 2023 (JEPS101701)	1-Jul-1998	moist meadow with Poa, Carex simulata, Iris missouriensis		Inyo NF	7248
15	[Maps to spring just S of Clover Patch] T3S, R30E, NW 1/4 of NW 1/4	Mono	Watterson Canyon (3711866)	CNDDB recent survey form (Green 2023 pers. comm.)	13-Jun-2000	Occasional plants. 20 percent in flower, rest vegetative. In fine pumice soil. Granitic hills upslope. Grazed meadow (sagebrush uplands). Meadow with Carex, Collomia, Penstemon rydbergii, Potentilla gracilis. Site quality Fair.	Grazing. Site bisected by 4WD ranch road.	Inyo NF	7808

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
15	Great Basin Province; East of Sierra Nevada; Clover Patch. Along FS Rd. 3S01B, road crossing near S end of meadow.	Mono	Watterson Canyon (3711866)	CCH2, Aug. 2023 (UC1787079)	13-Jun-2000	Springfed grazed meadow of fine silty pumice soil, granitic outcrops on hills E. Numerous frost heaves. Uplands of Artemesia tridentata, Chrysothamnus, Pinus monophylla. Flws pink-purple.		Inyo NF	7805
15	Inyo National Forest. Clover Patch. Along FS Rd. 3S01B, road crossing near S end of meadow.; Watterson Cyn. quad	Mono	Watterson Canyon (3711866)	CCH2, Aug. 2023 (RSA accession #: 685360)	13-Jun-2000	Springfed grazed meadow of fine silty pumice soil, granitic outcrops on hills E. Numerous frost heaves. Uplands of Artemesia tridentata, Chrysothamnus, Pinus monophylla. Scattered along dry meadow margins and roadside. Flws pink-purple.		Inyo NF	7809
16	[Maps to alkali flat SW of Big Alkali Lake, western Long Valley]	Mono	Whitmore Hot Springs (3711867)	Calflora, Aug. 2023 (wb2493-564)	1-Jun-2022			BLM	6880
16	Long Valley.	Mono	Whitmore Hot Springs (3711867)	CCH2, Aug. 2023 (POM accession: 113400)	27-May-1926	In damp meadow		BLM	7000
16	Near Big Alkali Lake, 3.1 miles NE of Whitmore. TRS: T3S R29E sec 21	Mono	Whitmore Hot Springs (3711867)	CCH2, Aug. 2023 (RENO63191)	12-Jun-1976	Wet alkaline meadow. Juncus, Carex.		BLM	6880
16	Hot Creek [In Long Valley]	Mono	Whitmore Hot Springs (3711867)	CCH2, Aug. 2023 (CAS:BOT-BC:47669)	8-Jun-1936	filaments for the most part distinct flowers 5 merous.		BLM	

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
17	Close to Dutch Pete's, 1/4 mile east of horse corral.	Mono	Benton Hot Springs (3711875)	CCH2, Aug. 2023 (RSA accession: 893177)	6-Aug-2018	In wetland area. Salix exigua, Iris missouriensis, Rosa woodsii subsp. ultramontana, Artemisia tridentata, Ericameria nauseosa, Stephanomeria exigua, Grayia spinosa, Stipa hymenoides		BLM	6401
18	Whiskey Creek	Mono	Tom's Place (3711856)	CCH2, Aug. 2023 (CAS:BOT-BC:47670)	1-Jun-1938			Inyo NF	
	Tahoe National Forest. On state highway 89. Donner campground.	Nevada	Hobart Mills (3912042)	CCH2, Aug. 2023 (CHSC064176)	11-Jun-1993	Herb, 30 cm. Flowers magenta. Wet meadow, montane. [The image of this specimen looks like Primula jeffreyi. It is doubtful that it is P. pauciflora]		Tahoe NF	5775
	Local landmark: Pickett Peak. Pickett Peak Quad. [This specimen might be Primula hendersonii which was also collected at this site and represented by other PUA specimens collected by other collectors. It is out of range for Primula pauciflora.]	Trinity	Forest Glen (4012333)	CCH2, Aug. 2023 (PUA39954)	28-Jun-1980	Conifer Forest/Woodland; Mainly Evergreen Forest; Forest Opening; Herb Cover: 6 - 10%; Aspect: North; Slope Position: Upper Third; Vertical Slope Shape: Smooth; Horizontal Slope Shape: Convex. Soil Origin: Residual; Substrate: Sedimentary & Metasedimentary; Soil Texture: Loamy Sand		Shasta-Trinity NF	5500

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
	Fort Dick	Del Norte	Crescent City (4112472)	CCH2, Aug. 2023 (JEPS48822)	24-Apr-1938	[Either the location or the determination of this collection must be in error. No other collections of Primula pauciflora are known from the North Coast or North Coast Range or Del Norte County. There are no collections of other alkaline plain species from Fort Dick. On 24 Apr 1938, Ruby Van Deventer was in Josephine County, Oregon, and two locations for Primula pauciflora are known from that county near Waldo and Eight Dollar Mtn in the CPNWH.]		Unknown	1099
	Between N and Middle forks of Cosumnes River; Junction of Sand Ridge Road and Cutaway Lane, 2.1 mi SW of Somerset	El Dorado	Camino (3812066)	CCH2, Aug. 2023 (UCR-172644)	20-Apr-2006	Uncommon; with grasses against boulders. Oak woodland and small meadow beside flowing creek. [According to Sanders (2023 pers. comm.) the determination of this specimen is in doubt.]		Unknown	2182
	E of Sacramento, between N and Middle Forks of the Cosumnes River; Sand Ridge Road, 1.9 mi. east of Calif. Hwy 49	El Dorado	Fiddletown (3812057)	CCH2, Aug. 2023 (UCR-173695)	7-Apr-2006	Rare; one viable plant found; with Ranunculus californicus. Grassy meadow beside Big Canyon Creek, surrounded by oak woodland. According to Sanders (2023 pers. comm.) the determination of this specimen is in doubt.]		Unknown	1490

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
	Junction of French Creek Road and Big Canyon Road, 0.5 mile south of Frenchtown	El Dorado	Shingle Springs (3812068)	CCH2, Aug. 2023 (UCR-173332)	27-Apr-2006	Rare; open roadside bank. Oak/pine forest and riparian area beside a creek. According to Sanders (2023 pers. comm.) the determination of this specimen is in doubt.]		Unknown	1116
	Yosemite Valley;Yosemite National Park.	Mariposa		CCH2, Aug. 2023 (MIN238249)	1888-5-23	[Based on other collections from Yosemite Valley, this collection is most likely Primula jeffreyi]			
	Peregoy's Meadows, Glacier Point Turnpike, Mariposa County;Yosemite National Park.	Mariposa		CCH2, Aug. 2023 (MIN237980)	1897-6-5	[Based on other collections from this location, this is most likely Primula jeffreyi]			
	[data not captured]. [No location information for this specimen.]			CCH2, Aug. 2023 (GHbarcode-01922669)					
	[data not captured] [No location information for this specimen.]			CCH2, Aug. 2023 (GHbarcode-01922710)					

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.>