Species *Veronica copelandii* Eastw.
Copeland's speedwell

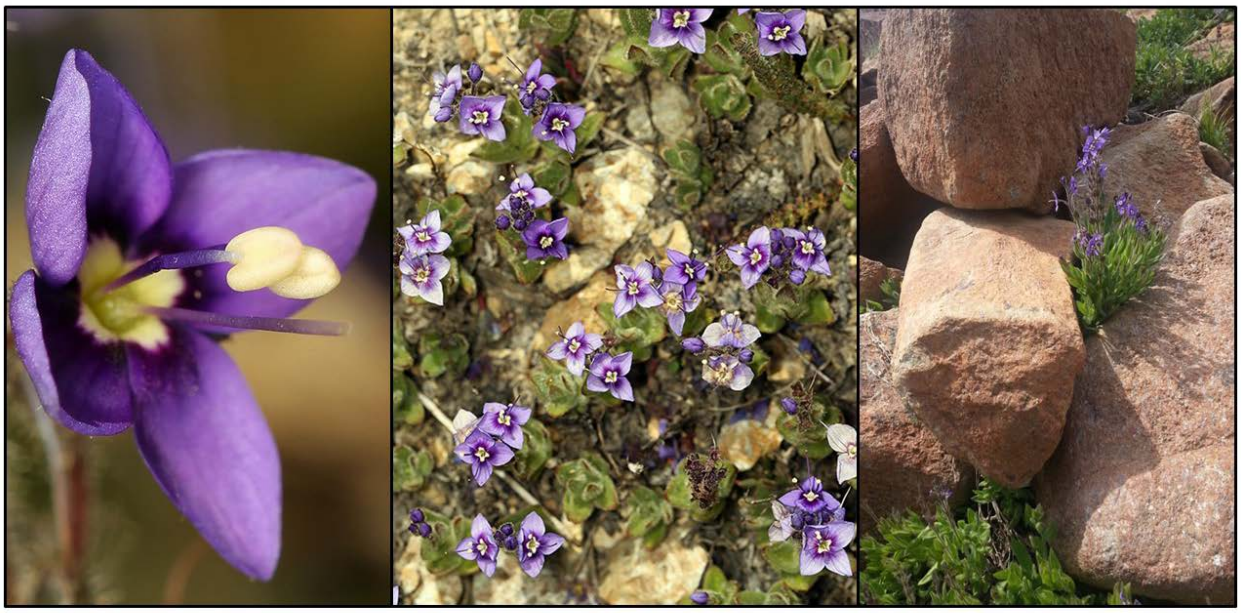


Photo Source: CalPhotos 2020
Photo Credits: Steve Matson: left and middle. Julie Kierstead: right.

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 Copeland's speedwell

Entity	Status	Status Definition
NatureServe CA[a]	G3 S3	G3: **Vulnerable** — At moderate risk of extinction or elimination due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors. 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.
California Rare Plant Rank[b]	4.3	4: Plants of limited distribution. 0.3: Not very endangered in California. *Veronica copelandii* was first added to the *CNPS Inventory of Rare and Endangered Plants* in 1974 as list 1B and was changed to list 4 in 1980.

Table 1. Current status of Copeland's speedwell		
Entity	**Status**	**Status Definition**
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]	Not present	
Oregon State Listing[h]	Not present	
NatureServe NV[i]	Not present	
Nevada State Listing[j]	Not present	

[a] California Natural Diversity Database, California Dept. of Fish & Wildlife [CNDDB 2020]
[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] 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 2015]
[g] Oregon Biological 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.

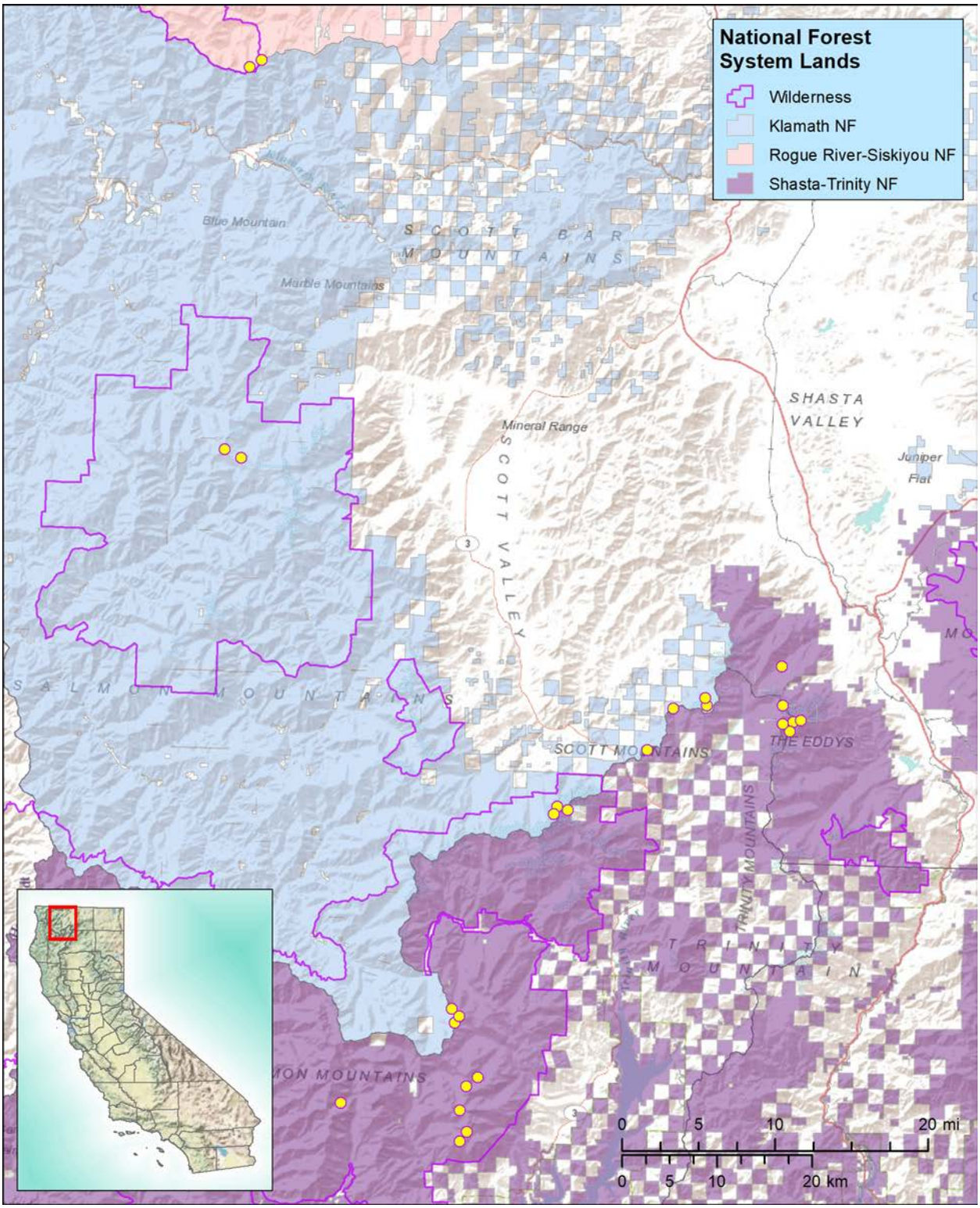
Distribution, abundance, and population trend on the planning unit[1]

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 Copeland's speedwell 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)**	**Historical (not seen in past 20 years)**	**Most Recent Obs. Date**	**Total Records on NFS lands**
Klamath:	(1), 8, 13, 17,	0	5	1	4	21-Jul-2012	5

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

Table 2. Known Occurrence Frequency of Copeland's speedwell 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)**	**Historical (not seen in past 20 years)**	**Most Recent Obs. Date**	**Total Records on NFS lands**
	21						
Rogue River-Siskiyou	(1), 26	0	2	1	1	21-Jul-2012	2
Shasta-Trinity:	2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15, 18, 19, 20, 23, 24, 25	0	18	4	14	15-Jul-2020	18
Totals:	N/A	0	25	6	19	N/A	24



Sources: *Distribution*: Calflora 2020, CCH 2020. *Baselayers*: 2013 National Geographic Society, i-cubed, Esri, Garmin, NOAA, NPS, USGS.

The total number of occurrences for Copeland's speedwell, 26, was estimated using GIS tools and methods described by Green and Sims (2018).

Copeland's speedwell is endemic to the Klamath Range (KR) bioregion, primarily contained within the boundary of the ultramafic sheet of the eastern Trinity Alps, otherwise known as the Trinity Ophiolite Complex (Gruau 1991, Kierstead 2019); with outliers to the north in the Marble Mountains and Red Butte Wilderness Areas. Endemic to California, the overall distribution pattern for Copeland's speedwell is within the Klamath Range bioregion (KR), and nearly half of the populations lie along the forest boundary between the Klamath and Shasta-Trinity National Forests, with 10 of the occurrences situated along the dividing forest, and county, border. Of the 26 occurrences, 24 are on USFS lands (five in Klamath NF, 18 in Shasta-Trinity NF, and one occurrence in Rogue River-Siskiyou NF, but very near the forest border with Klamath NF). Sixteen occurrences are located inside designated wilderness areas, including record #1 that is situated on the boundary of designated wilderness area. Two occurrences sit on private lands or lands of unknown ownership. The majority of occurrences for this species are historical; only five of the 26 sites have confirmed sightings since the year 2000. Current observations from 2016-2020 seasons report that the number of individuals per population is variable between sites, ranging from several plants to many hundreds to thousands (Wayman pers. comm. 2020, Kierstead pers. comm. 2020, DeCamp pers. comm. 2020).

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

Copeland's speedwell is a rhizomatous perennial herb characteristic of subalpine coniferous forests, meadows, and seeps, occurring strictly on serpentine soils between 2,070 and 2,590 meters in elevation (CNDDB 2020, CNPS 2020). It occupies moist microhabitats in small hanging meadows or along rivulets and streams, sometimes near melting snow, in otherwise dry scree slopes. Associates include *Pinus monticola*, *P. balfouriana*, *Phyllodoce breweri*, *Bistorta bistortoides*, *Epilobium siskiyouense*, *Draba howellii*, *Carex* spp., and *Juncus* spp.

Veronica copelandii is part of the circum-pacific clade of *Veronica*, with the most closely related species distributed in Western North America and Japan (Albach 2006). Copeland's speedwell is similar in appearance to *V. cusickii* and may be distinguished from this closely related taxon by its pubescent leaves, light blue to violet corolla, and localized distribution within the Klamath Ranges, as opposed to the widespread intermountain and eastern Californian distribution of *V. cusickii* (Jepson eflora 2020, Eastwood 1906). *Veronica copelandii* reproduction occurs between mid-July and August (CNPS 2020), with the majority of plants flowering in August (CCH 2020). Pollination is most likely mediated by Syrphid flies, bumblebees, Muscoid flies, and Halictid bees, as described for the most phylogenetically close species *Veronica cusickii* (Jepson eFlora 2020, Bainbridge 2017, Albach et al. 2006). Other pollinators for more phylogenetically distant species within *Veronica* include Syrphid and Dipteran flies, various species of butterfly, and leafcutter bees (CPC 2020). Species in *Veronica* typically have limited seed dispersal ability, with seed dispersal often mediated by bulk water flow. This broadly conserved trait is illustrated well by high alpine species from New Zealand, which employ a derived, hygrochastic capsule dehiscence dispersal mechanism, ensuring that seeds fall only in the presence of water (Pufal 2010). As *Veronica* spp. seeds generally have no special adaptations for dispersal via wind or animals, any movement away from the mother plant is likely mediated by bulk water flow. This

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

serves to localize seeds in areas of seasonal inundation, and, importantly for Copeland's speedwell, to nearby serpentinite-derived soil substrates. Similarly, this bulk-flow seed dispersal mechanism likely serves to concentrate the *V. copelandii* seed bank within soil-stabilizing features, such as among boulders or within rocky crevices. Localization of plants near these soil-stabilizing features also mediates the risk of disturbance for populations of Copeland's speedwell, which are likely fairly immune to disturbance other than that introduced by severe weathering events (Kierstead 2019).

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

Populations of *Veronica copelandii* have limited census information available. As such, information on population trends is largely unavailable, due to the irregular monitoring that the species receives. As a CNPS List 4 plant, occurrence data for Copeland's speedwell is not recorded by the California Natural Diversity Database. Due to the location of this species along National Forest boundaries, the expansion of monitoring or management for this species would likely require a joint effort of staff from several forests. In terms of current threats, the heavy recreational use of Mt. Eddy and the Trinity Alps has resulted in some trampling of this species by hikers (Kierstead 2019). However, the most likely long-term threat to this species is climate change, which is predicted to negatively affect high elevation species at the upper limits of their range through changes in the timing of flowering, pollination, and seed germination (Brown et al. 2016, Gremer et al. 2020, Hülber et al. 2010, Mondoni et al. 2012). Due to the microclimate specialization of this species, which favors stream rivulets near melting snowpack, the trend toward reduction in snowpack quantity and timing is particularly important (Kierstead pers. comm. 2020). As a perennial, it is also vulnerable to damage from exposure during winters with reduced snowpack (Kierstead pers. comm. 2020). In addition, climate change may also favor encroachment of denser forest into what is currently relatively open habitat" (Kierstead 2019). Warming and drying may also be deleterious to summer survival, as it grows in areas of extended summer drought. This species' resilience in cases of extreme drought is unknown, and reduced overall precipitation or shifts in seasonal precipitation due to climate change may adversely affect populations of Copeland's speedwell.

<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.>

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

Taxonomy[4]

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

Table 3. Name status of Copeland's speedwell

Entity	Name Status
CNDDB and CNPS	*Veronica copelandii* Eastw.
Jepson eFlora	*Veronica copelandii* Eastw.
Jepson Manual (1993)	*Veronica copelandii* Eastw.
Flora of North America	*Veronica copelandii* Eastwood
USDA NRCS[a] PLANTS	*Veronica copelandii* Eastw.
[a] Natural Resources Conservation Service [NRCS]	

Synonymy: There are no taxonomic synonyms for Copeland's speedwell.

Jepson eFlora link: https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=47957

Type locality: United States, California, Siskiyou County, Mt. Eddy (*Copeland 3931*, UC) (Eastwood 1906, CCH2 2020).

Key literature

Bainbridge, S., and A. Treher. 2017. *Veronica cusickii* Species Profile. Natureserve, Arlington, Virginia.

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Persons Contacted

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Kierstead, Julie. 2020. Email correspondence regarding threats to and observations of *V. copelandii*. Personal communication 14 July 2020.

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Author(s) and Date:

Jonathon Holguin, CNPS, 3 September 2020. Revised by Ellen Dean (CNPS) to incorporate reviewer comments 9 February 2022.

Reviewer(s) and Date:

Ellen Dean, CNPS, 3 September 2020, Aaron E. Sims, CNPS, 5 October 2020; David L. Magney, CNPS 6 October 2020

Julie A. Kierstead, USDA Forest Service Region 5 Ecosystem Planning, 16 December 2020

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 Copeland's speedwell 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 red.

Rec. #	Locality	County	Quad	Ref. (Source)	Date Last Obs'd	Population Info	Threats	Land Mgr.	Elev. (ft.)
1	Klamath/Siskiyou Mts. Rogue River-Siskiyou National Forests, Siskiyou Mountains, Red Butte Wilderness, NE slope of Red Butte. Elev. given as 6310 ft.	Siskiyou	Kangaroo Mtn. (4112382)	CCH, Aug 2020 (CAS1198156)	21-Jul-2012			Klamath NF; Rogue River-Siskiyou	6316
2	Klamath Ranges. Small drainage between meadowy cirque and upper Dead Fall Lakes; 0.8 km west of top of Mount Eddy	Trinity	Mount Eddy (4112234)	CCH, Aug 2020 (CHSC76788)	12-Sep-1999			Shasta-Trinity NF	7841
2	By Deadfall Lakes. Shasta-Trinity National Foreset. In open habitat with Carex sp and Epilobium siskiyouense. Common only here, about 40 plants here. 70% flowering, 30% vegetative, 0% fruiting. Corolla purple.	Trinity	Mount Eddy (4112234)	CCH2, Aug 2020 (Kang, H. 353, DAV304472)	18-Aug-2019	About 40 plants.		Shasta-Trinity NF	7864

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

Rec. #	Locality	County	Quad	Ref. (Source)	Date Last Obs'd	Population Info	Threats	Land Mgr.	Elev. (ft.)
3	The Eddys, Trinity Mountains, headwaters of Eddy Creek and western tributary of Dale Creek; on ridgetop 0.2 to 0.8 east from summit of Forest Road 40N45.	Siskiyou	South China Mtn. (4112235)	CCH, Aug 2020 (JEPS101395)	11-Jul-1988			Shasta-Trinity NF	7800
4	5 mi n of the town of Seiad Valley (ridge e of Kangaroo Peak, s of Lily Pad Lake)	Siskiyou	Scott Mountain (4112236)	CCH, Aug 2020 (JEPS84019)	17-Jul-1986			Shasta-Trinity NF	6365
5	SW of trail from Leroy Mine to Sunrise Basin near ridge	Siskiyou	Caribou Lake (4112218)	CCH, Aug 2020 (HSC66250)	21-Aug-1980			Shasta-Trinity NF	7503
6	Slopes above Bear Basin	Trinity	Siligo Peak (4012288)	CCH, Aug 2020 (HSC75541)	9-Aug-1980			Shasta-Trinity NF	7503
7	Mt. Eddy, N-facing slopes in the Eddy Creek Drainage	Siskiyou	South China Mtn. (4112235)	CCH, Aug 2020 (HSC91114)	6-Oct-1978			Shasta-Trinity NF	7602
8	Near Cabin Meadow Creek, close to the town of Callahan	Siskiyou	South China Mtn. (4112235)	CCH, Aug 2020 (HSC49933)	2-Aug-1978			Klamath NF	6719
9	Trinity County: Trinity Alps. On switchbacks above Deer Lake	Trinity	Siligo Peak (4012288)	CCH, Aug 2020 (UCD124712)	13-Jul-1975			Shasta-Trinity NF	7500
10	on e flank of Rock Mountain Rock Mountain; Trinity Alps, Rock Mountain	Trinity	Caribou Lake (4112218)	CCH, Aug 2020 (JEPS74419)	29-Jul-1973			Shasta-Trinity NF	7600

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

Rec. #	Locality	County	Quad	Ref. (Source)	Date Last Obs'd	Population Info	Threats	Land Mgr.	Elev. (ft.)
11	1 air mi sw of Mount Eddy summit (se edge of Middle Deadfall Lake); Middle Deadfall Lake	Trinity	Mount Eddy (4112234)	CCH, Aug 2020 (JEPS66428)	1-Aug-1971			Shasta-Trinity NF	7300
12	Red Rock Mtn.	Trinity	Caribou Lake (4112218)	CCH, Aug 2020 (HSC707)	19-Aug-1967			Shasta-Trinity NF	7503
13	Near E. Boulder Lake, between Trinity and Scott river drainage	Siskiyou	Billys Peak (4112227)	CCH, Aug 2020 (CHSC1906)	1-Aug-1962			Klamath NF	7300
14	Shasta National Forest, between Marshy and Mosquito Lakes Shasta National Forest; Salmon Trinity-Alps Wilderness Area, Scott Mountains, Shasta	Trinity	Billys Peak (4112227)	CCH, Aug 2020 (JEPS27821)	29-Aug-1960			Shasta-Trinity NF	6900
15	due w of Mount Eddy (Deadfall Lakes); Deadfall Lakes	Trinity	Mount Eddy (4112234)	CCH, Aug 2020 (JEPS16354)	4-Sep-1956			Shasta-Trinity NF	7500
16	along edge of Cabin Meadow Creek which flows down the n slope of ridge between Scott Mountain and Mount Eddy Cabin Meadow Creek; Siskiyou Mountains, Cabin Meadow Creek	Siskiyou	South China Mtn. (4112235)	CCH, Aug 2020 (UC1001151)	26-Jul-1952			Private	6500

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

Rec. #	Locality	County	Quad	Ref. (Source)	Date Last Obs'd	Population Info	Threats	Land Mgr.	Elev. (ft.)
17	Klamath National Forest, Marble Mountains	Siskiyou	Marble Mountain (4112352)	CCH, Aug 2020 (RSA426513)	31-Dec-1945			Klamath NF	8002
18	Summit Lake, Trinity Alps	Trinity	Mt. Hilton (4012381)	CCH, Aug 2020 (CHSC1908)	13-Aug-1942			Shasta-Trinity NF	8060
19	Mount Eddy	Siskiyou	Mount Eddy (4112234)	CCH, Aug 2020 (CHSC1907)	29-Jul-1939			Shasta-Trinity NF	8500
20	head of Bear Creek	Trinity	Covington Mill (4012287)	CCH, Aug 2020 (JEPS16456)	12-Aug-1911	12-Aug-11		Shasta-Trinity NF	6800
21	summit s of Marble Mountain	Siskiyou	Marble Mountain (4112352)	CCH, Aug 2020 (JEPS7875)	8-Aug-1908	8-Aug-08		Klamath NF	6000
22	Scott Mountain	Siskiyou	Scott Mountain (4112236)	CCH, Aug 2020 (GH367566)	22-Aug-1876			Private	
23	Stonewall Pass	Trinity	Siligo Peak (4012288)	Calflora, May 2020 (po114088)	16-Jul-2014	Among peridotite boulders		Shasta-Trinity NF	7372
23	Stonewall Pass	Trinity	Siligo Peak (4012288)	Wayman, K. pers. comm. 2020	15-Jul-2020			Shasta-Trinity NF	
24	East side of Echo Lake	Trinity	Siligo Peak (4012288)	Wayman, K. pers. comm. 2020	15-Jul-2020	On a gentle slope on the east side of the lake		Shasta-Trinity NF	
25		Siskiyou	Billys Peak (4112227)	Wayman, K. pers. comm. 2020	15-Jul-2020	carpeting the ground, in rock crevices, and in meadows		Shasta-Trinity NF	

Duplicate records from the same site are given the same record number and are included in red. Rows containing questionable records are highlighted in red.									
Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
26	Red Buttes and Kangaroo Mtn. vicinity. Extends onto Oak Knoll Ranger District	Siskiyou	Kangaroo Mtn. (4112382)	NRIS, Aug 2020	1987	1000 indiv.		Rogue River-Siskiyou NF	