Species: *Stuckenia filiformis* (Pers.) Börner subsp. *alpina* (Blytt) R.R. Haynes, Les, & M. Král, northern slender pondweed

Photo Sources: CalPhotos (2021), Giblin et al. (2003+)

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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 northern slender pondweed.		
Entity	**Status**	**Status Definition**
NatureServe CA[a]	G5T5	G5: Secure — Common; widespread and abundant.

	S2S3	T5: (Infraspecific Taxon) Secure — Common; widespread and abundant. S2: Imperiled — 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. 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. Range Rank — A numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of a taxon.
California Rare Plant Rank[b]	2B.2	2B: Plants rare, threatened, or endangered in California, but more common elsewhere. 0.2: Moderately threatened in California (20–80% occurrences threatened / moderate degree and immediacy of threat). This taxon was added to the *CNPS Inventory of Rare and Endangered Plants of California* in 1994 (as *Potamogeton filiformis*). It has undergone no changes in rank since that time.
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]	S2? HP List: 2	S2: Imperiled in Oregon because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6–20 occurrences. ?: Assigned rank is uncertain. List 2 contains taxa that are threatened with extirpation or presumed to be extirpated from the state of Oregon.
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 2021, 2021a]
[b] California Native Plant Society [CNPS 2021]
[c] California Department of Fish and Wildlife [CDFW 2021]
[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 2021]
[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 2021]
[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.

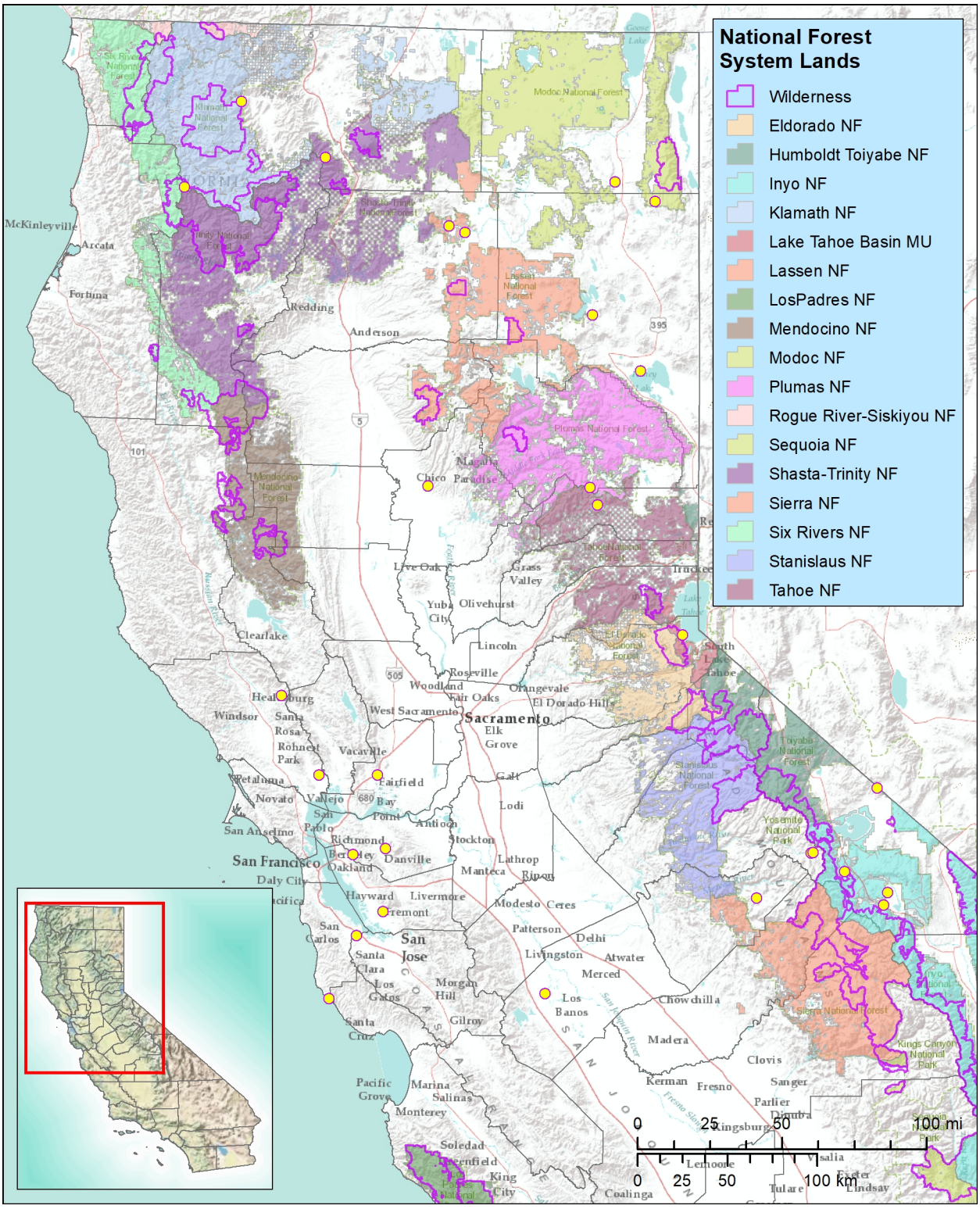
Distribution, abundance, and population trend on the planning unit[1]

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 northern slender pondweed 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:	1	1	0	0	1	26-Jul-1972	1
Klamath	27	0	1	0	1	12-Aug-1979	1
Modoc:	11	1	0	0	1	26-Aug-1995	1
Plumas	26	0	1	0	1	7-Sep-1974	1
Shasta-Trinity:	25	0	1	1	0	24-Jul-2016	1
Six Rivers:	24	0	1	0	1	25-Jul-1979	1
Tahoe:	4	1	0	0	1	17-Sep-1976	1
Totals:	N/A	3	2	1	4	N/A	5

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



Sources: *Distribution*: CCH1 2021, CCH2 2021, CNDDB 2021. *Baselayers*: 2013 National Geographic Society, i-cubed, Esri, Garmin, NOAA, NPS, USGS.

Northern slender pondweed was last updated in the CNDDB on 12 January 2009 (CNDDB 2021), and therefore all Calflora, CCH, and/or NRIS records prior to this date are assumed to have already been reviewed and entered into the CNDDB for this plant. Accordingly, only records from Calflora, CCH, and/or NRIS reported after this date have been reviewed for potential new or updated occurrence information and are included in Table 4 in Appendix 1 as applicable.

In western North America, *Stuckenia filiformis* subsp. *alpina* is found from Alaska to central California and as far east as Nebraska. It is also found throughout Canada, and south into the upper Midwest and New England. The distribution throughout North America is patchy (FNA 1993+, JEPS 2021). In California, northern slender pond weed is known from the Klamath Ranges (KR), central High Sierra Nevada (c SNH), Great Valley (GV), Central Coast (CCo), San Francisco Bay (SnFrB), and Great Basin (GB) bioregions (JEPS 2021). Outside of North America, this subspecies is also found in Greenland and Eurasia (FNA 1993+, JEPS 2021).

Stuckenia filiformis subsp. *alpina* has 29 location records in California. Seven of these records occur on Forest Service lands; one each on the Six Rivers, Klamath, Shasta-Trinity, Modoc, Plumas, Tahoe and Inyo National Forests. The Six Rivers location (record #24) occurs in the Trinity Alps Wilderness, and the Klamath National Forest record (record # 27) occurs in the Marble Mountains Wilderness. Of the remaining records, three are known from Yosemite National Park, and two are likely managed by the BLM. Four records are on lands managed by California Department of Parks and Recreation, and one record is on lands managed by the California Department of Fish and Wildlife. Three other locations are managed by city or county agencies. The remaining nine records are either on private land or locations with unknown land ownership. Only three of the 29 known localities have been visited in the last 20 years. All records are presumed extant, but nine of these locations have not been visited in over 50 years, including a location in Palo Alto (record #3) that is only known from a collection made in 1899 (CCH1 2021, CCH2 2021, CNDDB 2021).

Very little population information is available for *Stuckenia filiformis* subsp. *alpina* in California. Of the recorded locations for the subspecies, only three have been visited more than once (record #s 1, 23 and 25). Only five records have any comments on abundance, and of those, only record #11 notes this subspecies as being common and widespread. *S. filiformis* subsp. *alpina* clearly needs more fieldwork to determine its population trends, and more populations are expected to be found in California (Bainbridge 2017, CCH1 2021, CCH2 2021, CNDDB 2021).

Studies carried out in West Asia have found that many pondweeds from saline and coastal habitats that were initially identified as *Stuckenia filiformis* were later determined to be *Stuckenia pectinata* (Kaplan 2008). In California, supposed *Stuckenia filiformis* subsp. *alpina* specimens were tested from several locations in Suisun Bay and the West Delta, and they were all found to be *S. pectinata* (Patten 2016). Studies in Europe and Asia have generally found *S. filiformis* to be a species of mountains and freshwater (Kaplan 2008), so specimens of *S. filiformis* subsp. *alpina* found at low elevation and in coastal areas in California may need to have their identifications reevaluated.

The CNDDB includes 21 element occurrences, but only 20 of them are included in this analysis of the California distribution of *Stuckenia filiformis* subsp. *alpina*. CNDDB EO 10 is mapped to Crystal Bay on the Nevada side of Lake Tahoe. An additional non-CNDDB record from Browns Island, in the West Delta (Contra Costa County) is also not included in this distribution analysis as it was later identified as most likely *Stuckenia pectinata* and not *S. filiformis* subsp. *alpina* (Patten 2016).

Nine of the 29 California records of *Stuckenia filiformis* subsp. *alpina* are not currently included in the CNDDB. These non-CNDDB records are located at least 4.4 miles away from the nearest CNDDB occurrence and would seem to represent new occurrences that should be evaluated for inclusion in the CNDDB.

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

Stuckenia filiformis subsp. *alpina* is a rhizomatous, tubered, perennial, aquatic herb with grass-like leaves that flowers from May to July. It grows up to 65 cm long. The leaf sheaths or stipules are often inflated or tightly clasping the stem (FNA 1993+, Patten 2016, JEPS 2021). The submerged inflorescence is terminal with flowers arranged in whorls around the stem (CNPS 2021, JEPS 2021). The subspecies present in California is identified by the flower whorls being less than 4 cm apart (FNA 1993+). Fruits are drupelets, 2–3 mm wide with inconspicuous beaks (FNA 1993+, JEPS 2021). Pondweeds can exhibit a wide range of appearances within a species, and growth form is often influenced by environment (Lindqvist et al. 2006, Patten 2016). This means fruit and leaf sheath characters are more reliable than leaf morphology for identifying this subspecies (Patten 2016). In some cases, genetic testing may be necessary to distinguish *S. filiformis* subsp. *alpina* from other species of *Stuckenia* (Patten 2016).

In California *Stuckenia filiformis* subsp. *alpina* is found in a wide variety of aquatic habitats at elevations up to 2150 m (FNA 1993+, CNPS 2021, JEPS 2021). This subspecies can grow in fresh, calcareous, brackish or saline waters, and it may prefer alkaline waters (Hellquist 1980, FNA 1993+, JEPS 2021). *Stuckenia filiformis* subsp. *alpina* can be found in clear shallow water in ponds and lakes, as well as streams, rivers, saline springs, and inland tidal wetlands (FNA 1993+, CNDDB 2021, CNPS 2021, JEPS 2021). It also occurs in seasonally wet areas and developed areas, including drainage ditches and city ponds (CCH2 2020, CCH1 2021, CNDDB 2021, JEPS 2021). Co-occurring plants include: *Eleocharis macrostachya*, *Elodea* spp., *Eriogonum latifolium*, *Iva axillaris*, *Lythrum hyssopifolia* (naturalized), *Muhlenbergia richardsonis*, *Myriophyllum* sp., *Potamogeton crispus* (naturalized), *Rorippa* sp., and *Veronica* sp. (CCH2 2020, CCH1 2021, CNDDB 2021). *S. filiformis* subsp. *alpina* has also been recorded with two rare gastropod species: the freshwater mussel, *Gonidea angulata*, which is critically imperiled (G3S1) in California; and the freshwater snail *Lanx patelloides*, which is an imperiled (G2S2) California endemic (CNDDB 2021, NatureServe 2021).

There are four species of *Stuckenia* in North America, and *Stuckenia filiformis* subsp. *alpina* is one of two recognized subspecies of *Stuckenia filiformis* (Haynes et al. 1998) and the only

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

subspecies of *S. filiformis* found in California (JEPS 2021). There is disagreement about whether *S. filiformis* should be divided into subspecies or not. While the subspecies are accepted in North America, they are not generally recognized in Europe, particularly since the distinguishing characteristics appear to be mainly a result of environmental differences and not genetics (Kaplan 2008, Patten 2016). The genus *Stuckenia* is distinguished from other pondweed genera by having long leaf sheaths, opaque submerged leaves, and flexible peduncles that help keep the flowers submerged (Les et al. 1996, Lindqvist et al. 2006). While pollination has not been studied in *S. filiformis*, *Stuckenia pectinata*, which also flowers underwater, self-pollinates by using air bubbles to transport pollen through the water (Zhang et al. 2010.) Pondweeds (*Potamogeton* and *Stuckenia* species) spread clonally (Lindqvist et al. 2006). Waterfowl may also aid propagule dispersal (Wersal et al. 2005, Lindqvist et al. 2006). Pondweeds are an important food source for ducks, and *Potamogeton* and *Stuckenia* species together account for at least half of the food consumed by waterfowl in North America (Wersal et al. 2005). Pondweeds, can support complex communities of bacteria, algae and other unicellular organisms on their leaf surfaces (Harguinteguy et al. 2014, Patten 2016, Sebilian 2017). They also provide important habitat for aquatic invertebrates and fish (Wersal et al. 2005, Patten 2016, Sebilian 2017). Submerged aquatic vegetation such as *S. filiformis* subsp. *alpina* may also be important for mitigating the effects of climate change. For example, beds of aquatic vegetation can provide stabilization and protect sediments against wave action and storm damage, as well as sequester carbon in both living and dead tissue (Patten 2016).

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

The occurrence rank (habitat quality) is not noted for any records of *Stuckenia filiformis* subsp. *alpina* (CCH1 2021, CCH2 2021, CNDDB 2021). No specific threats are recorded at any of the locations, but a study done in the Suisun Bay and West Delta found that the invasive aquatic plant *Egeria densa* prevented *Stuckenia pectinata* from spreading into the fresh water upriver (Borgnis and Boyer 2015, CCH1 2021, CCH2 2021, CNDDB 2021). There appears to be little information on *S. filiformis* subsp. *alpina*'s competitive abilities, but it has been recorded as occurring with introduced aquatic species (CCH1 2021, CCH2 2021, CNDDB 2021) so further research on these interactions could be useful. Pollution of waterways due to agriculture, mining, industry and other sources can cause poor growth in aquatic vegetation, and a study in Argentina found that an unspecified subspecies of *Stuckenia filiformis* was less abundant in areas with more water pollution (Wersal et al. 2005, Harguinteguy et al. 2014).

Rising sea levels due to climate change could affect coastal and bay populations of *Stuckenia filiformis* subsp. *alpina* by increasing salinity and water temperature in these particular habitats. Increases in water temperature have been shown to stress aquatic plants, which could reduce reproductive effort and the ability to defend themselves against herbivory and disease (Sebelian 2017). Increases in water salinity have been shown to reduce seed production in *Stuckenia pectinata*, though increases in water temperature may be able to buffer *S. pectinata* from the

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

negative effects of increased salinity (Sebelian 2017). In saline and brackish waters of Suisun Bay, beds of *S. pectinata* have expanded over the last 30 years, in spite of invasive species limiting their ability to move into fresh water (Patten 2016). *Stuckenia filiformis* subsp. *alpina* may have similar responses to these conditions, though more study is needed. The Shasta-Trinity, Klamath, and Six Rivers NF occurrences are in montane lakes that do not received heavy recreational use, so it is less likely they are threatened with invasive aquatic plants.

This subspecies has been found in a wide variety of habitats throughout northern and central California. However, few of these sites have been revisited. Aquatic plants are vouchered less frequently than terrestrial plants, because of the logistical and processing inconveniences associated with collecting plants in the water and drying them efficiently. As the result of this collection bias, it is likely that this plant is more common than one would think based on the number of current records. This suggests that *S. filiformis* subsp. *alpina* requires more fieldwork to determine the abundance and stability of its California populations, as well as factors that affect its persistence.

Taxonomy[4]

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

Table 3. Name status of northern slender pondweed.

Entity	Name Status
CNDDB and CNPS	*Stuckenia filiformis* (Pers.) Börner ssp. *alpina* (Blytt) R.R. Haynes et al.
Jepson eFlora	*Stuckenia filiformis* (Pers.) Börner subsp. *alpina* (Blytt) R.R. Haynes, Les, & M. Král
Jepson Manual (1993)	*Potamogeton filiformis* Pers.
Flora of North America	*Stuckenia filiformis* subsp. *alpina* (Blytt) R. R. Haynes, Les, & M. Král
USDA NRCS[a] PLANTS	*Stuckenia filiformis* (Pers.) Börner ssp. *alpina* (Blytt) Haynes, D.H. Les & M. Kral

[a] Natural Resources Conservation Service [NRCS 2021]

Synonymy: *Potamogeton marinus* L. *forma alpinus* Blytt, *Potamogeton filiformis* Pers. var. *alpinus* (Blytt) Ascherson & P. Graebner, *Coleogeton filiformis* (Pers.) D.H. Les & R.R. Haynes var. *alpinus* (Blytt) D.H. Les & R.R. Haynes, *Potamogeton borealis* Raf., *Potamogeton filiformis* Pers. var. *borealis* (Raf.) H. St. John, *Potamogeton marinus* L. var. *macounii* Morong ex Macoun, *Potamogeton* filiformis Pers. var. *macouniii* (Morong ex Macoun) Morong (Les and Haynes 1996).

Jepson eFlora link (JEPS 2021): https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=80318

Type locality: Norway (four syntypes cited by Les and Haynes 1996).

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

Key literature

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Persons Contacted

none

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Reviewer(s) and Date:

Aaron E. Sims, California Native Plant Society, Rare Plant Program Director, 19 Arpil 2021;
Julie Ann Kierstead, USDA Forest Service Region 5, Ecosystem Planning, 15 September 2021

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 northern slender pondweed 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	JUNE LAKE, 2 MILES WEST OF HIGHWAY 395, AT JUNE LAKE MARINA.	Mono	June Lake (3711971)	CNDDB, Jan. 2021 (EO 1)	26-Jul-1972	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1972 COLLECTION BY REVEAL AND REVEAL.		Inyo NF	7621
1	June Lake.	Mono	June Lake (3711971)	CCH2, Sep. 2021, RSA	27-Aug-1933			Inyo NF	7621
2	0.25 MILE SOUTH OF INGOMAR.	Merced	Ingomar (3712028)	CNDDB, Jan. 2021 (EO 2)	27-Jul-1948	VICINITY REPORTED IN TWO COLLECTIONS FROM 1948; H. MASON AND S. SMITH #8216 AND M. NOBS AND S. SMITH #1. NEEDS FIELDWORK.		unknown	85
3	PALO ALTO.	Santa Clara	Palo Alto (3712242)	CNDDB, Jan. 2021 (EO 3)	25-Jul-1899	ONLY SOURCE OF INFORMATION FOR THIS SITE IS AN 1899 COLLECTION BY CONGDON. NEEDS FIELDWORK.		unknown	50
4	PACKER LAKE (NORTH OF SIERRA CITY).	Sierra	Sierra City (3912056)	CNDDB, Jan. 2021 (EO 4)	17-Sep-1976	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1976 COLLECTION BY HOPKINS. NEEDS FIELDWORK.		Tahoe NF	6224

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.)**
5	ABOUT 5 MILES EAST OF EAGLE LAKE BIOLOGY STATION AT POINT WHERE ROAD COMES NEAREST TO WILLOW CREEK.	Lassen	Gallatin Peak (4012056)	CNDDB, Jan. 2021 (EO 5)	12-Jul-1967	SITE BASED ON TWO 1967 CARTER COLLECTIONS. NEEDS FIELDWORK.		unknown	5120
6	WESTFALL MEADOWS, YOSEMITE NATIONAL PARK, ABOUT 1.5 AIR MILE SOUTH OF GLACIER POINT ROAD AT CROSSING OF BRIDALVEIL CR.	Mariposa	El Capitan (3711966)	CNDDB, Jan. 2021 (EO 6)	8-Jul-1994	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1994 COLLECTION BY TAYLOR. NEEDS FIELDWORK.		Yosemite National Park	7100
7	POND IN QUARRY EAST OF ROUND TOP, SIBLEY VOLCANIC REGIONAL PRESERVE, OAKLAND HILLS.	Contra Costa	Oakland East (3712272)	CNDDB, Jan. 2021 (EO 7)	7-Jun-1992	ONLY SOURCE OF INFORMATION IS A 1992 COLLECTION BY ERTTER ET AL. NEEDS FIELDWORK.		Sibley Volcanic Regonal Preserve-East Bay Regional Parks District	1600
8	LARKIN LAKE, TRENCH CANYON, EASTERN MONO BASIN, ON NEVADA STATE LINE.	Mono	Cedar Hill (3811827)	CNDDB, Jan. 2021 (EO 8)	15-Jul-1980	ONLY SOURCE OF INFORMATION IS A 1980 COLLECTION BY TAYLOR. NEEDS FIELDWORK.		BLM	6700

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
9	WEST SIDE OF LAKE TAHOE ABOVE EMERALD BAY, 14 MILES FROM TAHOE CITY.	El Dorado	Emerald Bay (3812081)	CNDDB, Jan. 2021 (EO 9)	4-Oct-1929	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1929 COLLECTION BY MASON. NEEDS FIELDWORK.		D. L. Bliss State Park-California Department of Parks and Recreation	
10	SOUTH LOOP OF WESTSIDE ROAD IRRIGATION DITCH, PIT VALLEY, N OF LIKELY.	Modoc	Likely (4112025)	CNDDB, Jan. 2021 (EO 11)	20-Jul-1947	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1947 COLLECTION BY GRANT & SCHNEIDER. NEEDS FIELDWORK.		unknown	
11	BLUE LAKE, 13 MILES SE OF LIKELY, WARNER MOUNTAINS.	Lassen	Jess Valley (4112023)	CNDDB, Jan. 2021 (EO 12)	26-Aug-1995	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1995 COLLECTION BY OSWALD.		Modoc NF	6100
12	HOT CREEK, WHERE CREEK IS CROSSED BY OWENS RIVER RD, N OF LAKE CROWLEY.	Mono	Whitmore Hot Springs (3711867)	CNDDB, Jan. 2021 (EO 13)	7-Sep-1969	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1969 THORNE & TILFORTH COLLECTION. NEEDS FIELDWORK.		BLM?	6800
13	ANO NUEVO STATE RESERVE, BETWEEN HWY 1 AND THE PACIFIC OCEAN, N OF SANTA CRUZ.	San Mateo	Franklin Point (3712223)	CNDDB, Jan. 2021 (EO 14)	31-Jul-1978	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1978 TAYLOR & PIERCE COLLECTION. NEEDS FIELDWORK.		Ano Nuevo State Park-California Department of Parks and Recreation	50

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
14	ALAMEDA CREEK AREA, EAST BAY REGIONAL PARKS, FREMONT.	Alameda	Niles (3712158)	CNDDB, Jan. 2021 (EO 15)	18-Aug-1977	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1977 HESKETH COLLECTION. NEEDS FIELDWORK.		Quarry Lakes Regional Recreation Area-East Bay Regional Parks District	40
15	NORTH GATE RD AT NW BASE OF MOUNT DIABLO.	Contra Costa	Clayton (3712188)	CNDDB, Jan. 2021 (EO 16)	11-May-1996	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1996 ERTTER ET AL COLLECTION. NEEDS FIELDWORK.		unknown	600
16	CITY POND, CITY HALL, FAIRFIELD.	Solano	Fairfield North (3812231)	CNDDB, Jan. 2021 (EO 17)	29-May-1981	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1981 HAUG COLLECTION. NEEDS FIELDWORK.		Private	20
17	FOOTE RANCH, IMMEDIATELY NE OF INTERSECTION OF HWY 128 & IDA CLAYTON RD, SW BASE OF MT ST HELENA.	Sonoma	Mount St. Helena (3812266)	CNDDB, Jan. 2021 (EO 18)	31-Aug-1997	MENTIONED AS "UNCOMMON" IN 1997. NEEDS FIELDWORK.		unknown	600
18	ON THE N SIDE OF BUTTE CREEK NE OF THE SKYWAY, BUTTE CREEK RESERVE.	Butte	Chico (3912167)	CNDDB, Jan. 2021 (EO 19)	25-May-1987	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1987 OSWALD COLLECTION. NEEDS FIELDWORK. DID WE MAP THIS CORRECTLY?		Butte Creek Canyon Ecological Reserve-California Department of Parks and Recreation?	260

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
19	PIT RIVER ON SE SIDE OF SR 299 BRIDGE UPSTREAM OF CONFLUENCE WITH HAT CREEK.	Shasta	Cassel (4012185)	CNDDB, Jan. 2021 (EO 20)	29-Sep-2001	MENTIONED AS PRESENT AT A SITE FOR GONIDEA ANGULATA. NEEDS FIELDWORK.		Private-Pacific Gas and Electric	2755
20	BURNEY CREEK AT FALLS TRAIL BRIDGE.	Shasta	Burney Falls (4112116)	CNDDB, Jan. 2021 (EO 21)	25-Sep-2001	MENTIONED AS PRESENT AT A SITE FOR LANX PATELLOIDES. NEEDS FIELDWORK.		McArthur-Burney Falls State Park-California Department of Parks and Recreation	2890
21	Eastern Sierra Nevada, Convict Creek, UC Sierra Nevada Aquatic Research Lab, Mt. Morrison Rd, 0.8 mi NW of intersection with Hwy 395	Mono	Convict Lake (3711857)	CCH2, Sep. 2021 (UCSB039030)	2-Sep-1980			Los Angeles Department of Water and Power	
22	Vernal pond adjacent to and on the North side of the Tioga Pass road 3.25 miles West of Tioga Pass entrance station, Dana Fork of the Tuolumne River.	Tuolumne	Tioga Pass (3711983)	CCH2, Sep. 2021 (UC1949789)	30-Aug-06			Yosemite NP	9400

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
23	0.4 mile West of Parker Pass Creek - Dana Fork of the Tuolumne River confluence on North side of Dana Fork near pullout view of Mammoth Peak.	Tuolumne	Tioga Pass (3711983)	CCH1, April 2021 (YM-YOSE118589)	1-Sep-2006			Yosemite NP	
23	Yosemite National Park, Dana Meadows floor of the meadows ca. 300 meters due ESE of Benchmark 9451; Tioga Pass 7.5' USGS quadrangle.	Tuolumne	Tioga Pass (3711983)	CCH2, Sep. 2021 (UC1755375)	11-Aug-2008			Yosemite NP	9439
24	Near Red Cap Lake, close to the town of Forks of Salmon	Humboldt	Salmon Mtn. (4112324)	CCH2, Sep. 2021 (G.L. Clifton 10957)	25-Jul-1979			Six Rivers NF	5853
25	Dobkins Lake	Siskiyou	Mount Eddy (4112234)	CCH2, Sep. 2021 (Jennifer Whipple 179)	4-Sep-1976			Shasta-Trinity NF	6802
25	Dobkins Lake	Siskiyou	Mount Eddy (4112234)	CCH2, Sep. 2021, HSC	6-Aug-1977			Shasta-Trinity NF	6803
25	Shasta-Trinity National Forest, Dobkins Lake, ~2.3 km. N of Mount Eddy	Siskiyou	Mount Eddy (4112234)	CCH2, Sep. 2021 (Dana York 3294)	24-Jul-2016			Shasta-Trinity NF	6792

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Rec. #	**Locality**	**County**	**Quad**	**Ref. (Source)**	**Date Last Obs'd**	**Population Info**	**Threats**	**Land Mgr.**	**Elev. (ft.)**
26	Local landmark: Wades Lake. Sierra City Quad.	Plumas	Gold Lake (3912066)	CCH2, Sep. 2021, PUA 24182	7-Sep-1974			Plumas NF	
27	Local landmark: Isinglass Lake. Scott Bar Quad.	Siskiyou	Boulder Peak (4112351)	CCH2, Sep. 2021, PUA 24182	12-Aug-1979			Klamath NF	
28	1 mile W of Schelville	Sonoma	Sears Point (3812224)	CCH2, Sep. 2021, CAS 267237	Jun-1955			unknown	
29	Lassen County: Hartson Reservoir.	Lassen	Susanville (4012034)	CCH2, Sep. 2021, DAV342434	24-Jun-1963			CDFW, Honey Lake State Wildlife Area	
	CRYSTAL BAY, MINK HARBOR, LAKE TAHOE.	State of Nevada	Kings Beach (3912021)	CNDDB, Jan. 2021 (EO 10)	17-Jun-1931	ONLY SOURCE OF INFORMATION FOR THIS SITE IS A 1931 COLLECTION BY JEPSON. NEEDS FIELDWORK.		unknown	6300
	Browns Island North of Pittsburg near confluence of Sacrament and San Joaquin rivers opposite Pittsburg Marina; at West end of island.	Contra Costa	Antioch North (3812117)	CCH2, Sep. 2021 (Barbara Ertter 10715)	18-Aug-1991			unknown	

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.>