

Species: *Shepherdia canadensis* (L.) Nutt.  
 Canadian buffalo-berry



**Photo Source:** Calphotos 2021

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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.

<b>Table 1. Current status of Canadian buffalo-berry</b>		
<b>Entity</b>	<b>Status</b>	<b>Status Definition</b>
NatureServe CA <sup>a</sup>	G5, S1	G5: Demonstrably Secure — Common; widespread and abundant. S1: Critically Imperiled — Critically imperiled in the state because of extreme rarity (often 5 or fewer

		occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the nation or state/province.
California Rare Plant Rank <sup>b</sup>	2B.1	2B: Rare and endangered in California, more common elsewhere. 0.1: Seriously endangered in California. This taxon was added to the <i>CNPS Inventory of Rare and Endangered Plants of California</i> in 2006 and has undergone no changes since that time (CNPS 2021).
California State Listing <sup>c</sup>	Not listed	
USDA Forest Service <sup>d</sup>	Not listed	
USDI FWS <sup>e</sup>	Not listed	
USDI BLM <sup>f</sup>	Not listed	
NatureServe OR <sup>g</sup>	Not listed	
Oregon State Listing <sup>h</sup>	Not listed	
NatureServe NV <sup>i</sup>	Not listed	
Nevada State Listing <sup>j</sup>	Not listed	
<sup>a</sup> California Natural Diversity Database, California Dept. of Fish & Wildlife [CNDDDB 2021, 2021a] <sup>b</sup> California Native Plant Society [CNPS 2021] <sup>c</sup> California Department of Fish and Wildlife [CDFW 2021] <sup>d</sup> US Forest Service Region 5 Forester's List [USDA 2013] and Pacific NW Survey and Manage [USDA & BLM 2014] <sup>e</sup> US Department of Interior Fish and Wildlife Service [USFWS 2021] <sup>f</sup> US Department of Interior Bureau of Land Management [BLM 2020] <sup>g</sup> Oregon Biodiversity Information Center [ORBIC 2019] <sup>h</sup> Oregon Department of Agriculture [ODA 2018] <sup>i</sup> Nevada Natural Heritage Program [NNHP 2021] <sup>j</sup> Nevada Division of Forestry [NDF 2012] Note: Individual State Heritage Programs (CNDDDB, ORBIC, NNHP) represent NatureServe and contain more up-to-date ranks for their state than NatureServe Explorer.		

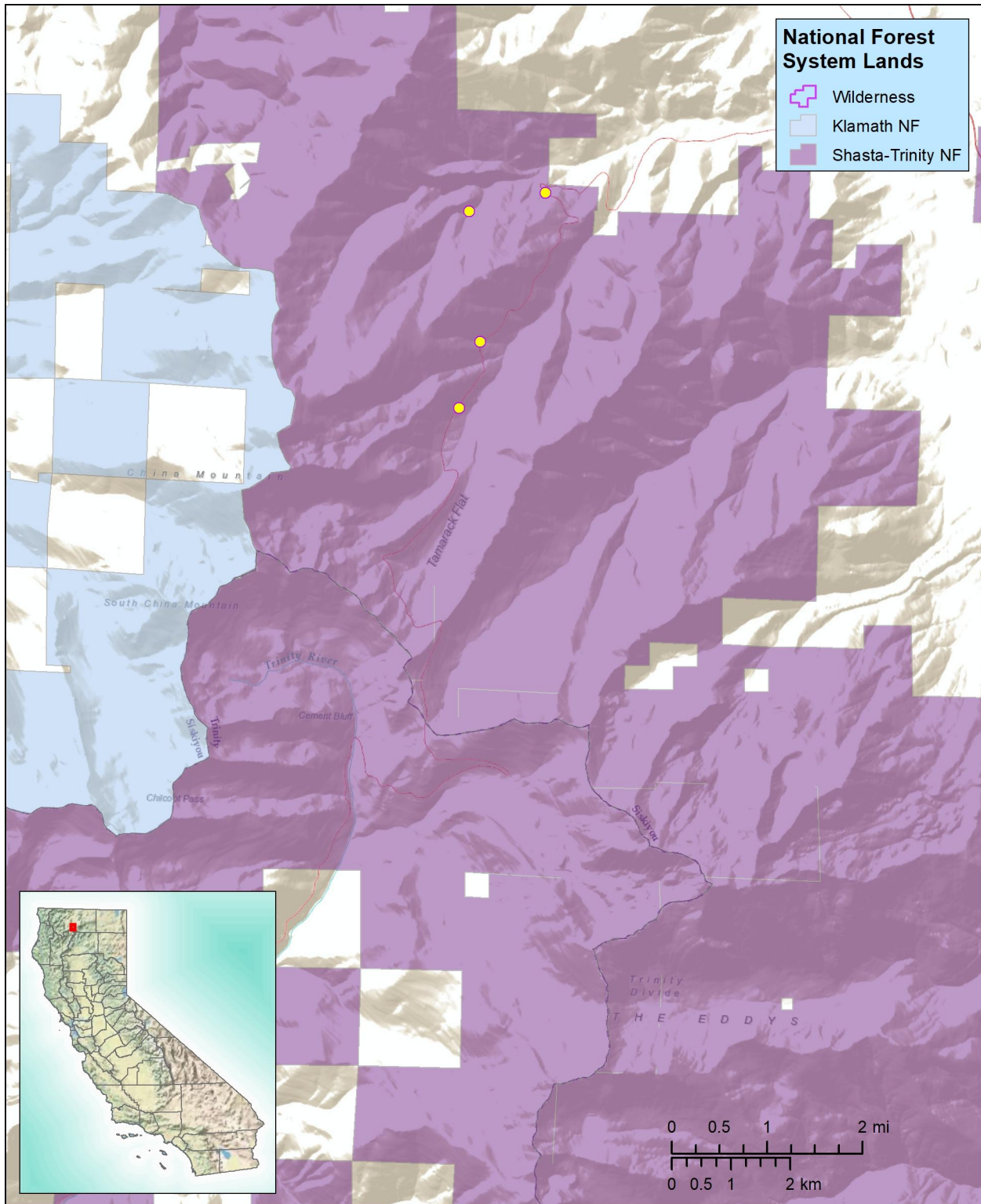
## Distribution, abundance, and population trend on the planning unit<sup>1</sup>

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 CNDDDB.

**Table 2. Known occurrence frequency of Canadian buffalo-berry within the planning area (NRIS, CNDDDB, Calflora/CCH databases)**

<sup>1</sup> 1909.12 Chapter 10, Section 12.53, components 2, 3, and 4.

<b>National Forest System (NFS) lands in California</b>	<b>Record #s (from Table 4)</b>	<b>CNDDDB EOs</b>	<b>Non-CNDDDB Records</b>	<b>Recent (seen in past 20 years)</b>	<b>Historical (not seen in past 20 years)</b>	<b>Most Recent Obs. Date</b>	<b>Total Records on NFS lands</b>
Shasta-Trinity:	1, 2, 3, 4	1	3	4	0	31-May-2014	4
<b>Totals:</b>	N/A	1	3	4	0	N/A	4



**Sources:** *Distribution:* Calflora 2021, CalPhotos 2021, CCH2 2021, CNDDDB 2021, Green 2021 pers. comm., Montagne 2021 pers. comm. *Baselayers:* 2013 National Geographic Society, i-cubed, Esri, Garmin, NOAA, NPS, USGS.

Canadian buffalo-berry was last updated in the CNDDDB on 7 May 2007 (CNDDDB 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 CNDDDB 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 California, Canadian buffalo-berry is only known from the Parks Creek drainage (Scott Mountains, Siskiyou County) of the Klamath Ranges bioregion (KR). Outside of California, Canadian buffalo-berry has a broad distribution in North America. In the north, it occurs in Alaska and all Canadian provinces. In the west, it ranges as far south as California, Arizona and the Rocky Mountain states. East of the Continental Divide, it occurs as far south as Illinois and Pennsylvania (CNPS 2021, NRCS 2021). The closest known location outside of California is approximately 100 miles to the northeast near Bly, Oregon (CPNWH 2021).

All four of the California records are located on the Shasta-Trinity National Forest; no records occur in Wilderness Area. The species was first reported from California by Edwards and Edwards (1996), and none of the records are historical. Population numbers have been reported for three of the locations: record #1 has approximately 12 to 20 shrubs in one (or perhaps two) areas, record #2 has approximately five shrubs, and record #4 has approximately four shrubs. There are likely more plants in this area along streams feeding the Parks Creek watershed.

Of the four California records of Canadian buffalo-berry, one is currently included in the CNDDDB. The three non-CNDDDB record (#2, #3 and #4) are located at least 0.75 mile from the known CNDDDB occurrence. These records seem to represent new occurrences and should perhaps be evaluated for inclusion in the CNDDDB.

## **Brief description of natural history and key ecological functions<sup>2</sup>**

Canadian buffalo-berry is a dioecious shrub to 4 m tall (JEPS 2021). In California, it blooms from May to June, producing showy, red fruits in July and August (CalFlora 2021, CCH2 2021). Plants grow on slopes in the understory of mesic upper montane coniferous forest, sometimes along streams, often in dense vegetation, at 1294–1758 m in elevation; in California, substrates include rocky, ultramafic (serpentinite) or gabbroic soils (CNDDDB 2021, CNPS 2021, Kierstead 2021 pers. comm.). Associates of this species in California include: *Pseudotsuga menziesii*, *Abies concolor*, *Pinus* spp., *Calocedrus decurrens*, *Rhododendron occidentale*, *Cornus sericea*, *Quercus vacciniifolia*, *Lonicera conjugialis*, and *Sisyrinchium idahoensis* (Edwards and Edwards 1996, CCH2 2021, CNDDDB 2021).

The genus *Shepherdia*, in the family Elaeagnaceae, contains just three species, all endemic to North America (JEPS 2021). Canadian buffalo-berry shrubs are usually unisexual, with the small, yellowish to brown-red pistillate and staminate flowers borne on separate individuals (Walkup 1991, Lin et al. 2015, CalPhotos 2021). Ants, flies (usually syrphid flies), and occasionally bees have been reported as insect visitors and pollinators of the flowers of this species in early spring (Lin et al. 2015, Bateman and Nielsen 2020, ACRRE 2021). The fruits are

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<sup>2</sup> Basis for other 1909.12 Chapter 10, Section 12.53 components.



fleshy drupes, each with one stone, containing one seed (Lin et al 2015). Fruit dispersal is by animals (bears, small mammals, birds) and gravity (Walkup 1991, Hamer 1996, ACCRE 2021). Seed germination in this species has been well-studied and can require scarification and/or cold stratification (Walkup 1991, Favorite 2003, ACCRE 2021). Flower and seed production in young plants begins at 4–6 years of age (Walkup 1991, Hamer 1996).

Canadian buffalo-berry generally grows on alluvial (often sandy or rocky) soils within forest (Walkup 1991). It is able to grow on nutrient-poor soils, due to its symbiotic associations with nitrogen-fixing bacteria (*Frankia* spp.) and vesicular-arbuscular mycorrhizae (Walkup 1991, ACCRE 2021). Studies have shown that Canadian buffalo-berry is more abundant and produces more fruit in higher-light environments, indicating that more open forest and light gaps are beneficial, and it may be an early to late seral species (Hamer 1996, Bateman and Nielson 2020, ACCRE 2021). Because of this, fire generally increases Canadian buffalo-berry population density and vigor (Hamer 1996, Walkup 1991). Severe fires will consume all above-ground leaves and stems, while light to moderate fires will leave some stems standing (Walkup 1991). The species is considered moderately fire-resistant, because post-fire resprouting occurs from adventitious buds on surviving root crowns as well as buds on lateral roots (Hamer 1996).

## **Overview of ecological conditions for recovery, conservation, and viability<sup>3</sup> including Threats and Risk Factors**

In California, this species has only been found in a very small area of the eastern Klamath Ranges bioregion and is known from just four occurrence records. These occurrences are approximately 100 miles from the closest populations in Oregon. Additional populations may exist in other areas of northern California and southern Oregon, or the Californian populations could have been started due to long-distance dispersal by migrating birds (Kierstead 2021 pers. comm.). Another possibility is that Canadian buffalo-berry was once more common in the region and suffered a decrease in abundance coincident with the decline of grizzly bears, which are the most important dispersal agent of Canadian buffalo-berry in more northern parts of its distribution (Hamer 1996). The species is also utilized and was likely managed by indigenous people (Favorite 2003, ACCRE 2021); as those practices (including vegetation management with fire) changed over the past two centuries, Canadian buffalo-berry may have declined. Only one of the occurrence records (record #3) has a site quality ranking and is ranked as good (Green 2021 pers. comm.). No immediate threats are listed for this species, although timber harvest activities are listed as a potential threat. The effects of climate change on this species are difficult to predict, as it occurs at intermediate elevations in canyons. As it is a shrub that grows in mesic habitats near summer water sources, increasing drought that affects water availability or pollination services would likely be detrimental. Increasing fire cycles, however, may be tolerated, since the species benefits from increased light levels and is considered moderately fire-resistant.

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<sup>3</sup> 1909.12 Chapter 10, Section 12.53, components 7, 9, 10, 11 and 12, as appropriate.

## Taxonomy<sup>4</sup>

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

Entity	Name Status
CNDDDB and CNPS	<i>Shepherdia canadensis</i> (L.) Nutt.
<i>Jepson eFlora</i>	<i>Shepherdia canadensis</i> (L.) Nutt.
<i>Jepson Manual</i> (1993)	Not included
<i>Flora of North America</i>	Not yet treated
USDA NRCS <sup>a</sup> PLANTS	<i>Shepherdia canadensis</i> (L.) Nutt.
<sup>a</sup> Natural Resources Conservation Service [NRCS 2021]	

Synonymy: *Hippophae canadensis* L., *Elaeagnus canadensis* (L.) A. Nelson, *Lepargyrea canadensis* (L.) Greene (Tropicos 2021)

Jepson eFlora link (JEPS 2021): [https://ucjeps.berkeley.edu/eflora/eflora\\_display.php?tid=44297](https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=44297)

Type locality: Habitat in Canada (Linnaeus 1753)

## Key literature

- [ACRRE] Alberta Centre for Reclamation and Restoration Ecology. 2021. Revegetation Species Profile: *Shepherdia canadensis*. Available at: [https://acrr.ualberta.ca/acrr/wp-content/uploads/sites/45/2018/04//Shepherdia\\_canadensis.pdf](https://acrr.ualberta.ca/acrr/wp-content/uploads/sites/45/2018/04//Shepherdia_canadensis.pdf) [accessed March 2021].
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<sup>4</sup> 1909.12, Chapter 10, Section 12.53, component 1.

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- [CPC] Center for Plant Conservation. 2021. CPC National Collection Rare Plant Database. Website <https://saveplants.org/national-collection/pollinator-search/> [accessed March 2021].
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## Persons Contacted

- Green, Kaitlyn. 2021. Contractor, California Department of Fish and Wildlife. Email correspondence regarding recent/unprocessed survey forms for *Shepherdia canadensis*. Personal communication 30 March 2021.
- Kierstead, Julie. 2021. Forest Botanist, Shasta-Trinity National Forest (retired). Email correspondence regarding distribution and population numbers of *Shepherdia canadensis*,

personal communication 29 March 2021; also, reviewer comments on Version 1 of this species account regarding possible bird dispersal of *Shepherdia canadensis*.

Montagne, Brenna. 2021. Forest Botanist, Shasta-Trinity National Forest. Email correspondence regarding new location of *Shepherdia canadensis*. Personal communication 31 March 2021.

York, Dana. 2021. Field Botanist. Email correspondence regarding location of his observations of *Shepherdia canadensis*. Personal communication 3 April 2021.

**Author(s) and Date:**

Ellen A. Dean, California Native Plant Society, Associate Rare Plant Botanist, 16 April 2021; revised 12 October 2021.

**Reviewer(s) and Date:**

Aaron E. Sims, California Native Plant Society, Rare Plant Program Director, 1 September 2021;

Julie Ann Kierstead, USDA Forest Service Region 5, Ecosystem Planning, 14 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 Canadian buffalo-berry within California (NRIS, CNDDDB, 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	PARKS CREEK ROAD, 4.9-5.25 MILES ABOVE JUNCTION WITH STEWART SPRINGS ROAD, PARKS CREEK DRAINAGE, SHASTA-TRINITY NF.	Siskiyou	China Mtn. (4112245)	CNDDDB, Mar. 2021 (EO 1)	20-Jul-2002	COLLECTED HERE IN 1995 BY EDWARDS AND EDWARDS AND BY NELSON AND ULLOA-CRUZ. THIS IS THE FIRST RECORD OF THIS SPECIES IN CALIFORNIA. CLIFTON COLLECTED THIS SPECIES IN THIS VICINITY IN 1997 AS DID TAYLOR IN 2002. NORTHEAST FACING SLOPE ALONG A SMALL STREAM, IN SHADE OF CONIFERS. ULTRAMAFIC COUNTRY ROCK WITH BLOCKS OF GABBRO IN STREAMLET. WITH CALO CEDRUS DECURRENS, ABIES CONCOLOR, PINUS SP., CORNUS SERICEA, RHODODENDRON OCCIDENTALE, ETC.	TIMBER HARVEST ACTIVITIES COULD POTENTIALLY THREATEN.	Shasta-Trinity NF	5680
1	Parks Creek Road (USFS Road 17; Stewart Springs	Siskiyou	China Mtn. (4112245)	CCH2, Mar. 2021 (JEPS95250)	30-Jul-1995	NE-facing slope along a small stream, in shade of conifers; ultramafic		Shasta-Trinity NF	5679

	Road of some maps)					country rock, with blocks of gabbro in streamlet			
1	Upslope from Parks Creek Road (Rd. 17), 5.25 mi above junction with Stewart Springs Rd., on the W slope of Parks Creek drainage Shasta-Trinity National Forests, Mt. Shasta Ranger District	Siskiyou	China Mtn. (4112245)	CCH2, Mar. 2021 (JEPS9719); Kierstead 2021 pers. comm.	22-Aug-1995	About 12-15 plants. Along spring-fed channel in mixed conifer forest of western white pine, lodgepole pine, white fir, Douglas-fir, Jeffrey pine, w/ <i>Lonicera conjugialis</i> , <i>Taxus brevifolia</i> , <i>Rhododendron occidentale</i> ; shrubs 1-6 dm tall, among other shrubs, berries bright translucent red.		Shasta-Trinity NF	5699
1	Klamath Ranges. The Eddys/Scott Mountains; along small tributary from the west to Parks Creek; above Road 17 8.0 road km south of Stewart Springs Road.	Siskiyou	China Mtn. (4112245)	CCH2, Mar. 2021 (CHSC099727)	23-Jul-2008	Along small creeklet flowing down an east-northeast facing slope, ultramafic/serpentine substrate; partial shade from incense cedar, lodgepole pine, Jeffrey pine, sugar pine, Douglas-fir; growing mixed with thick <i>Quercus vaccinifolia</i> , <i>Rhododendron occidentale</i> .		Shasta-Trinity NF	5732
1	Forest Road 17 ca. 4.9 road miles (above) junction with Stewart Springs Road, Parks Creek	Siskiyou	China Mtn. (4112245)	CCH2, Mar. 2021 (JEPS109700)	20-Jul-2002	Wet shaded understory of <i>Pinus contorta</i> - <i>Pinus monticola</i> stand, with <i>Rhododendron occidentale</i> shrub layer		Shasta-Trinity NF	5699
1	Parks Creek road (Siskiyou County, California, US)	Siskiyou	China Mtn. (4112245)	CalPhotos, Mar 2021 (ID: 0000 0000 0507 1636)	14-Jul-2005			Shasta-Trinity NF	

				(2007-05-24))					
1	Forest Rte 42N17	Siskiyou	China Mtn. (4112245)	Calflora, Mar. 2021 (mu8847)	27-Jul-2014	1+ individuals		Shasta-Trinity NF	5768
1	Shasta-Trinity National Forest, just above Forest Highway 17, on a small tributary to Parks Creek	Siskiyou	China Mtn. (4112245)	CalPhotos, Mar 2021 (ID: 0000 0000 0614 2085 (2014-06-27)); York 2021 pers. comm.	31-May-2014	Fewer than 20 shrubs at this spot. Area was searched thoroughly. Growing with <i>Cornus</i> and other riparian vegetation. Difficult to see. Growing along streamlet above road.		Shasta-Trinity NF	5768
2	Shasta-Trinity National Forest, 5.4 mi. on NF rd. 17, off US Hwy. 97	Siskiyou	China Mtn. (4112245)	CCH2, Mar. 2021 (RSA0011 836)	31-Jul-2007	Coniferous forest, growing in moist area near <i>Cornus</i> sp. and <i>Salix</i> spp. Woody shrub/bush up to 60-70 cm, leaves opposite, dark green above, light green/yellow below. Leaves and twigs covered in a rusty-lepidote. Stellate hairs on the upper surface of leaf. DNA voucher		Shasta-Trinity NF	4246
3	West side of Forest Service Rd 42N17, just north of tributary to Parks Creek.	Siskiyou	China Mtn. (4112245)	CNDDDB recent survey form (Green 2021 pers. comm.)	27-Jul-2014	About 5 plants. In fruit. Steep, wet drainage with <i>Cypripedium californicum</i> , <i>Epipactus gigantea</i> , etc. Thorough survey of this area was not performed. Likely more plants nearby. Site quality Good.		Shasta-Trinity NF	5215
4	Maps along Forest Service Rd 41N14Y west of Stewart Springs along tributary to	Siskiyou	China Mtn. (4112245)	Montagne 2021 pers. comm.	30-May-2014	Observed approximately four shrubs. Did not do an exhaustive survey.		Shasta-Trinity NF	4628

	the West Fork Parks Creek								
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## 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.>