1. **Species:** *Arnica viscosa* Gray, Mt. Shasta arnica

Photo Source: Clockwise from top left: Keir Morse 2010; Matt Berger 2018; Keir Morse 2010.

2. 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 Mt. Shasta arnica

Entity	Status	Status Definition
NatureServe CA (CNDDB[a])	G4	Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
California Rare Plant Rank (CNPS[b])	4.3	Watch List: plants of limited distribution. Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known).
California State Listing (CDFW[c])	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.
USDA Forest Service	Not listed	
USDI FWS[d]	Not listed	
USDI BLM[e]	Not listed	
NatureServe OR (ORBIC[f])	2	Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences.
Oregon State Listing (ODA[g])	Not listed	
NatureServe NV (NNHP[h])	Not present	
Nevada State Listing (NDF[i])	Not present	

[a] California Natural Diversity Database, California Dept. of Fish & Wildlife.
[b] California Native Plant Society.
[c] California Department of Fish and Wildlife.
[d] US Department of Interior Fish and Wildlife Service.
[e] US Department of Interior Bureau of Land Management.
[f] Oregon Biological Information Center.
[g] Oregon Department of Agriculture.
[h] Nevada Natural Heritage Program.
[i] Nevada Division of Forestry.
Note: Individual State Heritage Programs (CNDDB, ORBIC, NNHP) represent NatureServe and contain more up-to-date ranks for their state than NatureServe Explorer.

This species was included in the first edition of the *CNPS Inventory of Rare and Endangered Vascular Plants of California*, in 1974; excluding changes in CRPR format, its rank has not been modified (CNPS 2019).

3. Taxonomy: Table 2 summarizes this species or subspecies/variety's name status in key literature.

Table 2. Name status of Mt. Shasta arnica

Entity	Name Status
CNDDB and CNPS	*Arnica viscosa* Gray
Jepson eFlora	*Arnica viscosa* Gray
Jepson Manual (1993)	*Arnica viscosa* Gray
Flora of North America	*Arnica viscosa* A. Gray
USDA NRCS[a] PLANTS	*Arnica viscosa* A. Gray

[a] Natural Resources Conservation Service

Synonymy: This species has undergone no taxonomic revisions since its initial description (Gray 1878); no synonyms exist.

Jepson eFlora link: http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=1153

Type locality: Given in Gray (1878) as "On Mount Shasta at about 8,000 feet, Gray & Hooker."

4. Distribution, abundance, and population trend on the planning unit [12.53.2,3,4]:
Table 3 summarizes the distribution and frequency of this species or subspecies/variety within National Forest System Lands in California. Table 4 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 0.25 miles apart from each other as defined by the CNDDB.

Table 3. Known Occurrence Frequency of Mt. Shasta arnica 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)	Historic (not seen in past 20 years)	Most Recent Observation Date	Total Records on NFS lands
Klamath:	1, 15, 17, 18, 22, 24	0	6	0	6	1-Sep-1980	6
Shasta-Trinity:	2, 4, 6, 7, 9, 10, 11, 13, 14, 16, 19, 21, 23	0	13	0	13	1-Jan-1988	13
Totals:		0	19	0	19		19

Table 4. Known Occurrences of Mt. Shasta arnica within California (NRIS, CNDDB, Calflora/CCH databases). Duplicate records from the same site are given the same record number and are included in red.

Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
1	High Lake Basins near English Peak, marble Mountain Wilderness Area; N facing slope SSW of Upper English Lake	Siskiyou	English Peak (4112342)	CCH, Sep 2019 (HSC29299)	2-Sep-1968			Klamath NF	6102
1	Upper English Lake Marble Mountains Wilderness Area, Salmon Mountains, English	Siskiyou	English Peak (4112342)	CCH, Sep 2019 (UC1408754)	2-Sep-1968			Klamath NF	6100
2	Boulder Creek Basin, tributary to Canyon Creek, upper end of basin	Trinity	Mt. Hilton (4012381)	CCH, Sep 2019 (HSC4758)	24-Aug-1966			Shasta-Trinity NF	5600
2	Boulder Creek Basin, tributary to Canyon Creek	Trinity	Mt. Hilton (4012381)	CCH, Sep 2019 (RSA211219)	24-Aug-1966			Shasta-Trinity NF	5900
2	Boulder Cr. Lakes Trinity Alps, Boulder Cr. Lakes	Trinity	Mt. Hilton (4012381)	CCH, Sep 2019 (JEPS74633)	9-Aug-1970			Shasta-Trinity NF	5900
3	Tamarack Lake; Trinity Mountains,; in cirque above the lake	Shasta	Chicken Hawk Hill (4112214)	CCH, Sep 2019 (UC1755311)	10-Aug-1996				5200
3	Tamarack Lake; Trinity Mountains,; in cirque above the lake	Trinity	Chicken Hawk Hill (4112214)	Calflora, Sep 2019 (gr12480)	10-Aug-1996	1+ individuals			6070
3	Tamarack Lake; Trinity Mountains,; in cirque above the lake	Trinity	Chicken Hawk Hill (4112214)	Calflora, Sep 2019 (gr12480)	10-Aug-1996	1+ individuals			6070

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Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
3	Tamarack Lake; Trinity Mountains,; in cirque above the lake	Trinity	Chicken Hawk Hill (4112214)	Calflora, Sep 2019 (gr12480)	10-Aug-1996	1+ individuals			6070
4	Mt. Shasta (s side) Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (UC1494015)	6-Jun-1977			Shasta-Trinity NF	8500
4	Mount Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (CAS2488)	1-Sep-1912			Shasta-Trinity NF	
4	Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (UC892236)	1-Sep-1912			Shasta-Trinity NF	
4	Mt. Shasta.	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (RSA252728)	31-Dec-1912			Shasta-Trinity NF	
4	Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (UC572798)	17-Aug-1937			Shasta-Trinity NF	8850
4	Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (UC206766)	31-Dec-1877			Shasta-Trinity NF	8000
4	Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (UC444336)	31-Dec-1894			Shasta-Trinity NF	
5	Gully above Horse Camp Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (JEPS117876)	2-Aug-1976				8000
5	near Horse Camp, Mt. Shasta Type locality	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (DS109863)	12-Aug-1920				
5	first creek s of Horse Camp; Mount Shasta	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (UC558481)	1-Aug-1936				8000

Table 4. Known Occurrences of Mt. Shasta arnica within California (NRIS, CNDDB, Calflora/CCH databases). Duplicate records from the same site are given the same record number and are included in red.

Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
5	Horse Camp Slopes, slopes above the Shasta Fir forest	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (CAS287947)	18-Aug-1938				8250
5	some distance above, on sw slope of Mt. Shasta Horse Camp; Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (UC618863)	18-Aug-1938				8300
5	Horse Camp Slopes, above the Shasta Fir forest	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (DS268921)	18-Aug-1938				8250
5	in the valley of Horse Camp Creek	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (CAS287946)	8-Aug-1939				8100
5	Mount Shasta, in the valley of Horse Camp	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (LA202929)	8-Aug-1939				8100
5	in the valley of Horse Camp Creek	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (DS270272)	8-Aug-1939				8100
5	above Horse Camp; Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (UC1178563)	25-Aug-1949				8700
5	above Horse Camp; Mt. Shasta	Siskiyou	Mt. Shasta (4112242)	CCH, Sep 2019 (JEPS57207)	14-Aug-1967				8400
5	Horse Camp Mt. Shasta	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (JEPS2529)	4-Aug-1894				
6	Mt. Shasta, between Shasta Ski Bowl and Green Butte,	Siskiyou	Mccloud (4112232)	Calflora, Sep 2019 (gr13591)	14-Aug-1975	1+ individuals		Shasta-Trinity NF	8140

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Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
6	Mt. Shasta (s slope), above ski lodge Mt. Shasta National Forest, Mt. Shasta	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (UC1408803)	10-Aug-1969			Shasta-Trinity NF	8000
7	above Panther Meadows; Mt. Shasta, Panther Meadows	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (JEPS24419)	22-Aug-1960			Shasta-Trinity NF	8300
7	above Panther Meadows, Mt. Shasta	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (RSA142615)	22-Aug-1960			Shasta-Trinity NF	8200
8	Shasta-Trinity National Forests. McCloud Ranger District. Pvt. land. Where road crosses Panther Creek tributary SE of Gray Butte	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (CHSC65216)	3-Aug-1994				6400
8	Shasta-Trinity National Forests. McCloud Ranger District	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (CHSC65616)	3-Aug-1994				6562
9	Boulder Cr. Lakes.	Trinity	Caribou Lake (4112218)	CCH, Sep 2019 (RSA276672)	9-Aug-1970			Shasta-Trinity NF	5902
9	Trinity County: Boulder Creek Lakes. At west end of lower lake	Trinity	Caribou Lake (4112218)	CCH, Sep 2019 (UCD129148)	9-Aug-1970			Shasta-Trinity NF	5900
9	Boulder Creek Lakes; at west end of lower lake	Trinity	Caribou Lake (4112218)	CCH, Sep 2019 (HSC12657)	9-Aug-1970			Shasta-Trinity NF	5902

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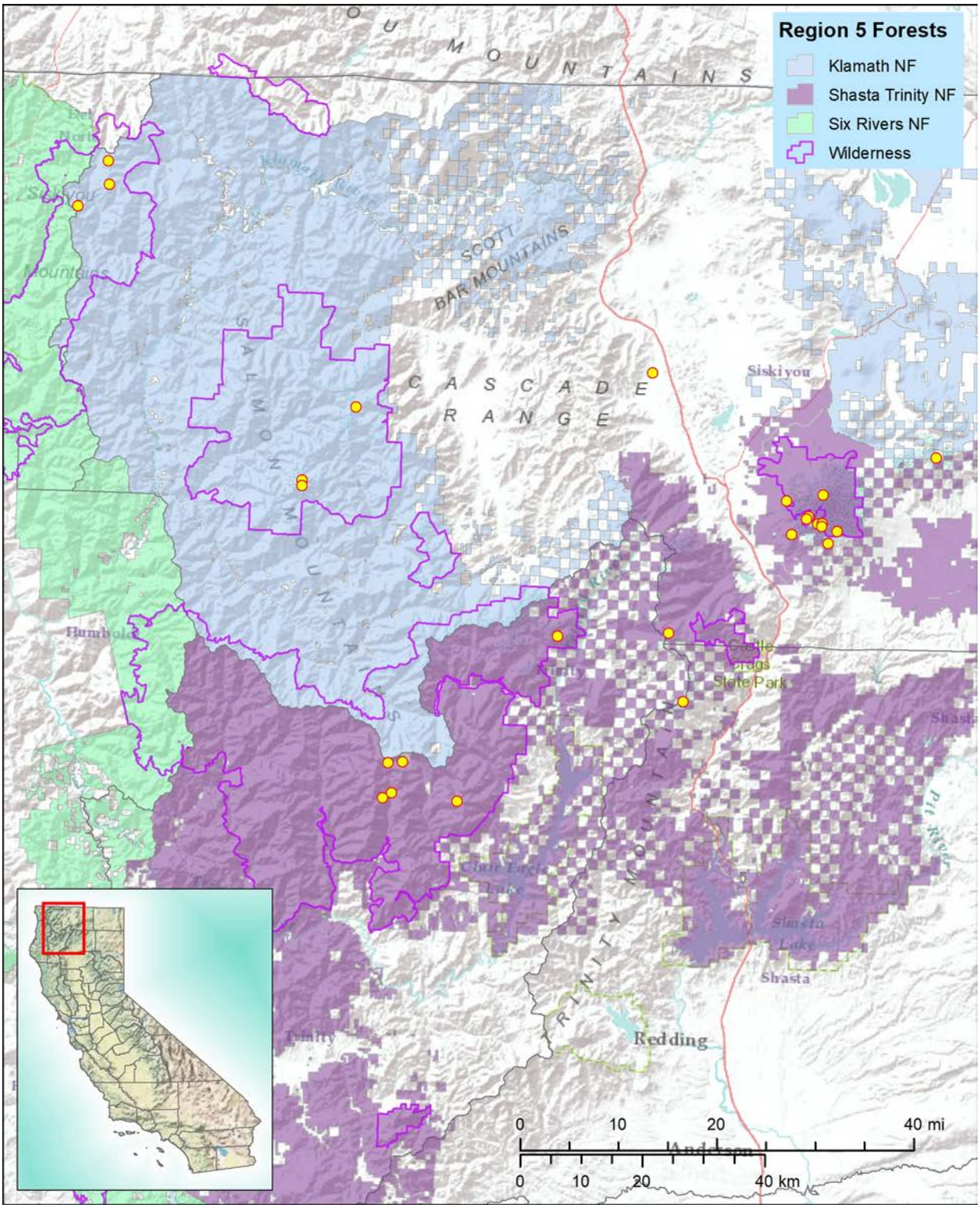
Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
10	Red Butte-Red Fir Ridge Research Natural Area Shasta Trinity National Forest	Siskiyou	Mccloud (4112232)	Calflora, Sep 2019 (ce426)	1-Jan-1988	1+ individuals		Shasta-Trinity NF	7277
10	Red Butte-Red Fir Ridge Research Natural Area Shasta Trinity National Forest	Siskiyou	Mccloud (4112232)	Calflora, Sep 2019 (ce426)	1-Jan-1988	1+ individuals		Shasta-Trinity NF	7277
11	Shasta-Trinity NF	Trinity	Siligo Peak (4012288)	NRIS, Apr 2017 (0514_ARVI6_56_0002)	5-Aug-1977	individuals		Shasta-Trinity NF	
11	Shasta-Trinity NF	Trinity	Siligo Peak (4012288)	NRIS, Apr 2017 (0514_ARVI6_56_0002)	5-Aug-1977	individuals		Shasta-Trinity NF	
12	Dry Creek Peak, cirque on north face at headwaters Antelope Creek (ca. 12 air miles NE of the summit of Mt. Shasta)	Siskiyou	Rainbow Mountain (4112148)	CCH, Sep 2019 (JEPS109883)	18-Aug-2005				6400
12	Dry Creek Peak, cirque on north face at headwaters Antelope Creek	Siskiyou	Rainbow Mountain (4112148)	Calflora, Sep 2019 (gr13606)	18-Aug-2005	1+ individuals			6421
12	Dry Creek Peak, cirque on north face at headwaters Antelope Creek	Siskiyou	Rainbow Mountain (4112148)	Calflora, Sep 2019 (gr13606)	18-Aug-2005	1+ individuals			6421
12	Dry Creek Peak, cirque on north face at headwaters Antelope Creek	Siskiyou	Rainbow Mountain (4112148)	Calflora, Sep 2019 (gr13606)	18-Aug-2005	1+ individuals			6421

Table 4. Known Occurrences of Mt. Shasta arnica within California (NRIS, CNDDB, Calflora/CCH databases). Duplicate records from the same site are given the same record number and are included in red.

Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
13	Mt. Shasta	Siskiyou	City Of Mount Shasta (4112233)	CCH, Sep 2019 (CAS140407)	31-Jul-1926			Shasta-Trinity NF	
14	Dry rocks N of Mirror Lake	Trinity	Mt. Hilton (4012381)	CCH, Sep 2019 (HSC32297)	8-Aug-1970			Shasta-Trinity NF	7503
15	Near Cliff Lake, close to the town of Fort Jones	Siskiyou	Boulder Peak (4112351)	CCH, Sep 2019 (HSC49949)	12-Aug-1979			Klamath NF	6404
16	W slope of Mt. Shasta, base of rocky cliffs and ridges	Siskiyou	Hotlum (4112243)	CCH, Sep 2019 (HSC63613)	28-Aug-1979			Shasta-Trinity NF	9003
17	Preston Peak	Siskiyou	Preston Peak (4112375)	CCH, Sep 2019 (HSC62123)	25-Jul-1960			Klamath NF	
17	Preston Peak	Siskiyou	Preston Peak (4112375)	CCH, Sep 2019 (HSC62124)	20-Sep-1960			Klamath NF	
18	S side of Devil's Punchbowl	Siskiyou	Devils Punchbowl (4112376)	CCH, Sep 2019 (HSC66241)	1-Sep-1980			Klamath NF	6001
18	Devil's Punchbowl Preston Peak Quad., Klamath National Forest	Siskiyou	Devils Punchbowl (4112376)	CCH, Sep 2019 (UC1483477)	1-Sep-1980			Klamath NF	6000
19	Bear Lakes Area; ESE of Big Bear Lake	Trinity	Tangle Blue Lake (4112226)	CCH, Sep 2019 (HSC78351)	14-Sep-1974			Shasta-Trinity NF	6102
20		Siskiyou	Gazelle (4112255)	CCH, Sep 2019 (JEPS24420)					

Table 4. Known Occurrences of Mt. Shasta arnica within California (NRIS, CNDDB, Calflora/CCH databases). Duplicate records from the same site are given the same record number and are included in red.

Rec. #	Locality	County	Quad	Reference (Source)	Date Last Observed	Population Info	Threats	Land Manager	Elev. (ft.)
21	between Panther Meadow and top of ski lift Mt. Shasta	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (JEPS32671)	2-Aug-1962			Shasta-Trinity NF	9500
22	just s of, extreme w Siskiyou Co Youngs Valley; Siskiyou Mts., El Capitan	Siskiyou	Preston Peak (4112375)	CCH, Sep 2019 (JEPS50861)	8-Aug-1967			Klamath NF	6000
23	trib to Canyon Creek Trinity Alps, Boulder Creek Basin, Canyon Creek	Trinity	Mt. Hilton (4012381)	CCH, Sep 2019 (JEPS74446)	24-Aug-1966			Shasta-Trinity NF	5900
24	Above Upper English Lake. Salmon Mountains. High Lake Basins in the vicinity of English Peak. Marble Mountains Wilderness Area.	Siskiyou	English Peak (4112342)	CCH, Sep 2019 (RSA238807)	2-Sep-1968			Klamath NF	6100
25	near Cliff Lake; Scott Bar Quad.	Siskiyou	Seven Lakes Basin (4112224)	CCH, Sep 2019 (UC1475693)	12-Aug-1979				6401
26	valley of Horse Camp Creek; Mount Shasta	Siskiyou	Mccloud (4112232)	CCH, Sep 2019 (UC642579)	8-Aug-1939				8100



Sources: *Distribution*: Calflora 2019, CCH 2019, NRIS 2019. *Baselayers*: 2013 National Geographic Society, i-cubed, Esri, Garmin, NOAA, NPS, USGS.

This species occurs in far-northern California (Siskiyou and Trinity counties), within the Klamath Ranges (KR) and Cascade Ranges (CaR) bioregions; its range extends as far as southern Oregon. As a CRPR 4 species, *Arnica viscosa* is not tracked by CNDDB. Only one data point exists in NRIS (2017), with the remaining 25 occurrences coming from CCH and Calflora. There are no data relating to population size or trends.

5. Brief description of natural history and key ecological functions [basis for other 12.53 components]:

Arnica viscosa is a perennial rhizomatous herb that grows in open, rocky sites within subalpine coniferous forest and upper montane coniferous forest, at elevations between 1,705 m and 2,745 m. The mature plant reaches 20-50 cm in height, emerging from a woody caudex; blooming occurs in August and September (CNPS 2019, Wolf and Barkley 2012). While this species' pollination biology has not been studied directly, congeners are visited by six families of Lepidoptera, most prominently by Nymphalidae, with confirmed pollinators drawn from Coleoptera, Diptera, Hymenoptera, and Lepidoptera (CPC 2019). In addition, the subgenus *Austromontana*, to which *A. viscosa* belongs, exhibits frequent apomictic reproduction, as evidenced by a wide variation in chromosome number (Wolf and Denford 1984). Three of the nine species in this subgenus are endemic to the Klamath region, conforming to a broader pattern of regional diversification (Ekenas et al. 2007, Whittaker 1960).

6. Overview of ecological conditions for recovery, conservation, and viability [12.53 7, 9, 10, 11, 12] including Threats and Risk Factors:

Arnica viscosa is the rarest species in the genus *Arnica*; it is known from just a handful of locations, and was originally thought to have been entirely confined to geologically recent (<14,000 years old) volcanic peaks (Wolf and Denford 1984b), though occurrences west of Interstate 5 are not on volcanic substrates (J. Kierstead pers. comm. 2019). This narrow distribution renders the species vulnerable to stochastic events and small-scale disturbance. An absence of relevant data makes it difficult to assess the long-term viability of existing occurrences. Within the Klamath Ranges bioregion, the pace of anthropogenic climate change will likely disrupt long-stable refugia for taxa of low mobility and narrow ecological requirements, though careful management may partially mitigate this risk (Olson et al. 2012). Fourteen of 26 occurrences lie within federally designated Wilderness areas (Calflora 2019, CCH 2019, NRIS 2019).

7. Key literature:

Ekenas, C., B.G. Baldwin, and K. Andreasen. 2007. A molecular phylogenetic study of *Arnica* (Asteraceae): low chloroplast DNA variation and problematic subgeneric classification. *Systematic Botany* 32(4): 917-928

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8. Literature cited:

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[NRIS] U.S. Department of Agriculture Forest Service, Natural Resource Information System. 2019. Natural Resource Information System; Threatened, Endangered and Sensitive Plants—Invasive Plants [accessed March 2019].

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Persons Contacted: Julie Kierstead, 6 November 2019

Author(s) and Date: Seth Kauppinen, 21 October 2019

Reviewer(s) and Date: Aaron E. Sims, 12 December 2019; David L. Magney, 5 November 2019. Julie Kierstead, 15 November 2019