Plant Species Evaluation Form

**Arnica spathulata** Greene

**KLAMATH ARNICA**

**Family:** Asteraceae  
**PLANTS Symbol:** ARSP4  
**Calif. Endemic:** No

**Synonyms/Other Names:** *Arnica spathulata* Greene was described by E.L. Greene in 1896, on the basis of a specimen from T.J. Howell. Another species, *Arnica eastwoodiae* Rydb.—described in 1927—was later recombined as *A. spathulata* subsp. *eastwoodiae* (Rydb.) Maguire. The latter subspecies is no longer recognized; and all formerly recognized entities are considered *A. spathulata* Greene (Tropicos 2018).

**Identification Issues:** Within California, *A. spathulata* is distinguished from congeneric taxa by the following traits: proximal and middle leaves are narrowed to a winged petiole, rather than sessile; young heads are held erect; and fruits are sparsely stalked-glandular (but otherwise glabrous), and bear a white pappus (Wolf and Barkley 2012). Specimens encountered without flower or fruit will be difficult to identify.

**Taxonomy:**

Unless otherwise cited, the following description is used with permission from the Jepson Herbarium. Jepson Flora Project (eds.) 2018. Jepson eFlora, http://ucjeps.berkeley.edu/eflora/, accessed in 2018. Copyright © Regents of the University of California.

Species In Genus: 29 species: North America, Eurasia. Etymology: (Latin or Greek: ancient name). Note: Diploid species sexual; polyploid species generally form seeds asexually.

Habit: Plant 1.5--4.5 dm, generally spreading-hairy and +- stalked-glandular. Stem: 1--few, loose, often branched distally. Leaf: basal generally prominent, < 15 cm, +- oblanceolate, +- widely wing-petioled, +- toothed; cauline 3--5 pairs, most proximal like basal, reduced distally on stem. Inflorescence: heads discoid, 1 or 3--9(25); involucre obconic to narrowly bell-shaped; phyllaries narrowly to widely lanceolate, glandular, coarsely spreading-hairy. Ray Flower: 0. Disk Flower: corolla sparsely soft-hairy and glandular proximally. Fruit: 5--10 mm, sparsely stalked-glandular, generally otherwise glabrous; pappus short-barbed, white. Chromosomes: 2n=38,76. eFlora Treatment Author: Steven J. Wolf & Theodore M. Barkley.

**Status:**

Note: Federally recognized Endangered, Threatened, Proposed, or Candidate species under the Endangered Species Act are omitted as they do not meet the definition of a Species of Conservation Concern (FSH 1909.12 § 12.52).

<table>
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<tr>
<th>State Listing</th>
<th>G-rank</th>
<th>S-rank</th>
<th>CRPR</th>
<th>R5 FSS</th>
<th>NFP SM</th>
<th>CA BLM</th>
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Arnica spathulata Greene

Expanded abbreviations and citations: State Listing=California Endangered Species Act Listing (CDFW 2018b), Nevada Division of Forestry Fully Protected Plant Species (NAC 527) (NDF 2012), Oregon Department of Agriculture Listed Plants (ODA 2014); G-rank=Global Conservation Status (CDFW 2018a; NatureServe 2018); S-rank=Subnational (state or province-level) Conservation Status (CDFW 2018a; NatureServe 2018; NNHP 2017; ORBIC 2016); CRPR=California Rare Plant Rank (CNPS 2018); R5 FSS=USDA Forest Service Region 5 Regional Forester Sensitive Plant Species List (USDA 2013); NFP SM=Forest Service and Bureau of Land Management Northwest Forest Plan Survey and Manage Species (USDA 2001); CA BLM=California Bureau of Land Management Designated Sensitive Species (BLM 2010); SWAP=California State Wildlife Action Plan Status (CDFW 2015); NNHP=Nebraska Natural Heritage Program Status (NNHP 2017); NNPS=Nebraska Native Plant Society Status (NNHP 2017); ORBIC=Oregon Biological Information Center Status (ORBIC 2016); OCS=Oregon Conservation Strategy Species (ODFW 2016); IUCN=International Union for Conservation of Nature Red List Status (IUCN 2017).

Distribution: Arnica spathulata occurs in southwestern Oregon and northwestern California. Within California, it can be found in the Klamath Ranges (KR) and North Coast Ranges (NCoR) bioregions, in Del Norte, Humboldt, Siskiyou and Trinity counties (CNPS 2018). United States Forest Service-administered lands on which this species occur include Klamath NF, Shasta-Trinity NF, and Six Rivers NF (Calflora 2017, CCH 2017).
**Arnica spathulata Greene**

**Locations within California:**
Record numbers indicate sites that contain an individual, population, or groups of populations located within ¼ mile of each other, per the California Natural Diversity Database (CNDDB 2017) definition of Element Occurrences (EOs) in California. Official EO numbers for plants in California are determined solely by the CNDDB and are included within the Reference (Source) column for CNDDB data. Duplicate records from the same site are given the same record number and included in red. The Population Info column includes total number of individuals and total number and size of populations/sub-populations when provided. Elevations provided in meters from source have been converted to feet. If not provided in original source, Land Manager information was obtained using the California Protected Areas Database (CPAD 2016) and Quad information was obtained using 24K Quads, SDE Feature Class (CDFG 2013). All other information is directly from the Reference (Source) unless additional citation is given.

<table>
<thead>
<tr>
<th>Rec. #</th>
<th>Locality</th>
<th>County</th>
<th>Quad</th>
<th>Reference (Source)</th>
<th>Date Last Observed</th>
<th>Population Info</th>
<th>Threats</th>
<th>Land Manager</th>
<th>Elev. (ft.)</th>
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<tbody>
<tr>
<td>1</td>
<td>Top of Shelter Cove grade.</td>
<td>Del Norte</td>
<td>Shelter Cove (4012411)</td>
<td>CCH, Jan 2017 (RSA47158)</td>
<td>24-Jun-1927</td>
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<tr>
<td>2</td>
<td>sw of, Pine Cone Ridge Mt. Lassic Lookout; North Coast Ranges, Humboldt-Trinity Co line</td>
<td>Trinity</td>
<td>Black Lassic (4012335)</td>
<td>CCH, Jan 2017 (UC1299273)</td>
<td>16-Jul-1949</td>
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<td>3</td>
<td>Along N side of ridge between Bear and Blanket Creeks.</td>
<td>Humboldt</td>
<td>Black Lassic (4012335)</td>
<td>CCH, Jan 2017 (HSC44152)</td>
<td>1-Jul-1977</td>
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<td>4</td>
<td>Forest Service Road 4N06A. Cow Creek Ridge. 1.5 mile from National Forest 1. Under powerlines.</td>
<td>Humboldt</td>
<td>Board Camp Mtn. (4012366)</td>
<td>CCH, Jan 2017 (HSC98679)</td>
<td>10-Jul-2008</td>
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<td>5</td>
<td>W of Edmond's Cabin on trail to old Denny</td>
<td>Trinity</td>
<td>Dees Peak (4112313)</td>
<td>CCH, Jan 2017 (HSC86351)</td>
<td>3-May-1985</td>
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<td>Shasta-Trinity NF</td>
<td>3202</td>
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<td>6</td>
<td>Klamath Natl Forest SE of Callahan. Forest Rd 40N08, 1.7 mi W of Scott Mountain rd (Hwy 3).</td>
<td>Siskiyou</td>
<td>Scott Mountain (4112236)</td>
<td>CCH, Jan 2017 (OBI55469)</td>
<td>21-Jul-1992</td>
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<td>Klamath NF</td>
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<th>Threats</th>
<th>Land Manager</th>
<th>Elev. (ft.)</th>
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<tbody>
<tr>
<td>7</td>
<td>about 3/4 mile west of Scott Mtn Forest Camp, Near Siskiyou-Trinity Coutny Line.</td>
<td>Trinity</td>
<td>Scott Mountain (4112236)</td>
<td>CCH, Jan 2017 (RSA119367)</td>
<td>28-Jul-1955</td>
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<td>8</td>
<td>Above Eight Mile Creek</td>
<td>Del Norte</td>
<td>Chimney Rock (4112356)</td>
<td>CCH, Jan 2017 (HSC43714)</td>
<td>22-Jul-1976</td>
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<td>9</td>
<td>Smith River Canyon [Cañon], 18 miles E. of Crescent City</td>
<td>Del Norte</td>
<td>Cant Hook Mtn. (4112368)</td>
<td>CCH, Jan 2017 (CAS326780)</td>
<td>13-Jun-1945</td>
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<td>10</td>
<td>Near Ship Mountain, close to the town of Gasquet</td>
<td>Del Norte</td>
<td>Ship Mountain (4112367)</td>
<td>CCH, Jan 2017 (HSC52838)</td>
<td>18-Jun-1979</td>
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<td>Cant Hook Mtn. (4112368)</td>
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<td>12</td>
<td>Grade north of Van on road to Gordon Mt., Siskiyou Mts.</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (RSA78714)</td>
<td>23-Jun-1952</td>
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<td>13</td>
<td>Humbug Mountain</td>
<td>Siskiyou</td>
<td>Badger Mtn. (4112276)</td>
<td>CCH, Jan 2017 (UC166158)</td>
<td>31-May-1909</td>
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<td>Klamath NF</td>
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<td>14</td>
<td>At intersection of Hayne's Flat Road on Coon Mountain.</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (RSA167218)</td>
<td>27-Jun-1950</td>
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<td>15</td>
<td>Near Table Mtn.</td>
<td>Del Norte</td>
<td>Hurdygurdy Butte (4112377)</td>
<td>CCH, Jan 2017 (HSC73700)</td>
<td>28-Jul-1980</td>
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<td>16</td>
<td>Near Summit of Craig's Creek Mtn.</td>
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<td>Gasquet (4112378)</td>
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<td>17</td>
<td>rocky ground, Douglas Park</td>
<td>Del Norte</td>
<td>Hiouchi (4112471)</td>
<td>CCH, Jan 2017 (DS178234)</td>
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<td>18</td>
<td>Douglas Park on Smith River</td>
<td>Del Norte</td>
<td>Hiouchi (4112471)</td>
<td>CCH, Jan 2017 (CAS250637)</td>
<td>24-Jun-1936</td>
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<td>19</td>
<td>French Hill Rd.</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>Calflora, May 2017 (jgr6245)</td>
<td>8-Jul-2005</td>
<td>1+ individuals</td>
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<td>21</td>
<td>Along French Hill Road, 2.7 miles from Jct. with Hwy. 199.</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (HSC46208)</td>
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<td>21</td>
<td>2.7 mi. from junction with Hwy. 199 on French Hill Rd.</td>
<td>Del Norte</td>
<td>Hiouchi (4112471)</td>
<td>CCH, Jan 2017 (HSC46311)</td>
<td>30-Jun-1970</td>
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<td>22</td>
<td>French Hill Rd., 9.7 mi. from junction with Hwy. 199</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (HSC59036)</td>
<td>30-Jun-1970</td>
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<td>Del Norte</td>
<td>Hiouchi (4112471)</td>
<td>CCH, Jan 2017 (OBI23211)</td>
<td>1-Jun-1968</td>
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<td>23</td>
<td>2 miles south of Gasquet on French Hill Road</td>
<td>Del Norte</td>
<td>Hiouchi (4112471)</td>
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<td>1-Jun-1968</td>
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<td>24</td>
<td>Near Smith River, S Siskiyou Fork</td>
<td>Del Norte</td>
<td>Hurdygurdy Butte (4112377)</td>
<td>CCH, Jan 2017 (HSC70768)</td>
<td>4-Aug-1980</td>
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<td>26</td>
<td>On south bank of the Smith River, 2.6 miles northeast of Gasquet on U.S. Highway 199</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
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<td>Hwy. 199, 2 mi. E of Gasquet, Pioneer Road</td>
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<td>Gasquet (4112378)</td>
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<td>Gasquet</td>
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<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (CAS139917)</td>
<td>30-Apr-1926</td>
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<td>27</td>
<td>Middle Fork, Smith River to Adams Sta.</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (DS131590)</td>
<td>1-Jul-1922</td>
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<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (POM252732)</td>
<td>12-Sep-1912</td>
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<td>27</td>
<td>near, on Old Gasquet Toll Road Gasquet; Middle Fork of Smith River</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (UC552278)</td>
<td>1-Jun-1935</td>
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<td>Six Rivers NF</td>
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<th>Elev. (ft.)</th>
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<tr>
<td>27</td>
<td>2 mi s Gasquet; French Hill</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
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<td>3 mi e of Gasquet; Smith River, 18-mile Creek</td>
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<td>Gasquet (4112378)</td>
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<td>29</td>
<td>N side of Middle Fork of Smith River on Old Gasquet Rd</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
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<td>1-Jun-1935</td>
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<td>Old Gasquet Toll Rd., 0.2 mi. N of southern entrance</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
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<td>30</td>
<td>Raspberry Lake, upper South Fork of Indian Creek</td>
<td>Siskiyou</td>
<td>Preston Peak (4112375)</td>
<td>CCH, Jan 2017 (DS197114)</td>
<td>20-Jul-1929</td>
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<td>Gasquet (4112378)</td>
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<td>4 miles northeast of Gasquet</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
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<td>33</td>
<td>Stony Creek bog near Gasquet.</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (HSC27695)</td>
<td>13-May-1973</td>
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<td>33</td>
<td>75 yards from road on trail to Stony Creek Bog</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
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<td>26-May-1978</td>
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<td>Above Stony Creek on Stony Creek Trail, 1 mi. N of Hwy. 199 off Middle Fork Rd.</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (HSC62889)</td>
<td>19-May-1979</td>
<td></td>
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<td>499</td>
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<td>33</td>
<td>Six Rivers National Forest: Stony Creek, above the junction with the N fork of Smith River, c. 1 mi north of Gasquet</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (UCR36984)</td>
<td>5-Jun-1983</td>
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<td>34</td>
<td>On south bank of the smith River, 2.6 miles northeast of Gasquet on U.S. Highway 199</td>
<td>Del Norte</td>
<td>Gasquet (4112378)</td>
<td>CCH, Jan 2017 (UCSB16485)</td>
<td>8-Jun-1962</td>
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<td>35</td>
<td>Grade east of Gasquet</td>
<td>Del Norte</td>
<td>High Plateau Mtn. (4112388)</td>
<td>CCH, Jan 2017 (DS18574)</td>
<td>1899-07-03</td>
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<td>35</td>
<td>Along Old Gasquet Toll Rd.</td>
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<td>High Plateau Mtn. (4112388)</td>
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<td>36</td>
<td>Near Gasquet Mtn., close to the town of Gasquet</td>
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<td>Gasquet Mt Rd.</td>
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<td>38</td>
<td>Smith River, along U.S. Highway 199, 3.2 miles north of Gasquet</td>
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<td>Near Wounded Knee Mtn, along FS road 18N08</td>
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<td>Broken Rib Mtn.</td>
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<td>41</td>
<td>Patrick Creek on hill</td>
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<td>Shelly Creek Ridge</td>
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<td>6-Aug-1923</td>
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<td>31-Dec-1903</td>
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<td>Very S portion of Sec. 27 on S bank of Rd. 305, 0.8 km. E of jct. with Rd. 308</td>
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<td>Old logging trail above of pullout near quarry on Rowdy Creek Road</td>
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<td>High Divide</td>
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<td>1+ individuals</td>
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### Arnica spathulata Greene

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<td>Holiday Rd. along the W Fork of Patrick Creek</td>
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<td>51</td>
<td>Near Browns Mine</td>
<td>Del Norte</td>
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<td>CCH, Jan 2017 (HSC65522)</td>
<td>1-Jun-1980</td>
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<td>Along Wimer Road at Stone Corral Lookout, 12.8 mi. from junction with N Bank Rd.</td>
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<td>High Divide (4112481)</td>
<td>CCH, Jan 2017 (HSC96444)</td>
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<td>Pine Flat</td>
<td>Del Norte</td>
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<td>54</td>
<td>Old Gasquet Toll Rd., 7.6 mi. N of Patrick Creek junction at Shelly Creek crossing</td>
<td>Del Norte</td>
<td>Shelly Creek Ridge (4112387)</td>
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<td>55</td>
<td>Summit Crescent City-Grants Pass Road</td>
<td>Del Norte</td>
<td>Broken Rib Mtn. (4112386)</td>
<td>CCH, Jan 2017 (DS125788)</td>
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<td>Hayne's Flat Road (intersection of) Coon Mountain</td>
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<td>56</td>
<td>Patrick Creek-O'Brien Rd, just s of state line State Line</td>
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<td>Shelly Creek Ridge (4112387)</td>
<td>CCH, Jan 2017 (JEPS84329)</td>
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### Arnica spathulata Greene

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<td>Near Oregon line, Siskiyou Mts. at spring on old road from Grants Pass.</td>
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<td>at the State Line north of Monumental.</td>
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## Distribution on National Forest System (NFS) Lands:
(Please see Reference column of Locations table above for references pertaining to Record Numbers indicated on NFS lands.)

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<th>Non-CNDDB Records</th>
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<th>Historic (not seen in past 20 yrs.)</th>
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<td>8</td>
<td>42</td>
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**Demographic and Population Trends:** The total number of occurrences for this taxon was estimated using GIS tools and methods described by Green and Sims (2018). *Arnica spathulata* is known from approximately 58 occurrences. Only one of these provides any information relevant to population size—a Calflora observation from Six Rivers NF in 2013, which documented 11-50 individuals (Calflora 2017, CCH 2017). There are no data on inter-annual variation at individual sites, and no published studies that address demography or population dynamics in this species.

**Life History:** *Arnica spathulata* is a perennial rhizomatous herb that blooms from May through August (CNPS 2018). While its pollination biology has not been investigated specifically, members of the genus *Arnica* are known to be visited by a variety of Hymenoptera, Coleoptera, Diptera, and Lepidoptera. Among the latter, Lycaenidae, Nymphalidae, Hesperiidae, Pieridae, and Papilionidae are all well represented. Among the Diptera, only the bee-flies (Bombyliidae) are confirmed pollinators. In the case of Hymenoptera and Coleoptera, no sub-ordinal data exist (CPC 2018).

**Diversity:** The genus *Arnica* comprises an assemblage of rhizomatous perennial herbs, within which there is substantial morphological variation. Taxonomic treatments differ widely; nearly 100 species have been described, but the majority of these names are considered invalid. The group has a circumboreal distribution, with a center of diversity in western North America: of the 29 species recognized worldwide, 26 are found in North America. *Arnica* has a base chromosome number of \( x = 19 \), but hybridization and polyploidy are common in the genus—largely the result of agamospermy. There are seven well-supported clades in *Arnica*, which map poorly onto the existing taxonomy of five subgenera. Within that taxonomy, *A. spathulata* is classified within subgenus *Austromontana*, a group of nine morphologically variable species inhabiting montane and alpine environments from central Alaska to southern California. It is uncertain whether this subgenus is monophyletic; but it is clear that *A. discoidea* and *A. spathulata* are sister taxa: the two are morphologically, genetically, and chemically very similar; *A. spathulata* differs primarily in its preference for serpentine soils (Ekenas et al. 2007).

**Habitat:** This species is found in lower montane coniferous forest and, is serpentine endemic, with at least 95% of occurrences on serpentine substrates (Wolf and Barkley 2012, Safford and Miller 2020). It tends to favor open, dry areas (NatureServe 2018), and has been observed at elevations between 640 and 1,800 meters (CNPS 2018). No data exist as to common floristic associates.

**Habitat Status or Trend:** The Klamath region has played host to a remarkable diversification in plant species, as a consequence of its complex geology and long history of isolation (Whittaker 1960). The region is one of six globally important temperate forest biodiversity hotspots, having served as a climatic refugium during the Pleistocene. More than a century of land use (including logging, mining, grazing, and modification of fire regimes) has significantly altered much of the region. Only 28% of the old-growth forest remains, and ongoing human impacts continue to degrade wild communities, especially in mesic lowland and mid-elevation areas, encompassing the elevation range of *A. spathulata*. The scale and speed of anthropogenic climate change might exceed the capacity of the Klamath region to provide refugia for taxa of low mobility and narrow ecological requirements, though careful management may partially mitigate this risk (Olson et al. 2012).
**Capacity for the Species to Disperse:** Plants in the genus *Arnica* have plumed achenes—a clear adaptation for dispersal by wind. In a study of the European species *A. montana*, it was found that pappus size was only weakly positively correlated with achene mass, meaning that larger diaspores were less apt to disperse over long distances. Inasmuch as achene size is strongly predictive of seedling quality and survival, this results in a steeply declining survivorship curve as dispersal distance increases: the farther an achene gets from its parent plant, the less likely it is to establish. The optimal dispersal distance for *A. montana* appears to be on the order of a few meters, despite its impressive pappus (Strykstra et al. 1998). While a similar investigation has not been carried out for *A. spathulata*, it should not be presumed that the species is an able disperser. That said, agamospermy is common in *Arnica* (Ekenas et al. 2007)—a trait correlated with successful establishment after low-probability dispersal events (Baker 1955).

**Threats:** The specific threats confronting *A. spathulata* have not been assessed. It is of conservation concern primarily because of its limited distribution within California (CNPS 2018).

**Literature Cited**


[CDFG] California Department of Fish and Game. 2013. 24K Quads, SDE Feature Class. Index for 1:24,000-scale (24K), 7.5-minute by 7.5-minute, paper U.S. Geological Survey maps in California.


Arnica spathulata Greene

[CDF] California Department of Forestry and Fire Protection. 2009. 1:24,000 County Boundaries (cnty24k09_1_poly) [shapefile]. California Department of Forestry and Fire Protection, California Department of Fish and Game. Berkeley Library Geodata. Available at: https://geodata.lib.berkeley.edu/catalog/ark28722-s73w23 [10 December 2017].


Arnica spathulata Greene


Persons Contacted:
Arnica spathulata Greene


Author(s) and Date:
Seth Kauppinen, Assistant Rare Plant Botanist, California Native Plant Society, (916) 447-2677 x212, skauppinen@cnps.org; Aaron E. Sims, Rare Plant Botanist, California Native Plant Society, (916) 324-3816, asims@cnps.org. July 30, 2018.

Molly S. Wiebush, Rare Plant Botanist Coordinator, California Native Plant Society, revised 25 January 2022.

Reviewer(s) and Date:
David Magney, Rare Plant Program Manager, California Native Plant Society, (916) 447-2677 ext. 205, dmagney@cnps.org. July 30, 2018.

Julie Ann Kierstead, USDA Forest Service Region 5 Ecosystem Planning, 4 January 2022.

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.

Additional Considerations at the Forest Level: Habitat amount and juxtaposition of both the species and habitat locations.