

Added to CRPR List 1B.2 on 2021-07-30

Rare Plant Status Review: *Silene bolanderi***Proposed Addition to California Rare Plant Rank 1B.2, G2 / S2**

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This species review is being expedited through a challenge cost share agreement between the California Native Plant Society and the USDA Forest Service, Pacific Southwest Region. Aside from being advanced as part of this agreement, the process, content, and information provided herein is not altered, modified, or developed differently in any way or form compared to other status reviews developed by CNPS.

Background and Taxonomy

Silene bolanderi A. Gray is a perennial herb in the Caryophyllaceae that is known from northwestern California in Humboldt, Mendocino, and Trinity counties, as well as northwestern Josephine County in Oregon. It is included in *The Jepson Manual, Second Edition* (Hartman et al. 2012) and is treated as *S. hookeri* subsp. *bolanderi* in the *Flora of North America North of Mexico* (Morton 2005). In the first *Jepson Manual* (Wilken 1993), *S. hookeri* subsp. *bolanderi* was treated as a synonym of *S. hookeri*. *Silene bolanderi* is a member of the *S. hookeri* complex, which also includes *S. hookeri*, *S. nelsonii*, *S. salmonacea*, and *S. serpentinicola* (Mesler et al. 2019). Mesler et al. (2019) chose 27 populations to represent the geographic range and taxonomic diversity of the *S. hookeri* complex, and using ITS and cpDNA sequence data, they developed a molecular phylogeny of the complex. That publication summarizes the complicated history of the names *S. bolanderi* and *S. hookeri* as follows:

“When properly circumscribed, *S. bolanderi* resembles *S. hookeri* in having pink petals with well-developed appendages, and in fact, the species has generally been treated as part of *S. hookeri*. The case for recognizing *S. bolanderi* as a distinct species rests on a combination of morphological and molecular evidence. With only two exceptions [at the Rickabaugh Glade and Poonkinney Road locations] the differences between the *S. bolanderi* and *S. hookeri* populations we have seen in the field are obvious and striking, especially when two previously unappreciated traits – androecium symmetry and corolla form – are taken into account. Moreover, the California populations we sampled with unambiguous *S. bolanderi* morphology nest as part of a well-supported clade on both the cpDNA and ITS trees. In sum, although closely related to *S. hookeri*, available evidence supports recognition of *S. bolanderi* as an independent, morphologically distinguishable lineage.”

To complicate matters further, until recently the circumscription of *S. bolanderi* included *S. nelsonii*, a novel taxon described in 2019. Mesler et al. (2019) recognized *S. nelsonii* based on morphological differences best seen in the field, strong support from their molecular analysis, and the fact that the species is almost fully allopatric with its relatives, evidence that when taken together indicates an evolutionarily independent lineage. According to Mesler et al. (2019), plant traits attributed to *S. bolanderi* in a paper by Nelson et al. (2006) and characters used to key to *S. hookeri* subsp. *bolanderi* in *Flora of North America North of Mexico* (Morton 2005) match those of *S. nelsonii*. Furthermore, the description of *S. bolanderi* in *The Jepson Manual, Second Edition* (Hartman et al. 2012) nearly matches *S. nelsonii* (apart from flower color and geographic

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range). As described in Hartman et al. (2012), *S. bolanderi* has white or pink flowers and occurs in the Outer North Coast Ranges (NCoRO), whereas the flowers of *S. nelsonii* are never pink and the species occurs in the Klamath Ranges (KR) (Mesler et al. 2019).

Silene bolanderi, *S. hookeri*, and *S. nelsonii* resemble one another in several morphological characters. All three species have one to several slender, shallowly buried rhizomes that radiate from the crown of a deep tap root, and emerge as a cluster of simple or sparingly branched, decumbent to erect, aerial shoots. Aerial shoots are often short (less than 10 cm) and typically bear less than or equal to three closely spaced pairs of elliptical to narrowly oblanceolate leaves, with one to a few flowers that are borne near ground level in a terminal dichasium. Leaves and stems are sparsely to densely canescent and green to gray-white (Mesler et al. 2019). *Silene bolanderi* is distinguished from the other two species by its combination of funnellform corolla shape (salverform in *S. hookeri*), usually pink petals with linear corona appendages > 1 mm long (white petals with appendages lacking or < 1 mm long in *S. nelsonii*), glabrous petal base margin (sparsely to densely ciliate in *S. nelsonii*), and radial androecium symmetry (bilateral in *S. hookeri*).

Silene bolanderi is named in honor of the botanist H. N. Bolander who collected the type material for this species (Gray 1867).

Ecology

Silene bolanderi grows on both serpentine and non-serpentine soil, usually in partly shaded meadows or grasslands in open woodland/forest or on the edges of chaparral at an approximate elevation of 421 to 1,149 meters. It is sometimes found on rocky slopes, canyons, or roadsides. Forest vegetation types include cismontane woodland, lower montane coniferous forest, and North Coast coniferous forest. It flowers from May to June. Species that can be associated with *S. bolanderi* are *Pseudotsuga menziesii*, *Pinus jeffreyi*, *P. ponderosa*, *Quercus garryana*, *Q. kelloggii*, *Arctostaphylos* spp., *Ceanothus* spp., and *Festuca californica* (CCH2 2021).

Distribution and Abundance

In California, *Silene bolanderi* occurs in the Klamath (KR), Outer North Coast Ranges (NCoRO), and Inner North Coast Ranges (NCoRI) bioregions in Humboldt, Mendocino, and Trinity counties (Mesler et al. 2019, CCH2 2021, Mesler 2021 pers. comm.). It also occurs as a cluster of disjunct populations in the northwestern corner of Josephine County, Oregon, where it is considered rare and “critically imperiled” (Mesler et al. 2019). As this species has just been reexamined and recircumscribed taxonomically, we only included California populations confirmed to be *S. bolanderi* by Michael Mesler in the table of estimated occurrences. The table includes locations/observations provided to us by Michael Mesler (Mesler 2021 pers. comm.), specimens cited under *S. bolanderi* in Mesler et al. (2019), and one Calflora observation where the observer had consulted Michael Mesler. Based on these data, there are approximately 38 estimated occurrences of *S. bolanderi* in California. There were four locations that we could not map which are highlighted in pink in the location table. During extensive field work, and after consultation with expert regional botanists (G. Hulse-Stephens, C. Williams, T. Sholars), Mesler et al. (2019) believe *S. bolanderi* may now be quite rare in California. One of the problems with estimating its rarity is access to private lands, because 33 of the 38 estimated occurrences are

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located on private land, while only five are on public land (two on US Forest Service lands and three on BLM lands). Of the 38 estimated occurrences, only half (19) have been confirmed to be extant over the past 20 years. With the exception of a newly discovered large populations near Zenia (Trinity County) and a large population at Rickabaugh Glade (Mendocino County), most of the known occurrences consist of 50 or fewer plants (Mesler et al. 2019).

Status and Threats

While *S. bolanderi* is more widely distributed than its close relative *S. nelsonii*, Mesler et al. (2019) indicate it is likely more sensitive. It occurs as a cluster of disjunct populations and is an S1 (critically imperiled) species in Oregon (Mesler et al. 2019; ORBIC 2019). *Silene bolanderi* is vulnerable to habitat conversion to high-value agriculture, ungulate grazing and trampling, road maintenance, and severe wildfire (six of the estimated occurrences near Zenia and Kettenpom were within the perimeter of the August Complex Fire) (Mesler et al. 2019, Mesler 2021 pers. comm.); Mesler et al. (2019) recommend a California Rare Plant Rank of 1B.2.

Summary

Based on the available information, CNPS and CNDDDB recommend adding *Silene bolanderi* to California Rare Plant Rank 1B.2 of the CNPS Inventory. If knowledge on the distribution, threats, and rarity status of *S. bolanderi* changes in the future, we will re-evaluate its status at that time.

Recommended Actions

CNPS: Add *Silene bolanderi* to CRPR 1B.2

CNDDDB: Add *Silene bolanderi* to G2 / S2

Draft CNPS Inventory Record

Silene bolanderi A. Gray

Bolander's catchfly

Caryophyllaceae

USDA Plants Symbol: None

CRPR 1B.2

Humboldt, Mendocino, Trinity

Oregon

Purdys Gardens (3912311), Redwood Valley (3912332), Laughlin Range (3912333), Foster Mtn. (3912342), Willits (3912343), Longvale (3912354), Jamison Ridge (3912362), Laytonville (3912364), Cahto Peak (3912365), Iron Peak (3912374), Zenia (4012324), Fort Seward (4012326), Wildwood (4012341), Dinsmore (4012345), Larabee Valley (4012346), Blake Mountain (4012355).

Cismontane woodland, lower montane coniferous forest, North Coast coniferous forest, meadows and seeps, chaparral (edges) / usually grassy openings, sometimes dry rocky slopes, canyons, or roadsides; sometimes serpentinite; elevation 420-1150 meters.

Perennial herb. Blooms May to June.

Potentially threatened by agricultural conversion, road construction and maintenance, grazing and trampling by livestock, and severe wildfires. See *Proceedings of the American Academy of*

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Arts and Sciences 7: 327–401 (1867) for original description and *Madroño* 66(4): 176-193 (2019) for revised taxonomy.

Literature Cited

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Personal Communications

Mesler, Michael. 2021. Professor Emeritus, Humboldt State University. Email correspondence about locations of and threats to *Silene bolanderi*, 27 May 2021.