

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

Rare Plant Status Review: *Silene hookeri***Proposed Addition to California Rare Plant Rank 2B.2, G4 / 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 hookeri Nutt. is a perennial herb in the Caryophyllaceae that is known from northwestern California in Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity counties, as well as seven counties in western Oregon (Mesler et al. 2019). It is included in both editions of *The Jepson Manual* (Wilken 1993, Hartman et al. 2012) and is treated as *S. hookeri* subsp. *hookeri* in the *Flora of North America North of Mexico* (Morton 2005). *Silene hookeri* is a member of the *S. hookeri* complex, which also includes *S. bolanderi*, *S. nelsonii*, *S. salmonacea*, and *S. serpenticola* (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 taxonomic history of the name *S. hookeri*, which has often been broken into subspecies: *Silene hookeri* ssp. *bolanderi* (recognized by Mesler et al. [2019] as *S. bolanderi*), *S. hookeri* ssp. *pulverulenta* (placed in *S. hookeri* by Mesler et al. [2019] and in *S. hookeri* ssp. *hookeri* by Morton [2005]), and *S. hookeri* ssp. *serpenticola* (recognized by Mesler et al. [2019] as *S. serpenticola*).

Silene hookeri, *S. bolanderi*, 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 hookeri* is distinguished from the other two species by its combination of salverform corolla shape (funnelform in *S. bolanderi* and *S. nelsonii*), 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 bilateral androecium symmetry (radial in *S. bolanderi* and *S. nelsonii*). *Silene hookeri* also often has smaller corollas with shallower lobes than the other two species.

According to the results of Mesler et al. (2019), plants assignable to *S. hookeri* on morphological grounds do not comprise a monophyletic group. One explanation for this result is that over time,

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the species gave rise to *S. bolanderi*, *S. salmonacea*, and *S. serpentinicola*, but otherwise remained little changed, and thus represents a plesiospecies. Even so, the authors strongly favor retaining *S. hookeri*, *S. salmonacea*, and *S. serpentinicola* as separate species. An alternative approach, which combines all of them into a single species, would unite morphologically distinctive elements that are almost certainly reproductively isolated from one another.

Silene hookeri is presumably named in honor of the English botanist William Jackson Hooker (father of the better known Joseph Dalton Hooker), although this is not specified in the protologue (Torrey and Gray 1838). William Hooker was a colleague and collaborator of Thomas Nuttall, who provided the epithet for this species as part of a manuscript sent to Torrey and Gray (Torrey and Gray 1838, Harvard University 2011).

Ecology

Silene hookeri grows on both serpentine and non-serpentine soil, sometimes on rocky slopes, often in open, grass-dominated areas within cismontane woodland, lower montane coniferous forest, and chaparral at an approximate elevation of 150 to 1,260 meters. It usually flowers from May to July, although flowers have been observed as early as March. Associated species may include *Pseudotsuga menziesii*, *Pinus jeffreyi*, *P. ponderosa*, *Calocedrus decurrens*, *Juniperus* sp., *Quercus* spp., *Arbutus menziesii*, *Arctostaphylos* spp., *Ceanothus* spp., and *Festuca* spp. (CCH2 2021).

Distribution and Abundance

Silene hookeri is the most widely distributed species in the *S. hookeri* complex, with populations ranging from northwestern Mendocino County through Humboldt, Trinity, Del Norte, and Siskiyou counties into western Oregon, where it is not considered rare (Mesler et al. 2019, Mesler 2021 pers. comm.). As this species has just been reexamined and recircumscribed taxonomically, we only included California populations either confirmed to be or considered likely to be *S. hookeri* by Michael Mesler in the table of estimated occurrences. Based on these data, there are approximately 28 estimated occurrences of *S. hookeri* in California. There were four locations that we could not map which are highlighted in pink in the location table. Of the 28 estimated occurrences, 26 are located on National Forest lands (Six Rivers, Klamath, and Shasta-Trinity National Forests), one is partly on BLM land, and one is on land of unknown ownership. Seventeen of the estimated occurrences have been confirmed to be extant over the past 20 years. Most populations are small (with less than 50 plants); the two largest known populations are both in Trinity County, one at Hell Gate Campground (approximately 100 plants) and the other at Post Mountain (approximately 200 plants) (Mesler 2021 pers. comm.). Additional exploration is warranted, as this species may have more occurrences in the region of Orleans and the mouth of the Salmon River as well as along the South Fork of the Salmon River near Cecilville (Mesler 2021 pers. comm.).

Status and Threats

Two *Silene hookeri* occurrence records (#18 at Hell Gate Campground and #19 near Forest Glen) are located within the perimeter of the 2020 August Complex Fire; the plants at Hell Gate have

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regenerated in 2021. However, that large population (100 plants) is now threatened by timber salvage operations. The other large population (200 plants) at Post Mountain, Trinity County is in the middle of a fuels reduction operation (Mesler 2021 pers. comm.). Mesler et al (2019) recommend a California Rare Plant Rank of 2B.2 based on the limited number of occurrences and the small size (< 50 plants) of most of the populations. *Silene hookeri* does not have conservation status in Oregon (ORBIC 2019).

Summary

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

Recommended Actions

CNPS: Add *Silene hookeri* to CRPR 2B.2

CNDDDB: Add *Silene hookeri* to G4 / S2

Draft CNPS Inventory Record

Silene hookeri Nutt.

Hooker's catchfly

Caryophyllaceae

USDA Plants Symbol: SIHO

Silene hookeri Nutt. ssp. *pulverulenta* (M.E. Jones) C.L. Hitchc. & Maguire, CBR (a synonym of *S. hookeri*)

CRPR 2B.2

Del Norte, Humboldt, Mendocino, Siskiyou, Trinity
Oregon

Brushy Mtn. (3912352), Forest Glen (4012333), Dubakella Mtn. (4012342), Naufus Creek (4012343), Thompson Peak (4112311), Orleans (4112335), Somes Bar (4112344), Happy Camp (4112374), Gasquet (4112378), Polar Bear Mtn. (4112385), Broken Rib Mtn. (4112386), Shelly Creek Ridge (4112387)

Cismontane woodland, lower montane coniferous forest, chaparral / grassy openings (often), rocky slopes (sometimes), serpentinite (sometimes); elevation 150–1260 meters.

Perennial herb. Blooms (March to April) May to July.

Potentially threatened by logging. Possibly threatened by vegetation/fuels management. See *A Flora of North America* 1(2): 193 (1838) 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 hookeri*, 8 June 2021.

Kierstead, Julie. 2021. Forest Botanist, Shasta-Trinity National Forest (retired). Email correspondence about threats to *Silene hookeri*, 8 June 2021.