Phacelia damnationensis

Rare Plant Status Review: *Phacelia damnationensis*
Proposed Addition to California Rare Plant Rank 1B.3, G2 / S2
R. Douglas Stone (CNPS), Aaron E. Sims (CNPS), and Katie Ferguson (CNDDB)
29 January 2024
Changes to the text are in blue font

This status review is being expedited through an agreement between the California Native Plant Society and the Center for Plant Conservation (CPC), with contributions from the State of California, CPC, and the California Plant Rescue initiative. 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**

*Phacelia damnationensis* Kierstead, Lindstrand & M.J. Lenz is a perennial herb in the Hydrophyllaceae. It is a Californian endemic found in the Klamath Ranges bioregion of Shasta County. It is a recently described taxon (Kierstead et al. 2023) and was therefore not included in *The Jepson Manual* (Wilken et al. 1993) but is treated in the *Jepson eFlora* (Walden et al. 2023). The treatment of Hydrophyllaceae in the *Flora of North America* is still unpublished. *Phacelia damnationensis* has been placed in *P.* sect. Baretiana together with *P. bolanderi*, *P. hydrophylloides*, and *P. procera* (Walden and Patterson 2012, Kierstead et al. 2023). *Phacelia bolanderi* and *P. hydrophylloides* are both allopatric, which minimizes the possibility of confusing them with *P. damnationensis*. The corolla color of *P. damnationensis* (i.e., cream to apple-green with occasional lavender tinge) is similar to that of *P. procera*, which differs in being an erect plant 0.5–2 m high (vs. decumbent to ascending and 0.3–0.9 m) with leaf-blades attenuate to auriculate at base (vs. truncate to subcordate) (Kierstead et al. 2023, Walden et al. 2023). The species name *damnationensis* means “growing in or at Damnation,” in reference to the type locality near Damnation Pass (Kierstead et al. 2023).

Forum Comment by Julie Kierstead: Phacelia damnationensis and *P. procera* are not sympatric, though *P. procera* approaches damnationensis much more closely than *hydrophylloides* or *bolanderi* (the other closely related taxa) do. The widely distributed *P. procera* forms a horseshoe around the highly localized western Shasta County *P. damnationensis* range. If you draw a polygon around *P. damnationensis* occurrences, there are no known *P. procera* occurrences within that polygon. So far.

**Ecology**

The habitat of *Phacelia damnationensis* is on open, rocky, gravelly slopes in lower montane coniferous forest (Kierstead et al. 2023). It has also become established on roadcuts and shoulders of forest roads, old skid trails from previous timber harvest, and coniferous forest plantations. The elevational range is generally from 3,700 to 4,720 feet, rarely as low as 3,300 feet (Calflora 2023, Kierstead et al. 2023, CCH2 2024; L. Lindstrand 2023, pers. comm.). Most of the known localities are on the Bragdon Formation geologic unit (consisting of interbedded shale, siltstone, sandstone, grit, and pebble-conglomerate), while localities in the vicinity of Damnation Peak are also on Copley Greenstone (Irwin 1994). Commonly associated plant species include *Pseudotsuga menziesii*, *Pinus ponderosa*, *P. lambertiana*, *Quercus chrysolepis*, *Notholithocarpus densiflorus* var. *echinoides*, *Ceanothus integerrimus*, *Arctostaphylos patula*,...
Toxicodendron diversilobum, and Draperia systyla (Kierstead et al. 2023). The blooming period is from mid-June to early September (Kierstead et al. 2023).

**Distribution and Abundance**

There are currently eleven known occurrences of *Phacelia damnationensis*, all of them documented since the species was first discovered in July 2019 (Calflora 2023, iNaturalist 2023, Kierstead et al. 2023, CCH2 2024; L. Lindstrand 2023, pers. comm.; Sims 2024, pers. comm.). There is also one collection from July 1996 that was misidentified as *P. procera* (J. Kierstead 2024, pers. comm.). The known localities are in the Trinity Mountains (a subrange of the Klamath Ranges) in western Shasta County. Most sites are on the divide between Clear Creek and the upper Sacramento River canyon, but there is one disjunct occurrence in the South Fork Hazel Creek watershed to the west of Tombstone Mountain. Three occurrences are on the Shasta-Trinity National Forest, six are on commercial timberland owned by Sierra Pacific Industries, and two are on BLM land. No occurrences are in federally designated Wilderness or other protected areas. Each occurrence is made up of three to 26 subgroups or colonies, with each colony comprising as many as 280 plants scattered over areas of up to 113 hectares (Kierstead et al. 2023). The overall population size across all occurrences is approx. 735–1,155 individual plants (L. Lindstrand 2024, pers. comm.). Using GeoCAT (Bachman et al. 2011), we estimated the overall Extent of Occurrence as 255 km² and the Area of Occupancy as 48 km² (sum of occupied 4 km² grid squares).

Largely as a result of thorough surveys completed by Len Lindstrand III in July–November 2019, July 2020, September 2021, and June 2022, the known occurrences of *P. damnationensis* are remarkably well-documented in spite of the fact that this species was only recently discovered and described (Kierstead 2024, pers. comm., L. Lindstrand 2024, pers. comm.). The eleventh occurrence was found by Chris McCarron in November 2023 (iNaturalist 2023) in an area where the plant was expected based on presence of suitable habitat (Kierstead 2024, pers. comm., L. Lindstrand 2024, pers. comm.). More new occurrences of *P. damnationensis* will eventually be found in extensive areas of suitable but as-yet unsurveyed habitat in rugged terrain of the Bragdon Formation geologic unit away from established roads (J. Kierstead 2024, pers. comm.; L. Lindstrand 2024, pers. comm.).

**Status and Threats**

*Phacelia damnationensis* has had no prior conservation status. Conservation seed collection and banking of *P. damnationensis* as part of the California Plant Rescue occurred on 24 September 2019, as a proactive measure three years prior to its formal description (Sims 2024, pers. comm.). Given its few known occurrences and limited geographic range, it is unquestionably rare. Habitats in the vicinity of the known occurrences have been subject to historical and recent wildfire, forest road construction, logging (including salvage logging after wildfire), and recreational activities (e.g., hunting and hiking); the two BLM occurrences are in a designated off-highway vehicle area (Kierstead et al. 2023). The species’ natural preference for steep, rocky, open slopes helps it to avoid disturbance by human activities and wildfires (Kierstead et al. 2023). The plants also appear to have some tolerance for growing on roadsides and other disturbed areas (Kierstead et al. 2023). Individual plants burned during the 2018 Carr and Delta fires were observed to produce vigorous regrowth from woody rootstocks, yet the species is evidently not a “fire follower” as some other *Phacelia* species are (Kierstead et al. 2023). Despite its rarity, the species is not currently endangered or threatened (Kierstead et al. 2023).
Summary
Based on the available information, CNPS and CNDDB recommend adding Phacelia damnationensis to California Rare Plant Rank 1B.3 of the CNPS Inventory. If knowledge on the distribution, threats, or rarity status of P. damnationensis changes in future, then we will re-evaluate its status at that time.

Recommended Actions
CNPS: Add Phacelia damnationensis to CRPR 1B.3
CNDDB: Add Phacelia damnationensis to G2 / S2

Draft CNPS Inventory Record
Phacelia damnationensis Kierstead, Lindstrand & M.J. Lenz
Damnation Pass phacelia
Hydrophyllaceae
USDA Plants Symbol: none
CRPR 1B.3
Counties: Shasta
Quad name (code): Bohemotash Mountain (4012275), Damnation Peak (4012285), Schell Mtn. (4012275), Tombstone Mtn. (4112213)
General Habitat: lower montane coniferous forest
Microhabitat Details:
- Microhabitat: openings, rocky, gravelly, talus, shale, sandstone, metamorphic, roadsides, disturbed areas
- Elevation: elevation 1005–1440 meters (3300-4720 feet)
- Life form: perennial herb
- Blooms: June to September
- Threats: Possibly threatened by logging, vehicles, road construction, road maintenance, and recreational activities, though appears to tolerate some disturbance caused by these factors.
- Taxonomy: Corolla color (cream to apple-green with occasional lavender tinge) similar to P. procera which differs in having stems erect and 0.5–2 m high (vs. decumbent to ascending and 0.3–0.9 m high) with leaf-blades attenuate to auriculate (vs. truncate to subcordate). Other related species (P. bolanderi, P. hydrophylloides) are allopatric.

Selected References:
- CNPS Status Review: Proposed Addition to CRPR 1B.3, G2/S2 (2024)
- Original Description: Madroño 69(4): 341–348 (2023)

Literature Cited


[CCH2] Consortium of California Herbaria Portal 2. 2024. Data provided by the participants of the Consortium of California Herbaria and the California Phenology Thematic Collections
Phacelia damnationensis

Element Code: ?
Added to CRPR 1B.3 on 2024-03-07


Personal Communications

Kierstead, Julie. 2024. Forest Botanist, Shasta-Trinity National Forest (retired). Email correspondence regarding initial collecting effort, additional, unsurveyed habitat for Phacelia damnationensis, the likelihood of finding more new occurrences, and redetermination of a July 1996 collection that was misidentified as P. procera. Personal communications 23 and 30 January 2024.

Lindstrand, Len III. 2023. Sierra Pacific Industries, Terrestrial and Aquatic Biologist and Botany Program Manager, Redding, CA. E-mail correspondence transmitting shapefiles for Phacelia damnationensis together with completed field survey forms to be submitted to the CNNDDB. Personal communication 28 November 2023.

Lindstrand, Len III. 2024. Sierra Pacific Industries, Terrestrial and Aquatic Biologist and Botany Program Manager, Redding, CA. E-mail correspondence regarding the estimate of overall population size for Phacelia damnationensis plus discussion of the newly discovered occurrence on Wild Cow Mtn., areas of additional, unsurveyed habitat and likelihood of finding more new occurrences. Personal communication 23 January 2024.

Sims, Aaron. 2024. California Native Plant Society, Rare Plant Program Director, Sacramento, CA. E-mail correspondence transmitting the CNNDDB field survey form for the CaPR seed collection of Phacelia damnationensis made in September 2019. Personal communication 05 January 2024.