Rare Plant Status Review: *Erythranthe serpentinicola*
Proposed Addition to California Rare Plant Rank 1B.1, G1 / S1
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This status review is being expedited though 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
Erythranthe serpentinicola D.J. Keil is an annual herb in Phrymaceae that is known only from west-central San Luis Obispo County, California. Described in 2020, it is not included in *The Jepson Manual* (Thompson 1993), the *Jepson eFlora* (Fraga 2018), or *Flora of North America North of Mexico* (Nesom and Fraga 2019). It was first collected by David Keil in 1979 (*Keil 13058,* OBI) and determined to *Mimulus nasutus*, with the specimen later annotated to *M. guttatus* by Thompson (year unknown), and then cited by Nesom in 2012 as *Erythranthe arenicola* (Keil 2020).

"After examining additional material, Nesom (2019) reevaluated *E. arenicola* and determined that it is actually a depauperate form of a more widespread species, *E. grandis* (Greene) Nesom, that is restricted to sandy, coastal sites in Monterey Co., California. He made no mention of the plant [Keil] had collected from an upland serpentine habitat in San Luis Obispo Co. In subsequent correspondence Dr. Nesom acknowledged that he had been mistaken and that the San Luis Obispo Co. plants are not at all the same as those from Monterey Co. He instead noted that they are similar to but not the same as *E. pardalis* (Pennell) Nesom of the Sierra Nevada foothills. Both the San Luis Obispo plants and *E. pardalis* are apparently restricted to serpentine substrates. Further investigation of photos and herbarium material revealed several features by which these plants differ. [Keil] therefore [is] recognizing the San Luis Obispo County plants as a new, serpentine-endemic species." (Keil 2020).

Erythranthe serpentinicola differs from the similar *E. pardalis* in having sessile distal cauline leaves, being densely puberulent at least distally with glandless trichomes in addition to the gland-tipped ones, having shorter fruiting pedicels, and having longer-exserted styles and longer-exserted corollas (Keil 2020).

The epithet "serpentinicola" is indicative of its affinity for serpentine substrates.

Ecology
Erythranthe serpentinicola occurs in open grassy slopes within chapparal, on serpentine outcrops and near serpentine seeps (Keil 2020, Zell pers. comm. 2022). This species appears to occupy a "very specialized microhabitat [of] ephemerally wet soils on the margins of perennial seeps" (Grossenbacher pers. comm. 2022). This species blooms February to May (Keil 2020, Zell pers. comm. 2022) and is known from 60–360 m in elevation. Species associates include: *Allium lacunosum* var. *lacunosum*, *Arctostaphylos obispoensis* (CRPR 4.3), *Astragalus curtipes*, *Calochortus obispoensis* (1B.2), *Carex obispoensis* (1B.2), *Ceanothus cuneatus*, *Chorizanthe*

aphanantha (1B.1), *Chorizanthe breweri* (1B.3), *C. palmeri* (4.3), *Cirsium fontinale* var. *obispoense* (1B.2), *Dudleya abramsii* ssp. *murina* (1B.3), *Erythranthe microphylla, Layia jonesii* (1B.2), *Lomatium parvifolium* (4.2), *Monardella palmeri* (1B.2), *Pickeringia montana, Quercus durata* var. *durata,* and *Salix breweri* (Keil 2020, CNPS 2022, Zell pers. comm. 2022).

Distribution and Abundance
Erythranthe serpentinicola is currently known from only six occurrences and is endemic to San Luis Obispo County, where it is found in the transition between the Central Coast (CCo) and the Outer South Coast Ranges (SCoRO) bioregions (Keil 2020, Calflora 2022, CCH2 2022, Zell pers. comm. 2022). Three occurrences are found in the Irish Hills, with additional occurrences near Laguna Lake, and in the South Hills Open Space in San Luis Obispo. One other occurrence is at Camp San Luis Obispo. Five of the six occurrences are recent. Two records are found in the Irish Hills Natural Reserve, and one record is from Laguna Lake Park/Open Space. Record # 6, from Camp San Luis Obispo, is on land managed by the California National Guard. The two remaining occurrences are on land of unknown ownership. Three occurrences include population information: approximately 1,500 individuals were observed at record #1 in 2021 (Zell pers. comm. 2022); approximately 2,000 individuals were observed in 2021 at record #4 (Zell pers. comm. 2022); and 11–50 individuals were observed in 2021 at record #5 (Calflora 2022). In 2021, record #2 had no *E. serpentinicola* present, possibly due to drought conditions—this is the only confirmed location that is not near a perennial seep (Zell pers. comm. 2022). Two records describe this species as "locally common" (Keil 2020). Other populations of E. *serpentinicola* are likely to occur in serpentine soils around San Luis Obispo (Keil 2020).

Status and Threats
"Potential threats include foot traffic, grazing, fire, and (for the site on private land) changes in land usage" Keil 2020. Fire may not be a severe threat to this species as long as it occurs after the growing season. Fire may reduce competition from other species, and *E. serpentinicola* has been observed blooming after fire. Disturbance during the growing and reproductive season could be detrimental to this species, but disturbance outside of growing season is probably beneficial because it provides substrate for seeds to germinate (Grossenbacher pers. comm. 2022). "When evaluated using IUCN (2000) Red List criteria, *E. serpentinicola* qualifies as Endangered (EN) – high risk of extinction in the wild, based on extent of occurrence estimated to be less than ~100 km²" (Keil 2020). Based on these IUCN criteria, Keil recommends a CRPR of 1B.1 (Keil 2020).

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

Recommended Actions
CNPS: Add *Erythranthe serpentinicola* to 1B.1
CNDDB: Add *Erythranthe serpentinicola* to G1 / S1

Draft CNPS Inventory Record
Erythranthe serpentinicola D.J. Keil

Sent to: CW, N. Fraga, D. Grossenbacher, A. Zell, G. Nesom on 22 February 2022

Irish Hills monkeyflower
Phrymaceae
USDA Plants Symbol: not available
Synonyms: none
CRPR 1B.1
Counties: San Luis Obispo
San Luis Obispo 3512036, Morro Bay South 3512037, Pismo Beach 3512026
General Habitat: Chapparal (openings), meadows and seeps (edges)
Microhabitat: Serpentinite, rocky, openings, mesic
Elevation: 60-360 meters
Life form: annual herb.
Blooms: February to May.
Threats: Potentially threatened by foot traffic, grazing, and changes to land use
Taxonomy: Similar to *E. pardalis* of the Sierra Nevada foothills.
Selected References:

- Original description: *Phytoneuron* 33: 1-13 (2020)

Literature Cited

Calflora. 2022. Information on wild California plants for conservation, education, and appreciation. Website http://www.calflora.org/ [accessed 11 February 2022].

[CCH2] Consortium of California Herbaria Portal 2. 2022. Data provided by the participants of the Consortium of California Herbaria and the California Phenology Thematic Collections Network. Regents of the University of California and Cal Poly, San Luis Obispo. Website http//:www.cch2.org/portal/index.php [accessed February 2022].

[CNPS] California Native Plant Society, Rare Plant Program. 2022. Inventory of Rare and Endangered Plants of California (online edition, v9-01 1.0). Website https://www.rareplants.cnps.org [accessed 1 February 2022].

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Nesom, G. L. and N. S. Fraga. 2019. *Erythranthe* Spach, *in* Flora of North America Editorial Committee (eds.), *Flora of North America North of Mexico, Volume 17*. Website http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=107275 [accessed 11 February 2022].

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Keil, D. J. 2020. *Erythranthe serpentinicola* (Phrymaceaea), a new serpentine-endemic species from San Luis Obispo County, California. *Phytoneuron* 33: 1-13. (Original description.)

Personal Communications

Sent to: CW, N. Fraga, D. Grossenbacher, A. Zell, G. Nesom on 22 February 2022

Grossenbacher, Dena. 2022. Assistant Professor, Biological Sciences Department, California Polytechnic State University, San Luis Obispo. Email about *Erythranthe serpentinicola*. 26 January 2022.

Zell, Annie. 2022. M.S. candidate, Biological Sciences, California Polytechnic State University, San Luis Obispo. Email correspondence, including field survey form, for *Erythranthe serpentinicola*. 20 January 2022.