Rare Plant Status Review: *Boechera microphylla*
Proposed Deletion from California Rare Plant Rank 3, G4Q / S3

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Changes to original text in blue font

Boechera microphylla (Nutt.) Dorn is a perennial herb in the mustard family (Brassicaceae). It was originally described as *Arabis microphylla* Nutt. with the type locality in the Rocky Mountains (Nuttall in Torrey & Gray 1838). *Arabis microphylla* var. *microphylla* was added to the CNPS Rare Plant Inventory in 1980 (CNPS 2023) and was treated under this name in the first edition of *The Jepson Manual* (Rollins 1993). Its name was later changed to *Boechera microphylla* in accordance with the transfer of most but not all North American *Arabis* species to *Boechera* (Al-Shehbaz 2003 and additional references cited therein). In 2009, its status was changed from CRPR 4.3 to 3, reflecting taxonomic uncertainty (CNPS 2023).

Currently, *Boechera microphylla* is no longer considered to occur in California, with the name *Boechera paupercula* (Greene) Windham & Al-Shehbaz in use for the Californian plants to which the name *Boechera microphylla* had been misapplied (Windham and Al-Shehbaz 2006, 2012; Al-Shehbaz and Windham 2010). *Boechera paupercula* appears to be relatively common and widespread in California with an estimated 85 occurrences in the Klamath Ranges (KR), high Cascade Range (CaRH), Sierra Nevada (SNH), Warner Mountains (Wrn), and White & Inyo Mountains (W&I) (Windham and Al-Shehbaz 2012, Calflora 2023, CCH2 2023, iNaturalist 2023, SEINet 2023). This could be an underestimate since *B. paupercula* occurs in rocky, subalpine and alpine habitats well away from roads and human habitation. Outside of California, *B. paupercula* ranges to Oregon, Washington, Idaho, Wyoming, and British Columbia (Al-Shehbaz and Windham 2010, NatureServe 2023).

Comments made by Michael Wyndham during Forum Review: “Ihsan Al-Shehbaz and I chose to exclude *Boechera microphylla* from the 2nd edition of the Jepson Manual due to the absence of any bona fide collections from California. I'm attaching a map of the documented distribution of *B. microphylla* based on microsatellite DNA analyses conducted in my lab at Duke University. The genetically confirmed localities closest to California are in Humboldt Co., NV and Harney Co., OR.

To evaluate the status of this species in California, we've sampled eight herbarium specimens previously identified as *Arabis* (*Boechera*) *microphylla* (see attached Excel file). Five of these bore no genetic relationship to *B. microphylla* (i.e., they were outright misidentifications). Note that only one of the five members of this taxonomically disparate group contains a *B. paupercula* genome, so it is incorrect to say that the name "*Boechera paupercula* (Greene) Windham & Al-Shehbaz (is) in use for the Californian plants to which the name Boechera microphylla had been misapplied."

Again, referring to the Excel file, we found that three of the eight sampled California specimens identified as *B. microphylla* do contain genomes from that species, but these are apomictic triploid hybrids that also have genomes derived from *B. sparsiflora* or *B. fernaldiana.* These reproductively competent hybrids most likely formed in mixed species populations in Nevada, but there is a chance that they arose from undetected mixed populations in NE California. Based

on the locations of these hybrids and the biogeography of the region, future efforts to find *B. microphylla* in California should focus on Modoc and Lassen Counties. But, for now, I am unaware of any correctly identified vouchers of *B. microphylla* from the state and recommend its exclusion from the flora."

In accordance with these findings, CNPS and the CNDDB recommend deleting *Boechera microphylla* from CRPR 3 in the CNPS Rare Plant Inventory. If further fieldwork or research leads to the discovery of *B. microphylla* in California, this species can be re-evaluated for inclusion in the Rare Plant Inventory.

Recommended Actions
CNPS: Delete *Boechera microphylla* from CRPR 3
CNDDB: Delete *Boechera microphylla* from G4Q / S3

Current CNPS Inventory Record
Scientific Name: *Boechera microphylla* (Nutt.) Dorn
Common Name: small-leaved rockcress
Family: Brassicaceae
Element Code: PDBRA06162
USDA Plants Symbol:
Synonyms/Other Names: *Arabis microphylla* Nutt. var. *microphylla*
CA Rare Plant Rank: 3
Fed List: None
State List: None
Global Rank: G4Q
State Rank: S3
Other Status: Nothing listed
CRPR Changes: changed from 4.3 to 3 on 2009-11-18
Add Date: 1980
Date Edited: 2021-05-26
Lifeform: perennial herb
Blooming Period: Jul
Elevation: 1700 – 3265 meters (5580 - 10710 feet)
General Habitats: Pinyon and juniper woodland (granitic, rocky, volcanic)
Microhabitat Details: Nothing listed
Microhabitat: Nothing listed
Notes: See *Rhodora* 43(511):426-428 (1941) for taxonomic treatment.
Threats: Nothing listed
Taxonomy: Nothing listed
California Counties and Islands: Alpine (ALP), Inyo (INY), Modoc (MOD), Mono (MNO), Plumas (PLU), Tulare (TUL)
States: California (CA), Idaho (ID), Montana (MT), Nevada (NV), Oregon (OR), Utah (UT), Washington (WA), Wyoming (WY)
Quads: Dexter Canyon (3711877), Ebbetts Pass (3811957), Emerson Peak (4112022), Frenchman Lake (3912082), Janesville (4012035), Kettle Rock (4012026), Last Chance Mtn. (3711736), McKesick Peak (4012012), Onion Valley (3912078), Quinn Peak (3611835), Telescope Peak (3611721)

Revised CNPS Inventory Record
Boechera microphylla (Nutt.) Dorn
Synonym(s)/Other Name(s): *Arabis microphylla* Nutt. var. *microphylla*
Considered But Rejected (CBR)
CBR Reason: Excluded from the *Jepson eFlora*. Currently not known to ~~Does not~~ occur in CA. Apomictic triploid hybrids containing the genomes of *B. microphylla* occur in Lassen, Modoc, and Plumas counties, and the species should be searched for in those counties. ~~The name *Boechera paupercula* (Greene) Windham & Al-Shehbaz is now in use for the California plants to which the name *Boechera microphylla* was misapplied.~~

Literature Cited

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