

Added to List 2.2 on 1/5/09

**Rare Plant Status Review: *Botrychium pumicola*
New Add to List 1A or 2.2**

Nicholas Jensen (CNPS) and Roxanne Bittman (CNDDDB)
December 1, 2008

Changes made since the original status review appear in blue.

Background

Botrychium pumicola is an herbaceous, rhizomatous perennial in the Ophioglossaceae. According to Donald Farrar (pers. comm. 2008), *B. pumicola* will be included as native to California in *The Jepson Manual* (2nd edition). *B. pumicola* can be differentiated from other, similar species of *Botrychium* based on a number of characteristics including sporophore and trophophore stalk length, pinnae vein characteristics, and large spores that are released in tetrads. For more information on *Botrychium* systematics and an informative species description of *B. pumicola* please visit <http://www.public.iastate.edu/~herbarium/botrychium.html>. The fertile, spore-bearing portion (sporophore) of the leaf (leaves) of *B. pumicola* is present from July to September.

B. pumicola was previously included on the list of “Very Rare and Endangered Plants” in the 1st Edition (1974) of the CNPS Inventory. It was included on List 2 (Plants Rare and Endangered) in the 2nd Edition (1980), and List 1B (Plants Rare and Endangered in California and Elsewhere) in the 3rd Edition (1984) of the CNPS Inventory. In the 4th Edition (1988) of the CNPS Inventory it was included on List 1A (Plants Presumed Extinct in California). *B. pumicola* was moved to the Considered But Rejected (CBR) list in the 5th (1994) Edition of The CNPS Inventory based on the assumption that the, “only known CA occurrence on Mt. Shasta (is) a misidentification.” It has remained on the CBR List ever since.

More recently, Donald Farrar (pers. comm. 2008) states that, “I have examined the (only California herbarium) specimen in detail, including the spore tetrads and the leaf venation as well as the overall morphology. There can be no question of its identity. It is *B. pumicola*.”

In California, *B. pumicola* is known from one occurrence (represented by a single herbarium collection from 1941) on the south side of Diller Canyon on the west side of Shastina, west of Mt. Shasta in Siskiyou County. In Oregon, *B. pumicola* is known from approximately 200 occurrences. Many of these occurrences contain a relatively-small number of plants and the overall Oregon population of the species is estimated at 17,000 individuals. NatureServe ranks *B. pumicola* as a G3 (Vulnerable) taxon.

The occurrence of *B. pumicola* in California is known from timberline or near timberline in volcanic pumice in alpine and subalpine coniferous forest habitats at approximately 2750 meters in elevation. Donald Farrar (in his description of the species available at <http://www.public.iastate.edu/~herbarium/botrychium/B-pumicola-1-12-05.pdf>) states that *B. pumicola* “typically grows in loose volcanic (pumice) soils, often, at lower

elevations, in frost pockets or comparable areas that retain moisture late into spring. Plants occur in relatively open sites with little competing vegetation and in *Pinus contorta*-*Purshia tridentata* forests with substantial herbaceous cover (Amsberry and Meinke 2002).”

B. pumicola has not been documented in California since 1941. The original herbarium label indicates that only 2 plants were present at the collection site. Documented field surveys attempting to re-located *B. pumicola* were conducted in 1976, 1978, 1979, 1982, and 1986. More recently in 2007-2008, John Game, Mike Park, Tom Madsen, and Eric White and Alan Smith searched the original collection site with no success. Additional field surveys should be conducted to attempt to re-locate *B. pumicola* in California. Additionally, suitable habitat within and beyond the known range of *B. pumicola* should be searched for new occurrences.

There are no known threats to the habitat of *B. pumicola* at the site of the original collection. Land with suitable habitat in the immediate vicinity of the only known occurrence of *B. pumicola* is managed by the National Park Service and the U.S. Forest Service.

While the available information indicates that it may be appropriate to place *B. pumicola* on List 1A, Donald Farrar (pers. comm. 2008) cautions that, based on the number of new Botrychium species discoveries that continue to made in California (three in the last two years) as well as significant new range disjunctions, it may be, “premature to consider *B. pumicola* to be extinct in California.” If reviewers decide that List 1A is not the appropriate list placement for *B. pumicola* at this time, an alternate list placement would be List 2 (based on the number of occurrences in Oregon).

Based on the available information CNPS and CNDDDB recommend that *B. pumicola* be added to either List 1A or List 2.2. If reviewers decide that List 1A is the most appropriate list placement at this time, *B. pumicola* will automatically re-ranked to List 2.2 if it is re-discovered in California.

Recommended Actions

CNPS: Add to CNPS List 1A or 2.2

CNDDDB: Add to CNDDDB as G3 / SH

Please review the draft CNPS Inventory record below, respond Yes or No on the proposal to add this species to the Inventory and CNDDDB, and provide any edits/comments. If responding No, please provide supporting information.

Draft CNPS Inventory Record

Botrychium pumicola Coville ex Underw.
pumice moonwort
Ophioglossaceae

List 1A or 2.2

Siskiyou; Oregon

Mt Shasta (698B) 4112242

Alpine communities, subalpine coniferous forest / volcanic. Elevation 2750-2750 meters.

Perennial herb (rhizomatous). July-September.