

Kept on February 8, 2012

Rare Plant Status Review

**Proposal to keep *Polyctenium fremontii* var. *fremontii* as CNPS 4.3,
keep *Polyctenium williamsiae* as CNPS 1B.2,
and reject the *Flora of North America* and *The Jepson Manual, 2nd Edition*
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Background

Polyctenium fremontii var. *fremontii* and *Polyctenium williamsiae* are perennial herbs in the Brassicaceae family. Neither of these taxa is recognized in *The Jepson Manual, Second Edition* (TJM 2; see http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=39029 for current treatment) or the *Flora of North America, Vol. 7* (FNA; see http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250094639 for current treatment), as both have been lumped into *Polyctenium fremontii*, the only species within the genus. However, both *Intermountain Flora, Vol. 2B* (2005) and Holland and Morefield (2003) maintain *P. fremontii* and *P. williamsiae* as distinct species, while eliminating infraspecific taxa within *P. fremontii*. *Polyctenium fremontii* and *Polyctenium williamsiae* are easiest to identify by comparing fruit length, which is 3-6.5(-8) mm in *P. williamsiae* and 5-16 mm in *P. fremontii* (Holland and Morefield 2003, *Intermountain Flora*). Fruits of *P. williamsiae* are also slightly wider, more obtuse, and more lumpy-sided than those of *P. fremontii* (J.D. Morefield pers. comm. 2012). Also, the longest petals of *P. williamsiae* are shorter (2-4 mm) than those of *P. fremontii* (3-5 mm; *Intermountain Flora*).

Although *Intermountain Flora* recognized these two taxa, it also eliminated infraspecific varieties of *P. fremontii*. *Polyctenium fremontii* var. *confertum*, which was characterized by fruits that are slightly longer than some *P. williamsiae* specimens, has been included as a synonym of the latter, as the two taxa are often found co-occurring, and the different fruit shapes sometimes occur on the same plant (*Intermountain Flora*, Holland and Morefield 2003). *Polyctenium fremontii* var. *bisulcatum* is known from a single occurrence in Oregon, and it differs from the typical variety in that it has a denser, stellate pubescence throughout the plant, pubescent (vs. glabrous) sepals, and more compressed, somewhat bisulcate fruits (*Illustrated Flora of the Pacific States Vol. 2*). However, it was treated as a synonym of *P. fremontii* in *Intermountain Flora* and is not considered a rare plant by the Native Plant Society of Oregon (USFS/BLM 2012).

Although both *P. fremontii* and *P. williamsiae* were recognized in recent treatments, the determination of the TJM 2 author must also be considered. They were lumped because fruit length is controlled by the number of ovules that mature into seeds, and there is a degree of overlap in the range of all the characters used to differentiate *P. fremontii* and *P. williamsiae* (FNA). Also, other differentiating characters (petal length, fruit shape) were unreliable in differentiating herbarium specimens of *P. williamsiae* and *P. fremontii* (FNA). However, if fruit size/shape is determined primarily by seed set (which can be influenced by environmental conditions), one would expect to see a wide

range of variation in the fruits within single populations – a phenomenon that has not been observed (J.D. Morefield pers. comm. 2012). There is only one site in southeastern Oregon where the two different types of fruit have been found together, and they apparently do not interbreed (Holland and Morefield 2003, J.D. Morefield pers. comm. 2012). While the *FNA* and *TJM 2* treatments relied on herbarium material, Holland and Morefield (2003) conducted more extensive field surveys for their treatment. Genetic analyses also were conducted on *Polyctenium fremontii* to elucidate its phylogenetic relationship to other members of the Brassicaceae family, but no infrageneric variation was assessed (Beilstein et al. 2006).

Occurrences of *P. fremontii* var. *confertum* have already been treated as *P. williamsiae* in the CNDDDB at an earlier date. *Polyctenium williamsiae* is now known from six California occurrences, and globally from 34 occurrences. Based on the currently available information, we recommend that *P. fremontii* var. *fremontii* be kept as a California Rare Plant Rank 4.3 taxon, and *P. williamsiae* be kept as a rank 1B.2 species.

Recommended Actions

CNPS: Keep *Polyctenium fremontii* var. *fremontii* as 4.3

Keep *Polyctenium williamsiae* as 1B.2

CNDDDB: Change *Polyctenium fremontii* var. *fremontii* from G4T4 / S3.3 to G4T4Q / S3

Keep *Polyctenium williamsiae* as G2Q / S1

Revised CNPS Inventory Records

Polyctenium fremontii (Wats.) Greene var. *fremontii*

Fremont's combleaf

Brassicaceae

Rank 4.3

Lassen, Mono, Modoc, Plumas, Sierra, Siskiyou

Idaho, Oregon, Washington

Champs Flat (641B) 40120F8, Buckhorn Lake (656A) 40120H1

Great Basin scrub, lower montane coniferous forest, meadows and seeps, pinyon and juniper woodland, playas / mesic

See *P. fremontii* in *TJM 2*; where *P. williamsiae* is treated as a synonym. See *Proceedings of the American Academy of Arts and Sciences* 11:123 (1876) for original description, *Leaflets of Botanical Observation and Criticism* 2:219 (1912) for revised nomenclature, and *Intermountain Flora* 2B:416-419 (2005) for taxonomic treatment.

Polyctenium williamsiae Rollins

Williams' combleaf

Brassicaceae

Rank 1B.2

Lassen, Mono

Nevada, Oregon

West of Huntoon Spring (468C) 38118A6, Cedar Hill (469A) 38118B7, Aurora (486C) 38118C8, Dome Hill (487D) 38119C1, Shaffer Mtn. (621A) 40120D3, Anderson Mtn. (658A) 40120H5

Threatened by grazing and trampling. State-listed as Critically Endangered in NV. A synonym of *P. fremontii* in *TJM 2*. See *Journal of the Arnold Arboretum* 64:508 (1983) for original description, and *Intermountain Flora* 2B:416-419 (2005) for taxonomic treatment.

Literature Cited

Beilstein, M.A. I. Al-Shehbaz, and E.A. Kellogg. 2006. Brassicaceae phylogeny and trichome evolution. *American Journal of Botany* 93(4):607-619.

Holland, R.F. and J.D. Morefield. 2003. Current knowledge and conservation status of *Polyctenium williamsiae* Rollins (Brassicaceae; including *Polyctenium fremontii* var. *confertum* Rollins), the Williams combleaf. Status report prepared for U.S. Fish and Wildlife Service, Nevada State Office.

U.S. Forest Service and Bureau of Land Management. 2012. Interagency Special Status / Sensitive Species Program (ISSSSP). Accessed on January 5, 2012. Available online at <http://www.fs.fed.us/r6/sfpnw/issssp/species-index/flora-vascular-plants.shtml>.