

## *Botrychium pinnatum*

NORTHWESTERN MOONWORT

Family: Ophioglossaceae

### Agency Status:

US Fish & Wildlife Service: None.

### Heritage Rank:

Global: G4?

State: S1

Range Context: Widespread/peripheral

Wyoming Contribution Rank: Low

Description: Northwestern moonwort is a perennial fern relative, 3-12 cm tall with a single leaf divided into two dissimilar segments. The vegetative (sterile) segment is bright, shiny green, oblong to triangular, short-stalked with a blade 1-8 cm long x 0.5-5 cm wide that is once to twice-pinnately compound with 7-11 approximate to overlapping, of ovate to elliptical leaflets (pinnae). The lowest and second lowest pairs of pinnae are about equal. All pinnae are deeply lobed, 3-5 mm long. The spore-bearing (fertile) leaf segment is 1-2X longer than the vegetative segment and twice-pinnately divided. Vegetative and spore-bearing segments are joined to a common basal stem for 3-7 cm (Wagner and Wagner 1993; Farrar and Popovich 2012).

Local field characters: Nearly symmetrical ovate leaflets with lobed margins on both sides are characteristic.

Similar Species: *Botrychium lanceolatum* has a ternately divided trophophore. The leaves of *Botrychium hesperium* are dull gray-green. The pinnae of *Botrychium echo* are well-spaced with diverging lobes.

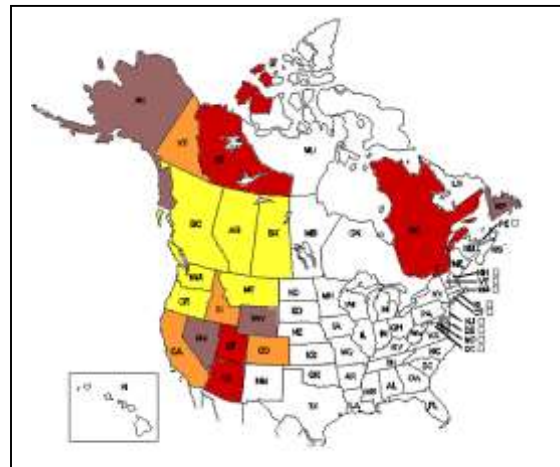
Distribution: Western North America from Alaska to California and New Mexico; also Greenland. In Wyoming, known only from the Big Horn Mountains (Big Horn and Johnson counties). Previous reports from western Wyoming (Wagner and Wagner 1993) were based on inference.



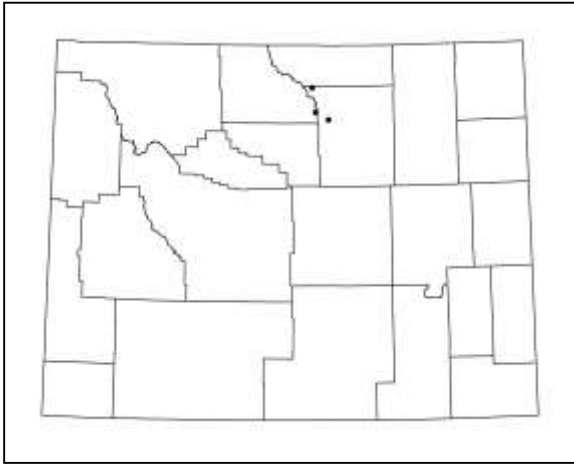
Above: *Botrychium pinnatum* specimen by Ben Legler (13250 RM)

Phenology: Mid August.

Habitat: Variable habitat from closed and open canopy forests to open meadows, often near streams and seeps (Farrar 2011, Farrar and Popovich 2012). Wyoming populations are in hummocked wet meadows in forest openings and margins.



Above: Rangewide distribution of *Botrychium pinnatum* from NatureServe. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>.



Above: State distribution of *Botrychium pinnatum*

endemic in western North America. *American Fern Journal* 76:33-47.

Wagner Jr., W. H. and F. S. Wagner. 1993. Ophioglossaceae. Pages 85-106 in *Flora of North America* Editorial Committee, editor. *Flora of North America North of Mexico*. Vol. 2. Pteridophytes and Gymnosperms. Oxford University Press, New York, NY.

Original authors: Joy Handley and Bonnie Heidel 2015-03-03

Extracted from database: 18-MAY-15

Occurrences in Wyoming: Known from 3 extant occurrences in Wyoming. First collected in 2009, last observed in 2014.

Abundance: Unknown.

Trends: Unknown.

Protection Status: All known occurrences are on public lands managed for multiple use.

Threats: Unknown.

Managed Areas: Occurs on lands managed by Bighorn National Forest.

References:

Farrar, D. R. 2011, December last update. *Botrychium pinnatum* species description, map, and photo page. In Farrar, D.R. 2011, December last update. Moonwort (*Botrychium*) systematics. Department of Ecology, Evolution and Organismal Biology, Iowa State University, Ames. Online. Available: <http://www.public.iastate.edu/~herbarium/botrychium.html>

Farrar, D. R. and S. J. Popovich. 2012. Ophioglossaceae. Pages 24-35 *Colorado Flora: Eastern Slope*, fourth edition. W.A. Weber and R.C. Wittmann. University Press of Colorado, Boulder, CO.

Wagner Jr., W. H. and F. S. Wagner. 1986. Three new species of moonworts (*Botrychium* subg. *Botrychium*)