

***Botrychium lineare* (Narrowleaf grapefern) confirmed in Wyoming**

By Deanna Reyher

A *Botrychium* species occurrence was located in the Black Hills National Forest, Crook County, Wyoming on June 19, 2003 by Drew King and Cheryl Mayer. One of the *Botrychium* species at the site had the appearance of *Botrychium campestre* (prairie moonwort) based on morphological characteristics. Because of the interest in that species, Reed Crook joined Drew and Cheryl, and the group spent additional time intensively searching the immediate and adjacent area. Additional documented plants with differing morphological characteristics indicated that more than one species occurred at this site.

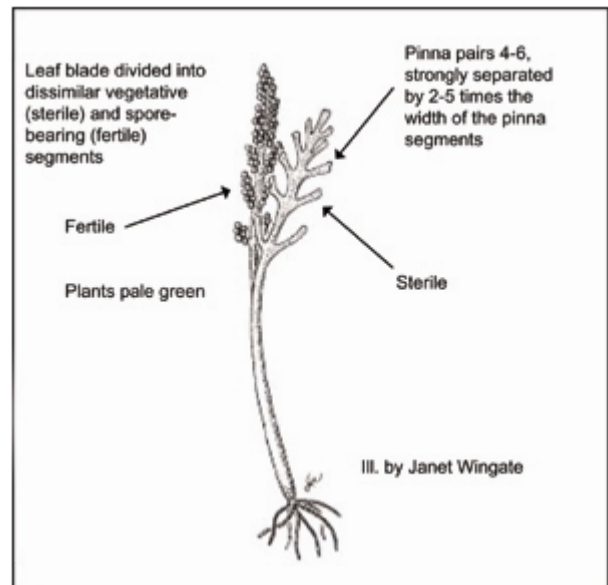
Based on recent experiences with *Botrychium* species in the Black Hills and identification challenges in this genus, the Forest has taken additional steps to confirming species identity. The Forest collects and sends fresh *Botrychium* plant specimens to Dr. Donald Farrar at Iowa State University. Lab analysis completed at Iowa State University is used to confirm species identification. It was through this effort that Dr. Farrar confirmed that *Botrychium lineare* (narrowleaf grapefern; slender moonwort) occurs in Wyoming in December 2003.

A characteristic habitat, if there is one, cannot be described for this species in the Black Hills based on only the one known Wyoming site, let alone for the other areas where it might occur within Wyoming. The species has been found associated with a wide variety of ecological conditions and range of elevations (0 to 10,000 feet) across its distribution. Some similarities between habitat conditions at this site in comparison to other known occurrences include: the species colonized an old disturbance (i.e. old native surface roadbed), the site continues to receive low levels of natural and activity-associated disturbances that may be maintaining appropriate site conditions for this species, the microhabitat is open with no tree canopy though there is deciduous cover below and coniferous cover above, and the relatively coarse-textured soils at the site have formed from parent materials that include limestone. The Black Hills NF occurrence is distant from the nearest occurrences in the Roosevelt National Forest of north-central Colorado and from Glacier National Park in northwestern Montana. Similar habitat may be present in other montane areas of Wyoming, such as in the Big Horns.

Dr. Farrar is working on *Botrychium lineare* taxonomy and has run electrophoretic analysis on plants from all currently known locations. Based on his work, *Botrychium lineare* has been documented to be quite variable from site to site. Based on the similarities that he has found between *Botrychium lineare* and *B.*

campestre, the question has been raised as to whether the two species warrant taxonomic distinction.

Botrychium lineare is a candidate for listing as Threatened under the Endangered Species Act (USDI Fish and Wildlife Service 2000). It is also a sensitive species in the Rocky Mountain Region of the U.S. Forest Service; summarized in Beatty et al. 2003). The Wyoming data and other new species distribution data from other states are being compiled by U.S. Fish & Wildlife Service in Boise, ID.



Botrychium lineare, by Janet Wingate

The following description for *Botrychium lineare* is taken from the species monograph (Wagner and Wagner 1994) and the Colorado Rare Plant Field (Spackman et al. 1997): *Botrychium lineare* has a leaf blade divided into vegetative (sterile) and spore-bearing (fertile) segments. It is 6-18 cm tall. The vegetative segment is pale green, with pinnae that are narrowly-linear or linear-spatulate, in 4-6 pairs, strongly separated by 2-5 times the width of the pinnae. By comparison, *B. campestre* has a broader and fleshier rachis, a fertile segment with fleshier, denser sporangia, and may have overlapping or fused pinnae.

Literature cited

- Beatty, B.L., W.F. Jennings and R.C. Rawlinson. 2003. *Botrychium ascendens*, *B. crenulatum*, *B. liheare*: A Technical Conservation Assessment. Posted electronically by the USDA Forest Service — Rocky Mountain Region at: <http://www.fs.fed.us/r2/projects/scp/>
- Spackman, S., W. Jennings, J. Coles, C. Dawson, M. Minton, A. Kratz and C. Spurner. 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, U.S. Forest Service, and U.S. Fish and Wildlife Service by the Colorado Natural Heritage Program, Fort Collins, CO. Also posted at: <http://www.cnhp.colostate.edu/>
- Wagner, W.H. and E.S. Wagner. 1994. Another widely disjunct, rare and local North American moonwort. *American Fern Journal* 84(1):5-10.