



Best Survey Period



Status: State threatened

Global and state rank: G3/S2

Other common names: dunewort, moonwort, grape-fern

Family: Ophioglossaceae (adder's-tongue)

Synonyms: *Botrychium matricariifolium* A. Br.

Taxonomy: This grape-fern species was discovered in 1982, when it was found simultaneously in Iowa and in Michigan during early summer surveys (Wagner & Wagner 1990). According to Wagner and Wagner, Michigan's dune-inhabiting plants were first thought to represent a different species or possibly a subspecies of the new taxon, owing to morphological differences observed in early collections. Ultimately, plants of the Great Lakes region and those of Iowa were determined to be the same taxon.

Total range: *Botrychium campestre* is concentrated in the upper Great Lakes region, western Iowa, and western Minnesota, ranging into Nebraska, North Dakota, Saskatchewan, and Manitoba, with isolated disjunct occurrences known in New York and eastern Canada (Wagner & Wagner 1990).

State distribution: Prairie dunewort is known primarily from perched dunes along the northern Lake Michigan shoreline, with one occurrence in southern Benzie County and seven occurrences in Leelanau County, including North Manitou Island, South Manitou Island, and South Fox Island, as well as

mainland portions of Sleeping Bear Dunes National Lakeshore. A substantial population is known from Grand Sable Dunes in Pictured Rocks National Lakeshore, and inland populations have been discovered in the Camp Grayling Military Reservation in Crawford County.

Recognition: Wagner & Wagner (1990) note that prairie dunewort can be distinguished from all other moonworts by its combination of characters: **occurrence in exposed prairie or dunes habitats; very early appearance in the spring; the masses of minute round gemmae (vegetative propagules) on the stem, and the usually sessile (stalkless) or subsessile leaves with more or less deeply incised, narrowly and asymmetrically flabellate (fan-shaped) segments.** *Botrychium campestre* is similar to the widespread *B. minganense* Victorin. (mingan moonwort), with which it may commonly occur. *Botrychium minganense* can be distinguished by its generally larger size, its flat (as opposed to longitudinally infolded) leaves with unlobed basal pinnae (lateral division of leaf). If the basal pinnae are unlobed, they are not usually 2-cleft as is characteristic in *B. campestre* (Morin et al. 1993).

Best survey time/phenology: This grape-fern emerges early in comparison to several other botrychiums. This is perhaps the reason it was unnoticed by botanists until the 1980s, when it was discovered on open dunes in the spring. The best period to search for dunewort is May through approximately early June, although during warm springs, this species may senesce and die back by



the beginning of June in many coastal sites. It may also be visible through June and into early July in northern sites. Because of its relatively early appearance in the growing season, as well as its diminutive size, this species can be quite easily overlooked.

Habitat: This species occurs in dry prairies and sand dunes, as well as sandy, dry disturbed sites, such as roadsides and old fields. In Michigan, prairie dunewort occurs principally in perched sand dune systems, where it is associated with such species as *Artemisia campestris* (wormwood), *Arctostaphylos uva-ursi* (bearberry), dune grasses (*Ammophila breviligulata* and *Calamovilfa longifolia*), *Arabis lyrata* (lyre-leaved rock cress), and often several other notable grape-ferns, such as *B. hesperium* (western moonwort), *B. lunaria* (common moonwort), *B. matricariifolium* (daisy-leaved grape-fern), *B. minganense*, *B. acuminatum* (pointed moonwort) and *B. simplex*, (least moonwort) (Wagner & Wagner 1990). Several species of botrychiums often co-occur in habitats, forming what Wagner & Wagner (1983) have termed “genus communities.”

Biology: As for several other grape-fern species, very little is known of the natural history of this taxon. Long-term monitoring of selected populations in Iowa and Minnesota has only been recently initiated. The few data available indicate that plants may be dormant during the growing season, and apparently do not produce aerial shoots each year. Thus, the leaves visible in colonies do not necessarily represent the number of plants that may actually be present. Farrar & Johnson-Groh (1990) reported the presence of subterranean gemmae in *B. campestris* and three other grape-fern taxa, the first documentation of such structures in any known fern. According to Farrar & Johnson-Groh, the ecological significance of gemmae is related to the advantage conveyed by asexual reproduction in habitats that are often very dry. Prairie moonwort is a spring species, with aerial shoots dying back by early June in Lake Michigan sites.

Conservation/management: Owing to the paucity of information concerning the biology and ecology of this rare and variable moonwort, habitat maintenance and protection is currently the best strategy for perpetuating this species. The open dunes and prairie habitats inhabited by this grape-fern are communities in which natural disturbance (e.g. sand movement) is an important factor, and thus it is essential to maintain such regimes in order to maintain appropriate habitat.

Comments: In the Great Lakes region, the majority of occurrences are coastal and found primarily in perched dune areas along Upper Lake Michigan and the Lake Superior shoreline in Pictured Rocks National Lakeshore. Wagner & Wagner (1990) note that as field workers become familiar with this species, its habitat, and phenology, more inland occurrences are likely to be identified.

Research needs: Long term habitat and population monitoring would likely be the most beneficial investigations at this time, in addition to continued inventory along coastal areas and potential inland habitats.

Related abstracts: open dunes, wooded dune and swale complex, acute-leaved moonwort, western moonwort, goblin fern

Selected references

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- Morin, N.R. et al. 1993. “Ophioglossaceae C. Agardh, Adder’s-tongue Family, by W.H. Wagner, Jr. and F.S. Wagner.” In, *Flora of North America: Volume 2, Pteridophytes and Gymnosperms.* Oxford Univ. Press, New York, NY. 475 pp.
- Wagner, W.H. Jr. and F.S. Wagner. 1990. Moonworts (*Botrychium* subg. *Botrychium*) of the upper Great Lakes region, USA and Canada, with descriptions of two new species. *Contr. U. of Mich. Herb.* 17:313-325.
- Wagner, W.H. Jr. and F.S. Wagner. 1983. Genus communities as a systematic tool in the study of New World *Botrychium* (Ophioglossaceae). *Taxon* 32:51-63.

Abstract citation

- Higman, P.J. and M.R. Penskar. 1999. Special plant abstract for *Botrychium campestris* (prairie dunewort). Michigan Natural Features Inventory, Lansing, MI. 2 pp.

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