

Common Moonwort



Botrychium lunaria



Photo credits: W. Carl Taylor. USDA NRCS (1992); downloaded from USDA-Plants Database.

Scientific Name *Botrychium lunaria*
(L.) Sw.

Family Name Ophioglossaceae
adder's-tongue family

Did you know?

Botrychium lunaria was named by Carl Linneaus for the pinnae which have a crescent moon shape. The common name, moonwort, comes from this species but not all moonwoorts have crescent-shaped pinnae. In the past it was thought that these ferns could raise the dead, open locks, or remove the shoes of horses that tread upon them.

Summary

Protection Endangered in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ½ minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5, S1

A global rarity rank of G5 means: This species is demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological

factors.

Conservation Status in New York

There is only one known population and three historical populations. One of the historical populations is probably extirpated. This fern has always been considered rare in New York.

Short-term Trends

The only existing population has seen a reduction in numbers but the severity is complicated by the difficulty in counting individuals without harming them and the added difficulty of distinguishing them from the closely related *Botrychium minganense*. All the plants may not appear each year so long-term counts must be done to verify trends.

Long-term Trends

Only four locations were ever known for this fern. Plants still exist at one locality and habitat exists at another. The population along a road in Jamesville has not been seen since the 1870s and is probably gone.

Conservation and Management

Threats

The primary threat to *Botrychium lunaria* is the loss of its open habitats to successional overgrowth and development. Trampling by visitors to the only known site is also a threat since the plants are small and easily overlooked.

Conservation Strategies and Management Practices

An evaluation of the management needs of the existing population should be undertaken.

Research Needs

A long-term demographic study should be undertaken to understand the biology and trends of this plant in New York.

Habitat

This is a fern of northern white cedar forests and open pastures that are casually grazed where the underlying bedrock is calcareous. Often found with other moonworts (New York Natural Heritage Program 2005). Open fields, occasionally forests in southern occurrences (Flora of North America 1993). Open fields and meadows, or sandy or gravelly streambanks (Gleason and Cronquist 1991). In dry pastures, meadows, and on hillsides and rocky ledges (Cobb 1984). Open turf, gravelly or ledgy slopes, shores and meadows, chiefly calcareous (Fernald 1970).

Associated Ecological Communities

Calcareous Talus Slope Woodland

An open or closed canopy community that occurs on talus slopes composed of calcareous bedrock such as limestone or dolomite. The soils are usually moist and loamy; there may be numerous rock outcrops.

Pastureland

Agricultural land permanently maintained (or recently abandoned) as a pasture area for livestock.

Other Probable Associated Communities

Calcareous pavement barrens
Limestone woodland

Associated Species

Mountain Maple (*Acer spicatum*)
Lyre-leaved Rockcress (*Arabidopsis lyrata*)
Wild Sarsaparilla (*Aralia nudicaulis*)
Mingan's Moonwort (*Botrychium minganense*)
Fragile Rockbrake (*Cryptogramma stelleri*)
Marginal Wood Fern (*Dryopteris marginalis*)
Virginia Strawberry (*Fragaria virginiana*)
Naked Bishop's-cap (*Mitella nuda*)
Northern White Cedar (*Thuja occidentalis*)

Identification Comments

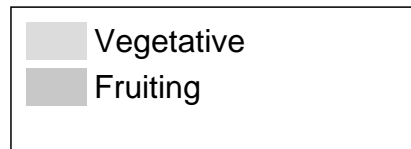
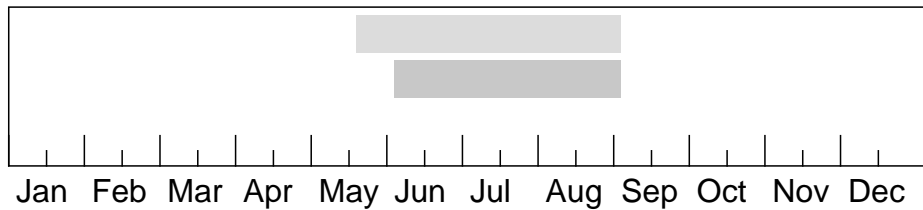
Moonwort is a very small, perennial fern with a single aboveground frond. The dark-green frond is usually about 4 inches long and can be seen through mid-summer. It is divided into two leaves above a common stalk. The sterile leaf is usually dark green, thick, and fleshy. It has up to nine usually overlapping pairs of broadly fan-shaped leaflets (pinnae). The top edges are rounded and smooth or wavy or rarely have teeth. The fertile leaf is longer than the sterile leaf with branches that bear grape-like sporangia. Spores germinate underground and develop into tiny, non-photosynthetic gametophytes which depend on a fungus for nourishment.

Best Life Stage for Identifying This Species

This fern is best identified when the leaves are fully formed.

The Best Time to See

Mature fronds of this plant are visible from June to August. This should be the time of year when surveys for this species are conducted.



The time of year you would expect to find Common Moonwort in New York.

Similar Species

Botrychium lunaria is most easily confused with *Botrychium minganense*, *Botrychium campestre*, and *Botrychium simplex*. The pinnae of *Botrychium minganense* and *Botrychium campestre* are narrower, wedge shaped and do not overlap. *Botrychium campestre* has a shorter and more branched fertile leaf and the pinnae of the sterile leaf are often deeply divided at the top. Its leaves can only be seen in the spring. In *Botrychium simplex* the upper pinnules are somewhat fused together and not separate. The fertile leaf often arises from near the ground level. *Botrychium matricariifolium* pinnules are long and narrow with a central midrib and secondary segments. Reliable field determination of moonworts depends on the careful use of technical keys and comparison with silhouette outlines of verified specimens. Identification can be complicated because there is often a high degree of morphological variability between individuals in a population and between populations of the same species. Several species may grow together at the same site, and the few diagnostic characters may not be apparent in small plants.

Taxonomy

Kingdom Plantae

└ Phylum Filicinophyta

└ Class Ophioglossopsida

└ Order Ophioglossales

└ Family Ophioglossaceae (adder's-tongue family)

Additional Common Names

Moonwort

Moonwort Grape Fern

Synonyms

Botrychium lunaria var. *onondagense* ((Underwood) House)

Botrychium onondagense (Underwood)

Osmunda lunaria (L.)

Additional Resources

Links

Flora of North America

http://efloras.org/florataxon.aspx?flora_id=1&taxon_id=200002876

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=BOTRYCHIUM+LUNARIA>

Google Images

<http://images.google.com/images?q=BOTRYCHIUM+LUNARIA>

USDA Plants Database

<http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=BOTRYCHIUM+LUNARIA>

New York Flora Atlas

<http://www.newyork.plantatlas.usf.edu/Plant.aspx?id=1977>

Best Identification Reference

Flora of North America Editorial Committee. 1993. Flora of North America, North of Mexico. Volume 2. Pteridophytes and Gymnosperms. Oxford University Press, New York. 475 pp.

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