Species Status Assessment

Common Name	northern adder's tongue	**Date Updated:**	2024-01-31
Scientific Name	*Ophioglossum pusillum*	**Updated By:**	Rachael A. Renzi
Family	Ophioglossaceae		

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

Northern adder's tongue is a perennial fern in the adder's tongue family (Ophioglosaceae). It is the only species of the genus *Ophioglossum* in New York (Werier et al. 2023). Despite having over 100 documented occurrences around the state, only a handful remain extant today. Six of these occurrences are based on specimens collected in the early 1980s with no quantitative data (NYNHP 2023). Two were documented by site visits more recently, in 2011 and 2021 (NYNHP 2023). Individual plant counts at these sites ranges from over 10,000 plants to 1 plant (NYNHP 2023). It is considered rare across most of its range in North America (NatureServe 2023). Its rarity may be exacerbated by its inconspicuous stature, as it can be easily overlooked (NYNHP 2024). *Ophioglossum pusillum* is considered an early successional species by some, and may rely on habitat that is continually open, such as fields, swamps, or roadsides (McMaster 1996). Surveys across its historic range in New York are needed to confirm absences of this plant. Additionally, research at known sites may help us understand the reasons for the apparent loss of nearly 100 populations.

I. Status

a. Current legal protected Status

i. Federal: **Candidate:**

ii. New York: Exploitably Vulnerable

b. Natural Heritage Program

i. Global: G5

ii. New York: S1 **Tracked by NYNHP?** On Active Tracking List

Other Ranks:

COSEWIC: Not listed in Canada
IUCN Red List: Not assessed by IUCN Red List

Status Discussion:

Ophioglossum pusillum is Exploitably Vulnerable in New York and rare across its range in North America (Ring 2023, NatureServe 2023). In New York, there are eight extant occurrences, but over 100 historical occurrences (NYNHP 2023). Six of these occurrences are based on specimens collected in the early 1980s with no quantitative data. The two more recently visited populations occur in St. Lawrence County and Cayuga County (NYNHP 2023). Complete surveys of these populations are needed. While the plants may be overlooked due to their small stature, the presence of suitable open habitat l kely plays an important role in its perseverance (MNHESP).

II. Abundance and Distribution

Region	Present?	Abundance	Distribution	Time Frame	Listing status or S-Rank	SGCN?
North America	Yes	Unknown	Unknown	Unknown		
Northeastern US	Yes	Unknown	Unknown	Unknown		
New York	Yes	Unknown	Unknown	Unknown	E	
Connecticut	Yes	Unknown	Unknown	Unknown	S1	
Massachusetts	Yes	Unknown	Unknown	Unknown	S2	
New Jersey	Yes	Unknown	Unknown	Unknown	S3	
Pennsylvania	Yes	Unknown	Unknown	Unknown	S1	
Vermont	Yes	Unknown	Unknown	Unknown	S1	
Ontario	Yes	Unknown	Unknown	Unknown	S4	
Quebec	No	-	-	-		

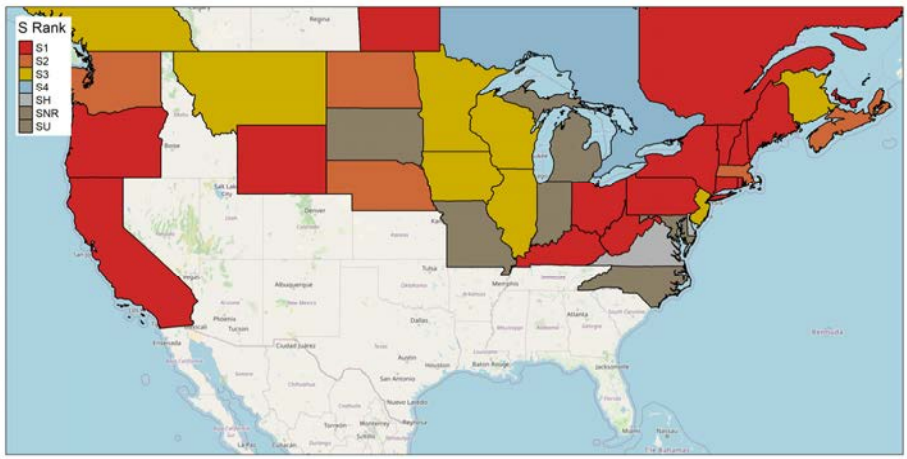

Figure 1: Ophioglossum pusillum North American distribution.

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	Unknown

III. NY Rarity and Trends

Trends Discussion

There are over 100 historical populations in New York, yet few sites are known to exist today (NYNHP 2023). There has been a strong negative trend among populations of *Ophioglossum pusillum.* This trend is not limited to New York, as Massachusetts populations show a similar condition of historic population outnumbering extant ones (MNHESP 2019).

Details of historic and current occurrence

The range of *Ophioglossum pusillum* occurs from Nova Scotia west to North Dakota, south to Virginia, possibly North Carolina, Indiana, and Nebraska; and in the Pacific Northwest (Weakley 1997). In California, it is known historically from El Dorado and Siskiyou Counties (Skinner 1997). In NY, historical populations ranged across the state (NYNHP 2023). However, only eight are considered extant (NYNHP 2023). Populations are lacking from Long Island, Hudson Valley, and Western New York (NYNHP 2023).

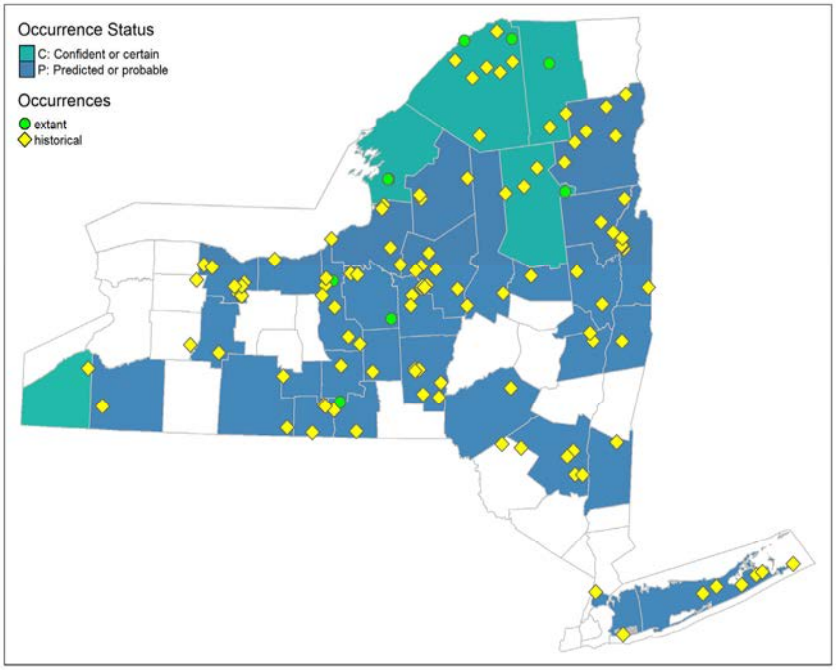

Figure 2. *NYS distribution for* Ophioglossum pusillum.

Table 1. *Number of records (element occurrences) of* Ophioglossum pusillum *grouped by the dates known to be extant (the years spanning first observation to last observation) and the number and percent of total of USGS 7.5 minute map quadrangles these observations fall within for New York State.*

Years	# of Records	# of distinct quads	% of quads in State
Pre-1995	115	161	16.3
1995-2004	0	0	0.0
2005-2014	1	2	0.2
2015-2023	1	1	0.1

Monitoring in New York

Most of the occurrences of *Ophioglossum pusillum* in New York have only been visited, or collected from, once. The populations are not regularly monitored. One of the recently surveyed populations occurs on state forest land.

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems)*:

NatureServe broad habitat types: Grassland/herbaceous, Riparian (NatureServe 2023).

Northeastern Habitat Classification Macrogroup: Central hardwood swamp, wet meadow / shrub marsh.

Openings in Silver maple-ash swamp, Shrub swamp (Edinger et al. 2014, NYNHP 2023).

Habitat or Community Type Trend in New York

Declining: **Stable:** **Increasing:** **Unknown:** ✓

Time Frame of Decline/Increase:

Habitat Specialist **Yes:** **No:** ✓

Habitat Discussion:

Ophioglossum pusillum can be found often in sandy soils in sites that are not heavily shaded, like moist sandy fields and ditch banks (Reznicek 2011). In New York, it can be found in springy open wet habitats including banks of streams, wet open road banks, and open habitats that sometimes have experienced past disturbances (Werier et al. 2023). It has been described as growing in sandy soil in low vegetation and in openings in a silver-maple shrub swamp, even growing on a moss-covered log (NYNHP 2023). In North Carolina and Virginia, its habitat is described as moist streamside meadow (Weakley 1997). In British Columbia, it is found in periodically flooded wet meadows and lake margins, in the lowland and montane zones (Douglas 1989). In one population in BC, the plants are growing along a trail that was an old logging and mining road, indicating a tolerance for some past or present disturbance (Barclay-Estrup & Hess 1974). Openings in vegetation seem to provide habitat for this fern to grow reproduce, however, more research is needed.

Associated species from one site in New York include *Acer rubrum* var. *rubrum, Asclepias incarnata* spp. *incarnata, Boehmeria cylindrica, Carex lacustris, Cicuta bulbifera, Cornus amomum* spp. *amomum, Eupatorium perfoliatum, Eutrochium maculatum, Galium palustre, Ilex verticillata, Impatiens capensis, Leersia oryzoides, Lycopus uniflorus, Lysimachia thyrsiflora, Lythrum salicaria, Onoclea sensibilis, Osmunda regalis* var. *spectabilis, Parthenocissus quinquefolia, Phragmites australis, Pilea pumila* var. *pumila, Rosa multiflora, Rubus* spp., *Rumex* spp., *Solanum dulcamara, Solidago canadensis, Solidago gigantea, Solidago rugosa, Symphyotrichum lanceolatum* var. *lanceolatum, Symphyotrichum puniceum* var. *puniceum, Thelypteris palustris* var. *pubescens, Toxicodendron radicans, Toxicodendron vernix, Typha latifolia, Vaccinium corymbosum, Vitis* spp. (NYNHP 2023).

Commented [RRA(1]: EO 17410 -- has anyone cited a specific field survey?

V. Species Demographics and Life History *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize)*:

Ophioglossum pusillum is a perennial fern. It is described as an early-successional species (McMaster 1996). It produces a sporophore from which it releases spores for reproduction. It also reproduces via branching underground rhizome that creates clonal colonies (McMaster 1996). A 1994 study of four populations in Massachusetts found an absence of genetic variability among populations, and among individuals (McMaster). Vegetative reproduction may

be favorable for short term maintenance of population size but may leave the ferns with an inability to adapt to change (McMaster 1994). Studies on the genetic individuality between and within populations of *O. pusillum* in New York may provide insight into the apparent decline of extant populations.

***Table 2**. Phenology of* Ophioglossum pusillum *in New York State (NYNHP 2023).*

Phenology	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fruiting												

VI. Threats

At one of the largest extant sites in New York, *Phragmites australis* was found. Shading and competition, especially from invasive species, may be considered as threats for *Ophioglossum.* Further research regarding the habitat and biology may reveal threats.

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: **No:** ✓ **Unknown:**

If yes, describe mechanism and whether adequate to protect species/habitat:

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Control of *Phragmites australis* at known sites may be beneficial.

Complete Conservation Actions table using IUCN conservation actions taxonomy at link below. Use headings 1-6 for Action Category (e.g., Land/Water Protection) and associated subcategories for Action (e.g., Site/Area Protection) - https://www.iucnredlist.org/resources/conservation-actions-classification-scheme

***Table 3.** Recommended conservation actions for* Ophioglossum pusillum.

Conservation Actions	
Action Category	**Action**
Land/water protection	1.1. Site/area protection
Land/water protection	1.2. Resource & habitat protection
Land/water management	2.1. Site/area management
Land/water management	2.2. Invasive/problematic species control
Land/water management	2.3. Habitat & natural process restoration

VII. References

This SSA drew heavily from these resources:

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New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry. 2023. Element Occurrence and Element Dataset. Albany, New York. [Exported 12/14/2023].

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Douglas, G.W., G.B. Straley, and D. Meidinger. 1989. The vascular plants of British Columbia. Part 1. Gymnosperms and Dicotyledons (Asteraceae through Cucurbitaceae). Crown Publications Incorporated. Victoria, British Columbia, Canada. 208 pp.

Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). 2014. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, A bany, NY. https://www.nynhp.org/documents/39/ecocomm2014.pdf

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Ring, Richard M. 2023. New York Rare Plant Status Lists. New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry, Albany, NY. December 2023. 108 pp.

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Weakley, A.S. 1997. Flora of the Carolinas and Virginia: working draft of 21 July 1997. The Nature Conservancy, Southeast Regional Office, Southern Conservation Science Dept., Chapel Hill, North Carolina.