Species Status Assessment

Common Name	northern monkshood	**Date Updated:**	2024-03-07
Scientific Name	*Aconitum noveboracense*	**Updated By:**	Richard M. Ring
Family	Ranunculaceae		

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

Northern monkshood (*Aconitum noveboracense)* is a perennial herb species known only from three isolated geographic regions: the Catskill Mountains of New York, northeastern Ohio, and the "Driftless Area" (the unglaciated portion of northeast Iowa and southwest Wisconsin). These three populations are genetically similar (Keukenreuther 1996). Some studies have suggested that *A. noveboracense* is not genetically distinct from the closely related *A. columbianum*, a western species not present in NY.) It is listed as Threatened under the US Endangered Species Act. Both long-term and short-term trends in NY state have been in decline, in terms of number of populations as well as overall population size. In NY, Monkshood occupies streams, ravines, and headwater seep habitats with significant cold air drainage, typically on sandstone substrates (NYNHP 2023).

I. Status

a. Current legal protected Status

i. Federal:	Threatened	**Candidate:**	
ii. New York:	Endangered		

b. Natural Heritage Program

i. Global:	G3		
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:

Aconitum noveboracense is Endangered in NY and Federally Threatened (Ring 2023). There are seven extant populations in New York, and five additional historically known populations, of which at least three appear to be extirpated. All of these are found in the Catskill Mountains in

southeastern NY. The extant populations have undergone consistent population decline over the last 40 years, and the total number of individuals numbered fewer than 400 according to the most recent surveys. Even though these populations are isolated in the Catskill Mountains, impacts (and continuing threats) from deer herbivory, catastrophic flooding events, and recreational use of the streamside habitats Northern Monkshood occupies are high.

II. Abundance and Distribution

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

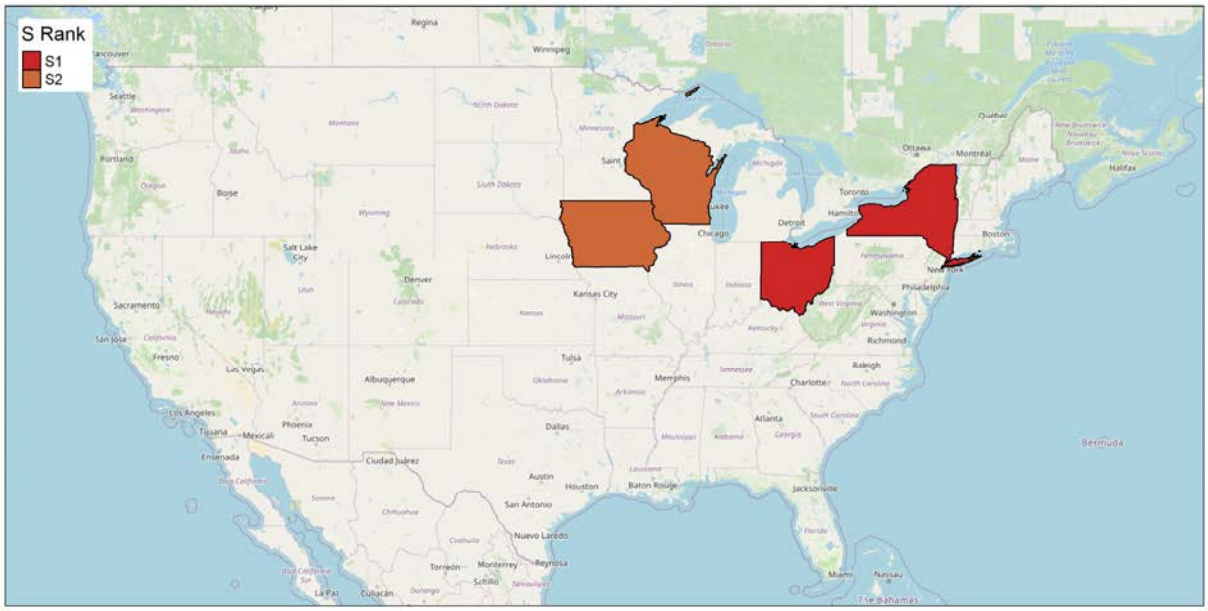


Figure 1 ***1:*** Aconitum noveboracense *North American distribution.*

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Disjunct	650 km

III. NY Rarity and Trends

Trends Discussion:

Short Term Trends (<100 years)

In New York, most locations, as well as the overall population, have been trending downward at least since NY Natural Heritage records began in the 1980s (NYNHP 2023). A 2012 study by the USFWS) found one population to have been extirpated, one with an unknown trend, and four with a downward trend, amounting to approximately an 80% decline since the 1980s (Wiley 2012).

Long Term Trends

The long-term trend in New York is down, with at least three Catskill occurrences apparently extirpated in the late 20th or early 21st centuries, and the historical locations in Chenango County not documented since the late 1800s.

Details of historic and current occurrence:

Comments on range: In New York this species is only currently known from Delaware, Ulster, and Sullivan counties, and historically from Chenango County. The Catskill populations are disjunct from Ohio, Iowa, and Wisconsin, but they have a similar genetic makeup. There are an estimated total of 400 to 500 plants in the remaining seven extant populations (NYNHP 2023).

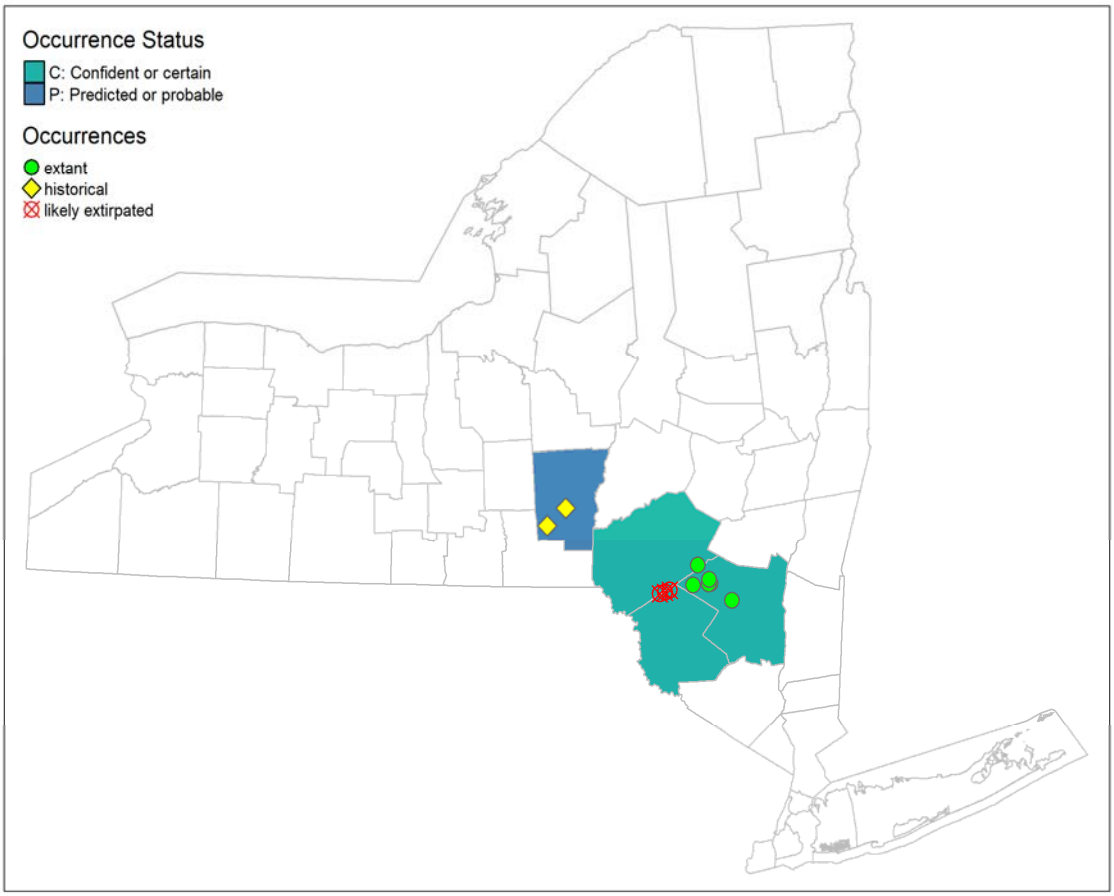


Figure 2 ***2:*** *NYS distribution for* Aconitum noveboracense

Table 1. *Number of records (element occurrences) of* Aconitum noveboracense *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	8	11	1.1
1995-2004	3	5	0.5
2005-2014	3	5	0.5
2015-2023	2	5	0.5

Monitoring in New York:

The last thorough census of New York's populations was undertaken by the Fish and Wildlife Service in 2012 (Wiley 2012). No regular monitoring program is in place for any of the populations.

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

NatureServe broad habitat types: Bare rock/talus/scree, Cliff, Riparian

Northeastern Habitat Classification Macrogroup: Cliff and Talus, Northern Hardwood and Conifer,

NY Natural Heritage Communities: Beech-maple mesic forest, Calcareous cliff community, Hemlock-northern hardwood forest, Ice cave talus community, Acidic talus slope woodland

Habitat or Community Type Trend in New York

Declining:	**Stable:**	**Increasing:**	**Unknown:** ✓
Time Frame of Decline/Increase:			
Habitat Specialist	**Yes:** ✓	**No:**	

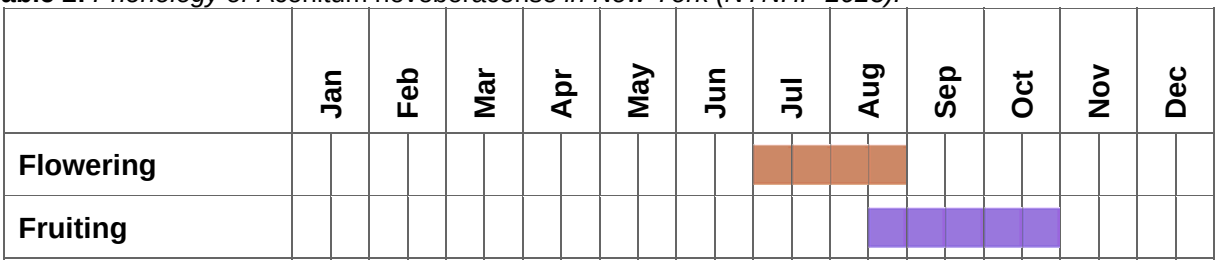
Habitat Discussion:

In New York, Northern Monkshood occurs along streams and ravines (or in one case, a cliffside seep), shaded by beech, sugar maple, yellow birch, or eastern hemlock. All existing occurrences have been found on sandstone-derived rocky or sandy soils, at elevations ranging between 400 and 1000 meters (New York Natural Heritage Program 2023). A significant common habitat factor, range wide, appears to be the cold soil environment associated with cliff, talus slope, and spring/headwater stream habitats. In most of the habitats occupied by northern wild monkshood, there is either active and continuous cold air drainage or cold ground water flowage out of the nearby bedrock (Read 1981). Local distribution of the species is also closely associated with areas where ground water or subterranean air is emanating, which contributes to a local microclimate with high relative humidity (Cole and Kuchenreuther 2001).

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):*

Northern Monkshood is a perennial herb species. In New York flowering occurs in July and August, and large plants may bloom for over 60 days ((Keukenreuther 1996). Pollination is accomplished by bumble bees (genus *Bombus)*, and studies suggest that successful self-fertilization (apomixis) is not common in the species. (Keukenreuther 1996). However, Northern Monkshood can reproduce asexually via bulbils – axillary buds which contain both root and apical meristem tissue ((Keukenreuther 1996). The seeds do not appear to be significantly dispersed by animals, but rather by water or simple gravity. The seeds apparently do not persist to form seed banks. The species' highly specialized habitat requirements for cool microsites likely limits its ability to successfully disperse. Germination of seedlings as well as establishment of tubers from bulbils occurs in the spring – seedlings rarely produce true leaves or reproduce sexually in their first year (Keukenreuther 1996). Some studies have shown that asexual reproduction through bulbils is more common in populations which had lower substrate temperatures and/or were more susceptible to flooding (Keuchenreuther 1991, Keuchenreuther *et al* 1986), which suggests climate change may affect asexual reproduction. Data from the closely-related Columbia monkshood (*Aconitum columbianum*) suggests that plants may take several years to reach flowering size.

Table 2: *Phenology of* Aconitum noveboracense *in New York (NYNHP 2023).*



VI. Threats

Climate change is a particular threat for this rare species, as it is threatened by rising temperatures in its cool microhabitats, by droughts drying up the seeps and headwater streams where some of the NY populations occur, and by increased potential for catastrophic flooding at the remaining NY populations (NYNHP 2023). Rivers may be threatened by trout stream improvements and flood control projects. Extensive damage from deer browse was observed during 2012 surveys (Wiley 2012), with deer overpopulation threatening all the known NY populations.

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:

The regulatory mechanism is the Federal ESA listing. It is unknown if this is enough to protect the species or habitat.

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

Regular monitoring of the extant populations is needed. Protection of areas where recreational land use (trout fishing) likely impacts creekside habitats should be implemented. Introduction or re-introduction of plants to extirpated sites or nearby sites with the appropriate specialized habitat should be considered.

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* Aconitum noveboracense**.**

Conservation Actions	
Action Category	**Action**
Land/water protection	1.1. Site/area protection

Conservation Actions	
Action Category	**Action**
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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