

Species Status Assessment

| | | | |
|------------------------|----------------------------|----------------------|--------------|
| Common Name | musk root | Date Updated: | 2024-03-12 |
| Scientific Name | <i>Adoxa moschatellina</i> | Updated By: | Richard Ring |
| Family | Viburnaceae | | |

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

Musk Root (*Adoxa moschatellina*) is a small perennial wildflower in the Viburnaceae family (previously Adoxaceae), and the only member of the genus *Adoxa* in North America. It has a circumboreal distribution globally, and in the US is found primarily in the upper Midwest, with a disjunct population in New York limited to the Catskills. Apparently never abundant in New York, there are only three known extant populations, and historical records of an additional five populations. Current trends are difficult to assess due to a lack of recent surveys (Biotics 2023). Musk Root is associated with cool microclimates and rocky soils, and in New York has been found on mossy rock ledges, talus slopes, and the bases of cliffs, in shade (NYNHP 2023, 2024).

I. Status

a. Current legal protected Status

| | | | |
|----------------------|-------------------|-------------------|--|
| i. Federal: | | Candidate: | |
| ii. New York: | <u>Endangered</u> | | |

b. Natural Heritage Program

| | | | |
|----------------------|-----------|--------------------------|-------------------------|
| i. Global: | <u>G5</u> | | |
| ii. New York: | <u>S1</u> | 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:

Adoxa moschatellina is Endangered in New York. Musk root is limited in distribution to the Catskill Mountains where it is often found on fragile talus slopes, often near cold-air vents through the talus. Currently, there are three known extant populations, apparently stable with no immediate threats. There are an additional five historical populations known from the Catskills,

| Percent of North American Range in NY | Classification of NY Range | Distance to core population, if not in NY |
|---------------------------------------|----------------------------|---|
| 1-25% | Disjunct | 900 miles |

III. NY Rarity and Trends *(provide map, numbers, and percent of state occupied)*

Trends Discussion *(insert map of North American/regional distribution and status):*

Short term trends (<100 years)

This plant has a very limited distribution in New York. Many of the known and historical populations are within protected landscapes. Based on historical data and the well-protected landscapes, the short-term population trend is presumed stable. The projected short-term trend is also presumably stable.

Long term trends

As an uncommon plant with limited distribution, generally found in areas not frequently surveyed, the long-term population trends are difficult to assess. To date, only one of the six historical populations have been rediscovered. More survey work is needed to follow-up on the remaining historical populations. As a small plant that may be easy to overlook, occupying habitats in rugged, boulder terrain, there is a good probability that these historical populations still persist. Despite past intensive survey efforts to find more populations of this plant, only two new populations have been discovered. There also may be more populations than currently documented. Based on limited information, the past population trend in New York is presumed stable. Given this species' preference for cool, shady microclimates there is a need for revisits to known populations and checks of the remaining known historical sites to better project a long-term population trend (NYNHP 2023).

Details of historic and current occurrence:

There are three known populations and five historical locations all within the Catskill Mountains. These populations within the Catskills are disjunct and nearly a thousand miles from the next closest populations. Two of the three known populations are estimated to have 200 or more plants, with one additional population of up to a few dozen plants.

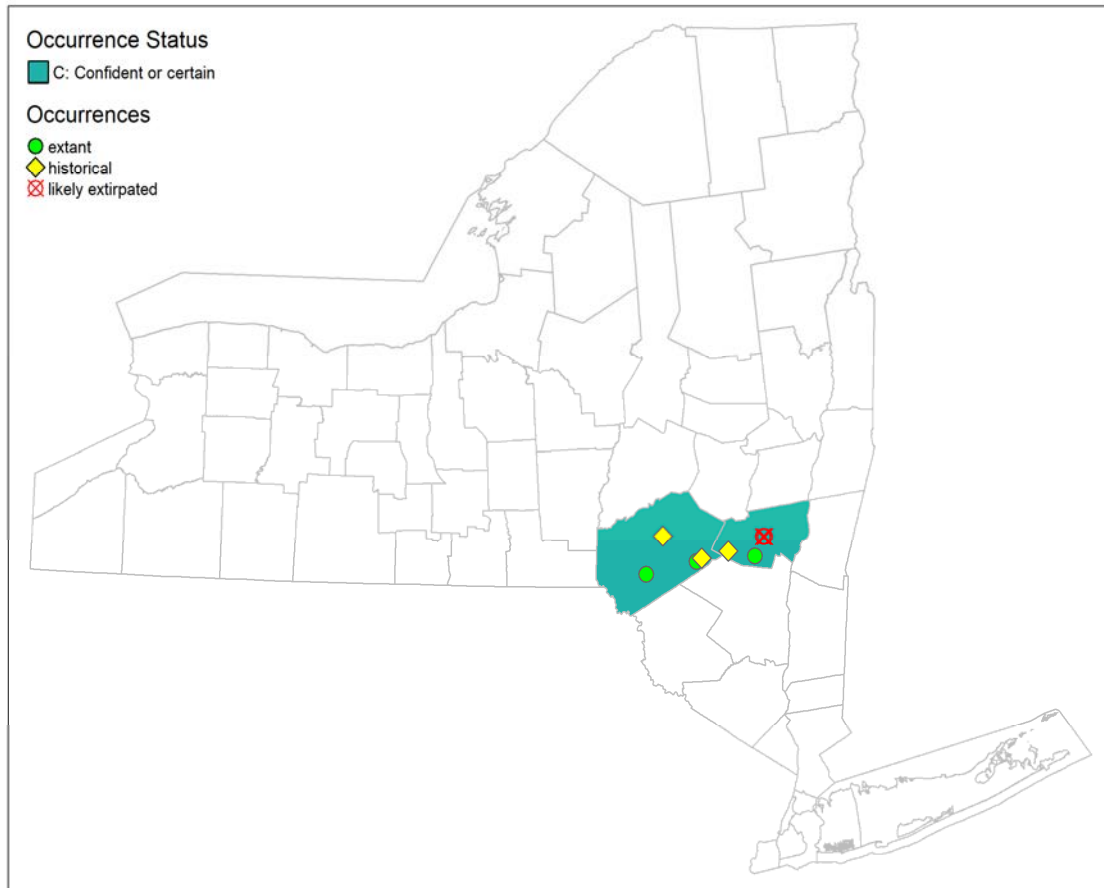


Figure 2: NYS distribution for *Adoxa moschatellina*.

Table 1. Number of records (element occurrences) of *Adoxa moschatellina* 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 | 13 | 1.3 |
| 1995-2004 | 2 | 2 | 0.2 |
| 2005-2014 | 2 | 2 | 0.2 |
| 2015-2023 | 0 | 0 | 0.0 |

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

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

NY Natural Heritage Communities: Acidic talus slope woodland, Hemlock-northern hardwood forest, Ice cave talus community.

Habitat or Community Type Trend in New York

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

Habitat Discussion:

This small clump-forming plant often occurs near the base of cliffs in rich woods, around cold air vents along lower portions of talus slope, and sometimes on red sandstone ledges and hillsides, or in shallow soil on mossy rock ledges (New York Natural Heritage Program 2004). Moist, often mossy places in forested regions (Gleason and Cronquist 1991). Mossy woods, wet rocks, etc. (Fernald 1970).

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):*

Musk root is a perennial, herbaceous species. Few studies have been made of the reproductive ability of this circumboreal species. One study of European populations found low levels of seed production, with a high level of self-pollination, possibly due to self-incompatibility (Holmes 2005). The species apparently is adapted for pollination by dipterid species, based on floral morphology, although Lepidopterans have also been found flying between blooms and carrying *Adoxa moschellatina* pollen (Holmes 2005). It reproduces asexually via long stolons (Gleason and Cronquist 1991), with relatively few stolons producing inflorescences (Holmes 2005).

Table 2. Phenology of *Adoxa moschellatina* in New York (NYNHP 2023).

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Flowering | | | | | | | | | | | | |
| Fruiting | | | | | | | | | | | | |
| Vegetative | | | | | | | | | | | | |

VI. Threats

This is a plant of cool climates and habitats, and so may suffer habitat loss in New York as the climate warms. Considering that this plant can be located near cold air vents on talus slopes, which are rather fragile communities, any disturbance to the talus community undoubtedly would have an impact on the plants. At the same time, small scale natural disturbances may be needed to maintain an open canopy. At this point, few invasive species are present in areas where this plant is found. As a result, the immediate threat from invasive species is rather low.

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:

As a plant already located within a relatively protected landscape, minimal management needs are necessary. If this plant is found in areas that receive significant recreational traffic, fencing may be recommended to limit access to the fragile talus slopes.

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 *Adoxa moschatellina*.

| 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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NatureServe. 2023. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>. [Accessed 12/14/2023].

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Gleason, Henry A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden, Bronx, New York. 910 pp.

Holmes, David. 2005. Sexual reproduction in British populations of *Adoxa moschatellina* L. *Watsonia* 25: 265:273

Holmgren, Noel. 1998. The Illustrated Companion to Gleason and Cronquist's Manual. Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden, Bronx, New York.

Mitchell, Richard S. and Gordon C. Tucker. 1997. Revised Checklist of New York State Plants. Contributions to a Flora of New York State. Checklist IV. Bulletin No. 490. New York State Museum. Albany, NY. 400 pp.

Reschke, Carol. 1990. Ecological communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation. Latham, NY. 96 pp. plus xi.

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