

Species Status Assessment

Common Name	Hooker's orchid	Date Updated:	2024-02-13
Scientific Name	<i>Platanthera hookeri</i>	Updated By:	Rachael A. Renzi
Family	Orchidaceae		

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

Hooker's orchid (*Platanthera hookeri*) is a perennial herb in the orchid family. It is one of 16 species of the genus *Platanthera*, all of which are native to NY (Werier et al. 2023). The orchid grows from Newfoundland west to Manitoba, and south to Pennsylvania and Ohio (NatureServe 2023). It is rare throughout much of its range (NatureServe 2023). In NY, it historically grew at over 50 locations scattered throughout the state, but after sharp decline in the 19th century, it is extant only in the foothills of the Adirondacks and in Tompkins County in very small numbers (NYNHP 2023, 2024). Overall, there are less than 150 plants left in the state, and all but six plants occur at one population in the Adirondacks (NYNHP 2023, 2024). *Platanthera hookeri* grows in successional forest or in forested areas with open understories, usually with poplar and pines (NYNHP 2023, 2024). The open, successional habitat may be important for the life cycle, especially for the establishment of new plants and their mycorrhizal partners (Reddoch & Reddoch 2007). Some additional factors that may have led to the dramatic decline of the plant over the last 150 years include acid rain, increased deer herbivory, and forest succession (NYNHP 2023, 2024; Reddoch & Reddoch 2007). Repeated surveys to the extant or recently lost populations should be done to better understand the threats and the long-term patterns in population demography. Research on juvenile recruitment, especially in connection to mycorrhizal relationships, is needed.

I. Status

a. Current legal protected Status

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

b. Natural Heritage Program

i. Global:	<u>G4</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:

Platanthera hookeri is Endangered in New York (NYNHP 2023). There are four known populations in NY; one population has between 80 and 140 plants, while the rest have four or less plants (NYNHP 2023). Two additional populations have been reported in the last 20 years that recent surveys have failed to relocate (NYNHP 2023). Populations of this plant have declined sharply over the past 100 years (NYNHP 2023, 2024).

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	SH	
Massachusetts	Yes	Unknown	Unknown	Unknown	S2	
New Jersey	Yes	Unknown	Unknown	Unknown	SH	
Pennsylvania	Yes	Unknown	Unknown	Unknown	S1	
Vermont	Yes	Unknown	Unknown	Unknown	S1	
Ontario	Yes	Unknown	Unknown	Unknown	S3	
Quebec	No	-	-	-		

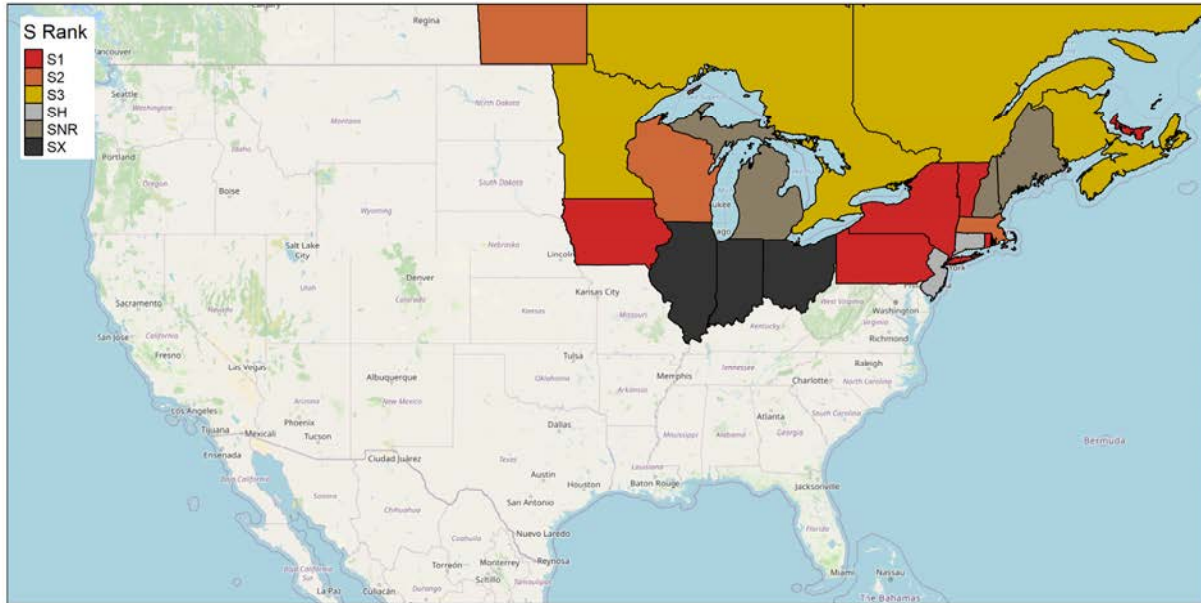


Figure 1. *Platanthera hookeri* North American distribution.

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

Populations of *Platanthera hookeri* have persisted at very low levels over 10-20 years and this trend of small fluctuating numbers will probably continue into the foreseeable future (NYNHP 2023, 2024). However, there is the risk that the small populations are aging out. In the last 30 years, three populations that had few plants dwindled to none (NYNHP 2023). Of the four remaining populations, three of these have four or less plants (NYNHP 2023).

There has been a large decline in populations of this orchid especially since the beginning of the 1950s. In the first half of the 20th century, 36 new locations were found for this orchid, then only 11 in the second half of the century and two since the year 2000 (NYNHP 2023, 2024). Many populations were lost, or became historical, in the 1970s, as only five populations were known then (NYNHP 2023, 2024). Only two of these populations have surviving plants today (NYNHP 2023). From these data we can imagine that this orchid was not an uncommon sight in our forests before the 1950s but now it is almost gone (NYNHP 2023, 2024). Decline could be due to acid rain, forest succession, and herbivory (Reddoch & Reddoch 2007). Across its range, NatureServe (2023) estimates both a short-term and long-term decline of 30-50%.

Details of historic and current occurrence

Historically *Platanthera hookeri* was reported throughout much of New York, ranging from the Hudson Valley and Adirondack foothills, west through central and western New York. Today the orchid is only known from a few populations near Ithaca and the eastern Adirondack foothills

(NYNHP 2023, 2024). It has been declining outside of NY as well; in Ontario and Quebec, the plant was reranked from S4S5 and S3S4 to S3 (Reddoch & Reddoch 2007; NatureServe 2023). *P. hookeri*'s entire range extends through Newfoundland and Nova Scotia, south to New Jersey and Pennsylvania, and west to Manitoba, Minnesota, and Iowa (NYNHP 2024). It is rare or even extirpated throughout its range (NatureServe 2023).

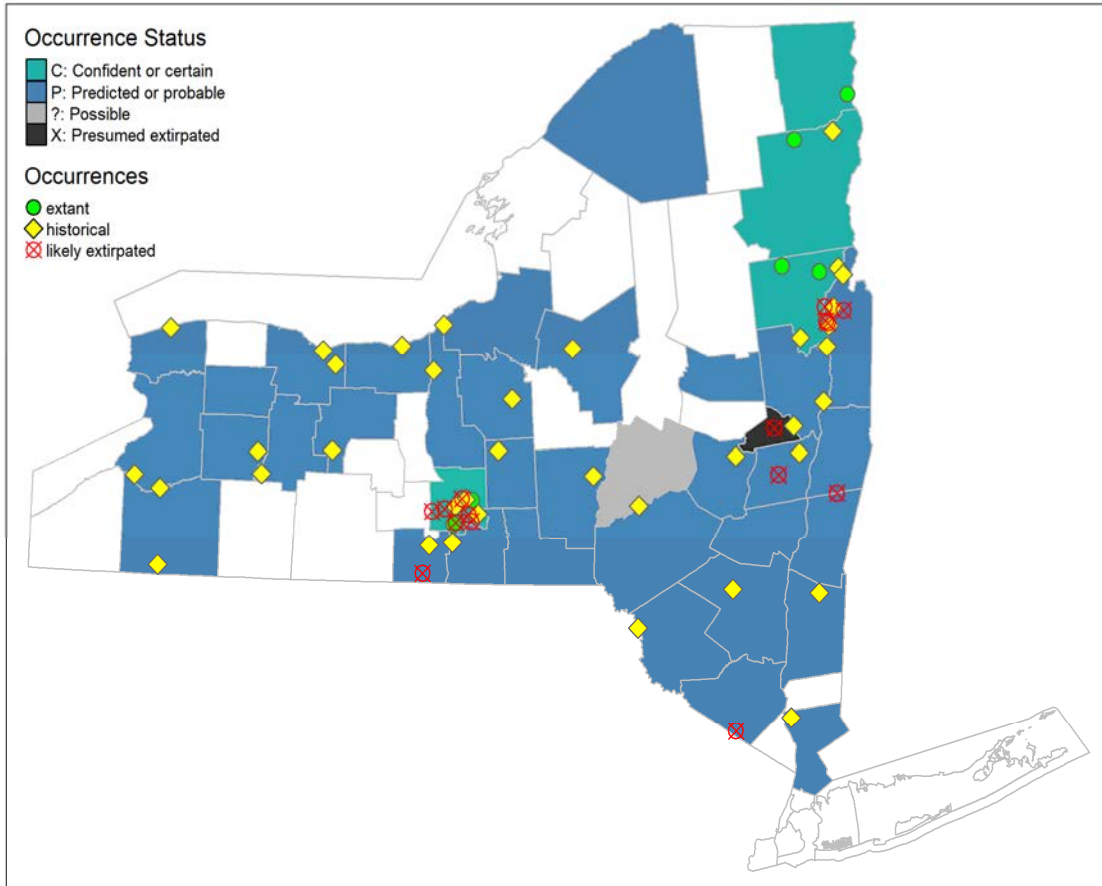


Figure 2. NYS distribution for *Platanthera hookeri*.

Table 1. Number of records (element occurrences) of *Platanthera hookeri* 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	56	69	7.0
1995-2004	4	4	0.4
2005-2014	3	3	0.3
2015-2023	2	2	0.2

Monitoring in New York

Of the extant populations, five occur on DEC land; four occur in the Adirondack Park Preserve, and one is on a state forest (NYNHP 2023). Another population is in a preserve (NYNHP 2023).

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

Northeastern Habitat Classification Macrogroups: Northern Hardwood and Conifer, Plantation and Disturbed Land Pioneer Forest, Cliff and Talus, Central Hardwood Swamp.

NY Natural Heritage Communities: Chestnut oak forest, Hemlock-northern hardwood forest, Beech-maple mesic forest, Red maple-hardwood swamp, Successional northern hardwoods, Appalachian oak-hickory forest, Appalachian oak-pine forest, Limestone woodland, Calcareous talus slope woodland, Pine-northern hardwood forest (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:

This orchid is found in dry to moist woodlands and forest, but seems to prefer more forested areas with open understories or successional forest, particularly those dominated by poplar and pine (NYNHP 2023, 2024). In North America, it is found in dry to rich moist woods, and dry to mesic coniferous and deciduous forest (FNA 2002; Gleason & Cronquist 1991; Fernald 1950). In Pennsylvania, it grows in rich, well-drained deciduous woods (Rhoads and Block 2000). In Michigan, it occupies coniferous or mixed woods, thickets, and borders, especially on wooded dunes and sandy soil near the Great Lakes and is less often in deciduous forest or hemlock-hardwoods (Voss 1972).

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):*

Platanthera hookeri is a tuberous, perennial forb (NYNHP 2023, 2024; Reddoch & Reddoch 2007). Reddoch and Reddoch (2007) describe its life history in the following stages: seed/protocorm, juvenile, immature, immature, flowering, vegetative, and terminal. Seed production may be negatively influenced by shading (Reddoch & Reddoch 2007). In their 25 year study, Reddoch and Reddoch (2007) rarely observed juvenile plants, yet when they did, nearly all were along a decaying log. It likely has mycorrhizal fungal associates like those described by Currah et al. (1990). Juvenile plants have a single, small, narrow leaf, and transition to immature plants with two, small elliptic or circular leaves, after one to four years (Reddoch & Reddoch 2007). Mature plants can flower for over 10 years though they usually cycle between flowering and vegetative states (Reddoch & Reddoch 2007). The periodicity of blooms within a population may be synchronized by rainfall and temperatures (Reddoch & Reddoch 2007). The frequency of flowering increases with leaf size, and the closer a plant is to the terminal stage, the smaller the leaf area is (Reddoch & Reddoch 2007). Mature plants can undergo a dormancy when in the vegetative state as well as in the terminal stage; the terminal

stage is represented by a single small, narrow leaf again (Reddoch & Reddoch 2007). This final stage can last for one to several years before all evidence of its existence disappears; the plants themselves can live for an estimated 40 years (Reddoch & Reddoch 2007). To maintain a population size, continued growth, or a continued procession towards the terminal stage, must be offset by a repletion by juvenile plants (Reddoch & Reddoch 2007). Though this study spanned 25 years, longer-term studies are needed, and studies regarding juvenile recruitment are needed.

Table 2. Phenology of *Platanthera hookeri* in New York State (NYNHP 2023).

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

VI. Threats

The real reasons for the decline of this orchid are unknown; it could be that as individuals naturally senesce, recruitment is failing to occur. Substantial habitat remains throughout the state but past land management practices, habitat destruction, and other factors such as the increase in the deer herd, climate change, and pollution have all been suggested (NYNHP 2023, 2024). Reddoch and Reddoch (2007) suggest decline could be caused by acid rain, herbivory, and succession. More detailed research into this orchid’s decline is needed.

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:

Once more is known about the direct threats to these plants, appropriate management can be undertaken. With so few populations known today and the sharp decline observed over the past 100 years, frequent monitoring should take place to better understand the dynamics influencing these populations.

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 *Platanthera hookeri*.

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:

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].

New York Natural Heritage Program. 2024. Online Conservation Guide for *Platanthera hookeri*. Available from: <https://guides.nynhp.org/hookers-orchid/>. Accessed February 12, 2024.

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].

Werier, David, Kyle Webster, Troy Weldy, Andrew Nelson, Richard Mitchell, and Robert Ingalls. 2023 New York Flora Atlas. [S. M. Landry and K. N. Campbell (original application development), USF Water Institute. University of South Florida]. New York Flora Association, Albany, New York. [Accessed 11/21/2023].

Additional references:

Currah, R.S., E. A. Smreciu, and S. Hambleton. 1990. Mycorrhizae and mycorrhizal fungi of boreal species of *Platanthera* and *Coeloglossum* (Orchidaceae). Canadian Journal of Botany. **68**(6): 1171-1181. <https://doi.org/10.1139/b90-149>

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, Albany, NY. <https://www.nynhp.org/documents/39/ecocomm2014.pdf>

Fernald, M.L. 1950. Gray's manual of botany. 8th edition. D. Van Nostrand, New York. 1632 pp.

Flora of North America Editorial Committee. 2002. Flora of North America, North of Mexico. Volume 26. Magnoliophyta: Liliidae: Liliales and Orchidales. Oxford University Press, New York. 723 pp.

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.

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.

Reddoch, Joyce M. and Allan H. Reddoch. 2007. Population Ecology of *Platanthera Hookeri* (Orchidaceae) in southwestern Quebec, Canada. *The Journal of the Torrey Botanical Society* 134(3). [https://doi.org/10.3159/1095-5674\(2007\)134\[369:PEOPHO\]2.0.CO;2](https://doi.org/10.3159/1095-5674(2007)134[369:PEOPHO]2.0.CO;2)

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.

Rhoads, Ann F. and Timothy A. Block. 2000. The Plants of Pennsylvania, an Illustrated Manual. University of Pennsylvania Press, Philadelphia, PA.

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.

Voss, E.G. 1972. Michigan Flora, Part I. Gymnosperms and Monocots. Cranbrook Institute of Science Bulletin 55 and the University of Michigan Herbarium. Ann Arbor. 488 pp.