

Species Status Assessment

Common Name	auricled twayblade	Date Updated:	2024-01-30
Scientific Name	<i>Neottia auriculata</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):

Auricled twayblade is an herbaceous perennial in the orchid family (Orchidaceae). The genus *Neottia* is synonymous with *Listera*. There are two other species of *Neottia* of conservation concern in New York state: *N. bifolia* and *N. convallarioides*. *Neottia cordata* var. *cordata* is also uncommon in New York (Werier et al. 2023). *Neottia auriculata* is at the southern edge of its range in New York, with a native range extending from Manitoba and northeastern Minnesota through Newfoundland, and northern New England (NatureServe 2023). Its global status is vulnerable (NatureServe 2023). *N. auriculata* tends to grow in cool microclimates, in moist soil or sand in proximity to rivers or swamps that experience ice scouring or seasonal flooding (NYNHP 2023, 2024; FNA 2002). In New York, there are two recorded sites from which *Neottia auriculata* is known; one site is in the Tug Hill region, and the other in the Adirondacks (NYNHP 2023). However, the last sighting of *N. auriculata* in NY was in 2005, when 3 plants were seen; more recent visits found no plants (NYNHP 2023). It is possible that this orchid has disappeared from the state, but due to its small size and seemingly dynamic populations, this orchid is difficult to track (USFS 2005). Targeted surveys and consistent monitoring may help discern patterns in population trends for this little orchid. It may also be the case that closing canopy vegetation shades out the plant and clearing habitat for *N. auriculata* may improve the current lack of plants (NYNHP 2023).

I. Status

a. Current legal protected Status

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

b. Natural Heritage Program

i. Global:	<u>G3G4</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:

Neottia auriculata is Endangered in New York (Ring 2023). It has only been observed at two locations, and only one site is known today (NYNHP 2023). The New York populations are near the southern edge of the orchid's range, with populations more abundant in Canada and in northern New England (NatureServe 2023). There is plenty of additional available habitat, but surveys are difficult since this is such a small plant, and populations tend to be small and local (NYNHP 2024). Targeted surveys in suitable habitat are needed.

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

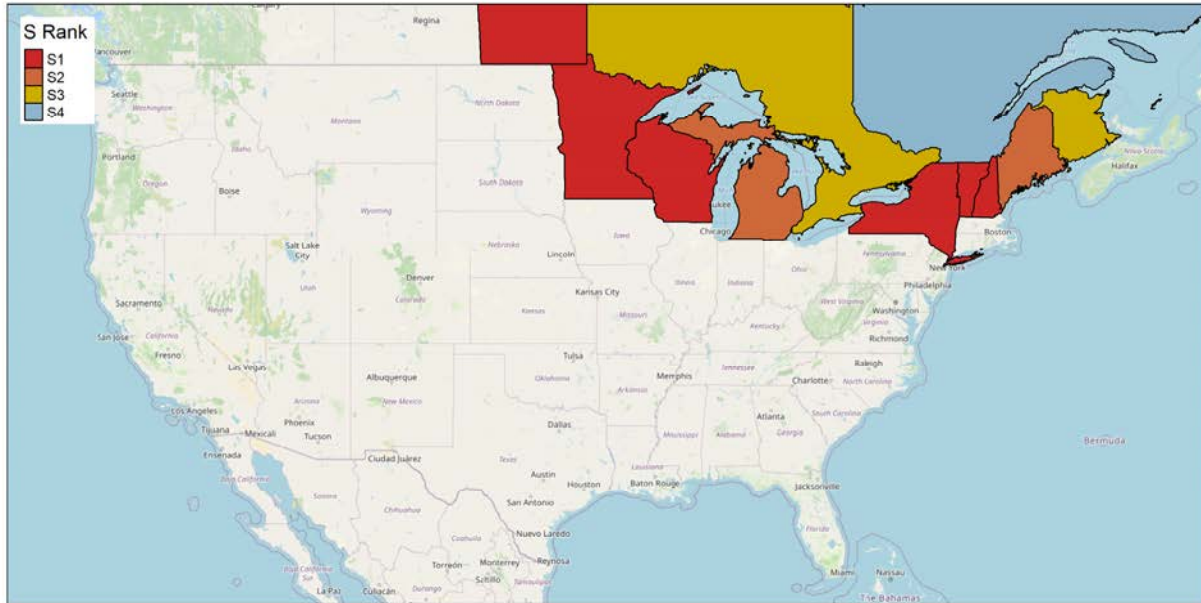


Figure 11. *Neottia auriculata* North American distribution.

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	1,000 km

III. NY Rarity and Trends

Trends Discussion

NatureServe (2023) reports the abundance of *Neottia auriculata* over the last 100 years as relatively stable ($\leq 10\%$ change). In New York, the orchid appears to be decreasing in abundance. It has not been seen at one location since 1927, while the other location has been in documented decline since 1986 (NYNHP 2023). The last three visits to this population, in 2013, 2016, and 2018, found no plants (NYNHP 2023). Trends are difficult to assess, however, due to the fluctuating and ephemeral nature of the populations. The orchids rely on a dynamic river environment, where they may appear at differing stretches of the same river over the years (USFS 2005). Long term trends are difficult to assess for the same reason short-term trends are difficult to discern; the populations rely on a dynamic environment, and so populations are also dynamic (NatureServe 2023; USFS 2005). *Neottia auriculata* is a rare plant, and early qualitative data regarding occurrences are scarce.

Details of historic and current occurrence

In New York, *Neottia auriculata* is at the southern edge of its range (NatureServe 2023). It is restricted to the Adirondack and Tug Hill regions, wherein it is habitat specific. In these regions, the plant has only been reported from two sites. There have been as many as 80 orchids at one site, with half of the plants in flower. Unfortunately, no plants have been seen there since 2005 (NYNHP 2023). Surveys in nearby habitat, such as in swamp downstream of documented occurrences, are needed to confirm the absence of *Neottia auriculata* in New York. Targeted

surveys may be essential in discovering or rediscovering populations. This orchid ranges from Newfoundland to Manitoba and northeastern Minnesota, south to northern Wisconsin, northern Michigan, northern New York, and New England (NatureServe 2023). It has been reported from Labrador, but this report is in question (NatureServe 2023). It has also been falsely reported from Nova Scotia and Prince Edward Island (Kartesz 1999). Field surveys, especially in Canada, may find previously undiscovered populations.

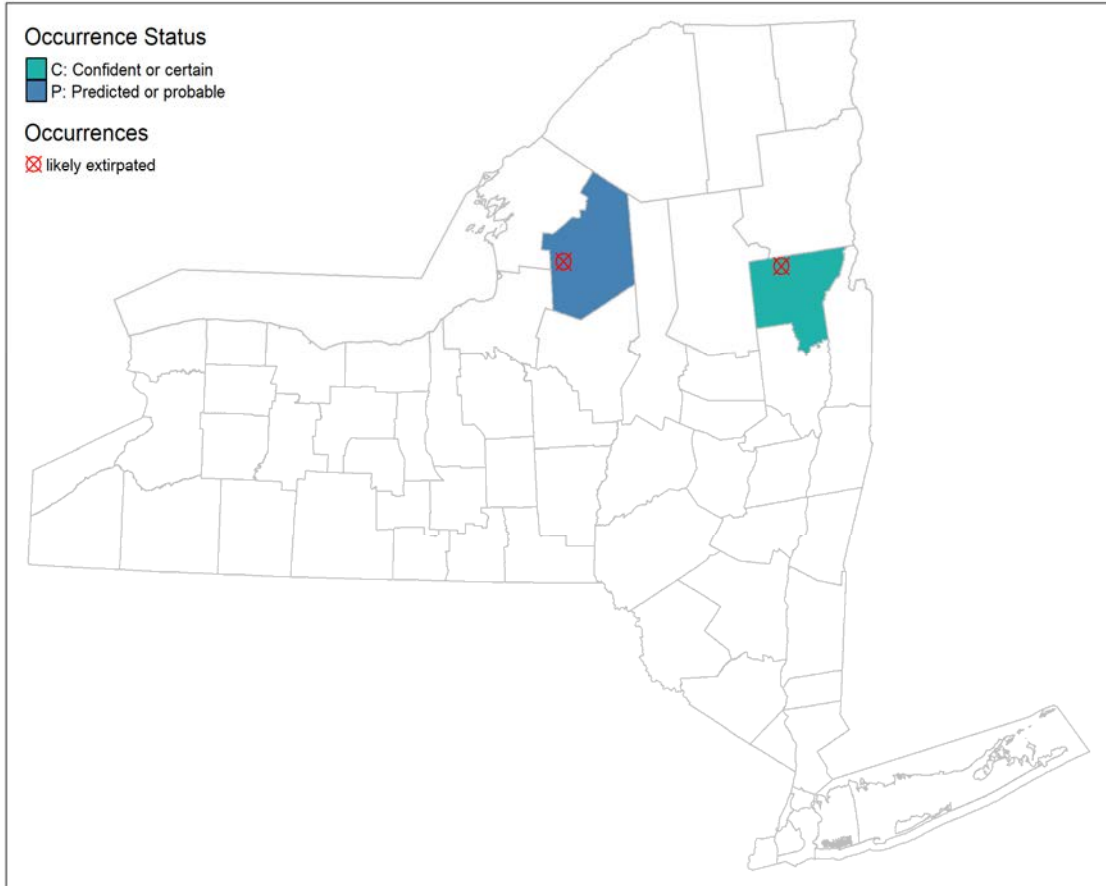


Figure 22. NYS distribution for *Neottia auriculata*.

Table 1. Number of records (element occurrences) of *Neottia auriculata* 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	2	2	0.2
1995-2004	1	1	0.1
2005-2014	1	1	0.1
2015-2023	0	0	0.0

Monitoring in New York

The populations of *Neottia auriculata* have not been regularly monitored, but one population has been visited at least fifteen times between 2018 and 1981. Unfortunately, the last visits, in 2013, 2016, and 2018 found no plants (NYNHP 2023). Though last visited in the mid-1980s, no plants have been found at the other population since 1927 (NYNHP 2023).

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

NatureServe broad habitat types: Forest - Conifer, Forest/Woodland, Forest - Hardwood, Forest - Mixed, scrub-shrub wetland, Bog/fen, Riparian, forested wetland, spring/spring brook (NatureServe 2023).

Northeastern Habitat Classification Macrogroup: Floodplain forest, northern white cedar swamp, mixed hardwood swamp (spruce fir) hemlock; wet meadow shrub marsh, northeastern floodplain forest, northern swamp ()

NY Natural Heritage Communities: Floodplain forest, Northern white cedar swamp, Red maple-hardwood swamp, Riverside ice meadow, Shrub swamp, Spruce-fir 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:

Neottia auriculata grows in cool microclimates, in alluvial soils that remain cool throughout summer (FNA 2002). This orchid is found in low woods, often under hemlock or near coniferous swamps or alder thickets along riverbanks, stream backwaters, small side channels, or edges of lakes (NYNHP 2023, 2024). Descriptions of its habitat often include moist forest, shrub swamps, alder thickets, ice-scoured alluvial banks, flooded banks, or occasionally sphagnum bogs (Fernald 1950; FNA 2002; Gleason & Cronquist 1991). Throughout its range, plants are often found at the high-water flood line, in black muck at humic sites, alluvial sand, and occasionally in calcareous silts or rocky substrates. It has been found in both calcium-rich and calcium-poor sites, though the most characteristic substrate is sandy soil in open alder thickets along rivers (Voss 1972).

The following paragraph describes habitat of *Neottia auriculata* in Ontario, with information from NatureServe (2023). Plants have been found in both sandy and humic substrates. Sandy habitats include moist, sandy floodplains on open ground beneath the shade of alders, just above the spring high-water mark, acid sand of a seasonally flooded riverbank, loose sand of alder thickets, and shaded, damp sand-and-clay riverbank under alders and balsam trees. Humic *Neottia auriculata* habitat in Ontario includes black muck of an acidic alder thicket at the base of a slope, at the foot of a north-facing slope covered with hemlock and balsam fir in black mucky humus, and in dense woods of white cedar, hemlock, and alder where the orchids were growing in wet sphagnum moss near a stream. It has also been found in a spring (seep) bank on a lakeshore. In Quebec, plants have been found on a number of sites associated with rivers,

such as on the borders of rivers and lakes frequently under alders, on poorly drained alluvium in riparian alder (*Alnus rugosa*) woods, in river gravel and wooded riverbanks, and near the mouths of small rivers in calcareous sands. Plants also occur in low woods, including at a forested site of hemlock and black birch in moist soil a few feet from a brook, in low areas in wet forests, in mossy wet places under conifers, and in the undergrowth of conifers. In New Brunswick, this species most commonly grows beneath alders in sand or moss along the edges of rocky streams or rivers. Plants can also be found in alder thickets or arborvitae swamps and on banks.

The following paragraph describes habitat of *Neottia auriculata* in New England states, with information from NatureServe (2023). Plants were found under alders (*Alnus viridis* var. *crispa*) along rivers where ice-scouring and silt deposition during spring floods were evident. In Vermont, plants were found on hummocks under alder clumps in moist somewhat shaded habitat, within an alder thicket/swamp in moist woods. In Maine, the orchids were collected from habitats including alder thickets along rivers, stream banks, wet rocks along shores, banks and springs of spruce woods, boggy wet woods, and Thuja swamps. In Wisconsin, *Neottia auriculata* occurs on alder islands in mucky-sandy soil with sedges and grasses along a river slough. It has also been collected on the Lake Superior shoreline in moist acidic sand in an alder (*Alnus incana*) thicket. In Michigan, it typically occurs in moist, alluvial sands of open alder thickets along rivers and along Lake Superior. It is occasionally found in damp mixed woods or along the banks and mouths of creeks in moderately open habitat with sedges and grasses. On Isle Royale, the orchid occurs in spruce-fir boreal forest. In Minnesota, it has been collected in lowlands near the shore of Lake Superior, including the mossy banks of a creek and in a very shady place in an *Alnus-Cornus* swamp.

Individual plants are frequently found growing under alders (*Alnus* sp.) or among grasses and sedges. Frequent associates include *Alnus rugosa*, *Cornus stolonifera*, *Thalictrum polygamum*, *Calamagrostis canadensis*, *Aster puniceus*, *Conioselinum chinense* and *Trientalis borealis*. In Ontario, associates on sandy riverbanks and floodplains include *Alnus* sp., *Platanthera flava*, *Habenaria psycodes*, *Atrichum crispum*, *Pellia epiphylla*, *Carex intumescens*, *Picea glauca*, *Acer rubrum*, *Ilex verticillata*, *Viburnum cassinoides*, *Equisetum pratense*, *Onoclea sensibilis*, *Athyrium felix-femina*, *Glyceria striata*, *Carex crinata*, *C. gracillima*, *Thalictrum polygamum*, *Rubus pubescens*, *Hypericum ellipticum*, *Viola* sp., *Scutellaria laterifolia* and *Viburnum trilobum*. Associates at mucky sites include *Onoclea sensibilis*, *Athyrium felix-femina*, *Carex intumescens*, *Maianthemum canadense*, *Rubus pubescens*, *Viola* sp., *Thalictrum polygamum*, *Platanthera psycodes*, *Scutellaria laterifolia* and *Climacium dendroides*. In New Hampshire, associates include alder (*Alnus* sp.) and violets (*Viola* sp.). Associates in a Vermont alder thicket/swamp include *Alnus rugosa*, *Galium palustre*, *Aryopteris clintoniana* and *Polygonum sagittatum*. Associates in a Wisconsin lakeshore alder thicket include *Ophioglossum vulgatum*, *Spiranthes gracilis*, *Liparis loeselii* and *Lycopodium inundatum* (NatureServe 2023).

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):

Neottia auriculata is an herbaceous perennial orchid. There is little specific knowledge available relating to the biology or life history of *Neottia auriculata*. Seeds of *N. auriculata* are believed by some to be impervious to moisture and consequently, may be dispersed via floatation to new, available habitat by spring floods (Alverson 1981b). If germination at new sites is to occur, a source of nourishment is necessary if plants will continue to develop (Maier 1978). Most terrestrial orchids form mycorrhizal associations with various fungi, usually Zygomycetes of the

genus *Rhizoctonia* (Case 1964). Such associations typically begin at germination when the fungi digest the orchid seed coat. A protocorm typically develops shortly thereafter and begins to differentiate. Many orchids are saprobes when immature and, in such situations, the fungus may play an essential role in providing nourishment (Case 1964). *Neottia auriculata* flowers from mid-June to mid-July in New England (Brackley 1985; Crow 1982), late June to early July in southern Ontario, and until late July farther north (Whiting and Catling 1977). Fernald (1899) stated that *Neottia auriculata* apparently flowers in late June in Maine, about ten days earlier than *N. convallarioides*. Case (1964) listed the time of flowering from late June to early August. There is a belief that populations of *Neottia auriculata* are highly ephemeral (Case, in litt.), due in part to the dynamic nature of the alluvial sand habitat and the short longevity of the species life span (Nepstad 1981). Plants tend to develop best at the high-water line of spring floods (Crow 1982).

Table 2. Phenology of *Neottia auriculata* in New York State (NYNHP 2023).

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

VI. Threats

Some fear that natural flooding and ice scouring may threaten this plant, but it seems to reappear each year after significant flooding and ice scouring events. These actions may maintain these populations (NYNHP 2023). There are few real threats to this plant in New York, but threats throughout its range include changes in hydrology, destruction of habitat, and overcollection (NatureServe 2023).

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:

No direct management requirements are needed for this orchid except to protect the sites where populations occur. This should include protection to any waterways that may influence the 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 *Neottia auriculata*.

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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