

# Species Status Assessment

<b>Common Name</b>	Fairywand	<b>Date Updated:</b>	2024-01-11
<b>Scientific Name</b>	<i>Chamaelirium luteum</i>	<b>Updated By:</b>	Kyle J. Webster
<b>Family</b>	Melanthiaceae		

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

Fairywand (*Chamaelirium luteum*), also called devil's bit, is a perennial forb/herb in the Bunchflower Family (Melanthiaceae). *Chamaelirium luteum* occurs in eastern North America from Michigan and Ontario, east to Massachusetts, and south to Louisiana and Florida. It is relatively rare in the northern portion of its range, and more common in Pennsylvania, Virginia, and North Carolina. Fairywand is the only representative of the *Chamaelirium* genus in NY (Werier et al. 2023).

In New York, *Chamaelirium luteum* can occur in a wide variety of habitats including limestone woodlands, rich mesophytic forests, red cedar rocky summits, successional old fields, Allegheny oak forests, calcareous talus slope woodlands, maple-basswood rich mesic forests, successional northern hardwoods, red maple-tamarack peat swamps, and rich sloping fens (NYNHP 2023, 2024).

*Chamaelirium luteum* has declined in New York over the last 100 years. The factors for this decline are not completely understood, but succession and canopy closure are important factors. Overcollections of the plants for its root, which was highly valued for its medicinal properties, may also have contributed to its decline (NYNHP 2024). There are approximately 50 historical occurrences, but only nine extant populations are known today. More research and surveys of *Chamaelirium luteum* are needed to understand the reasons for its decline and identify strategies for its conservation in New York.

## I. Status

### a. Current legal protected Status

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

### b. Natural Heritage Program

<b>i. Global:</b>	<u>G4G5</u>		
<b>ii. New York:</b>	<u>S1S2</u>	<b>Tracked by NYNHP?</b>	On Active Tracking List

**Other Ranks:**

COSEWIC: Not listed in Canada

IUCN Red List: Not assessed by IUCN Red List

**Status Discussion:**

*Chamaelirium luteum* is Endangered in New York (Ring 2023). There are nine extant, 50 historical, and one extirpated occurrence in New York. This species is threatened by over collection and natural succession, which are both likely factors in its decline. More research is needed to fully understand the reasons for its decline and to identify strategies for its conservation.

**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	S1	
New Jersey	Yes	Unknown	Unknown	Unknown	S3	
Pennsylvania	Yes	Unknown	Unknown	Unknown	S4	
Vermont	No	-	-	-		
Ontario	Yes	Unknown	Unknown	Unknown	SX	
Quebec	No	-	-	-		

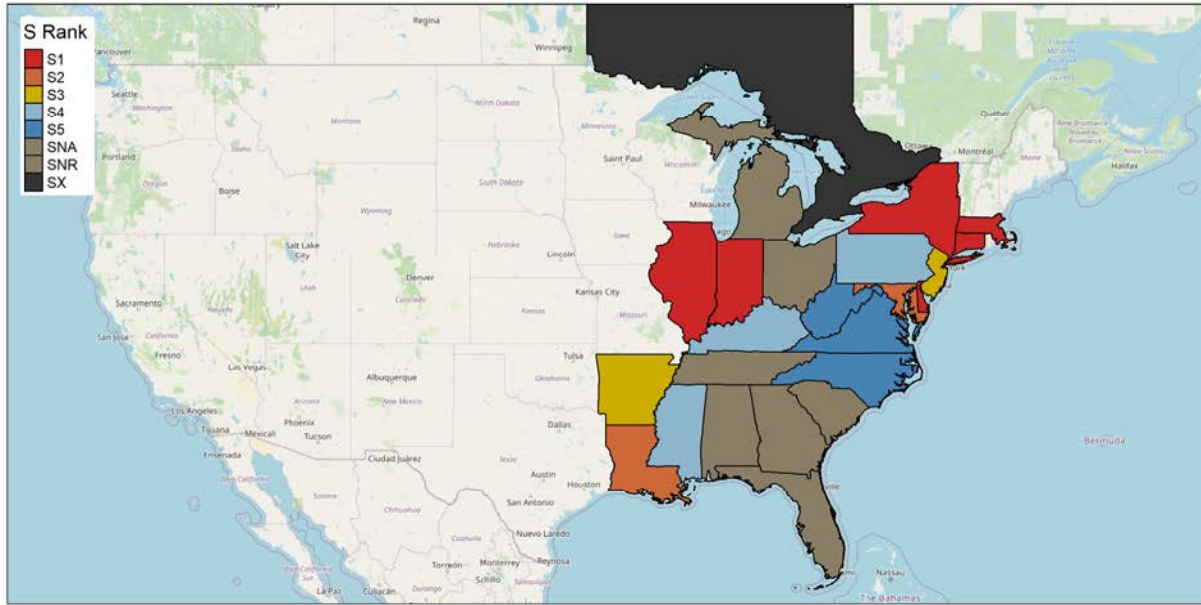


Figure 11: *Chamaelirium luteum* North American distribution.

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

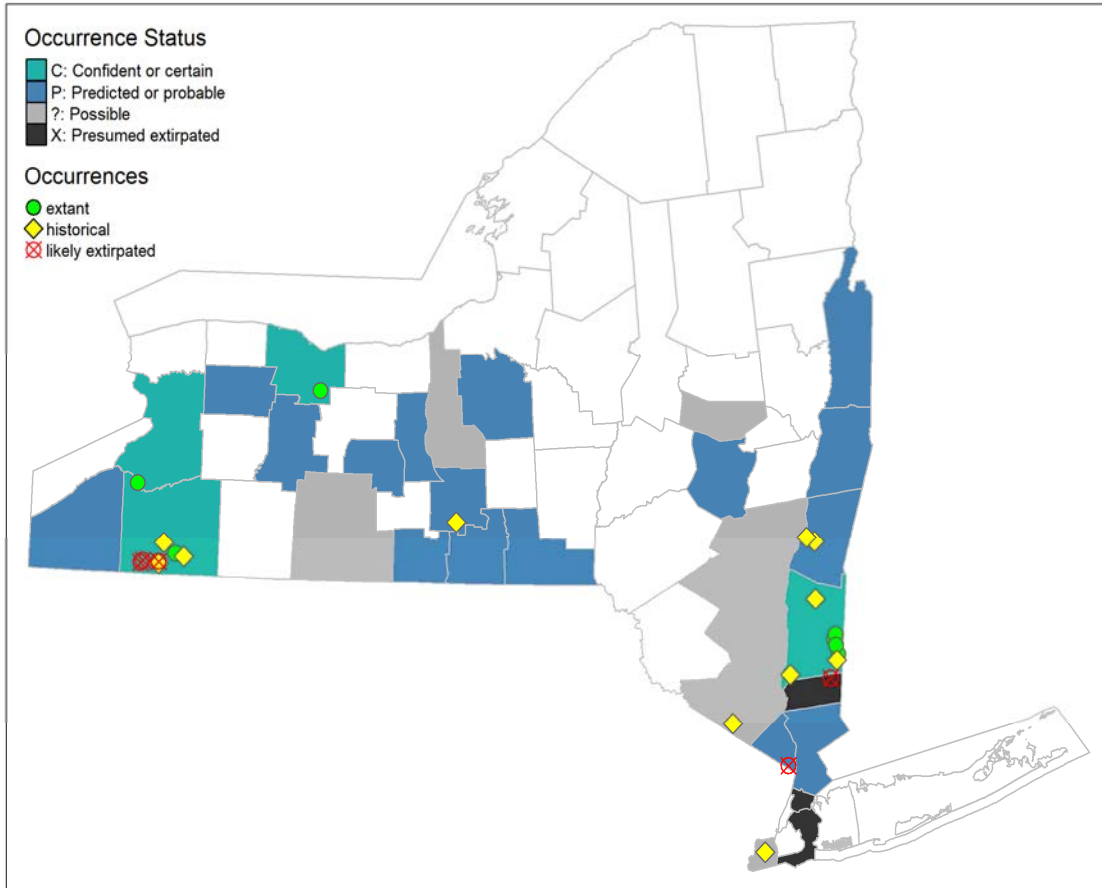
### III. NY Rarity

#### Trends Discussion

*Chamaelirium luteum* has declined in both the short and long-term. There has been a continuous decline in the number of plants within known populations over the past 20-30 years and a clear decline in the overall number of extant populations of the last 100 plus years. Succession and canopy closure are likely drivers of this decline, along with over collection, but the factors for this decline are not completely understood and need further study. In the early 1900s, the roots of this plant were collected and sold for medicinal purposes. Collectors received 30 to 45 cents per pound (NYNHP 2024). The amount of root stock collected from New York and its impact is not known.

#### Details of historic and current occurrence

This plant was historically documented from Rensselaer County south through the Hudson Valley and westward throughout New York south of the Adirondacks. While this plant has had a broad distribution, today it is only known from a few populations in western New York and the southern Hudson Valley. There are approximately 10,000 individuals present in New York. Abundance may be underestimated due to the difficulty in locating vegetative individuals.



**Figure 22:** NYS distribution for *Chamaelirium luteum*.

**Table 1.** Number of records (element occurrences) of *Chamaelirium luteum* 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	23	32	3.2
1995-2004	0	0	0.0
2005-2014	0	0	0.0
2015-2023	1	1	0.1

### Monitoring in New York

There are 60 populations known statewide, of which nine are extant, 50 are historical, and one is extirpated. Only 14 of the 50 historical populations are shown in Figure 2 and Table 1. Two populations occur on NYS Park lands, one occurs on NYS DEC lands, and four occur on other protected lands. The populations on NYS Parks lands are monitored on a ten-year rotation. None of the other populations have been regularly monitored. Of the extant populations, six

were last seen between 1986 and 1992, two were seen in 2000 and 2002 respectively, and one was recently found in 2018 (NYNHP 2023, 2024).

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

NatureServe broad habitat types: Forest/Woodland, FORESTED WETLAND, Riparian

NY Natural Heritage Communities: Limestone woodland, Rich mesophytic forest, Red cedar rocky summit, Successional old field, Allegheny oak forest, Calcareous talus slope woodland, Maple-basswood rich mesic forest, Successional northern hardwoods, Red maple-tamarack peat swamp, Rich sloping fen.

#### **Habitat or Community Type Trend in New York**

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

#### **Habitat Discussion:**

In New York, *Chamaelirium luteum* is found in a wide variety habitat including oak woodlands, mesic woodlands, oak barrens, mixed young mesophytic woods, old pastures with red cedars, moist thickets, calcareous seeps in red maple-tamarack swamps; calcareous wet meadows within old successional woods, calcareous rocky summits, and rich sloping fens. In areas where the canopy is closed, the plants may remain vegetative; however, flowers typically appear as soon as the canopy is opened (Edinger et al. 2014, NYNHP 2023, 2024).

Moist meadows, thickets, rich wooded slopes, and covers (Flora of North America 2002). Moist woods and bogs (Gleason and Cronquist 1991). Moist meadows and woods (Newcomb 1977). Meadows, thickets, and rich woods (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):

*Chamaelirium luteum* is a dioecious perennial forb (Meagher 1981, NYNHP 2024, Werier et al. 2023), though occasional polygamo-monoecious plants, with perfect flowers at the base of the male inflorescences, are be found (Blau and Venezia 1983).

Plants flower from May through to July (NYNHP 2023, 2024, Blau and Venezia 1983) and seeds are dispersed in mid to late fall (Baskin et al. 2001, NYNHP 2023) by forced ejection or wind. The wing-like structures (arils) on the seeds may increase dispersal distance by wind (Meagher 1986, Meagher and Thompson 1987). The seeds require both cold stratified and light exposure to initiate germination. Baskin et al. (2001) found that seeds stratified for 12 weeks and then exposed to light for two weeks had a germination rate of 90-100%.

After germination the plants form a basal rosette with a short rhizome (Meagher 1981). While plants can persist in shade for an extended period, higher light conditions are needed to initiate flowering (NYNHP 2023, Allard 2003). Female plants were found to delay flowering until the plants were older and typically larger, and rarely flowered two years in a row (Meagher 1981).

The female plants have tall persistent inflorescences with many basal leaves, while male plants have shorter inflorescences that wither after flowering, with fewer basal leaves (Meagher 1981). Meagher (1981) reports male plants typically flowering prior to the female plants while Allard (2003) reports that they flower synchronously in the New England area. *Chamaelirium luteum* is insect pollinated. Floral visitors include bees and butterflies, but specific pollinators are not known.

Meagher (1981) found that populations typically contain more male than female plants, though only a small portion of the plants in a population flower every year (Meagher 1981). Individuals were typically small the year after flowering, indicating it is a significant drain of resources, and noted that this was more pronounced in female plants (Meagher 1981). Female plants were also found to have a higher mortality rate, presumably because of the impact of flowering (Meagher 1981).

**Table 2.** Phenology of *Chamaelirium luteum* in New York State.

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

## VI. Threats

Many plants are threatened by succession and lack of additional habitat in which to spread. While individual plants can survive for many years under canopy closure, they do not reproduce. In this habitat state the populations can be severely impacted by competition from other plants, deer browse, collection, and trampling.

### 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:

Some populations have benefited from the creation of light gaps (NYNHP 2023). At one site in the southern Hudson Valley where few to no plants were producing flowers, many trees were cut in order to create light gaps. The following season, many plants produced flowers and set seed, which resulted in the recruitment of juvenile plants (NYNHP 2023). Using this site as an example, the other sites may also benefit from the controlled removal of select trees and shrubs. More research regarding the management of these populations is needed.

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 *Chamaelirium luteum*.

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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