

# Species Status Assessment

**Common Name:** a zale moth

**Date Updated:** 2/27/2025

**Scientific Name:** *Zale largera*

**Updated By:** Hollie Shaw

**Class:** Insecta

**Family:** *Erebidae*

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

*Zale largera* is difficult to identify and needs expert review. It looks very similar to the white pine feeding *Z. duplicata* (NatureServe 2025).

*Zale largera* is known from only one location in New York in Clinton County. Its foodplant, *Pinus banksiana* is mostly restricted to that region of the state (Werier et al. 2025) and therefore *Z. largera* is restricted to the same area. Distribution data for the United States and Canada is incomplete or has not been reviewed by NatureServe for this taxon (NatureServe 2025).

Trends are unknown and additional research is needed. In New York, the species is known from one location. It was first reported in 1995 and was found again in 2024 at a site over 4.5 miles from the 1995 trap location but within the same habitat (New York Natural Heritage Program 2025a).

The only known food plant for *Z. largera* is *Pinus banksiana* (jack pine). The occupied habitat is known as sandstone pavement barrens and is globally rare (G2) (NatureServe 2025) and in New York is considered critically imperiled (S1) (New York Natural Heritage Program 2025a). The canopy at the site composed of jack pine and pitch pine (*Pinus rigida*) and there are numerous small perched boggy wetlands scattered throughout the barrens. There is extensive exposed sandstone bedrock and a layer of heath (Ericaceae) shrubs and sparse grasses (New York Natural Heritage 2025c).

## I. Status

### a. Current legal protected Status

i. **Federal:** not protected \_\_\_\_\_ **Candidate:** no \_\_\_\_\_

ii. **New York:** not protected \_\_\_\_\_

### b. Natural Heritage Program

i. **Global:** G4 \_\_\_\_\_

ii. **New York:** S1 \_\_\_\_\_ **Tracked by NYNHP?:** Yes \_\_\_\_\_

### Other Ranks:

-NYS 2025 SGCN Status: High Priority Species of Greatest Conservation Need

-IUCN Red List: Not listed

-Northeast Regional SGCN: Not listed

### Status Discussion:

This species is known from one site in New York that is a globally rare ecosystem and the food plant (jack pine) is mostly restricted to upstate New York as a native plant. It was rediscovered in 2024 (New York Natural Heritage Program 2025a).

## II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			-
Northeastern US	Yes	Unknown	Unknown			-
New York	Yes	Unknown	Unknown			-
Connecticut	Unknown	Unknown	Unknown			-
Massachusetts	Unknown	Unknown	Unknown			-
New Jersey	Unknown	Unknown	Unknown			-
Pennsylvania	Unknown	Unknown	Unknown			-
Vermont	Unknown	Unknown	Unknown			-
Ontario	Unknown	Unknown	Unknown			-
Quebec	Unknown	Unknown	Unknown			-

*Column options*

**Present?:** Yes; No; Unknown; No data; (blank) or Choose an Item

**Abundance and Distribution:** Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item

**SGCN?:** Yes; No; Unknown; (blank) or Choose an item

**Monitoring in New York** (*specify any monitoring activities or regular surveys that are conducted in New York*):

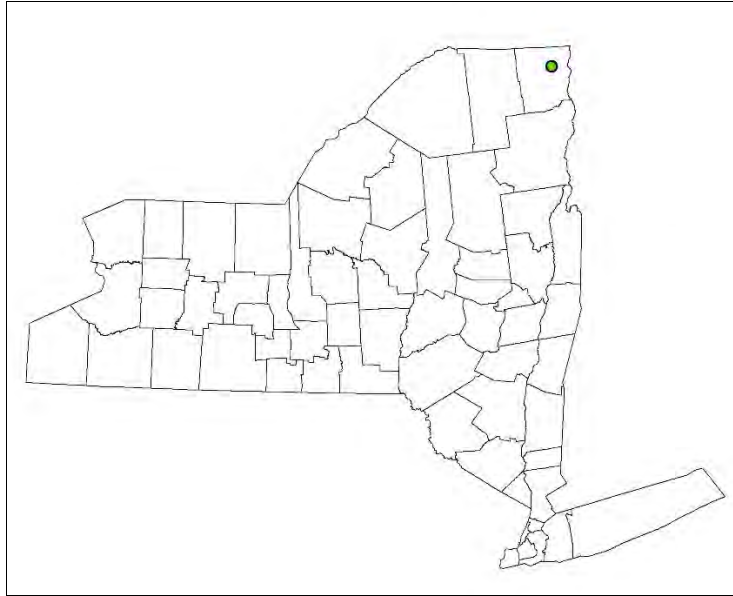
There are no known monitoring activities or regular surveys other than occasional lepidopteran surveys by the New York Natural Heritage Program.

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

The long-term trends are unknown. The one known location in New York was first documented in 1995. More sampling is needed to determine the short-term trends which are also currently unknown. A total of two adult moths were captured at black lights on successive nights in May of 1995 and one was found in 2024 at a trap location more than 4.5 miles from the original location within the same habitat (New York Natural Heritage Program 2025a).

Little is known about this species range wide including its distribution, status, and trends.

**III. New York Rarity** (provide map, numbers, and percent of state occupied)



**Figure 1.** Records of *Zale largera* in New York (New York Natural Heritage Program 2025a).

Years	# of Records	# of Counties	% of State
Pre-2000	1	1	<1%
2000- 2023	1	1	<1%

**Table 1.** Records of (*Zale largera*) in New York.

**Details of historic and current occurrence:**

This species is historically and currently known from one site in Clinton County, New York.

**New York’s Contribution to Species North American Range:**

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
Choose an item.	Choose an item.	The distribution is unknown.

Column options

**Percent of North American Range in NY:** 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item

**Classification of NY Range:** Core; Peripheral; Disjunct; (blank) or Choose an item

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

- a. Acidic Rocky Outcrop (in NY, Sandstone Pavement Barrens)
- b.

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

Habitat Specialist?	Indicator Species?	Pollinator Species?	Habitat/Community Trend	Time frame of Decline/Increase
Yes	Unknown	No	Unknown	

Column options

**Habitat Specialist, Indicator Species and Pollinator Species:** Yes; No; Unknown; (blank) or Choose an item

**Habitat/Community Trend:** Declining; Stable; Increasing; Unknown; (blank) or Choose an item

**Habitat Discussion:**

The habitat in New York is known as sandstone pavement barrens and is globally rare (G2) (NatureServe 2025) and in New York is considered critically imperiled (S1) (New York Natural Heritage Program 2025a). The canopy at the site composed of jack pine and pitch pine (*Pinus rigida*) and there are numerous small perched boggy wetlands scattered throughout the barrens. Jack pine is the food plant of *Z. largera*. There is exposed sandstone bedrock and a layer of heath (Ericaceae) shrubs and sparse grasses (New York Natural Heritage 2025c).

**V. Species Demographic, and Life History:**

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/Catadromous?
Yes	-	No	Yes	Yes	(blank)

Column options

**First 5 fields:** Yes; No; Unknown; (blank) or Choose an item

**Anadromous/Catadromous:** Anadromous; Catadromous; (blank) or Choose an item

**Species Demographics and Life History Discussion** (include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):

The exact phenology of *Z. largera* is unknown. *Z. largera* was once thought to belong to *Z. duplicata* as the food plant race *Z. duplicata largera*. The phenology for *Z. duplicata largera* was not described separately in Forbes (1954). If its life history is similar to *Z. duplicata*, the moth is active in May and early June. This appears to be true at the site in New York with captures in mid/late May in 1995 and early June in 2024. Caterpillars should be present in late June through

August. Data about the pupa stage and the exact timing of emergence in New York are unknown (New York Natural Heritage 2025c).

## **VI. Threats** (from NY 2015 SWAP or newly described):

The primary threats to *Z. largera* are the loss of habitat due to fire suppression and the introduction or spread of invasive species. Other threats include excessive logging, and mineral excavation (New York Natural Heritage Program 2024b). Most jack pinecones will not open without reaching temperatures of 120°F or more. These trees adapted to reproducing after fires (Michigan State University Extension 2014). While the loss of jack pines due to fire suppression is a potential threat, a large fire could also destroy the only known population in the state. It is essential for jack pines to persist without aggressive management techniques that could be detrimental to *Z. largera* (McCabe 2004).

The spraying of biological control agents or pesticides for spongy moths is another potential threat. Spongy moths inhabit deciduous forests that can be adjacent jack pine stands. It is unknown if the use of Btk (*Bacillus thuringiensis* - a bacterial biological control agent designed to kill spongy moth caterpillars) would affect *Z. largera* caterpillars.

<b>Threat Level 1</b>	<b>Threat Level 2</b>	<b>Threat Level 3</b>	<b>Spatial Extent</b>	<b>Severity</b>	<b>Immediacy</b>	<b>Trend</b>	<b>Certainty</b>
5. Biological Resource Use	5.3 Logging & Wood Harvesting	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.1 Fire & Fire Suppression	7.1.2 Suppression in the fire regime	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.3 Herbicides & pesticides (spongy moth pesticides)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

**Table 2.** Threats to *Zale larges*

## 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:**

Some of the land is protected.

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

The best management strategy for this species is the management of the natural community, or habitat, where this species occurs. Maintain the full suite of plant and animal species which requires frequent (every few decades) disturbance to maintain open-canopy, shrub-dominated communities and to prevent succession to a closed-canopy hardwood forest (Jordan et al. 2003). Researchers have determined that "an active fire management program utilizing prescribed fire with appropriate mechanical treatments" is the preferred method (Jordan et al. 2003). Researchers have also determined that the size, type, intensity, and timing of fires (pyrodiversity) needs to be evaluated for each site to maximize benefits to the natural community and the species it supports (Jordan et al. 2003). Since *Zale largera* depends on jack pine, a fire adapted species, appropriate fire management may be needed to maintain the jack pine component of the only known *Z. largera* location. Because jack pinecones are located and held at the top of the tree, high intensity crown fires are necessary for the cones to open and germinate in large numbers. However, some cones on each tree may not be encased in as thick a resin and may open without extreme heat. Some populations of jack pine may be more prone to this condition and may, therefore, not be as fire dependent. There is concern that the barrens where the only *Z. largera* occurrence is located is reaching maturity and may be replaced by other species if fire is excluded from the system (Hawver 1993). However, any prescribed burning program should take into account rare lepidoptera species which could be negatively affected by loss of eggs, pupae, larvae, or adults depending on the size and timing of the burned area. Any burning should leave refugia or large areas of unburned habitat and the entire area should not be burned in the same year. More research is needed into the biology and life-cycles of several highly habitat-specific rare lepidoptera species that inhabit these barrens before any intensive management strategy is determined (McCabe 2004).

Maintain a native shrub transition zone near the edges of the jack pine habitat. Reduce and/or eliminate invasive species (including invasive native woody species), minimize trail networks, and clearly mark existing trails. Encourage surrounding landowners to establish natural buffers and restore natural corridors to the main habitat (New York Natural Heritage Program 2025b).

Insecticide use should be avoided when possible if rare species are present. When insecticide use cannot be avoided, careful planning along with consistent rare species monitoring, can result in successful eradication of the target species without eliminating rare species. Attempt to control spongy moth populations to avoid extreme oak defoliation. A biocontrol alternative is *Bacillus thuringiensis* (Btk) for some target species, such as spongy moths. Sensitivity varies between species, and it appears that most species are not sensitive to Btk approximately two weeks post-application. There are two other spongy moth biocontrols that appear to be very effective at eliminating or slowing the spread of spongy moths with little effect on non-target species: Gypchek (Reardon et al. 2016) and *Entomophaga maimaiga* (a fungus). *E. maimaiga* was introduced in 1910 and 1911 and was rediscovered in 1989 in the northeast it can be highly variable (Shelton 2025).

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct Habitat Management	Site/Area Management
A.2 Direct Species Management	A.2.0.0.0 Direct Species Management	Invasive/problematic species control
B.3 Outreach	B.3.0.0.0 Outreach	Awareness and Communications
C.6 Design and Plan Conservation	C.6.0.0.0 Design and Plan Conservation	Site/Area Protection
C.6 Design and Plan Conservation	C.6.0.0.0 Design and Plan Conservation	Resource/Habitat Protection
C.6 Design and Plan Conservation	C.6.5.1.3 Develop a conservation, management, or restoration plan for protected private lands	Habitat & natural process restoration
C.7 Legislative and Regulatory Framework or Tools	C.7.0.0.0 Legislative and Regulatory Framework or Tools	Policies and Regulations
C.9 Education and Training	C.9.2.0.0 Training and individual skill development	

**Table 2.** Recommended conservation actions for *Zale largera*

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