Species Status Assessment

Common Name: A notodontid moth **Date Updated:** March 2025

Scientific Name: *Heterocampa varia* **Minor Edits By:** **NYSDEC Wildlife Section**

Class: Insecta

Family:

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

Heterocampa varia occupies habitat in six states on the east coast. *H. varia* is listed under the common names of prominent moth and sandplain heterocampa. Extant populations are known from NY, NJ, MA, and NC. This species historically ranged from Massachusetts to Georgia. *H. varia* inhabits scrub oak-pitch pine barrens and heath land, sandy grass lands with oak components, and open savanna-like oak woodland. The larval host plant of this species is scrub oak (*Quercus ilicifolia*), but this moth most likely feeds on additional oak species. The short-term trend for this species has been stable in New York, with extant populations occurring in eastern Long Island. The long term trends of this species have declined 50-90% due to habitat loss and fire suppression. This species is pyrogenic, requiring frequent fires to maintain open habitat and the growth of larval host plants.

DEC is not aware of any additional data or new information on population trends or threats to this species since the last SWAP revision in 2015. This species was listed as SPCN in 2015, but with the removal of this status in the 2025 revision it has been changed to SGCN.

I. Status

a. Current legal protected Status

i. **Federal:** Not listed **Candidate:** _____

ii. **New York:** Special Concern

b. Natural Heritage Program

i. **Global:** G3G4

ii. **New York:** S1S2 **Tracked by NYNHP?:** Yes

Other Ranks:

-NYS 2025 SGCN Status: SGCN

-IUCN Red List:

-Northeast Regional SGCN:

Status Discussion:

Heterocampa varia is not threatened in northeastern United States except by its rarity; there are only 10 extant occurrences in the 6 states with historical records. This species is listed as possibly extirpated in South Carolina, Georgia and Massachusetts; critically imperiled in New York and North Carolina; and vulnerable in New Jersey (NatureServe 2012). Increased monitoring could discover additional populations in historic localities.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Declining	2002-2012		-
Northeastern US	Yes	Declining	Declining	2002-2012		-
New York	Yes	Stable	Stable	2002-2012		Yes
Connecticut	No	-	-			-
Massachusetts	No data	Unknown	Unknown			-
New Jersey	No data	Unknown	Unknown			Yes
Pennsylvania	No	-	-			-
Vermont	No	-	-			-
Ontario	No	-	-			-
Quebec	No	-	-			-

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):*

Intermittent surveys have been conducted in pine barren communities of Long Island.

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

Short-term population trends of this species in New York have been relatively stable over the past decade. The long-term trend in New York has declined due loss of habitat and fire suppression. Throughout the species range, short term population trends have been relatively stable to 30% decline. The long-term trends have been in a decline of 50-90% (New York Natural Heritage Program 2011, NatureServe 2012).

In the Northeast, *Heterocampa varia* can be found in Nantucket and Martha's Vineyard, MA, eastern Long Island, NY and the New Jersey Pine Barrens. There are also disjunct populations in North Carolina, South Carolina and Georgia (NatureServe 2012). Recently, populations were discovered in northern Florida (Schweitzer et al. 2011).

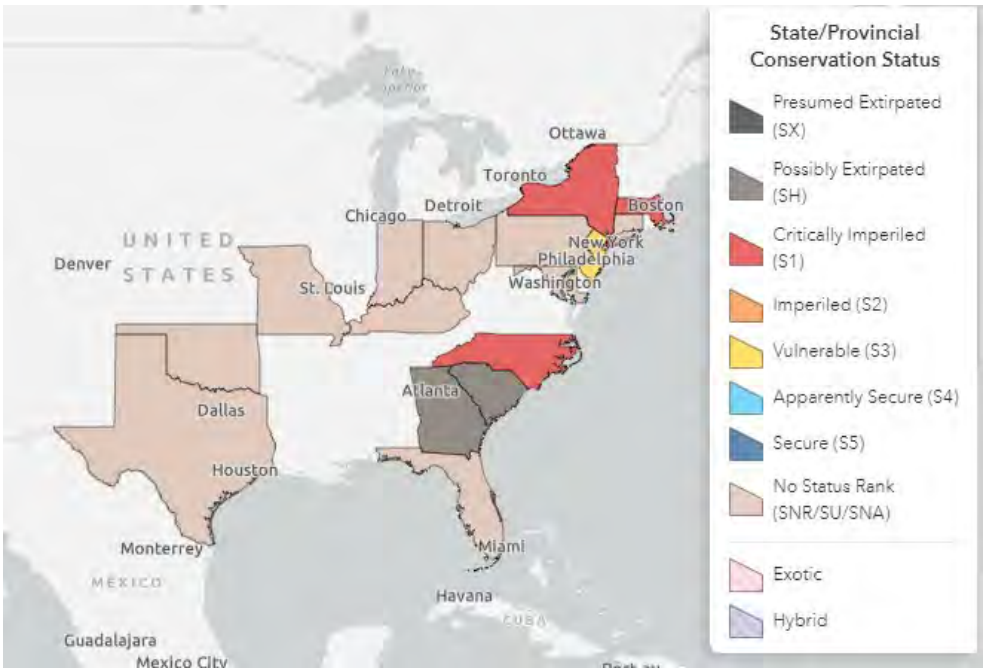

Figure 1. Conservation status of *Heterocampa varia* in North America (NatureServe 2024).

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

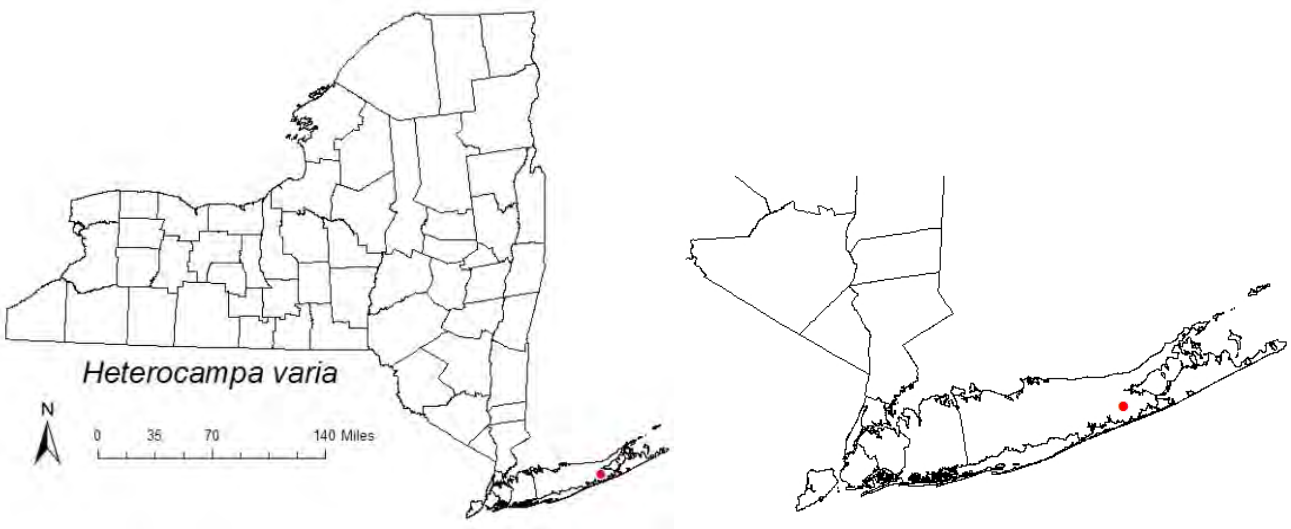

Figure 2. Occurrence locations of *Heterocampa varia* in New York (NYNHP 2013). Map created by Shawn Ferdinand, NYSDEC.

Details of historic and current occurrence:

This species was reported from Orient, Suffolk County (Forbes 1948).

A population of *Heterocampa varia* has been known to be extant and viable since 1986 in the dwarf pine barrens, Southampton, Suffolk County (New York Natural Heritage Program 2013). Specimens were collected in 1986, 1993, 1997, 1999, and 2005.

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
1-25%	Peripheral	

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. Oak Forest

b. Oak-Pine Forest

c. Pine Barrens

d. Coastal Hardwoods

e. Coastal Coniferous Barrens

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Pollinator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
Yes	No	Choose an item.	Declining	

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:

This species can be found in xeric habitats with sandy soils. In Long Island, this species is found in dwarf pine barrens, dominated by *Pinus rigida* and *Quercus ilicifolia*. In Massachusetts this species is associated with coastal scrub oak barrens and heathlands, sandplain grasslands with a scrub oak component and savanna-like oak woodland (Wagner et al 2003, Nelson 2007).

V. Species Demographic, and Life History:

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Yes	-	-	Yes	Yes	-

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):*

Adult flight period is from June through July. Adults emerge before midnight, and females probably will have mated by dawn. Eggs are laid on larval foodplant species, consisting primarily of scrub oak (*Quercus ilicifolia*), but can also be found on post oak (*Quercus stellate*) and dwarf oak (*Quercus prinoides*). Eggs hatch 6 to 9 days after oviposition. Larvae feed for 4-5 weeks before burrowing in the soil for pupation. Larvae pupate several inches under the soil and may overwinter for up 2-3 years. The depth at which larvae pupate protects them from wildfires (Nelson 2007, NatureServe 2012). This species is pyrogenic, requiring frequent fires for the maintenance of its habitat. Adults can be seen flying from mid-June to mid-August (New York Natural Heritage Program 2011, Schweitzer et al. 2011).

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

Habitat loss and fragmentation have historically caused declines in populations in MA, NY and NJ. Fire management is needed to maintain the open structure of the habitat and promote growth of host plants. Additional threats to this species include invasion of exotic plants, insecticide spraying, off-road vehicles and light pollution. Broad scale studies have found light pollution to affect moth behavior, reproduction and predation rates (Frank 2006). *Heterocampa varia* is threatened by introduced parasitoids, especially the tachinid fly (*Compsilura concinnata*). The tachinid fly parasitizes larger caterpillars, and reaches its greatest population densities and parasitism rates in late summer and early fall, when larvae of *Heterocampa varia* are developing (Boettner et al. 2000). General threats known to affect moths include habitat include natural succession of shrubland, woodland, and barrens habitats; land clearing; coastal erosion; and sea level rise (NYSDEC 2005).

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
1. Residential and Commercial	1.1 Housing & Urban Areas	(habitat loss)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
6. Human Intrusions & Disturbance	6.1 Recreational Activities	6.1.1 Motor vehicles	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	8.1 Invasive Non-Native Plants & Animals	8.1.1 Terrestrial animals (parasitoid flies)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.2 Problematic Native Plants & Animals	(overgrazing by deer)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.6 Excess Energy	9.6.1 Light pollution	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.1 Habitat Shifting & Alteration	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 2. Threats to *Heterocampa varia.*

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:

Heterocampa varia is of special concern in New York, though this status provides no legal protection.

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

Maintaining xeric oak scrub with sparse/no pine cover would benefit this species (Schweitzer et al. 2011). Forest fires are needed, on average, every 5-10 years to maintain this type of habitat. Lack of fires will result in succession of this community to a closed-canopy forest of tall oaks and other hardwoods (Little 1979, Jordan et al. 2003).

Additional surveys are needed with black-light traps to determine the extent of the occurrence and locate new occurrences. This species comes to light in June and July, typically after midnight. In addition, research is needed on the response of this species to prescribed burning and mechanical treatment to improve habitat (New York Natural Heritage Program 2011).

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct Habitat Management	Site 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.7 Legislative and Regulatory Framework or Tools	C.7.0.0.0 Legislative and Regulatory Framework or Tools	Policies and Regulations

Table 3. Recommended conservation actions for *Heterocampa varia* (add more lines as needed).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for other moths, and for *Heterocampa varia* in particular.

Easement acquisition:
____ Where appropriate, acquire easements to promote moth protection and conservation.
Fact sheet:
____ Create fact sheets covering moths.
Habitat management:
____ Determine best management regime for moth species, including fire and other forms of management.
Habitat monitoring:
____ Develop standardized measures of habitat parameters for each species of listed moth.
____ Investigate threats to food and host plants.
____ Monitor land development projects.
Habitat research:
____ Examine role of light pollution as threat to moths.
____ Determine host/ food plant.
Life history research:
____ Investigate the metapopulation dynamics of those species which warrant it.
____ Examine role of introduced parasites and predators in threats to moths.
Other action:
____ Develop standard definition of what is needed for "viable" populations of moths.
____ Research the role of pesticide use in threats to moths.
Population monitoring:
____ Inventory of species within historical range.
____ Develop standardized survey protocols for moths.
Private fee acquisition:
____ Where appropriate, encourage/assist private entities to acquire land for moth protection and conservation.
State fee acquisition:
____ Where appropriate, acquire land essential to moth protection and conservation.
State land unit management plan:
____ Incorporate needs of moths into state land management plans.

VII. References

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