# Species Status Assessment

**Class:** Insecta
**Family:** Notodontidae
**Scientific Name:** *Heterocampa varia*
**Common Name:** A notodontid moth (prominent moth)

**Species synopsis**:

*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.

## I. Status

### a. Current and Legal Protected Status

**i. Federal** ___Not Listed_____ **Candidate?** __No____

**ii. New York** ___Special Concern; SGCN_____

### b. Natural Heritage Program Rank

**i. Global** __G3G4_____

**ii. New York** __S1S2_____ **Tracked by NYNHP?** _Yes____

**Other Rank:**
Rounded Global Status: G3-Vulnerable
United States National Status: N3N4 (7 September 2000)
ICUN Red List: Not assessed

**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

### a. North America

#### i. Abundance

**_X_ declining ____increasing _____stable ____unknown**

#### ii. Distribution:

**_X_ declining ____increasing _____stable ____unknown**

**Time frame considered:** ___2002-2012_____

**Severe decline**

### b. Regional

#### i. Abundance

**_X_ declining ____increasing ____stable _____unknown**

#### ii. Distribution:

**_X_ declining ____increasing ____stable _____unknown**

**Regional Unit Considered:** ___Northeast_____
**Time Frame Considered:** ____2002-2012_____

Severe decline

**c. Adjacent States and Provinces**

| | | |
|---|---|---|
| **CONNECTICUT** | **Not Present __X___** | **No data _____** |
| **ONTARIO** | **Not Present __X___** | **No data _____** |
| **PENNSYLVANIA** | **Not Present __X___** | **No data _____** |
| **QUEBEC** | **Not Present __X___** | **No data _____** |
| **VERMONT** | **Not Present __X___** | **No data _____** |
| **MASSACHUSETTS** | **Not Present _____** | **No data __X__** |

**i. Abundance**

**_X__ declining ____ increasing ____ stable __X_ unknown**

**ii. Distribution:**

**_X__ declining ____ increasing ____ stable __X_ unknown**

Time frame considered: __Listed as threatened in 2009_____
Listing Status: _____Threatened_____ SGCN? __No_____

**Moderate decline**

| | | |
|---|---|---|
| **NEW JERSEY** | **Not Present _____** | **No data __X___** |

**i. Abundance**

**____ declining ____ increasing ____ stable __X__ unknown**

**ii. Distribution:**

**____ declining ____ increasing ____ stable __X__ unknown**

Time frame considered: __Not specified_____
Listing Status: _____Not Listed_____ SGCN? __Yes___

**d. NEW YORK** **No data _____**

**i. Abundance**

**____ declining ____ increasing _X_ stable _____ unknown**

**ii. Distribution:**

**____ declining ____ increasing _X_ stable _____ unknown**

Time frame considered: _____2002-2012_____

**Monitoring in New York.**

Intermittent surveys have been conducted in pine barren communities of Long Island over the last 10 years.

**Trends Discussion:**

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).

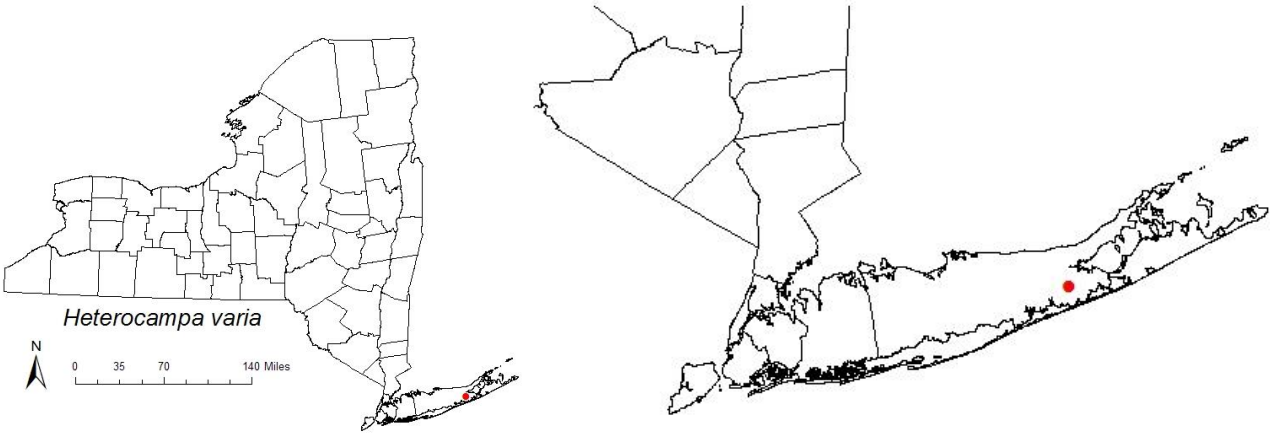


**Figure 1**. Occurrence locations of *Heterocampa varia* in New York (NYNHP 2013). Map created by Shawn Ferdinand, NYSDEC.

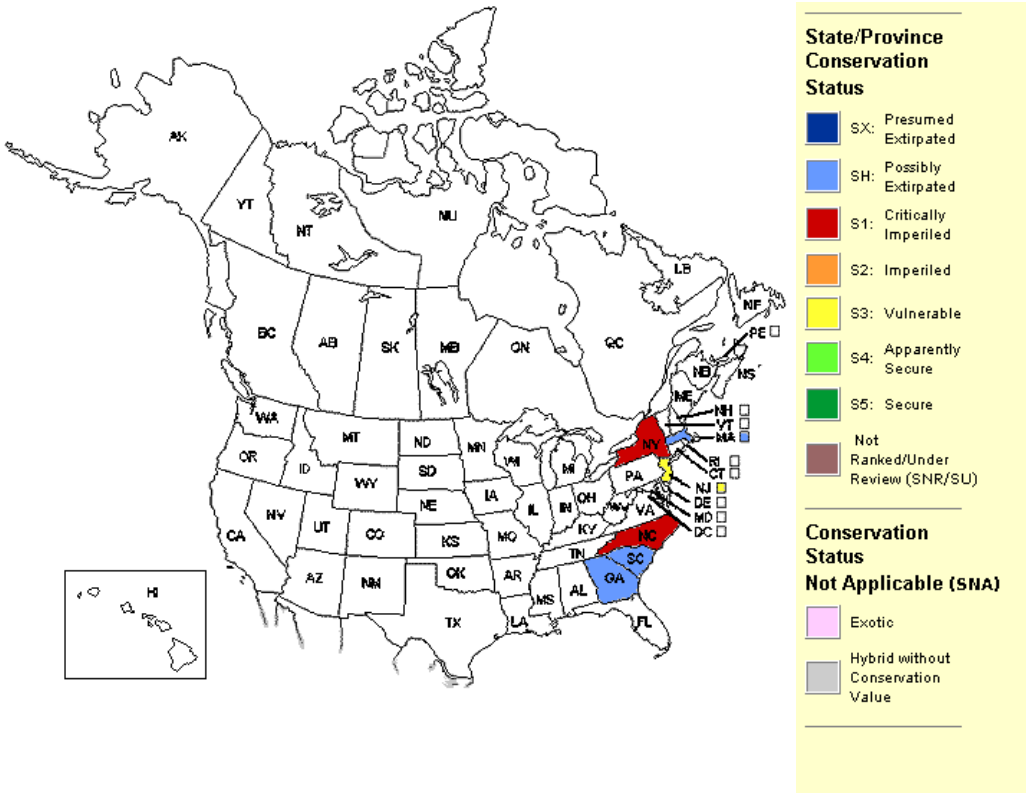


**Figure 2.** Conservation status of *Heterocampa varia* in North America (NatureServe 2012).

**III. New York Rarity, if known:**

| Historic | # of Animals | # of Locations | % of State |
|---|---|---|---|
| **prior to 1970** | _____ | __1___ | _____ |
| **prior to 1980** | _____ | _____ | _____ |
| **prior to 1990** | _____ | _____ | _____ |

**Details of historic occurrence:**

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

| Current | # of Animals | # of Locations | % of State |
|---|---|---|---|
| | _____ | __1___ | _____ |

**Details of current occurrence:**

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:**

**Distribution** (percent of NY where species occurs)

_X__ 0-5%

_____ 6-10%

_____ 11-25%

_____ 26-50%

_____ >50%

**Abundance** (within NY distribution)

___ abundant

___ common

_X_ fairly common

___ uncommon

___ rare

**NY's Contribution to North American range**

_____ 0-5%

_X__ 6-10%

_____ 11-25%

_____ 26-50%

_____ >50%

**Classification of New York Range**

**____ Core**

**_X__ Peripheral**

**____ Disjunct**

**Distance to core population:**

**_____**

## IV. Primary Habitat or Community Type:

1. Oak Forest
2. Oak-Pine Forest
3. Pine Barrens
4. Coastal Hardwoods
5. Costal Coniferous Barrens

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

**_X__ Declining ____Stable ____ Increasing ____Unknown**

**Time frame of decline/increase:** __Not specified_____

**Habitat Specialist? _X___ Yes _____ No**

**Indicator Species? ____ Yes __X__ No**

**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. New York Species Demographics and Life History

**_X__ Breeder in New York**

**_X_ Summer Resident**

**_X_ Winter Resident**

**_____ Anadromous**

**_____ Non-breeder in New York**

**_____ Summer Resident**

**_____ Winter Resident**

**_____ Catadromous**

**_____ Migratory only**

**_____Unknown**

**Species Demographics and Life History Discussion:**

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:

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).

**Are there regulatory mechanisms that protect the species or its habitat in New York?**

**_____ No ____ Unknown**

**__X__ Yes**

*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).

Conservation actions following IUCN taxonomy are categorized in the table below.

| **Conservation Actions** | |
|---|---|
| **Action Category** | **Action** |
| Law and Policy | Policies and Regulations |
| Education and Awareness | Awareness & Communications |
| Land/Water Protection | Site/Area Protection |
| Land/Water Protection | Resource/Habitat Protection |
| Land/Water Management | Site/Area Management |
| Land/Water Management | Invasive/Problematic Species Control |
| Land/Water Protection | Site/Area Protection |

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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