

## Species Status Assessment

**Class:** Lepidoptera  
**Family:** Riodinidae  
**Scientific Name:** *Calephelis borealis*  
**Common Name:** Northern metalmark

### Species synopsis:

The metalmarks are a diverse family of butterflies that mainly occur in the tropics. Unlike almost all other butterflies, metalmarks often rest flat against the undersides of leaves with the upper surface visible (New York Natural Heritage Program 2011).

The Northern metalmark is the only species of this family that occurs in New York. Its range extends from south-central United States to the Northeast. It is rare throughout its range. There are three major population clusters: northwest Connecticut to northwestern New Jersey (extant in Sussex and Warren Counties in New Jersey); Appalachia from central Pennsylvania through West Virginia then northwest into Ohio-Indiana; Ozark region mainly in Missouri, but Opler (1992) shows range extending into Arkansas and Oklahoma. Published information suggests that Ohio may be a stronghold. Records in Shapiro (1966) for southeastern Pennsylvania serpentine barrens are mostly dubious, although a voucher does exist to support the Lima record.

New York had one record historically and the species was rediscovered in 2007 in Dutchess County. In 2013 three more populations were found in Dutchess County.

This species is not likely to occur much more widely, but more colonies might turn up in the limestone areas of southeastern New York, especially near the New Jersey border. New York and two adjacent Connecticut counties are at the northeastern end of the range (New York Natural Heritage Program 2011).

**I. Status**

**a. Current and Legal Protected Status**

i. **Federal**      Not listed      **Candidate?**      No

ii. **New York**      Not listed; SGCN

**b. Natural Heritage Program Rank**

i. **Global**      G3G4

ii. **New York**      S1      **Tracked by NYNHP?**      Yes

**Other Rank:**

None

**Status Discussion:**

Northern metalmark is rare throughout its range, with only New Jersey's population ranked as S3 and all others ranked S1 or S3. Short- and long-term trends in abundance and distribution are unknown. It is thought to have declined substantially in some parts of the range, such as eastern Pennsylvania (NatureServe 2012).

The species has been reported as extant at a single site in Dutchess County in 2007 and at three additional sites in that county in 2013, but has not been reported elsewhere in the state since the 1860s (New York Natural Heritage Program 2011).

**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:** 50-90% decline in last 100 years; 0-30% since 2000

**Moderate decline**

**b. Regional**

**i. Abundance**

X  declining \_\_\_ increasing \_\_\_ stable \_\_\_ unknown

**ii. Distribution:**

X  declining \_\_\_ increasing \_\_\_ stable \_\_\_ unknown

**Regional Unit Considered:**  Northeast

**Time Frame Considered:**  50-90% decline in 100 years; 0-30% since 2000

**Moderate decline**

**c. Adjacent States and Provinces**

**CONNECTICUT** Not Present \_\_\_ No data \_\_\_

**i. Abundance**

X  declining \_\_\_ increasing \_\_\_ stable \_\_\_ unknown

**ii. Distribution:**

X  declining \_\_\_ increasing \_\_\_ stable \_\_\_ unknown

**Time frame considered:** \_\_\_\_\_

**Listing Status:**  Endangered, S1  SGCN?  Yes

**Moderate decline**

**NEW JERSEY**                      **Not Present** \_\_\_\_\_                      **No data** \_\_\_\_\_

**i. Abundance**

  X   declining    \_\_\_ increasing            \_\_\_ stable            \_\_\_ unknown

**ii. Distribution:**

  X   declining    \_\_\_ increasing            \_\_\_ stable            \_\_\_ unknown

Time frame considered:   Severe decline in last 30 years  

Listing Status:           Special Concern, S2S3                SGCN?   Yes  

**PENNSYLVANIA**                      **Not Present** \_\_\_\_\_                      **No data**   X  

**iii. Abundance**

\_\_\_ declining    \_\_\_ increasing            \_\_\_ stable              X   unknown

**iv. Distribution:**

\_\_\_ declining    \_\_\_ increasing            \_\_\_ stable              X   unknown

Time frame considered: \_\_\_\_\_

Listing Status:           Special Concern, S2S3                SGCN?   Yes

<b>ONTARIO</b>	<b>Not Present</b> <u>  X  </u>	<b>No data</b> _____
<b>QUEBEC</b>	<b>Not Present</b> <u>  X  </u>	<b>No data</b> _____
<b>VERMONT</b>	<b>Not Present</b> <u>  X  </u>	<b>No data</b> _____
<b>MASSACHUSETTS</b>	<b>Not Present</b> <u>  X  </u>	<b>No data</b> _____

**d. NEW YORK** **No data** \_\_\_\_\_

**i. Abundance**

\_\_\_\_ declining    \_\_\_\_ increasing    \_\_\_\_ stable      X   unknown

**ii. Distribution:**

\_\_\_\_ declining    \_\_\_\_ increasing    \_\_\_\_ stable      X   unknown

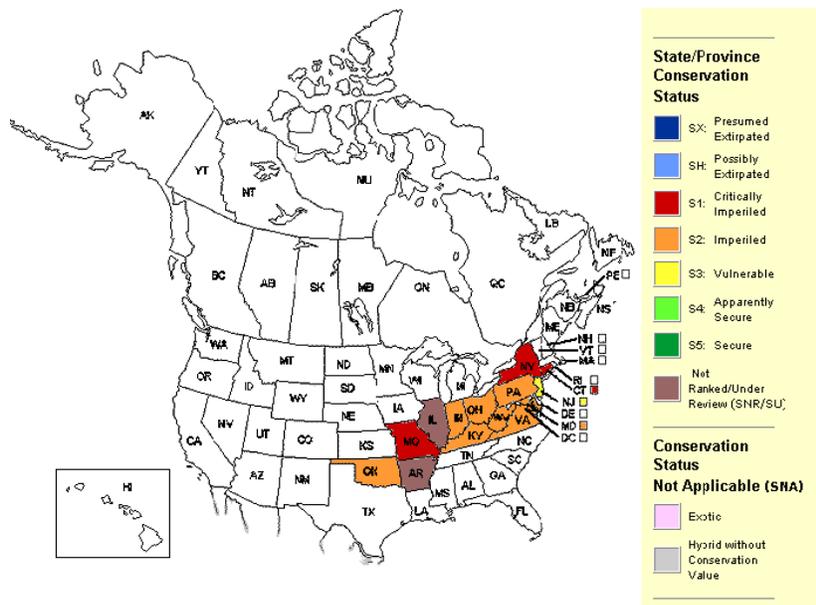
Time frame considered: \_\_\_\_\_

**Monitoring in New York.**

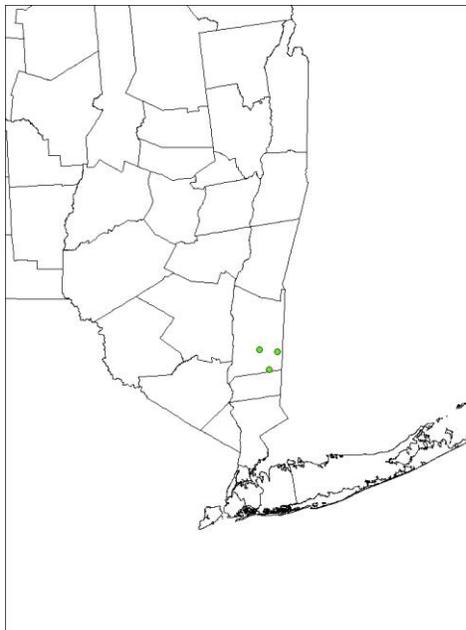
None

**Trends Discussion:**

Trends in distribution and abundance are mostly unknown, although some parts of the range appear to have experienced declines.



**Figure 1.** Conservation status of northern metalmark in North America (NatureServe 2012).



**Figure 2:** Approximate locations of three known sites in Dutchess County, discovered in 2007 and 2013 (NY Natural Heritage Program).

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

<b>Historic</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
<b>prior to 1970</b>	_____	_____	_____
<b>prior to 1980</b>	_____	_____	_____
<b>prior to 1990</b>	_____	_____	_____

**Details of historic occurrence:**

The northern metalmark was first described during the 1860s from a collection near Upper Coldenham in Orange County. Another record from calcareous ledges along the Delaware River (Forbes 1960) may refer to the Upper Coldenham site or possibly south of New York.

<b>Current</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
	_____	<b><u>1 county</u></b>	_____

**Details of current occurrence:**

Northern metalmark was re-discovered in Dutchess County in 2007. Three more populations were found in Dutchess County in 2013.

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

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

- 0-5%
- 6-10%
- 11-25%
- 26-50%
- >50%

**Abundance** (within NY distribution)

- abundant
- common
- fairly common
- uncommon
- rare

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

- 0-5%
- 6-10%
- 11-25%
- 26-50%
- >50%

**Classification of New York Range**

Core

Peripheral

Disjunct

**Distance to core population:**

~500 miles

**IV. Primary Habitat or Community Type:**

1. Open acidic peatlands
2. Rocky outcrop

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

Declining (fens)  Stable (rocky outcrops)  Increasing  Unknown

Time frame of decline/increase: \_\_\_\_\_

Habitat Specialist?  Yes  No

Indicator Species?  Yes  No

**Habitat Discussion:**

The habitat in New York appears to be openings in wooded limestone ridges, but the details are limited. The adults are said to also occur in nearby wetlands as they do in New Jersey. The typical habitats in states adjacent to New York include both natural openings on cliffs, ledges, or very rocky soil and also powerlines. The presence of nectar flowers in July is likely to be crucial and adults that are seen in wetlands may be there in search of nectar (New York Natural Heritage Program 2011).

Habitats are openings within forested or wooded areas. Such openings may be natural outcrops, shale or limestone barrens, glades or powerline rights-of-way. It is suspected but not known that females also move through the forest. Critical factors are lots of the larval foodplant (roundleaf ragwort, *Senecio obovatus*, only so far as known) and nectar (from flowers such as orange

milkweed, black-eyed susan, daisy or fleabane). Habitats are often (in New Jersey at least) just above a wetland (often a fen) into which the butterflies may wander a short distance. Edaphic setting is important to the foodplant and limestone and shale ridges seem to be most typical habitats. Reports of serpentine barrens in Pennsylvania (Shapiro, 1966) appear to be false and would imply another foodplant (such as *Senecio smallii*) (from NatureServe Explorer).

**V. New York Species Demographics and Life History**

- Breeder in New York**
  - Summer Resident**
  - Winter Resident**
  - Anadromous**
- Non-breeder in New York**
  - Summer Resident**
  - Winter Resident**
  - Catadromous**
- Migratory only**
- Unknown**

**Species Demographics and Life History Discussion:**

Northern metalmarks are generally very sedentary but do occasionally move between habitat patches. Adults perch on underside of leaves of shrubs or small trees. They are most often seen perched in sunny spots or on flowers (New York Natural Heritage Program 2011).

Eggs are laid on the underside of host plant leaves, which the caterpillars eat. This host is most often roundleaf ragwort (*Senecio obovatus*). Other possible hosts are golden ragwort (*Senecio aureus*) and common fleabane (*Erigeron philadelphicus*). Half-grown caterpillars hibernate in leaf litter. Adults nectar from flowers including butterflyweed, white sweet clover, goldenrod, ox-eye daisy, sneezeweed, and yarrow (Butterflies and Moths of North America 2012). In New York, this species has a flight period of about three weeks beginning in late June or July (New York Natural Heritage Program 2011).

In most places, one brood is produced, but there are two in late May-June and mid August in southwestern Missouri (Scott 1986). Adults appear in late June to mid July and are finished by the end of July in the rest of range. The range of 13 June to 31 July in Ohio may include both the earliest and latest known dates for single brooded populations. The corresponding larval stage would be about late July to early June. Hibernation is probably under the basal rosettes of the foodplant, perhaps a bit into the soil and occurs in the fifth or sixth instar (out of 8 or 9) according to Scott (1986) (NatureServe Explorer).

**VI. Threats:**

The main threats are habitat loss to development, invasive plants, succession, and the isolation of the remaining colony (or colonies). It is not known whether the remaining population is large enough to persist. Of most immediate concern though, is the elimination of nectar sources by deer. While they do not severely graze the foliage of the foodplant, roundleaf ragwort (*Senecio obovata*), they do eat the flowers which could reduce the foodplant in the long term. This has been observed several times in potential, but unoccupied, habitats in New Jersey (NY Natural Heritage Program).

Gypsy moth spraying could also be a threat, but the potential sensitivity of larvae to Btk (*Bacillus thuringiensis* variety *kurstaki* - a bacterial biological control used on gypsy moth caterpillars) is not known. This species proved to be remarkably unaffected by repeated collecting over most of the 20th century at the classic Springdale, New Jersey site, which suggests a larger population than was apparent (New York Natural Heritage Program 2011).

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

**No**       **Unknown**  
 **Yes**

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

Although unknown at this time, the potential needs include deer management and control of invasive plants. If no other colonies still exist in the state, serious consideration should be given to establishing a few additional colonies on secure sites near the current one (New York Natural Heritage Program 2011).

Conservation actions following IUCN taxonomy are categorized in the table.

Conservation Actions	
Action Category	Action
Law and Policy	Policies and Regulations
Education and Awareness	Training
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 butterflies, and for the northern metalmark in particular.

**Fact sheet:**

- \_\_\_ Develop fact sheets and other outreach material to educate the public about species at risk Lepidoptera.

**Habitat management:**

- \_\_\_ Determine best management regimes for species in each locality.

**Habitat research:**

- \_\_\_ Determine precise habitat needs of all life stages.
- \_\_\_ Ascertain food plants.
- \_\_\_ Determine the relationship between food availability and species numbers.

**Invasive species control:**

- \_\_\_ Identify species which impact negatively on butterfly populations.
- \_\_\_ Determine the best control method for those exotic species with minimal repercussions for butterfly populations.

**Life history research:**

- \_\_\_ Investigate the metapopulation dynamics of those species which appear to have distinct populations.
- \_\_\_ Establish the duration of all life stages.
- \_\_\_ Taxonomic research for related species.

**Other action:**

- \_\_\_ Determine the actual sensitivity of species to chemical formulations, particularly diflubenzuron and other commonly used agricultural pesticides.
- \_\_\_ Determine the effect of *Bacillus thuringiensis kurstaki* (BTK) used in Gypsy moth sprayings on various species.

**Population monitoring:**

- \_\_\_ Inventory of species within historical range.

**Statewide baseline survey:**

— Survey all species to more adequately define the list of species that need to be addressed.

**VII. References**

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**Date last revised:** February 11, 2014