

# Species Status Assessment

**Common Name:** Northern metalmark **Date Updated:** December 28, 2023

**Scientific Name:** *Calephelis borealis*

**Updated By:** Hollie Shaw

**Class:** Insecta

**Family:** Riodinidae

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

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 (NYNHP 2023b).

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.

This species was rediscovered in 2007 in Dutchess County where there are three known populations with the most recent observations in 2013 (NYNHP 2023a). There are additional observations in Dutchess County in iNaturalist (2023) from 2021 and 2023 that have not been verified.

This species is not likely to occur much more widely in the state. 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 edge of the range (NYNHP 2023b).

## I. Status

### a. Current legal protected Status

i. **Federal:** not listed **Candidate:** no

ii. **New York:** not listed; HPSGCN

### b. Natural Heritage Program

i. **Global:** G3

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

### Other Ranks:

-IUCN Red List: not listed

-Northeast Regional SGCN: RSGCN (high conservation concern)

### Status Discussion:

Northern metalmark is rare throughout its range, with only New Jersey’s population ranked as S3 in the northeast region. 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 2023b). The species was rediscovered in Dutchess County in 2007 where there are now three known populations. It has not been reported elsewhere in the state since the 1860s (NYNHP 2023b).

## II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown		Not listed	No
Northeastern US	Yes	Declining	Declining		RSGCN	Yes
New York	Yes	Stable	Stable	2007-2023	Not listed, S1, HPSGCN	Yes
Connecticut	Yes	Declining	Unknown	20 years	Endangered, S1	Yes
Massachusetts	No	Choose an item.	Choose an item.			Choose an item.
New Jersey	Yes	Declining	Declining	20 years	Special Concern, S3	Yes
Pennsylvania	Yes	Declining	Declining	20 years	Not listed, S1S2	Yes
Vermont	No	Choose an item.	Choose an item.			Choose an item.
Ontario	No	Choose an item.	Choose an item.			Choose an item.
Quebec	No	Choose an item.	Choose an item.			Choose an item.

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

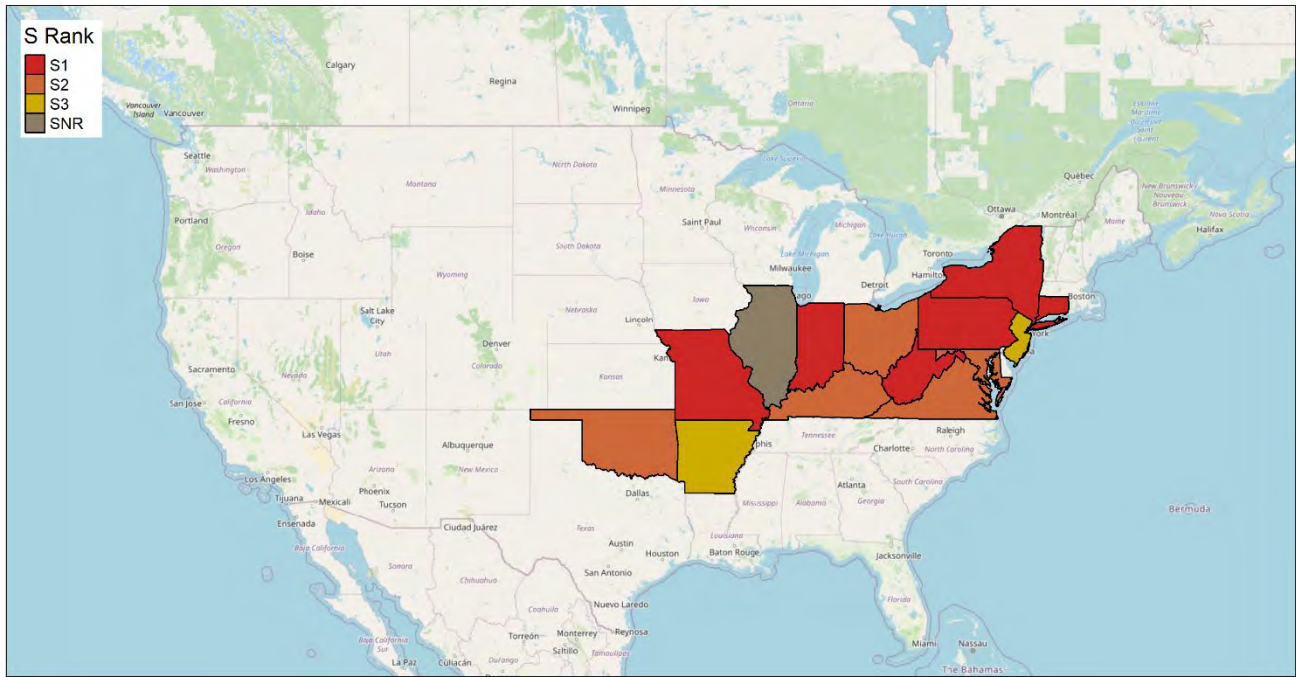
**SGCN?:** Yes; No; Unknown; (blank) or Choose an item

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

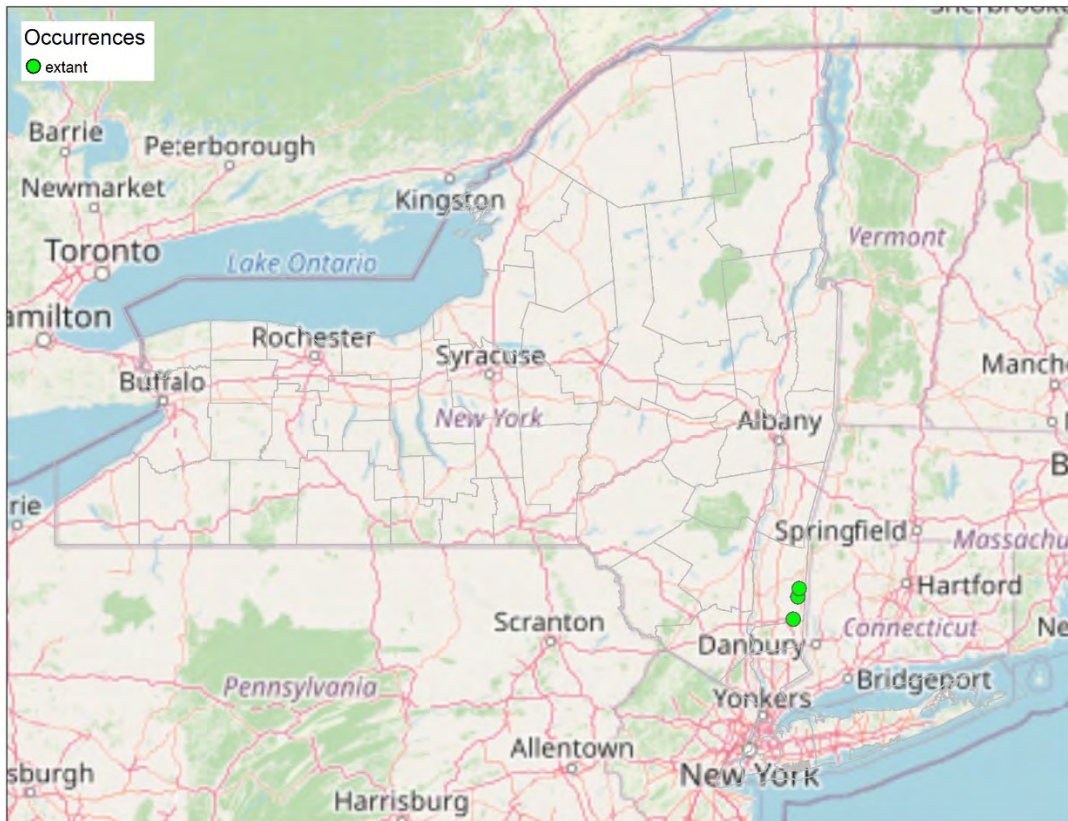
None.

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

Current trends are unknown. This species was considered historical in the state until it was rediscovered at three sites in Dutchess County in 2007 and 2013. There are no other reports from other regions of the state. However, other populations may be discovered in limestone habitats, especially near the New Jersey border (NYNHP 2023b).



**Figure 1.** *Calephelis borealis* distribution  
(Distribution may not be complete. NatureServe 2023)



**Figure 2.** *Calephelis borealis* distribution in New York State (NYNHP 2023a)

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

Years	# of Records	# Counties	% of State
Pre-1980	1-2	1	<1%
1980-2000	0	0	0
2000- 2023	3	1	<1

**Table 1.** Records of *Calephelis borealis* in New York.

**Details of historic and current occurrence:**

This species was discovered at three locations in Dutchess County in 2007 and 2013. Another known location in New York is from a collection(s) in the 1860s from which the species was first described near Upper Coldenham in Orange County. There is also a record that the species was first discovered along the Delaware River on calcareous ledges (Forbes 1960), however, this may refer to the Upper Coldenham site or possibly south of New York. There appear to have been no other records (Shapiro 1974). 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 the northeastern end of the range (NYNHP 2023b).

**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):

1. Oak Forest/Pine Barrens
2. Mixed Northern Hardwoods

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

Habitat Specialist?	Indicator Species?	Pollinator Species?	Habitat/Community Trend	Time frame of Decline/Increase
Yes	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 appears to be openings in wooded limestone ridges with the foodplant roundleaf ragwort (*Packera obovata*), 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. They have also been found along 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 (NYNHP 2023b).

**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):

Northern metalmarks have two broods in Missouri, but only one in other regions. Adults were found in mid-July in New York, but range wide they may be found from late-June to mid to late-July (Schweitzer et al. 2018). Adults perch on underside of leaves of shrubs or small trees. They are most often seen perched in sunny spots or on flowers. They are generally sedentary but will move short distances from their main habitats to obtain nectar and perhaps for other reasons (NYNHP 2023b). The larval host plant is roundleaf ragwort (*Packera ovovatus*) and possibly Small’s ragwort (*Packera anonyma*) (Schweitzer et al. 2018). Eggs are laid on the underside of host plant leaves. 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).

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

The main threats are habitat loss to development, invasive plants, succession, and the isolation of the remaining colonies. It is not known whether the remaining populations are large enough to persist. Deer are also a potentially serious threat. While they do not severely graze the foliage of the host plant, roundleaf ragwort (*Packera obovata*), they do eat the flowers which could reduce the foodplant in the long term. Of most immediate concern though is the elimination of nectar sources by deer. This has been observed several times in potential, but unoccupied, habitats in New Jersey. Spongy 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 spongy moth caterpillars) is unknown (Schweitzer et al. 2018, NYNHP 2023b).

<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>
1. Residential and Commercial	1.1 Housing & Urban Areas	(habitat loss/degradation)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.3 Other Ecosystem Modifications	7.3.2 Vegetation succession	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	(invasive plants)	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	8.2.3 Localized increase in invertebrate grazing	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	9.5 Air-Borne Pollutants	(gypsy moth spraying)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

**Table 2.** Threats to *Calephelis borealis*.

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

Yes: \_\_\_\_\_ No: ü 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:**

Potential management needs include deer management, invasive plant and pest control, and habitat management and restoration. If deer browse is identified as a threat, there are several deer management techniques that can be employed. In small areas, tall fencing can prevent deer from browsing on plants. Exclosures should include roundleaf ragwort (*Packaera obovata*) and nectar sources. If deer browse is a significant issue, consultation with New York State Department of Environmental Conservation is recommended. Invasive species should be controlled to ensure the foodplant and nectar sources remain. Management techniques include mechanical removal, chemical treatment directly to the invasive plant, and some can be eliminated with biocontrols, such as parasites that specially target specific species. Mid to late larval instars of northern metalmark are present at the recommended spraying time of Btk for spongy moth. It is unknown how northern metalmark larvae are affected by Btk, therefore direct spraying is not recommended in areas with known northern metalmark populations. Habitat restoration could include selective logging to open the canopy which would result in suitable habitat for *P. obovata* and to provide some connectivity to other nearby populations when possible. It would be beneficial to plant nectar sources near *P. obovata* because northern metalmarks are weak fliers and tend to stay near their foodplant unless there is a shortage of nectar (Schweitzer et al. 2018, NYNHP 2023b).

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

Action Category	Action	Description
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.9.0.0.0 Education and training	Training

**Table 3.** Recommended conservation actions for *Calephelis borealis*.

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 spongy 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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