Common Name: Northern metalmark
Scientific Name: *Calephelis borealis*
Taxon: Butterflies and Moths

SGCN – High Priority

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G3G4
New York: S1
Tracked: Yes

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 and Malikul (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).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

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).

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).

Primary Habitat Type
Open Acidic Peatlands
Rocky Outcrop

Distribution:
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).

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

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Residential & Commercial Development	Housing & Urban Areas (habitat loss/degradation)	W	M	H
2. Natural System Modifications	Other Ecosystem Modifications (natural succession)	W	M	M
3. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (invasive plants)	P	M	M
4. Invasive & Other Problematic Species & Genes	Problematic Native Species (deer over-browse)	P	M	H
5. Pollution	Air-Borne Pollutants (gypsy moth spraying)	N	L	H

References Cited:

New York Natural Heritage Program. 2011. Online Conservation Guide for *Calephelis borealis*. <http://www.acris.nynhp.org/guide.php?id=7878>. Accessed 28 January 2013.

Opler, P.A. and V. Malikul. 1992. Eastern Butterflies (Peterson Field Guide). Houghton Mifflin Company, Boston, Massachusetts. 396 pp.

Shapiro, Arthur M. 1966. Butterflies of the Delaware Valley. The American Entomological Society. Special Publication. 79pp.

Common Name: Henry's elfin ***SGCN – High Priority***
Scientific Name: *Callophrys henrici*
Taxon: Butterflies and Moths

Federal Status: Not Listed
New York Status: Special Concern

Natural Heritage Program Rank:
Global: G5
New York: SH
Tracked: Yes

Synopsis:
The primary range of Henry's elfin is coastal New England to Florida west to southern Iowa, much of Texas, and barely into New Mexico. Populations also occur in the Great Lakes region and in southern Canada, but the species seems to be absent from most parts of New England, New York, and Pennsylvania, and in much of the Midwest (Butterflies and Moths of North America 2012).

The range in New York is not well understood. Henry's elfin has been found mainly in the Albany area, but there are a few other records in the region stretching from Tompkins to Westchester counties. Glassberg (1993) indicates there are no recent records from the New York City area. With the habitat unknown and elfin collectors concentrating on the wrong habitats in the past, this butterfly could be widely overlooked. Considering that Henry's elfin is widespread in other regions occurring with evergreen hollies from Sandy Hook, New Jersey south into Florida, it is expected to occur with American holly (*Ilex opaca*) on Long Island. Similarly, the species occurs widely in the St. Lawrence region of Canada and should turn up in northern New York. Henry's elfin will probably eventually become more widespread in New York, as it has in both Massachusetts and Ontario as buckthorn (*Rhamnus* spp.) feeding strains spread (New York Natural Heritage Program 2011).

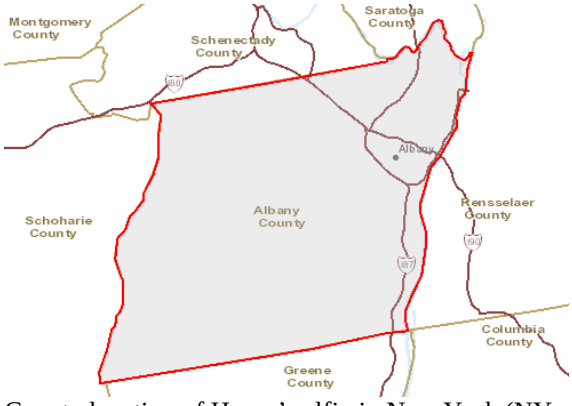
Tim McCabe recorded the species in the Albany Pine Bush in 2012 (SGCN Expert Meeting, November 2013).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Stable	Stable
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:
The habitat of Henry's elfin is essentially unknown in New York, especially for older records or where just a single individual has been observed or collected. Any observation that does not include several adults may not be reflective of the true habitat. Notably some of the Albany Pine Bush records, possibly all, are single individuals. In neighboring states, this species inhabits forests, but the exact habitat depends on the food plant which varies regionally. Tall shrub areas around bogs, or shrub swamps with mountain holly (*Nemopanthus mucronatus*) are potential habitat (NYNHP 2011).

Primary Habitat Type
Pine Barrens

Distribution:
Henry's elfin occurs in Albany County. There are records from 1989 and 2012.



County location of Henry's elfin in New York (NY Nature Explorer 2009)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Residential & Commercial Development	Housing & Urban Areas (habitat loss/degradation)	N	L	H
2. Natural Systems Modifications	Fire & Fire Suppression (too much or too little)	P	M	L
3. Natural System Modifications	Other Ecosystem Modifications (natural succession)	P	M	L

References Cited:
Butterflies and Moths of North America. 2012. <http://www.butterfliesandmoths.org/>. Accessed 4 January 2013.

Glassberg, J. 1993. Butterflies through binoculars: A field guide to butterflies in the Boston-New York-Washington region. Oxford University Press: New York. 160 pp.

New York Natural Heritage Program (NYNHP). 2011. Online Conservation Guide for *Callophrys henrici*. < http://www.acris.nynhp.org/guide.php?id=7861>. Accessed 4 January 2013.

Common Name: Hessel's hairstreak ***SGCN – High Priority***
Scientific Name: *Callophrys hesseli*
Taxon: Butterflies and Moths

Federal Status: Not Listed
New York Status: Endangered

Natural Heritage Program Rank:
Global: G3G4
New York: S1
Tracked: Yes

Synopsis:
The Hessel's hairstreak (*Callophrys hesseli*) is closely associated with its host plant, which is patchily distributed overall, but common in a few states, especially coastal southern New England, New Jersey, and eastern North Carolina. The individuals that occur along the Atlantic Coast, from southern Maine to North Carolina, are sometimes identified as a subspecies *Callophrys hesseli hesseli*. Populations are absent from most of Connecticut and northern New jersey, and there may be only one population between New Jersey and southeastern Virginia, on the Delaware-Maryland border. Hessel's hairstreak is still fairly widespread in suitable habitats in the Pine Barrens and Delaware Bayshore regions of New Jersey where the food plant is common. Populations are fairly frequently encountered from southeastern Massachusetts across southern Rhode Island to southeastern Connecticut. Many seemingly suitable habitats are unoccupied (Schweitzer et al. 2011).

Although the Hessel's hairstreak is one of just a handful of butterflies on the state endangered species list, nothing is known of its current status in New York; however, there is reason to believe that this species is extirpated from the state. Since the 1980s, only one of the known populations was found to be inhabited, and no butterflies have been seen at this site since the 1990s (NYSDEC SGCN Experts Meeting).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

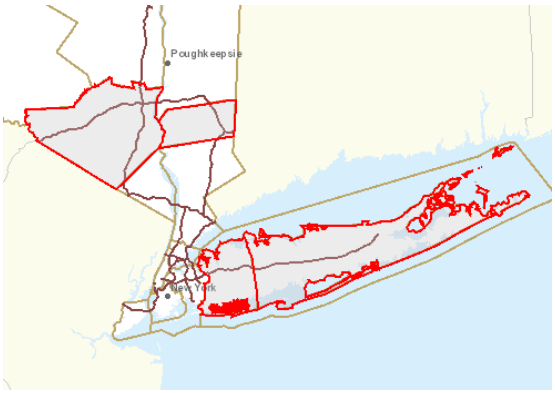
Habitat Discussion:
This species occurs exclusively in coastal and inland Atlantic white cedar swamps. Sunny glades with flowers within the swamp are favored locations. Adults stray at times up to 1/2 mile to nearby flowers (NatureServe 2012).

Primary Habitat Type
Atlantic White Cedar Swamp

Distribution:
All of the few known occurrences on Long Island were first discovered around 1980, and since then only one was subsequently found to harbor butterflies. At this site only 12 butterflies were collected during

seven surveys during 1983-1989, and surveys in the early and mid-1990s failed to find butterflies at any of the formerly occupied sites (NatureServe 2012).

Nassau County – No date; extirpated; Orange County – Historically confirmed; no date; Putnam County – Possible but not confirmed; Suffolk County – 1986.



Counties where Hessel's hairstreak occurred historically (NY Nature Explorer 2009)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Natural System Modifications	Dams & Water Management/Use (changes in hydrology)	N	L	H
2. Invasive & Other Problematic Species & Genes	Problematic Native Species (over-browsing by deer)	P	L	M
3. Climate Change & Severe Weather	Storms & Flooding (increased severe storms)	P	H	H

References Cited:

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>. Accessed 7 January2013.

Schweitzer, D.F., M.C. Minno, and D.L. Wagner. 2011. Rare, declining, and poorly known butterflies and moths (Lepidoptera) of forests and woodlands in the Eastern United States. USDA Forest Health Technology Enterprise Team FHTET-2011-01.

Common Name: Frosted elfin ***SGCN – High Priority***
Scientific Name: *Callophrys irus*
Taxon: Butterflies and Moths

Federal Status: Not Listed
New York Status: Threatened

Natural Heritage Program Rank:
Global: G3
New York: S1S2
Tracked: Yes

Synopsis:
The frosted elfin (*Callophrys irus*) is a small and inconspicuous brown lycaenid butterfly. Although it has a broad geographic distribution, it occurs in small, localized populations, many of which are declining (NatureServe 2012, Schweitzer et al. 2011). It is one of a suite of specialist disturbance-dependent lepidopteran species threatened by degradation of early-successional habitat in the northeastern United States (Wagner et al. 2003). Where their distributions overlap, it has similar habitat requirements to the federally endangered *Plebejus melissa samuelis* (Karner blue butterfly), and the phenologically similar *Erynnis persius persius* (Persius duskywing) (Schweitzer et al. 2011, Shapiro 1974, Wagner et al. 2003).

Much of the early literature failed to recognize the frosted elfin as a species distinct from *Callophrys henrici* (Grote and Robinson 1867) (Albanese et al. 2007a). However, three named subspecies exist (Swengel 1996). *Incisalia i. irus* ranges from northern New England and New York through Ohio and Michigan to Wisconsin, with scattered populations also further southeast including eastern Maryland and northern Florida. It uses wild lupine (*Lupinus perennis*) as the larval host. *Incisalia i. arsace* (Boisduval and Le Conte) occurs in Atlantic coastal states farther south than the main range of *I. i. irus*, from southern New England to South Carolina and possibly farther south. The larval host of *Incisalia i. arsace* is wild indigo (*Baptisia tinctoria*). *Incisalia i. hadra* occurs in Arkansas, Louisiana, and Texas and also feeds on wild indigo in the larval stage (Swengel 1996).

The genus has since been changed from *Incisalia*, assigned by Scudder in 1871, to *Callophrys*, assigned by Godart in 1984. *Callophrys i. irus* and *Calliphrys i. arsace* (both found in NY) may be sibling species. These ecotypes differ in feeding habits, food plant, phenology, and possibly larval maculation. Lupine-feeders can usually be distinguished from Baptisia-feeder butterflies by wing characteristics alone (Schweitzer, pers. comm. added to Schweitzer 1993b). In addition to physical differences, the Baptisia ecotype flies approximately 10 days later than the lupine one at a given latitude, which is in correlation with host plant appearance (Schweitzer 1993b).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Stable	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:
Optimal adult frosted elfin habitat includes areas with high host plant densities and moderate tree canopy cover. Areas of high adult frosted elfin density and activity are open areas with interspersed tree cover

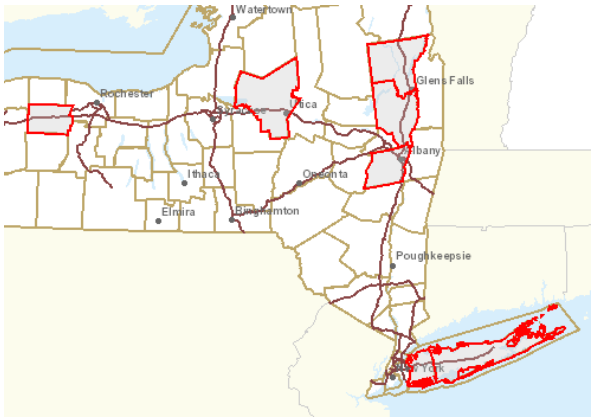
rather than the middle of large open expanses (Albanese et al. 2007a). In contrast, late instar larvae are found in more shaded areas, on host plants close to trees and under partial canopy cover (Albanese 2006). Although the adult population is associated with open habitat, partial canopy cover over the host plant appears to be vital for the development of frosted elfin larvae. Typical places where frosted elfins can be found include pine-oak and oak-heath scrub, roadsides, and open, brushy fields along the edges of open woods (Shapiro 1974, Opler and Malikul 1992, State of New York Endangered Species Working Group 1994).

Primary Habitat Type
Native Barrens and Savanna
Old Field/Managed Grasslands
Powerline

Distribution:
Frosted elfin populations occur in Albany, Saratoga, Suffolk, and Genesee counties (Shapiro 1974, Schweitzer 1992), as well as Warren County based on sightings during Karner blue butterfly surveys. The last in Schenectady County was at the Fort Hunter site in Rotterdam (Kathy O'Brien, pers. comm.). Both ecotypes occur on Long Island, the *Baptisia* feeder occurs in Westchester County, and the *Lupinis* feeder occurs in upstate and southwestern New York (Schweitzer 1993a). Populations in the Rome Sandplains (Pfitsch and Williams 2009) and Albany Pine Bush (Bried et al. 2012) are large for this species.

Due to their larval dependence on legumes with inflated pods, frosted elfins only occur in areas where the soil is acidic enough to support the growth of their host plants—blue lupine (*Lupinus pernnis*) in Albany, Genesee, Oneida, Warren, and Saratoga counties, and wild indigo (*Baptisia tinctoria*) in Richmond County (Shapiro 1974, State of New York Endangered Species Working Group 1994). Blue false indigo (*B. australis*) in Westchester county and rattlebox (*Crotalaria sagittalus*) are also sometimes selected (Shapiro 1974, State of New York Endangered Species Working Group 1994). Both types are usually associated with pine barrens in NY, although many lupine-feeder sites including those in Saratoga and Genesee counties, are oak savanna (Schweitzer 1993a, State of New York Endangered Species Working Group 1994).

North of New Jersey, natural habitat for the *Baptisia* ecotype rarely exists due to fire suppression. Frosted elfins now commonly use railroad or powerline right-of-ways, old fields, and rarely, roadsides. Powerlines provide good quality, stable habitat with dispersal corridors that lead to other sites (Schweitzer 1993b). Similar sites are often used by the *Lupinus*-feeder as well (Schweitzer 1993a, State of New York Endangered Species Working Group 1994).



Distribution of the frosted elfin in New York (New York Nature Explorer 2009)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Residential and Commercial Development	Housing & Urban Areas (habitat loss/degradation)	W	L	H
2. Residential and Commercial Development	Commercial & Industrial Areas (habitat loss/degradation)	W	L	H
3. Human Intrusions & Disturbance	Recreational Activities (ATV use)	R	L	M
4. Invasive and Other Problematic Species and Genes	Invasive Non-Native/Alien species (exotic thrip)	W	M	V
5. Invasive and Other Problematic Species and Genes	Invasive Non-Native/Alien Species (invasive plants)	P	M	M
6. Invasive & Other Problematic Species & Genes	Problematic Native Species (mammalian herbivory)	W	H	H
7. Natural System Modifications	Other Ecosystem Modifications (disturbance suppression, natural succession)	P	L	M
8. Natural System Modifications	Fire & Fire Suppression (inappropriate fire)	R	L	L
9. Pollution	Air-Borne Pollutants (mosquito spraying)	N	L	H
10. Climate Change & Severe Weather	Droughts	W	M	V
11. Climate Change & Severe Weather	Storms & Flooding (storms)	N	L	V

References Cited:

Albanese, G., M.W. Nelson, P.D. Vickery, and P.R. Sievert. 2007a. Larval feeding behavior and ant association in frosted elfin, *Callophrys irus* (Lycaenidae). Journal of the Lepodopterists' Society 61:61-66.

Albanese, G., P.D. Vickery, and P.R. Sievert. 2007b. Habitat characteristics of adult frosted elfins (*Callophrys irus*) in sandplain communities of southeastern Massachusetts. Biological Conservation 136:53-64.

Bried, J. T., J. E. Murtaugh, and A. T. Dillion. 2012. Local distribution factors and sampling effort guidelines for the rare frosted elfin butterfly. Northeastern Naturalist 19: 673-684.

NatureServe. 2009. NatureServe Explorer. <http://natureserve.org>. Accessed 30 November 2012.

Opler, P.A., and V. Maniikul. 1992. A field guide to eastern butterflies. Houghton MifflinCompany, Boston, Massachusetts, USA.

Schweitzer, D.F., M.C. Minno, and D.L. Wagner. 2011. Rare, declining, and poorly known butterflies and moths (Lepidoptera) of forests and woodlands in the eastern United States. US Forest Service, Forest Health Technology Enterprise Team, FHTET-2011-01. Morgantown, WV. 517 pp.

Shapiro, A.M. 1974. Partitioning of resources among lupine-feeding Lepidoptera. American Midland Naturalist 91:243‑248.

State of New York Endangered Species Working Group. 1994. Frosted Elfin species dossier (unpublished, draft completed July 1993, revised January 1994). New York State

Department of Environmental Conservation, Albany, NY.Swengel, A.B. 1996. Observations of *Incisalia irus* (Lepidoptera: Lycaenidae) in Central Wisconsin 1988-95. The Great Lakes Entomologist 29:41-62.

Wagner, D.L., M.W. Nelson, and D. Schweitzer. 2003. Shrubland Lepidoptera of southern New England and southeastern New York: Ecology, conservation, and management. Forest Ecology and Management 185:95‑112.

Common Name: Mottled duskywing ***SGCN – High Priority***
Scientific Name: *Erynnis martialis*
Taxon: Butterflies and Moths

Federal Status: Not Listed
New York Status: Special Concern

Natural Heritage Program Rank:
Global: G3
New York: S1
Tracked: Yes

Synopsis:
The mottled duskywing is thought to be extirpated from most of its range east of the Mississippi River, with a few colonies remaining in New York, Canada, and probably in the southern Appalachians and Great Lakes region. The main foodplant of the larva was once so common that it was commercially important as New Jersey tea, especially around the time of the American Revolution. Now the plant is so reduced that this skipper and two moths whose larvae feed on the leaves are probably gone from that state and much of the east (New York Natural Heritage Program 2012).

The historic range is approximately that depicted by Brock and Kaufman (2003). It extended from Massachusetts, Connecticut, and New Hampshire, west across New York and southern Ontario and the Great Lakes states to Minnesota and western Iowa, then south to the Gulf states, and central Texas (Opler and Krizek 1984), west to eastern Nebraska, eastern Kansas, the Ozarks, with disjunct isolated populations in the eastern foothills of the Rocky Mountains in central Colorado, and in the Black Hills (Stanford 1981, Stanford and Opler 1993, Opler 1994, Opler and Krizek 1984). The current range is drastically less than what was once present. The species is now apparently extirpated from New England, New Jersey, at least the eastern half (and possibly all) of Pennsylvania and most of Maryland, and it is very rare in West Virginia and Ohio. However, since 2001 it is still extant in at least three counties in New York. It seems unjustified to consider anything east of Ohio, including Canada, in any range extent estimation since such populations are mostly small, isolated, remnant colonies on a few hundred hectares or less of habitat and, in most cases, destined for extirpation (New York Natural Heritage Program 2012). The Albany Pine Bush is probably the only place in the Northeast where all three still occur (New York Natural Heritage Program 2012).

This skipper still occurs in the Albany Pine Bush and two additional preserves. However, it is unlikely that any sites are actually protected from deer. The foodplants are now known to be exclusively *Ceanothus* spp., which are favored by deer and deer have apparently caused the extirpation of colonies of this skipper in other states. This skipper has declined dramatically in Ohio and Canada and probably no longer occurs in any other states near New York, from New Hampshire through at least eastern Pennsylvania (New York Natural Heritage Program 2012).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Stable	Stable
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:
Former habitat types in New York likely included a variety of dry brushy or scrubby areas or relatively open woodlands with abundant New Jersey Tea (*Ceanothus americanus*), although as with any species of the genus *Erynnis*, the possibility of some records being misidentifications should be considered. The current and recently extirpated locations for this species in the Northeast and mid-Atlantic region are mostly inland Pitch Pine (*Pinus rigida*) barrens. One current New York occurrence is in an alvar grassland. In Ontario, oak savannas and oak woodlands can provide suitable habitat for this species, and it is likely that this was an historical habitat type in New York. The persistence of this species probably requires the foodplant to occur in substantial patches over an area of at least a few hundred acres or containing a cluster of smaller habitats (New York Natural Heritage Program 2012).

Primary Habitat Type
Pine Barrens

Distribution:
According to Robert Dirig (as of July 2007), the mottled duskywing still occurs in the Albany Pine Bush and vicinity, but is much less common than in the past. There also have been credible reports of this species from the Clintonville barrens in 2001 and 2004, and one was photographed on an alvar in Jefferson County in 2004. These three counties in New York comprise the majority or all of the current distribution in the entire Northeast, from Maine to Maryland.

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Invasive & Other Problematic Species & Genes	Problematic Native Species (deer overbrowse)	W	M	M
2. Natural Systems Modifications	Other Ecosystem Modifications (natural succession)	P	M	L
3. Natural System Modifications	Fire & Fire Suppression (too much/too little fire)	P	L	M

References Cited:
Brock, J. P., and K. Kaufman, 2003. Butterflies of North America. Kaufman Focus Field Guides, Houghton Mifflin Company, New York, NY 284 pp.

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Opler, P. A. and G. O. Krizek. 1984. Butterflies East of the Great Plains.

Stanford, Ray E. and Paul A. Opler. 1993. Atlas of Western USA Butterflies. Denver and Fort Collins, Colorado. 275 pp.

Common Name: Persius duskywing
Scientific Name: *Erynnis persius persius*
Taxon: Butterflies and Moths

SGCN – High Priority

Federal Status: Not Listed
New York Status: Endangered

Natural Heritage Program Rank:
Global: G5T1T3
New York: S1
Tracked: Yes

Synopsis:
The Persius duskywing (*Erynnis persius*) has a coast-to-coast range in North America, with its major population in the western states and a disjunct eastern subspecies, *E. p. persius*. The nominate subspecies, Erynnis persius persius, occupies a spotty and disjunct range in eastern North America, from southern New England west through Ontatio to Wisconsin, and south to New Jersey, possibly extending further south in the Appalachian Mountains. During the past 50 years the Persius duskywing has declines dramatically throughout its range. This subspecies is locally frequent, at best, and rare in most of its range. It is this subspecies that is the subject of this profile. The pine barrens and oak savannahs that these butterflies rely on have been destroyed and fragmented by urban and agricultural development and the butterflies have suffered from pesticide spraying, especially for gypsy moth control (Nelson 2007).

At least two subspecies should be recognized: typical *Erynnis persisus persius* is the now very rare eastern United States and southern Ontario taxon of conservation concern, while more western populations can all be combined as *E. persius borealis* or further split. Miller and Brown also recognize subspecies avinofi and fredericki. The latter is widely recognized in the literature. In this database information for the Great Lakes region and eastward, including southern Ontario, should be sought under subspecies *E. p. persius* (NatureServe 2012).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:
Habitats for the eastern subspecies of Persius duskywing include pine barrens, oak savanna, and other open, sunny locations (such as powerline rights of way) where its larval hostplants grow. They are also found in marshes. The duskywings will use a wide range of legumes as hostplants, principally wild (sundial) lupine (*Lupinus perennis*) and wild indigo (horseflyweed) (*Baptisia tinctoria*) (Shepherd 2005).

Primary Habitat Type
Pine Barrens
Powerline

Distribution:
Currently, Persius duskywing occurs only in Saratoga County, where it was last documented in 2001.

Known distribution of Persius duskywing in New York (New York Nature Explorer 2009)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Residential and Commercial Development	Housing & Urban Areas (habitat loss/degradation)	W	L	H
2. Residential and Commercial Development	Commercial & Industrial Areas (habitat loss/degradation)	W	L	H
3. Human Intrusions & Disturbance	Recreational Activities (ATV use)	R	L	M
4. Invasive & Other Problematic Species & Genes	Invasive non-native/alien species (exotic thrip)	W	L	V
5. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (invasive plants)	P	M	M
6. Invasive & Other Problematic Species & Genes	Problematic Native Species (mammalian herbivory)	R	L	H
7. Natural System Modifications	Other Ecosystem Modifications (disturbance supression, natural succession)	P	M	M
8. Natural System Modifications	Fire & Fire Suppression (inappropriate fire)	R	L	L
9. Pollution	Air-Borne Pollutants (mosquito spraying)	N	L	H
10. Climate Change & Severe Weather	Droughts	W	M	V
11. Climate Change & Severe Weather	Storms & Flooding (storms)	N	L	V

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Common Name: Bogbean buckmoth ***SGCN – High Priority***
Scientific Name: *Hemileuca* sp.1
Taxon: Butterflies and Moths

Federal Status: Not Listed
New York Status: Endangered

Natural Heritage Program Rank:
Global: G1Q
New York: S1
Tracked: Yes

Synopsis:
The bog buckmoth is a silk moth under the genus *Hemileuca*, of which there are 20 species in North America (Gradish and Tonge 2011). It is also commonly known as bogbean buckmoth or Cryan's buckmoth. *Hemileuca* sp. 1 fits in the *Hemileuca maia* species complex, where *H. maia, H. lucina*, and *H. nevadensis* are also included (Gradish and Tonge 2011). The status of the bog buckmoth has been intensively debated due to lack of genetic difference with other species within the complex and current thought is that the New York populations may be a distinctive subspecies of *H. nevadensis* (NatureServe 2013). This species stands out due to its unique use of fen habitat and its foodplant bog buckbean (*Menyanthes trifoliata*) (Tuskes et al. 1996, Gradish and Tonge 2011).

The primary foodplant, bog buckbean, is not a full reason to grant a species separation. A population in Wisconsin has been found to feed upon bog buckbean, making the distinctive foodplant restriction not as unique to the New York and Ontario populations as previously thought (Gradish and Tonge 2011). However, the larvae resemble other populations that span from New Jersey to central Wisconsin (NatureServe 2013). The ecological differences between bog buckmoth and other *Hemileuca* species are significant and are the basis for its species recognition and protection (Rubinoff and Sperling 2004).

Bog buckmoths are found on the northeastern margin of the *H. maia* complex distribution, with known populations in central New York and eastern Ontario (Legge et al. 1996). In New York, this species occupies six wetlands, all within Oswego County. This species inhabits minerotrophic fens (Bonanno and White 2011). Population trends in New York vary by each specific locality.

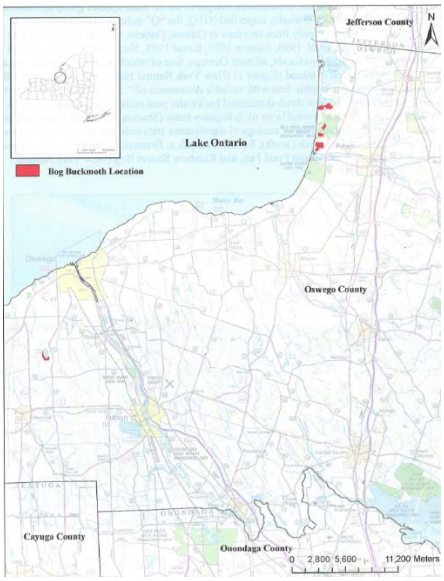
Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Severe Decline	Severe Decline
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:
The habitat for the six known localities in New York is characterized as medium fen with "…sedge – dominated floating peat mats on lake edges to low shrub-dominated backwater peat mats behind barrier dunes in the Lake Ontario basin" (Olivero 2001, Stanton 2003). The preferred host plant for *Hemileuca* sp. is bogbean (*Menyanthes trifoliata*), a shade intolerant species (Bonanno and White 2011).

Primary Habitat Type
Open Acidic Peatlands

Distribution:
There are currently three active bog buckmoth sites of the six documented localities: Silver Lake, Selkirk, and Deer Creek/Mud Creek.

At Rainbow Shores Bog, flying adults have not been sighted since 2003, despite annual surveying. Moths were abundant at this site in 1994 and 1996, crashed in 1996 and were very sparse through 2003 (Lawlor 2003). This site appears to have been extirpated (Bonanno 2013). The Deer Creek/Mud Creek site has shown the most extreme fluctuation pattern. Stanton (2000) considered this location to be an overflow site, which has supported a regular low-abundance population. The Deer Creek Marsh South population was first surveyed in 1992, when 11 larvae were found. The largest number of individuals found in subsequent surveys is six (Bonanno 2007). Selkirk Fen, South Pond Fen and Silver Lake fen support fluctuating but persistent populations (Bonanno and White 2011). In 2013, mean five-minute counts were very low: 1.0 at Selkirk, 0.3 at Deer Creek, and 0.0 at South Pond (Bonanno 2013).



Location of *Hemileuca* sp. populations in Oswego County (Bonanno and White 2011)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Natural System Modifications	Dams & Water Management/Use (changes in hydrology)	N	M	H
2. Natural System Modifications	Other Ecosystem Modifications (natural succession to woody swamps)	P	M	M
3. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (invasive plants i.e., *Phragmites*)	P	M	M
4. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (parasitoids)	P	L	V
5. Invasive & Other Problematic Species & Genes	Problematic Native Species (trampling by deer, rabbits)	N	L	V
6. Pollution	Air-Bourne Pollutants (pesticide spraying in nearby area)	N	L	H
7. Climate Change & Severe Weather	Habitat Shifting & Alteration	P	H	V
8. Invasive & Other Problematic Species & Genes	Beavers affecting hydrology	W	M	M

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Stanton, E. 2000. Final report: bog buck moth ecology and conservation management. A report prepared for the Nature Conservancy, Pulaski, NY.

Stanton, E. 2003. Development of a population monitoring program for the bog buck moth (Saturniidae: *Hemileuca* sp.). Report submitted to The Nature Conservancy, Central and Western New York Chapter, Pulaski, NY. 12 p.

Tuskes, P.M., J.P Tuttle, and M.M Collins. 1996. The wild silk moths of North America. A natural history of the Saturniidae of the United States and Canada. Comstock Publishing Associates, a division of Cornell University Press, Ithaca and London.

Common Name: Karner blue butterfly ***SGCN – High Priority***
Scientific Name: *Plebejus melissa samuelis*
Taxon: Butterflies and Moths

Federal Status: Endangered
New York Status: Endangered

Natural Heritage Program Rank:
Global: G5T2
New York: S1
Tracked: Yes

Synopsis:
In New York, the Karner blue butterfly (*Plebejus melissa samuelis*) is considered a subspecies of the Melissa blue (*Plebejus melissa*). Some experts suspect this will prove to be a full species; the number of species in this genus is not well understood (New York Natural Heritage Program 2011).

The Karner blue butterfly is currently found in Minnesota, Wisconsin, Michigan, northern Indiana, New York, Ohio and New Hampshire. The populations in Ohio and New Hampshire have been reintroduced from other states after they had been extirpated. It is still considered extirpated from Illinois, Iowa, Ontario, Pennsylvania, Massachusetts, and Maine.

The federally and state-listed Karner blue butterfly is completely management-dependent in New York, as is the case in most or all of the remaining portion of the range. Although about 50 subpopulations exist in NY, these cluster into four metapopulations, or recovery units. Of the 50 subpopulations, the vast majority have fewer than 100 butterflies present. This species does not persist well if the total July brood for the metapopulation is fewer than 1,000 adults (New York Natural Heritage Program 2011). The Federal Recovery Plan prescribes a minimum viable meta-population size of at least 3,000 adults in either brood within four of five consecutive years (USFWS 2003). The Plan defines a viable subpopulation as supporting at least 500 adult animals within at least 12.4 acres. To maintain meta-population levels above the minimum recovery thresholds Fuller (2008) determined that a minimum viable meta-population should contain between 7,641 and 12,960 adult butterflies.

Currently, the only known occupied sites in New York are clustered in Albany, Schenectady, Saratoga, and Warren counties and represent remnants of two or three once large metapopulations. Historically there were also specimens, or at least reports from Clayton, Tonawanda, Rome, Sullivan County, and Brooklyn (Shapiro 1974). This species would not persist in New York without active management (New York Natural Heritage Program 2011).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Severe Decline	Increasing
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:
Karner blue butterflies can be found in extensive pine barrens, oak savannas or openings in oak woodlands, and unnatural openings such as airports and right-of-ways that contain lupine (*Lupinus*

perennis), the sole larval food source. The original communities for some remnant populations in Saratoga and Warren Counties are unclear since there is little to suggest former pine barrens in these areas. Some recent populations have occurred in sandy old fields. The largest cluster of colonies was in the Albany-Schenectady County Pine Bush and parts of the region are still occupied, although today the largest population may very well be at Saratoga Sandplains Airport where it occurs mainly in restored habitat (New York Natural Heritage Program 2011).

Primary Habitat Type
Pine Barrens
Powerline

Distribution:
Even though there are about 50 subpopulations occupied each year, these cluster into four metapopulations, or recovery units. Of the 50 subpopulations, the vast majority have fewer than 100 butterflies present. The state recovery plan recognizes currently occupied sites in four areas: Albany, Schenectady, Saratoga, and Warren counties (NYSDEC 2013).

The largest metapopulation of the butterfly is at the Saratoga Sandplains Recovery Unit which had an estimated summer brood of 17,000-25000 in 2010. In 2011 and 2012, the number was lower, but analysis of the distance sampling has not been completed. Additional Karner blue butterfly sites occur in the Saratoga West Recovery Unit and Queensbury Sandplains, north of Albany. Metapopulation size estimates for the Albany Pine Bush Recovery Unit were >3,000 in 2012, and >5,000 in 2013 (APBPC unpublished data); the site supports more than 200 acres of suitable habitat and 60 individual sites within 10 sub-populations. Currently identified are 70 Karner blue localities and 56 subpopulations. Of those, 43 subpopulations are within the three recovery areas: 7 in the Albany Pine Bush, 27 in Saratoga Sandplains, and 9 in Saratoga West. Of these 43 subpopulations, only 15 are anticipated to have 8 more than 10 butterflies in the annual index counts. Eight subpopulations are within the Queensbury Sandplains in Warren County, which is considered a location for recovery under the state's draft recovery plan. Five subpopulations are within Glacial Lake Albany RU, but are isolated from any expected interaction with the sites in the recovery areas. A site is considered occupied until at least five years of adequate survey has failed to find the species.

As a result of considerable conservation efforts by the NYSDEC, USFWS, The Nature Conservancy, the Wilton Wildlife Preserve and Park and the Albany Pine Bush Preserve Commission, metapopulation sizes in the Saratoga Sandplains and Albany Pine Bush currently exceed the minimum federal recovery threshold of 3,000 butterflies in either brood. Both sites have developed recovery plans for their respective recovery units and active management and monitoring programs.

Historic range of the Karner blue butterfly and Federal Recovery Units (Zimmerman and O'Brien 2012)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Residential and Commercial Development	Housing & Urban Areas (habitat loss/degradation)	W	L	H
2. Residential and Commercial Development	Commercial & Industrial Areas (habitat loss/degradation)	W	L	H
3. Human Intrusions & Disturbance	Recreational Activities (ATV use)	N	L	M
4. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (exotic thrip)	W	L	V
5. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (invasive plants)	P	M	M
6. Invasive & Other Problematic Species & Genes	Problematic Native Species (mammalian herbivory)	R	L	H
7. Natural System Modifications	Other Ecosystem Modifications (disturbance supression, natural succession)	P	M	M
8. Natural Systems Modifications	Fire & Fire Suppression (inappropriate fire)	R	L	L
9. Pollution	Air-Borne Pollutants (mosquito spraying)	N	L	H
10. Climate Change & Severe Weather	Habitat Shifting & Alteration (host plant asynchrony)	W	H	V
11. Climate Change & Severe Weather	Temperature Extremes	W	M	V
12. Climate Change & Severe Weather	Droughts	W	M	V
13. Climate Change & Severe Weather	Storms & Flooding (storms)	R	M	V

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Common Name: Southern grizzled skipper ***SGCN – High Priority***
Scientific Name: *Pyrgus wyandot*
Taxon: Butterflies and Moths

Federal Status: Not Listed
New York Status: Endangered

Natural Heritage Program Rank:
Global: G1G2Q
New York: SH
Tracked: Yes

Synopsis:
The grizzled skipper has disappeared from much of its historic range and only survives today in small, fragmented colonies. Many authors have treated this as a subspecies of northern grizzled skipper (*P. centaureae*) despite substantial differences in adult color pattern, larval color, genitalia shape, and habitat preference, but for now it remains as a distinct species in most databases (Schweitzer et al. 2011). *Pyrgus wyandot* was described from Long Island and Washington D.C. in 1968 and historically occurred through much of the Appalachian Highlands from New York southward to North Carolina and westward to Ohio, with an isolated population in northern Michigan (Parshall 2002, Schweitzer et al. 2011). It has since been extirpated from a major portion of its range (New York-New Jersey and most of eastern Pennsylvania) (NatureServe 2013). This species is one of the most vulnerable to gypsy moth spraying due to the larvae habitat needs of open, exposed microhabitats within forest types that are prone to gypsy moth outbreaks (Schweitzer et al. 2011).

The last record of this species in NY was in 1970 from Tioga and Tompkins counties (NYSDEC SGCN Experts Meeting).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon			
> 50%		Rare	X		

Habitat Discussion:
Typical habitat for the southern grizzled skipper in New York is trap rock glades, shale barrens, and associated forest openings on other types of rocky outcrops (Schweitzer et al. 2011). Other important habitats are pastures, relatively open oak woods, and powerlines on south to west facing shale slopes, always with abundant bare rock or soil (NatureServe 2013). This species occurs in disturbed as well as natural habitats, including early and successional forest habitat where presence was recorded near Ithaca in the 1960s (Schweitzer et al. 2011). Adults seldom occur more than 30 meters from woods and sometimes occur in forested areas before the canopy becomes too dense (NYNHP 2013). Larvae feed almost exclusively on dwarf cinquefoil (*Potentilla canadensis*) and a variety of spring flowers are used for nectar, including pussytoes (*Antennaria*), moss phlox (*Phlox subulata*) and bird's foot violet (*Viola pedata*). Because larvae occur almost entirely in open, exposed microhabitats within forest types that are highly vulnerable to gypsy moth outbreaks, this is one of the most vulnerable species to spraying. Although the required food plants are very common, this species is nearly restricted to a narrow range of hot rock outcrop habitat (NatureServe 2013).

Primary Habitat Type
Oak Forest
Pasture/Hay
Powerline
Rocky Outcrop

Distribution:
There are no current records of this species in New York. It was last documented in 1970 in Tioga and Tompkins counties (NYNHP 2013).

Historic range of *Pyrgus wyandot* (excluding New Jersey counties) (Parshall 2002)

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Residential & Commercial Development	Housing & Urban Areas (habitat loss/degradation)	W	L	H
2. Natural System Modifications	Other Ecosystem Modifications (natural succession)	W	L	M
3. Natural System Modifications	Fire & Fire Suppression (too much or too little fire)	N	L	M
4. Pollution	Air-Borne Pollutants (gypsy moth spraying)	R	H	H
5. Climate Change & Severe Weather	Droughts	W	L	H

References Cited:

NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. Accessed: May 3, 2013.

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Schweitzer, D.F., M.C. Minno, and D.L. Wagner. 2011. Rare, declining and poorly known butterflies and moths (Lepidoptera) of forests and woodlands in the eastern United States. USFS Forest Health Technology Enterprise Team, Technology Transfer Bulletin FHTET-2011-01. 517p.

Common Name: Northern oak hairstreak ***SGCN – High Priority***
Scientific Name: *Satyrium favonius ontario*
Taxon: Butterflies and Moths

Federal Status: Not Listed
New York Status: Not Listed

Natural Heritage Program Rank:
Global: G4T4
New York: S2S4
Tracked: Yes

Synopsis:
The original specimen for this species apparently came from Ontario, Canada. However, since 1900 this subspecies has been found from the vicinity of Boston, Massachusetts (not before about 1980) southward though coastal New England, southeastern New York, and more widely from New Jersey through most of Georgia and west into Texas and Oklahoma. While it does occur in much of the lower Midwest eastward into Ohio and widely in the southeastern states, this species is unknown from the mountains (New York Natural Heritage Program 2012).

Distribution (% of NY where species occurs)		**Abundance** (within NY distribution)		**NY Distribution Trend**	**NY Abundance Trend**
0% to 5%	X	Abundant		Unknown	Unknown
6% to 10%		Common			
11% to 25%		Fairly common			
26% to 50%		Uncommon	X		
> 50%		Rare			

Habitat Discussion:
This species is most often found on dry rocky, or sandy oak, or oak-pine forest. Pitch pine and scrub oak may be present, but this butterfly is not generally found in classic pine barrens habitats. It may also turn up around more mixed forests (New York Natural Heritage Program 2012). As Shapiro (1974) noted, its habitat is not rare in southeastern New York.

Primary Habitat Type
Oak-Pine Forest
Pine Barrens

Distribution:
In New York the northern oak hairstreak occurs mostly in the lower Hudson Valley and on Long Island. The distribution also includes the Albany Pine Bush where one was collected in 1979. Historically, it was present in at least the Ithaca area, but according to Robert Dirig there are no records in that area since 1970, after collections in 1890, 1967, and 1970. Since 2000, there have been credible reports from Orange, Westchester, Rockland, and Suffolk counties (New York Natural Heritage Program 2012).

Threats to NY Populations				
Threat Category	**Threat**	**Scope**	**Severity**	**Irreversibility**
1. Residential & Commercial Development	Housing & Urban Areas (habitat loss/degradation)	W	M	H
2. Pollution	Air-Borne Pollutants (gypsy moth spraying)	R	M	M
3. Invasive & Other Problematic Species & Genes	Invasive Non-Native/Alien Species (gypsy moth/other species competing for food resources)	W	L	H

References Cited:

New York Natural Heritage Program. 2012. Online Conservation Guide for *Satyrium favonius ontario*. < http://www.acris.nynhp.org/guide.php?id=7865>. Accessed 23 January 2013.

Shapiro, A.M. 1974. Butterflies and Skippers of New York State. Search 4:1-60.