

Species Status Assessment

Common Name: Hessel's hairstreak

Date Updated: 10/18/2024

Scientific Name: *Callophrys hesseli*

Updated By: Annie Stupik

Class: Insecta

Family: Lycaenidae

Species 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 hessel*. 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 and Wagner 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. 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 from 1983-1989, and surveys in the early and mid-1990s failed to produce butterflies at any of the formerly occupied sites (NatureServe 2012). 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).

I. Status

a. Current legal protected Status

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

ii. **New York:** Endangered; HPSGCN

b. Natural Heritage Program

i. **Global:** G3

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

Other Ranks:

-IUCN Red List: n/a

-Northeast Regional SGCN: Yes

Status Discussion:

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, despite targeted searching by experts. The other

known Long Island sites were also searched by experts in the late 1980s and early 1990s without success. One remote inland Atlantic white cedar swamp in Orange County where the species was found in the late 1970s still contains suitable habitat and might be the most likely place to still harbor this butterfly in New York (NYNHP 2011a).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			-
Northeastern US	Yes	Unknown	Unknown			-
New York	Unknown	Unknown	Unknown		Endangered	Yes
Connecticut	Unknown	Unknown	Unknown		Endangered	Yes
Massachusetts	Unknown	Unknown	Unknown		Special concern	Yes
New Jersey	Yes	Unknown	Unknown		Special concern	Yes
Pennsylvania	No	-	-			-
Vermont	No	-	-			-
Ontario	No	-	-			-
Quebec	No	-	-			-

Column options

Present?: Yes; No; Unknown; No data; (blank) or Choose an Item

Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item

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

Monitoring in New York

There is no monitoring being conducted for this species in New York.

Trends Discussion

Trends for this species is difficult to determine due to lack of data and knowledge, in part due to its cryptic nature (NatureServe 2024). However, if the species is still present in New York, it is likely in decline due to loss of its host plant, Atlantic white cedar (*Chamaecyparis thyoides*; NYNHP 2011d).

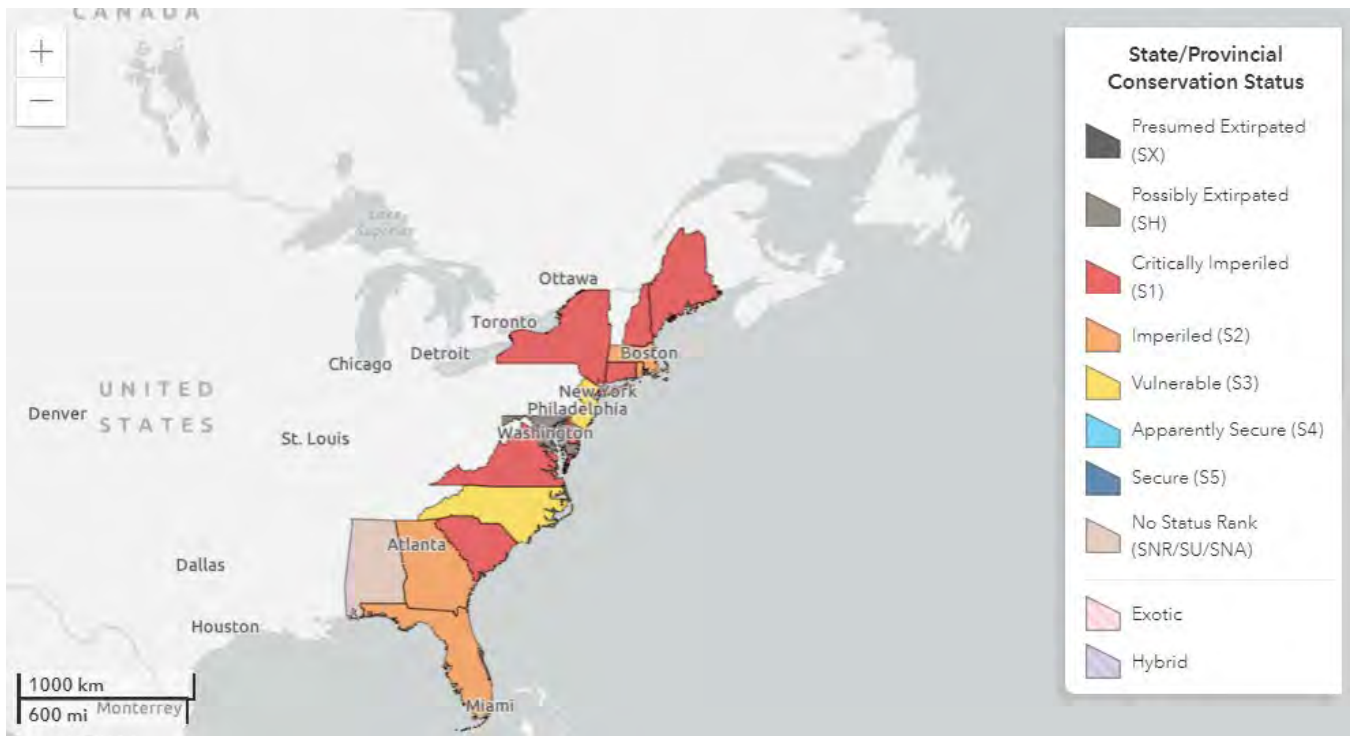


Figure 1. *Callophrys hesseli* status and distribution in North America (NatureServe 2024).

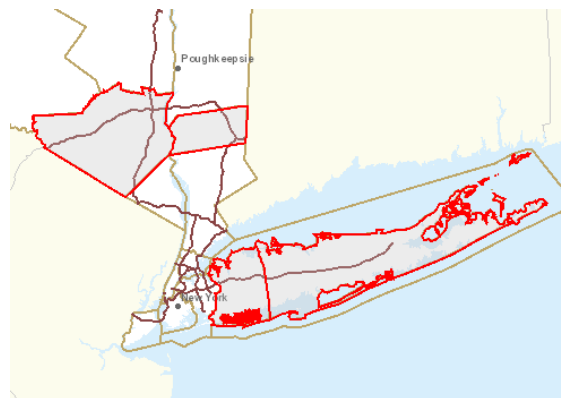


Figure 2. Occurrence of *Callophrys hesseli* in New York (New York Nature Explorer 2009).

III. New York Rarity

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-2000	2	2	_____
2000- 2023	_____	_____	_____

Table 1. Records of Hessel's hairstreak in New York.

Details of historic and current occurrence:

Nassau County – No date; extirpated; Orange County – Historically confirmed; no date; Putnam County – Possible but not confirmed; Suffolk County – 1986. There are no current occurrences and this species is thought to be extirpated in New York.

Shapiro (1974) reported two sites on the south shore of Long Island; the next mention of this species in New York is from about 1980, when five sites were known in Suffolk County and one in Orange County (Cryan 1985). However, this butterfly has not been seen in New York since the mid 1990s and many experts believe it is probably extirpated from the state (NYNHP 2011a).

It should be noted that this species is one of the most difficult butterflies in the eastern United States to find. This is especially true of the spring brood, because the adults usually perch in the canopy of relatively tall cedars and are only present for a few weeks per brood (Schweitzer and Wagner 2011).

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%	Core	

Column options

Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item

Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type (from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):

- a. Atlantic white cedar swamp
- b.

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Pollinator Species?	Habitat/Community Trend	Time frame of Decline/Increase
Yes	No	Choose an item.	Declining	Steep decline 1970s to present

Column options

Habitat Specialist, Indicator Species and Pollinator Species: Yes; No; Unknown; (blank) or Choose an item

Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

This species 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).

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):

The Hessel's hairstreak usually has one brood per year, with a partial second brood in some years in New Jersey and Rhode Island. Adults are present mostly from late April to mid- or late May, and a few in late July. In the Boston area and northward, the first brood is up to a month later and no second brood has been reported (Schweitzer and Wagner 2011).

Eggs are laid singly on the tips of the host twigs and hatch in in about a week. The larvae feed mostly on the new growth, at least in spring, and mature in about a month. Pupation probably occurs in the leaf litter, but this has not been confirmed in the wild. The pupae overwinter. Caterpillars eat the foliage of Atlantic white cedar (*Chamaecyparis thyoides*) (Schweitzer and Wagner 2011).

Adults spend most of their time in the tops of the cedars, although they descend to visit the damp soil at the edges of puddles, as well as flowers. It is hypothesized that they sip moist soil after eclosion before moving to the canopy (Schweitzer and Wagner 2011).

Flower visits have been reported at mid-day in hot weather (>32°C), but are otherwise typically in the morning or after 4:00 pm (Schweitzer and Wagner 2011).

Although they usually remain within the cedar swamp and nectar at highbush blueberry (*Vaccinium corymbosum*) or chokeberry (*Aronia*), late in the flight period butterflies may disperse out of the habitat into nearby fields, yards, and roadsides to nectar at other flowers. Usually no more than one to a few Hessel's hairstreaks are encountered, though dozens of individuals may be seen in exceptional circumstances (Beck and Garnett 1983).

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

The major issue with Hessel's hairstreak is maintaining an abundance of white cedar. Nectar plants may also be important. Logging, fires, beaver dams, and changes in water level due to road construction all affect the food plant directly, but in the long term, sapling death caused by browsing deer could be a greater threat. Overly abundance deer seriously affect, and sometimes prevent, cedar regeneration. White cedars are killed by fire, but with lower deer populations, can regenerate readily from seed. Deer can also virtually eliminate chokeberry, a favorite nectar flower (Schweitzer and Wagner 2011).

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
7. Natural System Modifications	7.2 Dams & Water Management/Use	-	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	(over-browsing by deer)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.5 Storms & Severe Weather	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 2. Threats to *Hessel's hairstreak*.

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

Yes: ü

No: _____

Unknown: _____

If yes, describe mechanism and whether adequate to protect species/habitat:

Hessel's hairstreak is listed as an endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Tidal Wetlands Act protects all tidal wetland habitats and adjacent areas under Article 25 of the NYS Conservation Law. This is not sufficient to protect the habitat sufficiently for the species.

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

First it is imperative to ascertain whether this endangered species remains extant in New York. All occurrences of Coastal Plain Atlantic white cedar swamps on Long Island as well as Inland Atlantic white cedar swamps in Putnam and Orange Counties should be surveyed during May to early June to determine whether this species remains a part of New York's Lepidopteran fauna, and if it does, recognize that the major issue with Hessel's hairstreak is maintaining an abundance of white cedar (Schweitzer and Wagner 2011).

The ecology of this tree is fairly well understood, and with proper management, the butterfly can persist with timber harvest. Generally, silviculture practices that maintain white cedar stands should perpetuate populations as long as there are substantial reservoirs of uncut cedars. Distances between stands should be relatively small (less than 1 km) and logging rotations should allow the cedar to regenerate and mature between cuts. Deer fences can be installed to protect against over-browsing and permit regeneration of white cedar in areas with high deer populations (Schweitzer and Wagner 2011). Regardless of whether this hairstreak still occurs in New York, all occurrences of Atlantic white cedar swamps, both coastal and inland, should be protected and managed.

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct Habitat Management	Site Management
A.2 Direct Species Management	A.2.0.0.0 Direct Species Management	Invasive/problematic species control
B.3 Outreach	B.3.0.0.0 Outreach	Awareness and Communications
C.6 Design and Plan Conservation	C.6.0.0.0 Design and Plan Conservation	Site/Area Protection
C.6 Design and Plan Conservation	C.6.0.0.0 Design and Plan Conservation	Resource/Habitat Protection
C.7 Legislative and Regulatory Framework or Tools	C.7.0.0.0 Legislative and Regulatory Framework or Tools	Policies and Regulations
C.9 Education and Training	C.9.0.0.0 Education and training	Training

Table 3. Recommended conservation actions for Hessel's hairstreak.

VII. References

- Beck, A.F. and W.J. Garnett. 1983. Distribution and notes on the Great Dismal Swamp population of *Mitoura hesseli* Rawson and Ziegler (Lycaenidae). *Journal of the Lepidopterist's Society* 37(4): 289-300.
- Cryan, J. 1985. Hessel's Hairstreak: endangered cedar swamp butterfly. *The Heath Hen* 2:22-25.
- Karlin, Eric F. 1997. The Drowned Lands' Last Stand: An inland Atlantic white cedar swamp in Orange County, New York. *Journal of the Torrey Botanical Society*. 124(1):89-97.
- NatureServe. 2024. NatureServe Explorer. October 4, 2024. https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.110485/Callophrys_hesseli. Accessed October 18, 2024.
- New York Natural Heritage Program (NYNHP). 2011a. Online Conservation Guide for *Callophrys hesseli*. <<http://www.acris.nynhp.org/guide.php?id=7857>>. Accessed 7 January 2013.
- New York Natural Heritage Program (NHNHP). 2011b. Online Conservation Guide for Coastal Plain Atlantic White Cedar Swamp. Albany, NY. <<http://www.acris.nynhp.org/guide.php?id=XXX>>.
- New York Natural Heritage Program (NYNHP). 2011c. Online Conservation Guide for Inland Atlantic White Cedar Swamp. Albany, NY. <<http://www.acris.nynhp.org/guide.php?id=XXX>>.
- New York Natural Heritage Program (NYNHP). 2011d. Online Conservation Guide for Atlantic White Cedar. Albany, NY. <<http://www.acris.nynhp.org/guide.php?id=XXX>>.
- New York State Department of Environmental Conservation (NYSDEC). 2009. New York Nature Explorer. <<http://www.dec.ny.gov/natureexplorer/app/>>. Accessed 7 January 2013.

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

Shapiro, A.M., and A.R. Shapiro. 1973. The ecological associations of the Butterflies of Staten Island. Journal of Research on the Lepidoptera 12:65-128.

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.

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