

# Species Status Assessment

**Common Name:** Tomah mayfly

**Date Updated:** February 2025

**Scientific Name:** *Siphonisca aerodromia* **Updated by:** Luke Myers and NYNHP

**Class:** Insecta

**Family:** Siphonuridae

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

The Tomah mayfly (*Siphonisca aerodromia*) is currently listed as an Endangered species in New York and is known to occur only in New York and in northern Maine. It was first collected in 1907 along the Sacandaga River; that population was subsequently lost when the Sacandaga Reservoir was constructed in the 1930s. Still without a common name, this mayfly was not reported in the United States again until 1978 when it was found in Tomah Stream in northern Maine. Several new occurrences of this species have been documented in Maine since then, and in New York since 1995.

Surveys of the Black River indicate that this species is locally abundant where suitable habitat exists on lower reaches of the river in Lewis and Jefferson counties. Surveys of the Sacandaga River were unsuccessful in locating any remnant populations of Tomah mayfly. Potential habitats were located on the East Branch of the Sacandaga River; however surveys of these habitats were likely too late in the season to encounter this species (Myers et al. 2010).

This species has also been reported historically from several locations in Quebec, Newfoundland, Labrador, and Nova Scotia (Needham 1908, Magnin and Harper 1970, Fiance 1978, Hutchinson 1989, Burian and Gibbs 1988, Burian and Gibbs 1991, Jacobus and McCafferty 2001).

McCafferty and Edmunds (1997) suggest that this species is not as rare as others have suggested, and that there are many other species of mayflies that are known from fewer locales.

DEC is not aware of any additional data or new information on population trends or threats to this species since the last SWAP revision in 2015 to indicate a need for change in SGCN status

## **I. Status**

### **a. Current legal protected Status**

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

ii. **New York:** Endangered

### **b. Natural Heritage Program**

i. **Global:** G2G3

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

### **Other Ranks:**

- New York 2025 SGCN status: High Priority Species of Greatest Conservation Need
- COSEWIC: Not listed
- IUCN Red List: Not listed
- Northeast Regional SGCN: RSGCN

**Status Discussion:**

New locations have been identified in New York recently (2009) due to increased surveys (Myers et al. 2010).

**II. Abundance and Distribution Trends**

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

*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):*

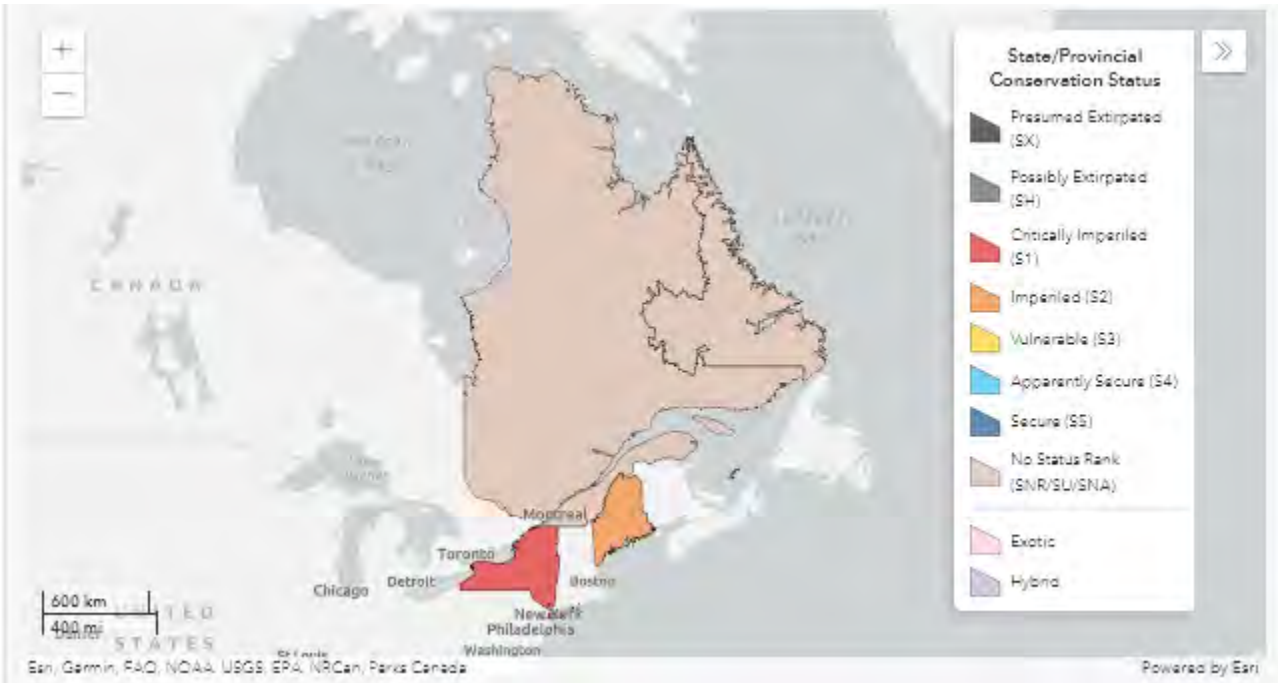
None.

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

Tomah mayfly was first discovered in New York in 1909 along the Sacandaga River in Fulton County. The location was destroyed by the construction of the Conklingville Dam in 1930s and the species was thought to have been extirpated. In 1978, the species was found in Tomah Stream in northern Maine. Extensive surveys following this discovery led to more than 15 additional locations in northern Maine.

Tomah mayfly was rediscovered in New York in 1986 along areas of the Black River in Jefferson and Lewis counties. Surveys conducted in 2009 revealed more new locations along the Black River (Myers et al. 2010).

Surveys of the Sacandaga River were unsuccessful in locating any remnant populations of Tomah mayfly. Potential habitats were located on the East Branch of the Sacandaga River; however surveys of these habitats were likely too late in the season to encounter this species (Myers et al. 2010).

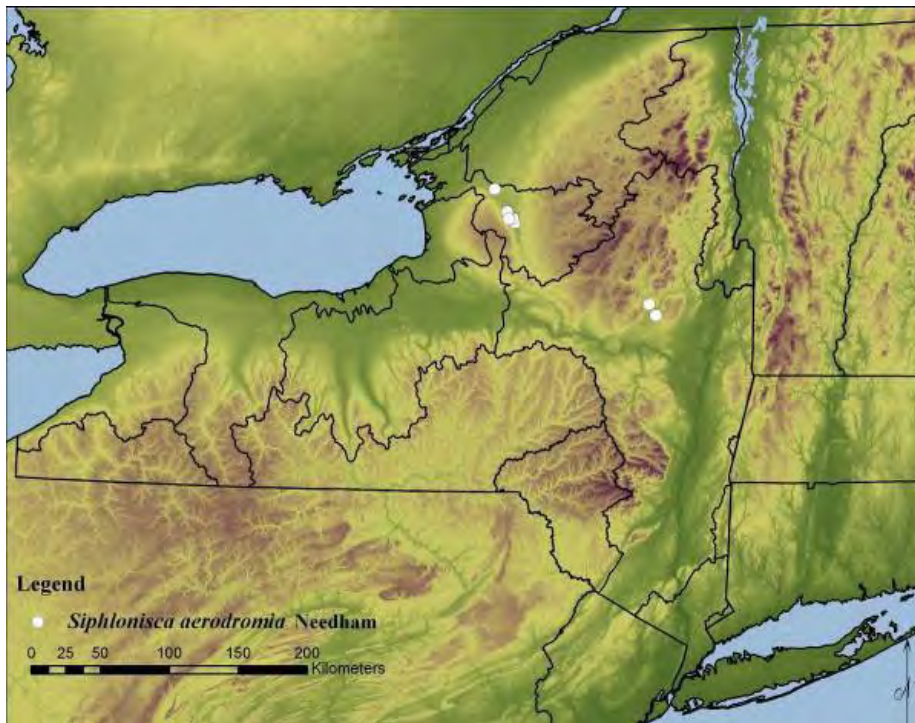


**Figure 1.** Conservation status of *Siphonisca aerodromia* in North America (NatureServe 2023)



**Figure 1.** Distribution of *Siphonisca aerodromia* in the state of Maine (www.maine.gov)

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



**Figure 3.** Distribution of *Siphonisca aerodromia* (Needham) in New York

Years	# of Records	# of Distinct Waterbodies/Locations	% of State
Pre-2000	_____	<u>2</u>	<u>0-5%</u>

2000- 2023	_____	11	_____
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**Table 1.** Records of *Siphonisca aerodromia* in New York.

**Details of historic and current occurrence:**

Historic occurrence: **Fulton Co.**, North Hampton, Fish House, May 25, 1914 (Needham 1908); Sacandaga Park, June 6, 1909 (Needham 1908)

Current occurrence: One location in Jefferson County and ten locations in Lewis County.

Tomah mayfly is found only in northern Maine and in two counties in New York. In Maine, it is considered abundant at one site, common at seven sites, and rare at five sites.

Stoneflies, mayflies, and caddisflies are difficult to fully document, and thus abundance and distribution remain largely uncertain despite the confirmed occurrences that exist. The recent surveys done by Myers et al. (2010) of the Upper Hudson, Lake Champlain, and NE Lake Ontario watersheds provided a wealth of new information on mayflies, but surveys should be done throughout the rest of the state to get a more complete understanding of abundance and distribution.

**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
26-50%	Disjunct	

*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. Riverine, cold water stream, sand and gravel bottom
- b. Palustrine, mineral soil wetland, meadow

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

Habitat Specialist?	Indicator Species?	Habitat/Community Trend	Time frame of Decline/Increase
Yes	Yes	Declining	

*Column options*

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

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

**Habitat Discussion:**

In Maine the Tomah mayfly inhabits small rivers and streams bordered by extensive areas of seasonally flooded sedge meadow. This is a dynamic habitat, characterized by a short period of flooding from snow and ice melt during April-May, followed by receding water from the floodplain during summer months. Standing water often remains until May or June as pools, channels, or isolated ponds. Tussock sedge and rushes are typically the dominant vegetation in these habitats. The inundated, decomposing sedge provides shelter, bottom surface, and abundant food for an unusually diverse and abundant aquatic invertebrate community (Maine Dept. of Inland Fisheries and Wildlife).

In New York this species has been reported from similar floodplain habitats on the Black River on the flanks of the Adirondack Mountains and the Tug Hill Plateau. This particular river is much larger in size than streams inhabited by *S. aerodromia* in Maine. This area receives some of the highest snowfall totals in the state and despite a number of flood control structures, is still prone to annual spring flooding (Carter 1980).

## V. Species Demographic, and Life History:

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/Catadromous?
Yes	Choose an item.	Choose an item.	Yes	Yes	Choose an item.

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 life history and ecology of Tomah mayfly has been studied extensively (Gibbs and Mingo 1986, Gibbs 1993, Gibbs and Siebenmann 1996, Gibbs et al. 1998, Huryn 2002). Descriptions of both larvae and adults have been provided by numerous authors (Needham 1908, Clemens 1915, Traver 1935, Burks 1953, Edmunds et al. 1976, Burian and Gibbs 1988).

Larvae migrate from the stream channel to sedge dominated (*Carex spp.*) floodplain habitats during the spring snowmelt in March and April. Once in the floodplain, larvae prey heavily on other aquatic insects present in the temporarily available habitats. It is during this time period that a majority of the larval growth is achieved. Adults emerge in late May and early June. Eggs are deposited in the water column where they eventually attach to submerged sand and gravel substrates (Myers et al. 2010).

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

<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>
4. Transportation & Service Corridors	4.1 Roads & Railroads	4.1.1 Roads (salt and maintenance)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
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.	Choose an item.
8. Invasive & Other Problematic Species	8.1 Invasive Non-Native Plants & Animals	Choose an item.(Didymo)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.1 Domestic & Urban Wastewater	9.1.2 Runoff (salt application)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.2 Industrial & Military Effluents	9.2.7 Other industrial discharges (heavy metals)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.1 Nutrient loads	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.3 Herbicides & pesticides	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.6 Excess Energy	9.6.1 Light pollution	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.4 Changes in Precipitation & Hydrological Regimes	11.4.2 Droughts	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

**Table 2.** Threats to *Siphonisca aerodromia*.

Stoneflies, mayflies, and caddisflies are usually only found at high quality, minimally-polluted sites. They are sensitive to pollution and vulnerable to any activity that affects water quality and are commonly used indices of aquatic ecosystem health. Their presence in an aquatic ecosystem is a strong indicator of a healthy body of water.

Poor water quality and the acute and chronic effects of contaminants in aquatic habitats as a significant threat to stoneflies, mayflies, and caddisflies. Water quality can be degraded by siltation, nutrient runoff, temperature increases, toxics (e.g., pesticides, heavy metals), lowered dissolved oxygen, and altered hydrology (dams, water withdrawal, ground water extraction). Additionally, contaminants that enter aquatic and terrestrial systems through atmospheric depositions and have both habitat and population-level effects.

Altering the flow of riparian habitats with dams and bridges, and for flood control, agriculture and development (roads, residential, commercial) can directly and indirectly stoneflies, mayflies, and caddisflies. Movement of populations of aquatic species are inhibited, and habitat for all species dependent on lotic systems is lost outright or degraded through decreased conveyance and increased sedimentation.

Populations could be adversely affected by disturbance of the benthos including dredging and channel modifications. Stream and road bank erosion of coastal soils, and erosion from agricultural fields are significant sources of sand/sediment. Larvae are particularly intolerant of stream pollution. Adults may be adversely affected by light pollution (Myers, pers. comm.).

Climate change poses a threat to aquatic species. By virtue of the small and isolated populations of this species, it is particularly vulnerable to storms that cause erosion and flooding. Winter storm events with excessive ice and heavy snowfall result in spring meltwater flooding and erosion.

Tomah mayfly was classified as “highly vulnerable” to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program (Schlesinger et al. 2011).

From 1993 to 2002, the NYSDEC Stream Biomonitoring Unit sampled macroinvertebrates at 1,532 sites on 917 streams in New York. Of the sites determined to have some impact, nonpoint source nutrient enrichment was the dominant impact, affecting 52% of sites (Bode et al. 2004).

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

Yes:

No:

Unknown:

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

The Tomah mayfly 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 Protection of Waters Program provides protection for rivers, streams, lakes, and ponds under Article 15 of the NYS Environmental Conservation Law.

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

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.3.0.0 Mitigate human environmental impact	Review development and other proposals that could impact hydrology and could threaten the population in the Black River
C.8 Research and Monitoring	C.8.1.1.1 Characterization, demographic study, population, or inventory	Statewide baseline survey: identify rivers and streams with necessary habitat and conduct surveys for new locations, including in the vicinity of the historical Sacandaga River occurrence.
C.8 Research and Monitoring	C.8.1.1.1 Characterization, demographic study, population, or inventory	Conduct more complete surveys of the Black River to determine larval and adult mayfly habitat usage and ecology in the Black River and any new sites as a result of statewide surveys.
C.8.1.1.1 Characterization, demographic study, population, or inventory	C.8.1.1.1 Characterization, demographic study, population, or inventory	Conduct more complete surveys of the Black River to completely define the extent of the occurrence and develop and apply a standardized sampling scheme that will result in long-term monitoring of the population.
C.8 Research and Monitoring	C.8.1.5.3 Analyzing threats or their impacts	Support and encourage research to increase knowledge about the impact of poorly known threats to the species.

**Table 3.** (need new recommended conservation actions for *Siphonisca aerodromia*).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for the Tomah mayfly.

**Habitat monitoring:**

\_\_\_\_\_ Review development or other proposals that could impact the flow, water quality, or other factors that could threaten the population in the Black River.

**Habitat research:**

\_\_\_\_\_ Support and encourage research that would increase knowledge of the impact of poorly known threats to this species (e.g. water quality degradation, removal of forested riparian buffers, hydrological flow alterations from existing or new dams).

\_\_\_\_\_ Conduct more complete surveys of the Black River to define larval and adult mayfly habitat usage and ecology in the Black River and any new sites that may be located as a result of statewide surveys.

**Population monitoring:**

\_\_\_\_\_ Conduct more complete surveys of the Black River to completely define the extent of the occurrence and develop and apply a standardized sampling scheme that will result in long-term monitoring of the population.

**Statewide baseline survey:**

\_\_\_\_\_ Identify rivers and streams with the necessary spring inundated sedge meadow habitat and conduct surveys for new locations including in the vicinity of the historical Sacandaga River occurrence (the exact historical location is inundated, but suitable habitat may exist elsewhere in the watershed).

## VII. References

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