

Species Status Assessment

Class: Insecta
Family: Siphonuridae
Scientific Name: *Siphonisca aerodromia*
Common Name: Tomah Mayfly

Species synopsis:

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.

I. Status

a. Current Legal Protected Status

- i. Federal Not Listed Candidate: No
- ii. New York Endangered; SGCN

b. Natural Heritage Program Rank

- i. Global G2G3
- ii. New York S1 Tracked by NYNHP? Yes

Other Rank:

Tomah mayfly is listed as Threatened in Maine, the only other state where it is known to occur. It is a former candidate for federal listing.

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

a. North America

i. Abundance

 declining increasing stable X unknown

ii. Distribution:

 declining increasing stable X unknown

Time frame considered: _____

b. Regional

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Northeast

Time Frame Considered: _____

c. Adjacent States and Provinces

CONNECTICUT Not Present No data _____

MASSACHUSETTS Not Present No data _____

NEW JERSEY Not Present No data _____

ONTARIO Not Present No data _____

PENNSYLVANIA Not Present No data _____

VERMONT Not Present No data _____

QUEBEC Not Present _____ No data

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: _____

Listing Status: _____

NEW YORK

Not Present _____

No data _____

i. Abundance

___ declining ___ increasing ___ stable X unknown

ii. Distribution:

___ declining ___ increasing ___ stable X unknown

Time frame considered: _____

Monitoring in New York.

None

Trends Discussion:

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).

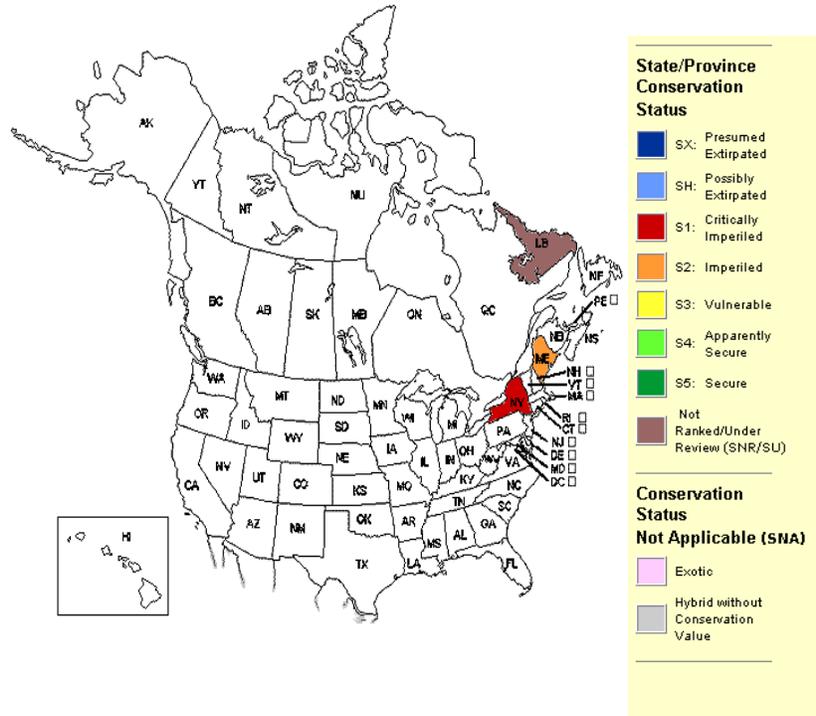


Figure 1. Conservation status of the tomah mayfly (NatureServe (2012)).

*Also included in the range are Quebec and Nova Scotia (Myers, pers. comm.).

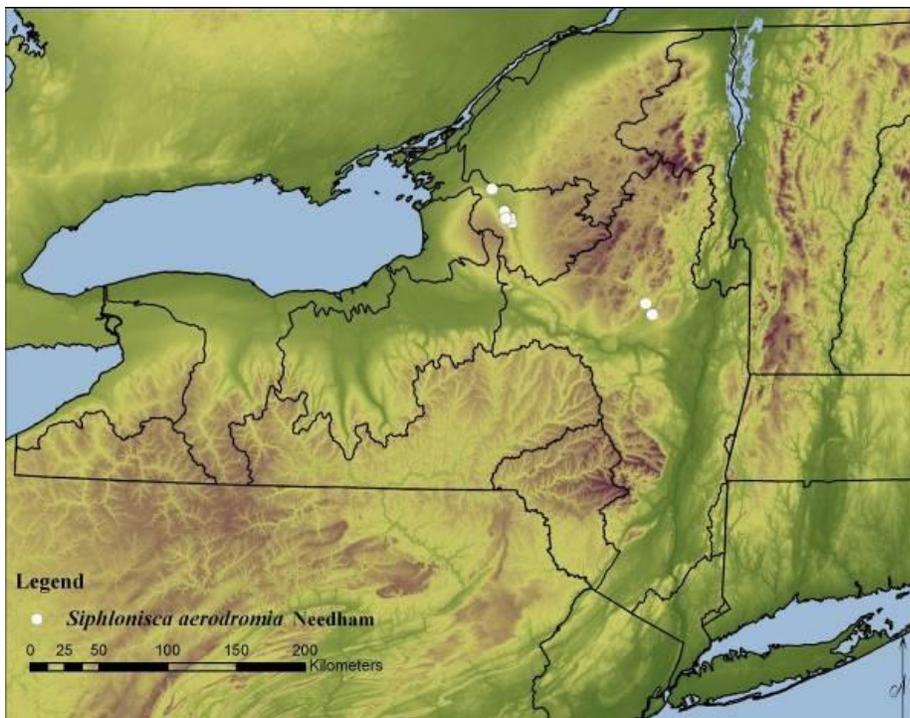


Figure 2. Distribution of *Siphonisca aerodromia* (Needham) in New York State.

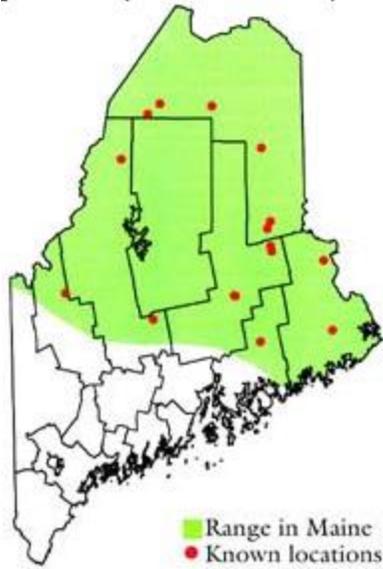


Figure 3. distribution of tomah mayfly in the state of Maine (www.maine.gov).

III. New York Rarity, if known:

Historic	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1970	_____	<u>2</u>	_____
prior to 1980	_____	_____	_____
prior to 1990	_____	_____	_____

Details of historic occurrence:

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

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	<u>11</u>	_____

Details of current occurrence:

One location in Jefferson County and ten locations in Lewis County.

New York's Contribution to Species North American Range:

Distribution (percent of NY where species occurs)

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

Abundance (within NY distribution)

- abundant
- common
- fairly common
- uncommon
- rare

NY's Contribution to North American range

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

Classification of New York Range

- Core
- Peripheral
- Disjunct

Distance to nearest population:

V. New York Species Demographics and Life History

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

Species Demographics and Life History Discussion:

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 are eventually attach to submerged sand and gravel substrates (Myers et al. 2010).

VI. Threats:

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?

No Unknown

Yes

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 Conservation Law.

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

Conservation actions following IUCN taxonomy are categorized in the table.

Conservation Actions	
Action Category	Action
Conservation actions have not been identified	

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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