



Insects

Tomah Mayfly

Siphonisca aerodromia

Priority 1 Species of Greatest Conservation Need (SGCN)

Class: Insects (*Insecta*)

Order: Mayflies (*Ephemeroptera*)

Family: Primitive Minnow Mayflies (*Siphonuridae*)



General comments:

The Tomah Mayfly belongs to the Primitive Minnow Mayfly family (Siphonuridae). Its larvae inhabit streams and rivers bordered by seasonally flooded sedge meadow, to which they move in early spring and prey upon other mayfly larvae prior to emerging as adults. This species is a rare Northeast endemic known only from a few sites in New York and eastern Canada, and 19 Maine rivers and streams where it has been intensively studied for several decades. It is listed as state Threatened and at risk due to its global rarity and the vulnerability of its stream habitat to alteration of critical hydrology patterns by dams and other water management activities, as well as from shoreline development, loss of riparian forest cover, pollution, and impacts of climate change.

Species Conservation Range Maps:

Town Map: [Siphonisca aerodromia_Towns.pdf](#)

Subwatershed Map: [Siphonisca aerodromia_HUC12.pdf](#)

SGCN Priority Ranking - Designation Criteria:

Risk of Extirpation:	Maine Status: Threatened	Federal Status: None	IUCN Red List Status: None
Regional Endemic:	<i>Siphonisca aerodromia</i> 's global geographic range is at least 90% contained within the area defined by USFWS Region 5, the Canadian Maritime Provinces, and southeastern Quebec (south of the St. Lawrence River).		
High Regional Conservation Priority:	Northeast Regional Synthesis (RSGCN): Responsibility: High, Concern: High NatureServe: Global Rank: G2 State Rank: S2		

Habitat Associations:

Formation: Freshwater Aquatic

Macrogroup: Lotic

★ Primary Habitat	Habitat System: Low Slope Headwater <i>only where seasonally flooded sedge meadow is adjacent to lotic habitat</i>
★ Primary Habitat	Habitat System: Moderate Slope Headwater <i>only where seasonally flooded sedge meadow is adjacent to lotic habitat</i>
★ Primary Habitat	Habitat System: Transitional Small and Medium Rivers <i>only where seasonally flooded sedge meadow is adjacent to lotic habitat</i>

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Formation: Freshwater Aquatic

★ Primary Habitat	Habitat System: Unknown Thermal Regime Small and Medium Rivers <i>only where seasonally flooded sedge meadow is adjacent to lotic habitat</i>
★ Primary Habitat	Habitat System: Warm Small and Medium Rivers <i>only where seasonally flooded sedge meadow is adjacent to lotic habitat</i>

Formation: Freshwater Marsh

Macrogroup: Eastern North American Marsh, Wet Meadow & Shrubland

★ Primary Habitat	Habitat System: Laurentian-Acadian Wet Meadow-Shrub Swamp <i>only where seasonally flooded sedge meadow is adjacent to lotic habitat</i>
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Formation: Northeastern Upland Forest

Macrogroup: Acadian-Northern Appalachian Forest

	Habitat System: Acadian-Northern Appalachian Forest Macrogroup- Unknown Habitat System <i>riparian habitat only</i>
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Threats

Threat Priority Level based on Severity and Actionability		Moderate Severity		High Severity	
	Highly Actionable		Medium-High		High
	Moderately Actionable		Medium		Medium-High
	Actionable with Difficulty		Low		Low

IUCN Level 1 Threat Natural Systems Modifications

IUCN Level 2 Threat: Dams and Water Management-Use

Severity: High Severity **Actionability:** Moderately Actionable

Notes: species requires seasonally flooded sedge meadows on streams and rivers; dams alter natural flooding regime and can permanently inundate riparian wetlands, alter and degrade stream habitat; water withdrawal for irrigation or other large scale consumptive uses can alter/degrade habitat integrity and cause direct mortality

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IUCN Level 1 Threat Other Options

IUCN Level 2 Threat: Other Threat

Severity: Moderate Severity	Actionability: Highly Actionable
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Notes: lack of comprehensive statewide species assessment, recovery goals/plan, and site-specific conservation plans

IUCN Level 2 Threat: Resource Needs

Severity: High Severity	Actionability: Moderately Actionable
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Notes: MDIFW lacks funding and staff to implement conservation actions for SGCN invertebrates (e.g., surveys and monitoring, research, habitat protection, outreach and education)

IUCN Level 1 Threat Biological Resource Use

IUCN Level 2 Threat: Logging and Wood Harvesting

Severity: Moderate Severity	Actionability: Moderately Actionable
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Notes: in riparian buffer where loss of intact forest canopy can degrade stream and riparian habitat integrity and water quality

IUCN Level 1 Threat Energy Production and Mining

IUCN Level 2 Threat: Renewable Energy

Severity: Moderate Severity	Actionability: Moderately Actionable
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Notes: in riparian buffer where loss of intact forested canopy can degrade stream and riparian habitat integrity and water quality; in stream channel from impacts of construction and poorly designed stream crossings

IUCN Level 1 Threat Other Options

IUCN Level 2 Threat: Education & Outreach

Severity: Moderate Severity	Actionability: Moderately Actionable
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Notes: some threats and challenges can be minimized through enhanced public outreach and advocacy (e.g., pesticide use, riparian habitat management, BMPS for stream crossings, awareness and appreciation)

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IUCN Level 1 Threat Other Options

IUCN Level 2 Threat: Lack of knowledge

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: lack of comprehensive knowledge about distribution, population sizes, trends, and status; although this species has been the target of considerable survey effort for the past four decades, it is possible a few more occurrences could be found

IUCN Level 1 Threat Pollution

IUCN Level 2 Threat: Agricultural and Forestry Effluents

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: in riparian buffer or stream channel where run off/application of pesticides, fertilizers, and other chemicals can degrade water quality or impact nymphs

IUCN Level 1 Threat Residential and Commercial Development

IUCN Level 2 Threat: Housing and Urban Areas

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: in riparian buffer where permanent land use changes, increased road crossings, and loss of intact forest canopy can degrade stream and riparian habitat integrity and water quality

IUCN Level 1 Threat Transportation and Service Corridors

IUCN Level 2 Threat: Roads and Railroads

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: in riparian buffer where loss of intact forest canopy can degrade stream and riparian habitat integrity and water quality (e.g., run-off, road salt); in stream channel where construction and maintenance can cause erosion of stream banks, sedimentation, water quality degradation, and direct mortality of nymphs; impacts to stream habitat from poorly designed stream crossings

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IUCN Level 1 Threat Transportation and Service Corridors

IUCN Level 2 Threat: Utility and Service Lines

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: in riparian buffer where loss of intact forest canopy can degrade stream and riparian habitat integrity and water quality; in stream channel where utility crossings can disturb stream bed and cause direct mortality of nymphs

IUCN Level 1 Threat Climate Change and Severe Weather

IUCN Level 2 Threat: Changes in Precipitation and Hydrological Regimes

Severity: Moderate Severity

Actionability: Actionable with Difficulty

Notes: extreme and/or prolonged events (flooding or drought) can cause direct mortality, displacement, disruption of access to seasonally sedge meadow habitat, erosion of stream banks, sedimentation, increased water temperatures, water quality degradation, etc

IUCN Level 2 Threat: Changes in Temperature Regimes

Severity: Moderate Severity

Actionability: Actionable with Difficulty

Notes: potential impacts from climate change or water management could exceed species' temperature thresholds

IUCN Level 2 Threat: Habitat Shifting or Alteration

Severity: Moderate Severity

Actionability: Actionable with Difficulty

Notes: potential impacts of climate change (e.g., increased water temperature, lack of spring snowmelt to flood riparian sedge meadow, etc)

IUCN Level 1 Threat Pollution

IUCN Level 2 Threat: Air-Bourne Pollutants

Severity: Moderate Severity

Actionability: Actionable with Difficulty

Notes: impacts to water quality and direct impacts to nymphs from acidification, mercury deposition, other contaminants, etc

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Species Level Conservation Actions:

Only species specific conservation actions that address high (red) or medium-high (orange) priority threats are summarized here.

Conservation Action	Category	Biological Priority	Type
Update statewide species assessment and draft a conservation plan, including recovery goals, as well as site-specific conservation plans for each occupied waterbody.	Species Management	critical	on-going

Threat(s) Addressed By This Conservation Action

- Other Threat
- Education & Outreach

Conservation Action	Category	Biological Priority	Type
Work with landowners and hydropower companies to cooperatively develop protocols and best management practices in managed river systems where species is present.	Habitat Management	high	new

Threat(s) Addressed By This Conservation Action

- Dams and Water Management-Use

Conservation Actions Associated with the Riverine Mayflies Guild:

Conservation Action	Category	Biological Priority	Type
Conduct comprehensive statewide surveys to inform/update diversity, distribution, habitat use, and status.	Survey and Monitoring	high	new

Threat(s) Addressed By This Conservation Action

- Lack of knowledge

Conservation Action	Category	Biological Priority	Type
Develop/distribute outreach materials to raise public awareness and appreciation of freshwater aquatic insect ecology, threats and conservation needs.	Public Outreach	moderate	on-going

Threat(s) Addressed By This Conservation Action

- Education & Outreach

Conservation Action	Category	Biological Priority	Type
Increase MDIFW staff capacity for survey and conservation of SGCN invertebrates.	Policy	critical	new

Threat(s) Addressed By This Conservation Action

- Education & Outreach
- Lack of knowledge
- Resource Needs

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Conservation Action	Category	Biological Priority	Type
Develop/distribute Best Management Practices for landowners, land managers and conservation partners to avoid and minimize impacts of intensive land use activities (e.g., forestry, stream crossings, agriculture, development, hydro facilities).	Habitat Management	critical	on-going

Threat(s) Addressed By This Conservation Action

- Utility and Service Lines
- Roads and Railroads
- Housing and Urban Areas
- Tourism and Recreational Areas
- Agricultural and Forestry Effluents
- Education & Outreach
- Renewable Energy
- Logging and Wood Harvesting

Conservation Action	Category	Biological Priority	Type
Update NatureServe S-ranks for all state-listed mayfly species.	Research	high	completed

Threat(s) Addressed By This Conservation Action

- Lack of knowledge

Broad Taxonomic Group Conservation Actions:

Additional relevant conservation actions for this species are assigned within broader taxonomic groups in Maine's Wildlife Action Plan: Element 4.

Habitat Based Conservation Actions:

Additional conservation actions that may benefit habitat(s) associated with this species can be found in Maine's Wildlife Action Plan: Element 4. Click on the Habitat Grouping of interest to launch a habitat based report summarizing relevant conservation actions and associated SGCN.

The Wildlife Action Plan was developed through a lengthy participatory process with state agencies, targeted conservation partners, and the general public. The Plan is non-regulatory. The species, threats, and voluntary conservation actions identified in the Plan complement, but do not replace, existing work