



Insects



Twilight Moth

Lycia rachelae

Priority 2 Species of Greatest Conservation Need (SGCN)

Class: Insects (*Insecta*)

Order: Butterflies, Skippers, And Moths (*Lepidoptera*)

Family: Emerald Moths And Allies (*Geometridae*)

General comments:

The Twilight Moth is a member of the Geometridae family and the genus *Lycia*. This species is widely distributed across boreal Canada, with scattered disjunct northeast U.S. populations tied to Pitch Pine-Scrub Oak barrens. In Maine, this very rare habitat is confined to York, Cumberland, and southern Oxford Counties. The Twilight Moth has only been documented at three sites, all Pitch Pine-Scrub Oak barrens, despite moderate survey effort in suitable habitat. This moth is listed as state Threatened and is at risk due to its dependence on a rare habitat that is highly vulnerable to development, gravel mining, forest succession from fire suppression, and aerial pesticide spraying.

Species Conservation Range Maps:

Town Map: [Lycia rachelae_Towns.pdf](#)

Subwatershed Map: [Lycia rachelae_HUC12.pdf](#)

SGCN Priority Ranking - Designation Criteria:

Risk of Extirpation:	Maine Status: Threatened	Federal Status: None	IUCN Red List Status: None
High Regional Conservation Priority:	NatureServe: Global Rank: G5 State Rank: S1		

Professional Discretion:

Current criteria ranked *Lycia rachelae* as SGCN priority 1, however, species should be SGCN priority 2 based on professional discretion.

Justification: no change from 2015 priority

Habitat Associations:

Formation: Northeastern Upland Forest

Macrogroup: Appalachian Oak - Pine Forest & Woodland

	Habitat System: Central Appalachian Dry Oak-Pine Forest <i>potential habitat</i>
	Habitat System: Central Appalachian Pine-Oak Rocky Woodland <i>potential habitat</i>

Macrogroup: North Atlantic Coastal Forest & Woodland

★ Primary Habitat	Habitat System: Northeastern Interior Pine Barrens <i>in the NE, typically restricted to PPSO barrens</i>
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Priority 2 SGCN



Formation: Northeastern Upland Forest

Habitat System: Northern Atlantic Coastal Plain Pitch Pine Barrens
potential habitat

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: Fire and Fire Suppression

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

Notes: pine barren habitat is fire dependent; fire suppression can alter successional stage and habitat availability over time; poorly timed/planned fire can cause direct mortality

IUCN Level 2 Threat: Removing or Reducing Human Maintenance

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

Notes: natural succession of PPSO and other barren habitat is a significant threat at some sites

IUCN Level 1 Threat Other Options

IUCN Level 2 Threat: Lack of knowledge

Severity: Moderate Severity **Actionability:** Highly Actionable

Notes: lack of comprehensive knowledge about distribution, status, threats, habitat, life history; extent of habitat/host plant use undocumented

Twilight Moth *Lycia rachelae*

Priority 2 SGCN



IUCN Level 1 Threat Other Options

IUCN Level 2 Threat: Resource Needs

Severity: High Severity

Actionability: Moderately Actionable

Notes: lack of funding and staff for implementing conservation actions (e.g., comprehensive surveys, long-term monitoring, research, habitat management, outreach & education)

IUCN Level 1 Threat Residential and Commercial Development

IUCN Level 2 Threat: Housing and Urban Areas

Severity: High Severity

Actionability: Moderately Actionable

Notes: loss and fragmentation of habitat; unprotected pine barrens are prime land for development in southern ME

IUCN Level 1 Threat Energy Production and Mining

IUCN Level 2 Threat: Mining and Quarrying

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: habitat loss; xeric pine barrens are prime areas for sand and gravel extraction

IUCN Level 1 Threat Other Options

IUCN Level 2 Threat: Education & Outreach

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: some threats and challenges can be minimized through enhanced public outreach and advocacy (e.g., pesticide use, habitat management, light pollution, awareness and appreciation)

IUCN Level 2 Threat: Other Threat

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: pesticides (e.g., aerial insecticide spraying, especially control efforts for gypsy moth in southern ME; herbicide applications for forest management or road maintenance) can cause direct mortality, decrease forage plant availability, etc; light pollution can affect behavior and reproductive success; lack of comprehensive species assessment and conservation plan, including recovery goals, and site-specific conservation plan for each occupied site

Twilight Moth *Lycia rachelae*

Priority 2 SGCN



IUCN Level 1 Threat Residential and Commercial Development

IUCN Level 2 Threat: Commercial and Industrial Areas

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: loss and fragmentation of habitat; unprotected pine barrens are prime land for development in southern ME

IUCN Level 1 Threat Transportation and Service Corridors

IUCN Level 2 Threat: Roads and Railroads

Severity: Moderate Severity

Actionability: Moderately Actionable

Notes: loss and fragmentation of habitat; unprotected pine barrens are prime land for development in southern ME

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
Develop and implement a systematic protocol for monitoring population size, status, and trends at each occupied site.	Survey and Monitoring	high	new

Threat(s) Addressed By This Conservation Action

■ Lack of knowledge

Conservation Action	Category	Biological Priority	Type
Conduct surveys to document potential new occurrences and extent of habitat use outside of pitch pine - scrub oak barrens.	Survey and Monitoring	high	new

Threat(s) Addressed By This Conservation Action

■ Lack of knowledge

Conservation Actions Associated with the Dry Barrens Lepidoptera Guild:

Conservation Action	Category	Biological Priority	Type
Communication with Maine Forest Service and Bureau of Pest Control is necessary to prevent unintended mortality from aerial pesticide spraying (e.g., for spongy moth and spruce budworm)	Species Management	high	on-going

Threat(s) Addressed By This Conservation Action

- Other Threat

Twilight Moth *Lycia rachelae*

Priority 2 SGCN



Conservation Action	Category	Biological Priority	Type
Conduct a statewide review of potential high quality barrens habitat that is threatened by ecological succession and identify strategic habitat restoration actions for implementation by key conservation partners.	Habitat Management	critical	on-going

Threat(s) Addressed By This Conservation Action

- Removing or Reducing Human Maintenance
- Fire and Fire Suppression

Conservation Action	Category	Biological Priority	Type
A concerted effort should be made to conserve as much of the remaining unprotected sandplain grasslands and PP/SO barrens as possible.	Habitat Management	critical	on-going

Threat(s) Addressed By This Conservation Action

- Commercial and Industrial Areas
- Roads and Railroads
- Housing and Urban Areas
- Other Threat
- Removing or Reducing Human Maintenance
- Fire and Fire Suppression
- Mining and Quarrying

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

Conservation Action	Category	Biological Priority	Type
Develop/distribute guidelines and outreach materials to inform conservation partners, land use managers, and the general public about the impacts of pesticides on native pollinators and to promote the alternative use of Integrated Pest Management practices.	Public Outreach	moderate	on-going

Threat(s) Addressed By This Conservation Action

- Education & Outreach
- Other Threat

Broad Taxonomic Group Conservation Actions:

Additional relevant conservation actions for this species are assigned within broader taxonomic groups in Maine's Wildlife

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Priority 2 SGCN



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