



Insects

Bold-based Zale Moth

Zale lunifera

Priority 2 Species of Greatest Conservation Need (SGCN)

Class: Insects (*Insecta*)

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

Family: Noctuid Moths (*Noctuidae*)

General comments:

The Bold-based Zale, a member of the Erebidae family, is at the northern edge of its range in Maine. Its larval host plant is Scrub Oak; and in northern parts of its range, the species is restricted to large, high quality Pitch Pine-Scrub Oak barrens – a very rare habitat in Maine confined to York, Cumberland, and southern Oxford Counties. Listed as state Special Concern, this moth has been documented at only two sites – both in York County Pitch Pine-Scrub Oak barrens. It 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: [Zale lunifera_Towns.pdf](#)

Subwatershed Map: [Zale lunifera_HUC12.pdf](#)

SGCN Priority Ranking - Designation Criteria:

State Special Concern:	Bold-based Zale Moth is listed as a species of Special Concern in Maine.
High Regional Conservation Priority:	NatureServe: Global Rank: G3 State Rank: S1

Habitat Associations:

Formation: Northeastern Upland Forest	
Macrogroup: Appalachian Oak - Pine Forest & Woodland	
	Habitat System: Central Appalachian Dry Oak-Pine Forest <i>potential habitat where scrub oak present</i>
	Habitat System: Central Appalachian Pine-Oak Rocky Woodland <i>potential habitat where scrub oak present</i>
Macrogroup: North Atlantic Coastal Forest & Woodland	
★ Primary Habitat	Habitat System: Northeastern Interior Pine Barrens <i>at northern edge of range is restricted to large, high quality PPSO barrens</i>
	Habitat System: Northern Atlantic Coastal Plain Pitch Pine Barrens <i>potential habitat where scrub oak present</i>

Threats

Bold-based Zale Moth *Zale lunifera***Priority 2 SGCN**

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

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)

Bold-based Zale Moth *Zale lunifera***Priority 2 SGCN****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 spongy 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**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

Bold-based Zale Moth *Zale lunifera***Priority 2 SGCN****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
Conduct surveys to document potential new occurrences and extent of habitat use outside of pitch pine - scrub oak barrens where host plant (scrub oak) is present.	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

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

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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 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.

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Priority 2 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