

**STATE
THREATENED**

Twilight Moth

(Lycia rachelae)

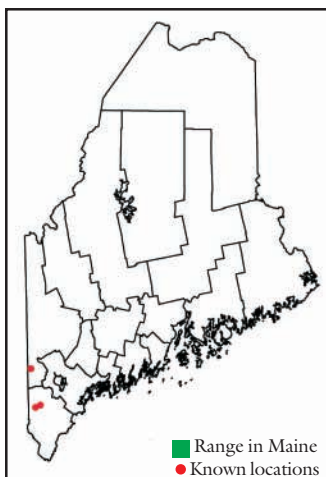


Description

Few people would recognize the inconspicuous twilight moth. However, this moth and a host of other invertebrates are only found in Maine's pitch pine-scrub oak woodlands. The twilight moth is a small, grayish-white moth that has a wingspan of about 1½ inches (males). Wings are reduced or nearly absent in the female. The wings are grayish-white or translucent with prominent dark grayish-brown veins. Blackish-brown stripes run perpendicular to the wing veins, and spots occur on the rear margin. The body is dark gray and is densely hairy in both sexes.

Range and Habitat

The twilight moth is found from Maine to Pennsylvania and west to Colorado and Manitoba. Its range in New England is highly scattered, and populations are restricted to pitch pine-scrub oak barrens. Maine seems to be at the northeastern extent of its range. Here the moth has been found only in pine barrens on sandy soils in glacial outwash plains in Fryeburg, Waterboro, and Shapleigh. The full range of habitats it uses is poorly understood. The twilight moth may also occur in other sand plain forests, including oak-pine forests or early successional aspen-birch thickets.



Life History and Ecology

Little is known of this moth's life history. Adults apparently emerge in early spring (April) and males begin searching for females. Males find females at night by searching for their scent (or pheromones) on the wind currents. Females are apparently flightless, or nearly so. After mating, the female lays eggs on or near host plants for the larvae, which include apples, birches, chokecherries, elms, poplars, willows, and other trees. It is unknown which trees serve as host plants in Maine. Eggs likely hatch in late spring or summer, and larvae mature and overwinter as larvae or pupae before emerging the following spring as adults.

Threats

Threats to this moth are not well understood. Small, separate populations at only three sites justified state listing of the moth as threatened in 1997. Loss of pine barren habitats to commercial and residential development in Maine is the greatest threat. Once development occurs within pine barrens, it is extremely difficult to manage and perpetuate pitch pine stands by fire. Aerial spraying of pesticides (including *Bt*), especially for other Lepidoptera like the gypsy moth, could eliminate populations. Conversion of forests to pine plantations destroys habitat. Off-road vehicles may destroy fragile plant communities. Gravel mining permanently destroys habitat.

Conservation and Management

Pitch pine-scrub oak barrens are rare habitats in Maine and are found at only seven sites. All have been surveyed for the twilight moth, but it has been found at only three sites. Pine barrens are host to a

suite of rare species, especially plants and invertebrates that depend on this unique habitat, such as the pine barrens zanclognatha (threatened), Edwards' hairstreak (endangered), and Karner blue butterfly (extirpated). Currently, there are 15 species of butterflies and moths recognized as "Special Concern" species associated with the state's pine barrens.

Maine has over half of the remaining pine barrens in New England. Much of Maine's pine barren habitat is now in conservation ownership. Even so, these sites need active management to maintain their diverse plant and invertebrate fauna. Large blocks of appropriate habitat are necessary for the long-term viability of moth populations.

Pine barrens are rejuvenated by fire, and the twilight moth may depend on this natural disturbance to create young, lush plants for the larvae to eat. Fire suppression may limit the viability of populations. If fire is suppressed, pine barrens will slowly mature to red oak and white pine forests that would not support the twilight moth. Prescribed burns are a routine management technique in New Jersey where the largest pine barrens remain.

More work is needed to assess populations, document life history, and determine appropriate habitat management for this species. Population introduction and management techniques are unknown at this time. As a state-threatened species, the twilight moth is protected from collection and possession by the Maine Endangered Species Act.

Recommendations:

- ✓ Prior to land development or forest harvesting, consult with a biologist from MDIFW or the Maine Natural Areas Program to assist with planning.
- ✓ Municipalities should strive to maintain important pitch pine barrens identified by MDIFW as open space, identify these areas in comprehensive plans, and conserve accordingly.
- ✓ Use voluntary agreements, conservation easements, conservation tax abatements and incentives, and acquisition to protect important habitat for threatened and endangered species.
- ✓ Where possible, expand existing public and conservation ownership of pine barren acreage to conserve large, contiguous blocks of habitat with a mix of young and old stands.
- ✓ If areas must be developed, minimize footprints of buildings, yards, and roads and landscape with indigenous pine barrens plants. Maintain fuel breaks around homes to minimize danger from wildfire. Compensate loss of pine barrens habitat by creating new pine barrens, restoring degraded habitat, or placing existing habitat in long-term conservation.

- ✓ Encourage forest management plans that perpetuate pine barrens. Avoid plantations and site conversion, and encourage native species, particularly pitch pine.
- ✓ Consider controlled burning, mowing, and mechanical vegetation management to create a mix of young and mature pitch pine and scrub oak stands.
- ✓ Limit commercial extraction of gravel and sand in pine barrens. Restore old gravel pits and agricultural fields to pitch pine habitat.
- ✓ Apply ¼ mile wide spray buffers around sections of pine barrens hosting rare and endangered species when spraying insecticides for control of gypsy moths and other pests. 🍷