



**Status:** State endangered

**Global and state rank:** G2G4/S1S2

**Family:** Noctuidae

**Range:** The majority of records for this moth are from northern Illinois and Indiana, Minnesota, and Michigan (Schweitzer et al. 2011). There are disjunct populations in Texas and Arkansas, and reports from Nebraska and North Carolina that have not been verified (Balogh 1987).

**State distribution:** There are four occurrences from two counties in Michigan (Montcalm and Newaygo). However, the host plant, prairie phlox (*Phlox pilosa*), occurs in many counties in southern Lower Michigan (Reznicek et al. 2011), and continued surveys should be conducted in these areas.

**Recognition:** The phlox moth has a wingspan of approximately 3.3 cm (1.3 in) and is characterized by a deep, purplish red upper forewing with a dark chocolate brown undersurface with a deep red spot at the apex. The hindwing is dark chocolate brown above. The undersurface of the hind wing is deep red on the outer and anterior half and chocolate brown on the posterior and inner half. The thorax is olive with a yellow tip on

the black abdomen (Hardwick 1996). Early instar larvae have a dark head and a cream to pale green body. Later instars have an orange-fawn head and light to bright green body with gray lateral stripes and a reddish-brown mid-dorsal band with a gray median line (Hardwick 1958).

**Best survey time:** The adult phlox moth is active from the fourth week of May to the second week of June. As adults are well camouflaged, and spend much of their time on the flowers of *Phlox pilosa*, visual inspections of these blossoms are the best method of locating individuals. Specifically, phlox moths resemble a partially dried corolla of the downy phlox flower, as their wings are slightly darker than fresh blossoms.

**Habitat:** The phlox moth occurs in prairies and oak-pine barrens on sandy soils. At some Michigan and Wisconsin sites it has been found to be associated with the Karner blue (*Lycaeides melissa samuelis*) (Masters and Karpuleon 1975). In Michigan specifically, the phlox moth has been recorded in oak-pine barrens with associated prairie openings. These sites have succeeded to closed oak woodland in which most of the prairie openings are maintained by disturbances such as utility rights-of-way, roads, trails, and ORV activities. While the Karner blue has been found at both Michigan phlox moth sites, no phlox moths have been recorded at any



other Karner blue locations. In Minnesota, the phlox moth is more closely associated with tallgrass prairie ecosystems (Balogh 1987). The phlox moth is found exclusively where its larval host plant, *Phlox pilosa*, occurs.

**Biology:** In Michigan, adults are diurnal and emerge in late May when their larval food plant flowers. Adults have been observed nectaring on their larval host plant. If other nectar sources are readily used, they are unknown. The phlox moth is univoltine and eggs are laid on the inner surfaces of the sepals next to the corolla on *Phlox pilosa*. After larvae emerge, they feed on the bud of the flower if it is still closed, or the seed if the flower has dropped. The larvae then seal themselves inside a bud with silk. Sealed capsules become discolored and hard, thus distinguishing them from healthy capsules. It is unknown how the phlox moth overwinters, but in other *Schinia* species, the pupa overwinters underground (Forbes 1954).

**Conservation/management:** Habitat protection and enhancement are essential to the conservation and long-term survival of the phlox moth. With so few populations in Michigan, it is vital that those populations that are known are protected, both from habitat destruction or alteration. The phlox moth's host plant, *Phlox pilosa*, occurs on sandy soils usually associated with oak-pine barrens and prairie landscapes. Improving the quality and size of these ecosystems will benefit the phlox moth by not only creating more habitat, but also by making short range movements of individuals easier. These short range movements are important for expanding populations to new areas that support the host plant and diversifying the genetics of a population by allowing individuals to find new mates. Several occupied sites are along roadsides, and these areas are particularly sensitive to the threat of mowing. Mowing not only can harm larvae, but it can also delay the flowering of *Phlox pilosa*, eliminating or delaying the food source for larvae. Similarly, herbicide may negatively impact larval food sources but also directly harm the phlox moth. Widespread use of herbicides in roadside areas is potentially a significant threat to the phlox moth.

Appropriately timed, prescribed burns can be an effective management tool for phlox moth habitat, but the fire tolerance of associated species of concern must be considered. Proper burn timing for the phlox

moth may be improper timing for the Ottoe skipper (*Hesperia ottoe*), which prefers similar habitat. Burns in phlox moth habitat should not be conducted during the presumed duration of the adult and larval stages (May through July; Schweitzer 1985).

**Research needs:** The most vital research need for the phlox moth is surveys in suitable habitat for new populations. Other research needs include gaining knowledge of the basic ecology of the phlox moth, such as preferred nectar sources, understanding its dispersal capabilities, population dynamics, and their response to habitat management practices. More knowledge is also needed on exactly where pupae overwinter (underground vs. above ground) as this may have significant implications for the tolerance of this species to the use of prescribed fire as a management tool.

**Related abstracts:** Oak-pine barrens, Karner blue butterfly

#### Selected references:

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