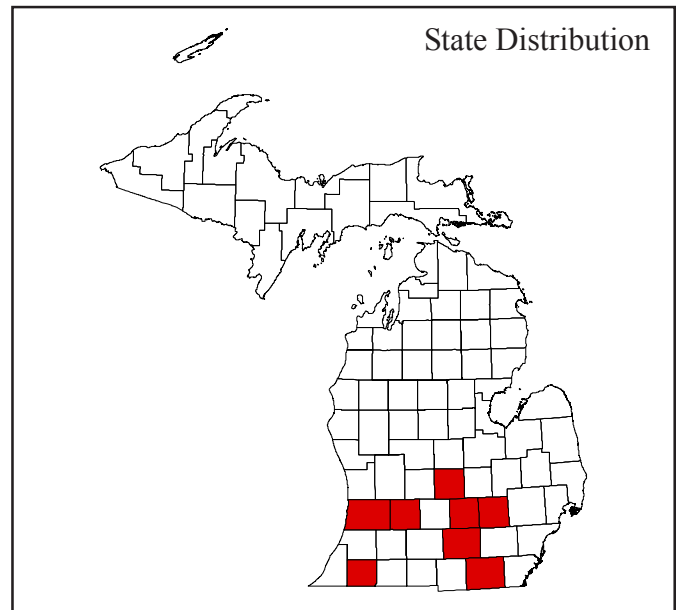
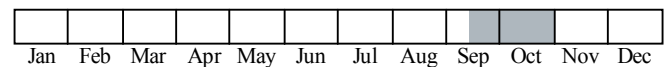


Papaipema speciosissima Grote and Robinson regal fern borer moth



Best Survey Period



Status: Special concern

Global and state rank: G5/S2S3

Family: Noctuidae (owlet moths)

Range: The regal fern borer moth has been reported across much of the eastern United States from Wisconsin south to Mississippi East to Florida and north to Maine.

State distribution: Known from 12 sites in eight counties of southern Michigan (Allegan, Barry, Cass, Clinton, Jackson, Ingham, Lenawee, Livingston), with many of those records prior to 1988.

Recognition: The regal fern borer moth (Lepidoptera: Noctuidae) has an average wingspan of 45-50 mm (1.6-2.0 in.) (Covell 1984). The forewings are bright orange, with some brown and violet shading. The wing contains a brown median line (i.e. line in the center of the wing) that is sharply bent at a right angle. The forewing either has three white or brown, narrow vertical bars or spots, the two inner spots or bars are almost fused (Covell 1984) or in the form *regalis*, lacks white spots or bars completely. The hind wings are orange-like in color with slightly darker shading with a visible, light median line in the center of the wing (Covell 1984).

Larvae bore into the roots of ferns (*Osmunda regalis* and *O. cinnamomea*).

Best survey time: Adult dates range from 16 September through the end of October in Michigan. The best way to survey for this species is by nighttime blacklighting, a technique where a white bed sheet is stretched across two trees or poles and an ultraviolet (and/or mercury vapor) light is used to illuminate the sheet thereby attracting moths to the sheet. Moths can be collected directly from the sheet. You also can search for the larvae of many species of *Papaipema* by searching for signs of feeding activity (Hessel 1954, Nielsen 1995). This includes inspecting ferns (*Osmundia* spp.) that contain a dry leaf or searching the base of these plants for a rusty, brown mud-like deposit which is caterpillar frass or feces. Larvae are most easily located between mid-July and mid-August.

Habitat: In Michigan, the regal fern borer moth occurs with its host plants in a variety of habitats including moist woods, low wet woods, swamps, marshes, lowland shrubs, and the edges of prairie fens.

Biology: The regal fern borer moth is restricted to colonies of the larval food plants, regal fern (*Osmunda regalis*), cinnamon fern (*O. cinnamomea*), and interrupted fern (*O. claytoniana*). The minimum plant



population size necessary to sustain the moth is not known. Some of the ferns in which this species feeds are likely to be 50 years old or older (Bird 1915). Eggs are laid on or near the food plant in the fall and hatch in late spring. The last week in May is believed to be the general date of emergence from the overwintering egg (Bird 1915). The final instar likely pupates in the soil under, or near the plant, around August 1st (Kwiat 1916). Adults are known to visit lights in the late summer or early fall during warm evenings, with temperatures usually above 50 degrees F.

Conservation/management: Additional surveys and monitoring are needed. Protection of known populations is essential for the persistence of this species in Michigan. Five populations occur in nature preserves or public game areas, which affords them some level of protection. Landowners and managers should be contacted at all sites and advised of protection and management concerns. Adults are quite sedentary and would not be expected to quickly recolonize an isolated site from which they had been extirpated (Hessel 1954), though they should move quickly between any adjacent management units (D. Schweitzer 1999). Of particular importance is information about the minimum size and age of an *Osmunda* population necessary to support the moth indefinitely and the effects of management on both the moth and the host plant populations.

Research needs: Major research needs, as outlined by Schweitzer for *Papaipema* in general (1999), include information on habitat requirements other than foodplants, on conditions under which females disperse, and on presence or absence of *Papaipema* in lowland forest habitats. Any information on the effects of management (i.e., timber harvest) would be very useful. Additional life history studies are needed. This information can be used to better time harvests or schedule harvest rotations. Information is needed to determine whether adults can locate suitable places for oviposition in foodplant patches harvested earlier in the same season.

Related Abstracts: floodplain forest, southern floodplain forest, relic conifer swamp, prairie fen

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