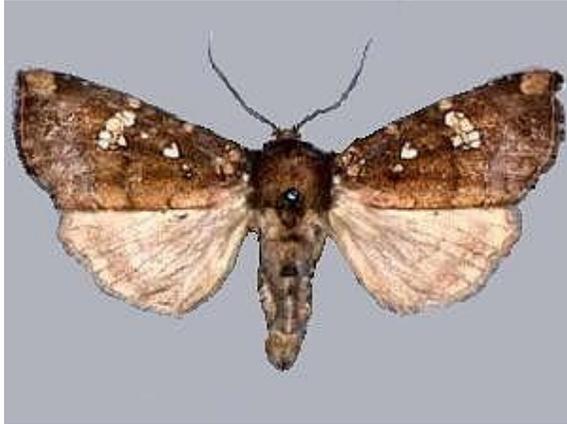


Papaipema dribi (Sacramento Mountains Borer Moth)



Jim Wiker,



Metzler,

Taxonomy

- **Class:** INSECTA
- **Order:** LEPIDOPTERA
- **Family:** NOCTUIDAE
- **Genus:** Papaipema
- **Scientific Name:** *Papaipema dribi* Barnes and Benjamin, 1926
- **Common Name:** Sacramento Mountains Borer Moth
- **Synonyms:**
- **Taxonomic Name Source:** Hodges, R.W. et al., eds. 1983. Check List of the Lepidoptera of America North of Mexico. E.W. Classey Limited and The Wedge Entomological Research Foundation, London. 284 pp.

Agency Status

- **NMDGF:**
- **Federal Status:**
- **BLM Sensitive:**
- **USFS:**
- **IUCN Red List:** [Not Evaluated](#)
- **Nature Serve Global:** [GH](#)
- **NHNM State:** S1
- **NM Endemic:** YES

Description

In the adult moth, the head, thorax and forewing are purple-tinted brown (Barnes and Benjamin 1926). The forewing has four to six light-colored spots, and the hindwing is completely white (Barnes and Benjamin 1926). The larva is unknown (Bird 1944).

Habitat and Ecology

The habitats and ecology of this rare species are not well understood. The site where *Papaipema dribi* was recently recorded in the Sacramento Mountains, is in a meadow-like opening within a narrow floodplain of a small riparian canyon. The floodplain is covered in debris from previous flood events. The overstory adjacent to the meadow opening is thick, dominated by willow (*Salix* sp.), cottonwood (*Populus* sp.), and juniper (*Juniperus* sp.). The surrounding

floodplain has dense bunchgrasses (Poaceae) and scattered horsetails (*Equisetum* sp., family Equisetaceae). Forbs in the vicinity include Apocynaceae: *Asclepias subverticillata*; Asteraceae: *Artemisia carruthii*, *Gutierrezia sarothrae*, *Helianthus ciliaris*, and *Viguiera dentata*; Convulvaceae: *Convolvulus arvensis* and *Ipomoea* sp.; Fabaceae: *Melilotus albus*; Geraniaceae: *Geranium caespitosum*; and Malvaceae: *Sphaeralcea* sp.. Uphill from the flood plain the soils are rocky and arid, and the surrounding slopes, which are rugged and steep, contain *Quercus gambelii* (Fagaceae). No pines (*Pinus* spp.) were at this site (Metzler 2022).

The larvae are not known, but larvae of other *Papaipema* species are stem and root borers of living plants (Metzler 2022). While some *Papaipema* are agricultural pests, others are generally rare specialists, feeding on a limited variety of host plants, with very restricted distributions (Oppenheim *et al.* 2018). Based on limited occurrence records, *P. dribi* is likely the latter. The genus is generally univoltine and overwinters as an egg inside of host plant tissue (Bird 1934). *Papaipema* adult females live for a very brief amount of time, up to two weeks, and are almost always observed in August and early September (Bird 1934, Metzler 2022).

Geographic Range:

This moth is reported in the literature from just three localities on the western slope of the Sacramento Mountains in Otero County, New Mexico. Historically, it was recorded near the towns of High Rolls and Bent. High Rolls is located at 1,988 m along the banks of Fresno Creek in Fresno Canyon, and Bent is located at the confluence of Tularosa and Nogales Creeks, in Tularosa and Nogales Canyons respectively, at 1,794 m. In an attempt to document the species after it had gone unseen for approximately a hundred years, Metzler (2022) searched the canyon areas near the two known historical localities for suitable riparian habitat, but all habitat was modified for agriculture and housing. Metzler (2022) then searched areas of Tularosa Canyon upstream of Bent, on Mescalero Apache Tribal Lands, for suitable undisturbed habitat. The habitat in Tularosa Canyon within Tribal Lands, is much more intact than areas downstream that were settled in the 1880's, and converted for agriculture, ranching, cattle grazing, and orchards (Metzler 2022). At an undisclosed locality on Apache Mescalero Tribal Lands, the moth was recorded in 2021, adjacent to a small tributary of Tularosa Creek. This is the only locality currently known to be occupied, though Metzler (2022) suggests surveys in comparable habitats in one of the many neighboring canyons both north and south of Bent and High Rolls, will likely reveal additional occurrences.

Conservation Considerations:

There is no targeted conservation for this species. It occurs on National Forest and Mescalero Apache Tribal Land (Metzler 2022). Research is needed to better understand the distribution, population size and trend, habitats and ecology, and threats to this species.

Threats:

Given how infrequently this species has been observed, the threats are not well understood. However, Metzler (2022) documented that several previously suitable habitats where historic localities are known, have been extensively modified for agriculture and housing. These areas were settled in the 1880's, and were subsequently converted for agriculture, ranching, cattle grazing, and orchards (Metzler 2022). The species has not been recorded in these areas for approximately 100 years.

Other more well-studied species of *Papaipema* are known to be rare and threatened, including *Papaipema eryngii*, *P. silphii* and *P. beeriana*, owing to host plant specialization (Molano-Flores *et al.* 2024), and habitat fragmentation as a result of agriculture and invasive species (Bess 2005, Andrew and Leach 2006). Reliance on a single host plant magnifies sensitivity to habitat loss and increases the risk for phenological mismatch (Kotiaho *et al.* 2005, Palash *et al.* 2022). Species with smaller ranges, like *P. dribi*, tend to have lower abundances and less chance of surviving

catastrophes and diminishing resources (Gaston 2003).

It was determined in the early twentieth century that the genus *Papaipema* had been declining for some time, and that decline was expected to continue (Bird, 1934). Bird (1934) reported that the main threats to these species were vegetation clearing by fire which kills overwintering eggs, and encroachment of agricultural land which decreases suitable habitat. However, Andrew & Leach (2006) report that burns, which have a natural history in prairie, is nowhere near as much of a threat for overwintering *Papaipema* moths as is grazing activities. Grazing directly degrades habitat by reducing the health and abundance of host plants (by as much as 60% in some studies) (McIntyre 2010), and promotes the spread of invasive species, which outcompete host plants and change the composition of vegetation communities (Souther *et al.* 2019). Furthermore, grazing in the Sacramento Mountains has been implicated in the decline of another resident Lepidoptera, the Sacramento Mountains Checkerspot Butterfly. Other threats driving declines of Lepidoptera in the Sacramento Mountains include a change in historical fire regimes, which has altered the plant community structure and created forests more prone to catastrophic wildfire (Kaufmann *et al.* 1998), drought, which is increasing due to climate change, and large scale, broad spectrum pesticide use. For example, in 1983 and 1984 during peak flight of many Lepidopteran species, carbaryl pesticides were sprayed using aerial application over 240,900 acres in the Sacramento Mountains at elevations between 1,830 and 3,350 m (6,000 and 11,000 feet), to control an outbreak of Western Spruce Budworm (Bennett and Linnea 1985).

Population:

The population size and trend is not known for this species, though it is rarely collected. There was speculation that this species had gone extinct, as it went unobserved for several decades. A re-discovery in 2021 included 14 specimens total from a single site close to the original type locality (Metzler 2022).

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More Information