Microphotus pecosensis (Rocky Mountain Pink Glow-worm)

Jason Wilder, 2014

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Taxonomy

- **Class**: Insecta
- **Order**: Coleoptera
- **Family**: Lampyridae
- **Genus**: Microphotus
- **Scientific Name**: *Microphotus pecosensis* Fall, 1912
- **Common Name**: Rocky Mountain Pink Glow-worm
- **Synonyms**: Microphotus octarthrus ssp. pecosensis Fall, 1912
- **Taxonomic Name Source**:Green, J.W. 1959. Revision of the species of *Microphotus*, with an Emendation of the Lampyrini (Lampyridae). The Coleopterists Bulletin 13(3): 80-96.

Agency Status

- **NMDGF**:
- **Federal Status**:
- **BLM Sensitive**:
- **USFS**:
- **IUCN Red List**: Data Deficient
- **Nature Serve Global**: GU
- **NHNM State**: S1
- **NM Endemic**:NO

Description

Like other species of *Microphotus*, *M. pecosensis* males are small, fragile beetles with very large eyes and barely visible reduced mouthparts between the eyes. The antennae are shorter than the pronotum, have less than eleven segments, and have a small bead-like process, called a tuberculiform appendix, on the tip of the terminal segment. They have short, pale legs (femora do not extend beyond the margin of the body), and simple tarsal claws. Females are larviform without elytra or hindwings. They have small, elongate, retractable heads, with simple eyes, called lateral ocelli or stemmata. The antenna is similar to that of the male yet has fewer segments. In *M. pecosensis* specifically, the elytra in males are more than three times as long as the pronotum (average about three and a half times as long), the eyes beneath are briefly contiguous posteriorly, the antennae have eight segments, and the median longitudinal line of pronotum is not impressed. The body length is typically 6-8 mm. These characteristics are seen in *M. chiricahuae* as well, but the two species can be separated by features of the male genitalia. In addition, the scutellum in this species is usually narrowly rounded at the apex (Green 1959). The species are not known to be sympatric, so distribution will also be indicative.

Habitat and Ecology

Microphotus pecosensis is a desert-dwelling nocturnal firefly with flightless females (Usener and Cognato 2006). It has been reported from desert canyons, oak-juniper transition zones, mixed conifer woodlands, and aspen groves (up to 9,000 ft.). The adult activity period begins in late June to early July. Around sunset females curl their two posterior segments toward the sky to attract males flying overhead. In one observation, females emerging in the evening displayed from rocks on the highest streamside banks (Cicero 1981). Like other fireflies, larvae in this genus have been observed feeding on snails, and may also feed on slugs, earthworms, and other soft bodied invertebrates.

Geographic Range:

Microphotus pecosensis was first collected by Fall (1912) in Pecos, New Mexico. This species has been collected across the southwest, including in Utah, Arizona, New Mexico, Colorado, and Texas in the US (Green 1959) and in Chihuahua, Mexico (Zaragoza-Caballero et al. 2023) (Fig. 41). Few of these occurrences have been verified recently, however, and it appears there are few collection records since the 1950s (Green 1959). It has recently been reported in the Gila National Forest in New Mexico (2004) (BugGuide 2023).

Conservation Considerations:

No conservation actions are in place for *Microphotus pecosensis*. Several of the known localities occur in protected areas, such as the Zion Wilderness in Utah (Protected Planet 2020), and other localities are on public lands such as national forests. Additional research on this species' life history traits, behavior, habitat associations, distribution, and population trends would be helpful in assessing its conservation status. Additional surveys, including citizen science efforts, are needed to better understand the current range of this species and determine if historic localities are extant.

Threats:

Females of this species are flightless, traveling only a few centimetres from their home sites in their lifetimes (Cicero 1981), making them especially vulnerable to ground disturbances such as trampling by livestock, habitat alterations, and impacts from ORV use (Fallon and Pérez-Hernández 2021). Roadside contamination from vehicles and flooding are also threats to this species, as adult females have been observed climbing up the steep face of road cuts to signal to males, while their larvae live down below in vegetation that accumulates along the road margin (Fallon and Pérez-Hernández 2021).

More generally, fireflies are threatened by habitat degradation, light pollution, and pesticide use (Lewis *et al.* 2020). Fireflies need moisture to complete their life cycles; it prevents desiccation of vulnerable immature stages, and it ensures the persistence of the soft-bodied invertebrates that are the larvae's preferred foods. This is especially critical in desert regions where this species is found. Degradation or loss of water sources negatively affects both fireflies and their soft-bodied prey. Because of this reliance on moisture, in the arid American West, fireflies are typically associated with permanent water sources. Drawdowns for human water usage and loss and degradation of water sources due to drought can lead to increased mortality of fireflies through desiccation (Fallon and Pérez-Hernández 2021). Climate change has further altered precipitation patterns in the southwestern US, resulting in an increase in the duration, intensity, and frequency of drought (NPS 2018).

Population:

Information on the size and status of this species population is not available.

References:

- Lloyd, J.E.. 2003. On research and entomological education VI firefly species and lists, old and now. *The Florida Entomologist* 86: (99-113).
- Lewis, S., Wong, C.H., Owens, A., Fallon, C., Jepsen, S., Thancharoen, A., Wu, C., De Cock, R., Novak, M., Lopez-Palafox, T., Khoo, V. and Reed, J.M. . 2020. A global perspective on firefly extinction threats. *BioScience* 70: (157-167).
- National Park Service (NPS). 2018. Natural Resources Monitoring at Chiricahua National Monument (U.S. National Park Service). 2019. https://www.nps.gov/im/sodn/chir.htm
- Reed, J.M., Nguyen, A., Owens, A.C.S. and Lewis, S.M.. 2019. Linking the seven forms of rarity to extinction threats and risk factors An assessment of North American fireflies. *Biodiversity and Conservation* 29: (57-75).
- Green, J.W.. 1959. Revision of the species of Microphotus, with an Emendation of the Lampyrini (Lampyridae). *The Coleopterists Bulletin* 13: (80-96).
- Usener, J.L. and A.I. Cognato. 2006. Phylogenetic review of desert firefly taxonomic characters (Coleoptera Lampyridae Microphotus). *Insect Systematics and Evolution* 37: (71-80).
- IUCN. 2021. The IUCN Red List of Threatened Species. Version 2021-1. www.iucnredlist.org
- Fall, H.C.. 1912. New Coleoptera cheifly from the Southwest. *The Canadian Entomologist* 44: (40-48).
- Alpert, G.. 2016. Ask a Ranger A Tale of Two Beetles. *Arizona Daily Sun* . https://azdailysun.com/sports/local/ask-a-ranger-a-tale-of-two-beetles/article_aee874c6-e197-51b7-b85d-30da2d72ef67.html
- BugGuide. 2020. Species *Microphotus pecosensis*. https://bugguide.net/node/view/250785
- Cicero, J.M.. 1981. Evolution of the glow-signal system in Microphotus (Coleoptera, Lampyridae). University of Arizona: (27).
- [MCZ] Harvard University Museum of Comparative Zoology. 2020. Entomology Collection, Online database. https://mczbase.mcz.harvard.edu/
- Usener, J.L.. 2004. Phylogenetic revision of desert fireflies (Coleoptera Lampyridae MIcrophotus). *Unpublished M.S. Thesis, Texas A&M University* .
- Usener, J.L. and A.I. Cognato. 2005. Patterns of mitochondrial diversity among desert firefly populations (Lampyridae Microphotus octarthrus). *The Coleopterists Bulletin* 58: (361-367).
- ITIS. 2019. Integrated Taxonomic Information System (ITIS). 2019. https://www.itis.gov/

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