

Bicellonycha wickershamorum (Southwest Spring Firefly)



Tony Palmer, 2023



Dylan Dorey, 2021

Taxonomy

- **Class:** Insecta
- **Order:** Coleoptera
- **Family:** Lampyridae
- **Genus:** Bicellonycha
- **Scientific Name:** *Bicellonycha wickershamorum*
Cicero, 1982
- **Common Name:** Southwest Spring Firefly
- **Synonyms:**
- **Taxonomic Name Source:** Cicero, J. M. 1982. The genus *Bicellonycha* in the United States with descriptions of a new species and subspecies (Coleoptera: Lampyridae, Photurinae). The Coleopterists Bulletin 36(2): 270-278.

Agency Status

- **NMDGF:**
- **Federal Status:**
- **BLM Sensitive:**
- **USFS:**
- **IUCN Red List:** [Vulnerable](#)
- **Nature Serve Global:** [G2G3](#)
- **NHNM State:** S1
- **NM Endemic:** NO

Description

This species is relatively easy to identify as it is the only firefly within this genus in the region. This species has black elytra, sometimes with yellow margins and a yellow elytral suture. In the subspecies *Bicellonycha wickershamorum piceum*, which we have here in New Mexico, the yellow margins are absent. The median pronotal vitta (center stripe) is dark black and the hind corners of the pronotum have an acute angle and specimens are typically 8.9-10.3 mm (Cicero 1982). All tarsal claws of the males are bifid, or apically cleft (Olivier 1911), but it is difficult to see this characteristic without a hand lens. There are a few sites in Arizona where *Bicellonycha wickershamorum* shares habitats with another flashing species, *Photinus knulli*, but *P. knulli* is usually found slightly later in the summer and is morphologically dissimilar. *Photinus knulli* is much smaller and the pronotum has rounded hind angles.

Habitat and Ecology

Bicellonycha wickershamorum is found in montane desert habitats of the Madrean Sky Islands and the Arizona and New Mexico Mountains Ecoregions, at elevations ranging from 4,000-6,000 ft. (Cicero 1982, C. Mollohan pers. comm. 2020). This species typically occurs in marshy areas and other perennial wetland habitats along permanent streams and rivers (Cicero 1982, C. Mollohan pers. comm. 2020, A. Walker pers. obs.). Adults of both sexes are winged and capable of flight, as are all known species of its subfamily, Photurinae. The breeding season for the nominate subspecies lasts from early June to late July, typically before the monsoon season starts (J. Cicero pers. comm.). The Gila southwest spring firefly has been observed from late May through August, but the phenology of this subspecies is not well understood. Adults are not known to feed. Larvae have been observed preying on snails at night and are typically found in riparian areas next to gentle streams (J. Cicero pers. comm. 2020). Late-instar larvae pupate in soil chambers they have constructed.

The courtship flash pattern is a single, quick (about 0.14 seconds), greenish flash, emitted at intervals of about 0.8 seconds (Martin et al. 2023). Flashing displays begin at dusk and continue into the night, for up to two hours. Adults can often be found crawling up tall vegetation, in suitable habitats, before sunset (A. Walker pers. obs.). Adult males typically fly and flash along streams. At dusk males fly close to vegetation and often find females that have not produced response flashes. As the night goes on, males fly higher in the air and can only find females by their response flashes (J. Cicero pers. comm. 2020). Adults can sometimes be observed flying and flashing well away from streams (C. Mollohan pers. comm. 2020).

Geographic Range:

Bicellonycha wickershamorum is found in Arizona, New Mexico, and Sonora, Mexico. The nominate subspecies, *B. w. wickershamorum* Cicero, 1982 (Southwest Spring Firefly) is endemic to the Madrean Sky Island mountain ranges of southern Arizona and northern Sonora. In the US, it has been reported from the Huachuca and Galliuero Mountains (Cicero 1982), where populations have been observed in Bear Canyon, Scotia Canyon, the Canelo Hills, the Mule Shoe, and Empire Gulch, as well as sites near Sonoita (Cicero 1982, Walker 2024). In Sonora, it has been recorded only at Canjón Bonito (J. Cicero pers. comm. 2023). Prior to 2023, the other described subspecies, *B. w. piceum* Cicero, 1982 (Gila Southwest Spring Firefly), was known only from the type locality, near Morenci, Arizona. However, expanded survey efforts have documented it in Arizona's Verde Valley and in the Gila Wilderness of New Mexico (Walker 2024).

Conservation Considerations:

Bicellonycha wickershamorum was assessed as Vulnerable on the IUCN Red List (Fallon and Cicero 2021a) and is one of five firefly species in the United States to be petitioned for protections under the Endangered Species Act (Fallon et al. 2023). In January of 2024, it received a positive 90 day finding, which means the US Fish and Wildlife Service agrees that there is sufficient information to suggest the species may be threatened (USFWS 2024). This triggers an in-depth review process before a listing decision can be made. The species is threatened with extinction due to its limited distribution, with few localities, and because of its reliance on wetland habitats in an increasingly arid landscape. Major threats to the species include increasing drought due to climate change, overuse of groundwater, riparian corridor fragmentation, habitat degradation and direct trampling due to cattle, intrusive recreation, light pollution, and hydrological modifications for farming, ranching, and copper mining. At the subspecies level, the nominate subspecies, *B. w. wickershamorum*, is listed as Vulnerable on the Red List (Fallon and Cicero 2021b) and *Bicellonycha wickershamorum piceum* is listed as Endangered (Fallon and Cicero 2021c). *Bicellonycha w. piceum* is not as well understood, and at the time the assessment was done, it was known from only the type locality. While it is now known from several localities across New Mexico and Arizona, most populations observed have very few individuals. This firefly is at high risk of habitat loss and more research is needed to better understand its conservation needs. For more information on the conservation status of this species, see the firefly species fact sheet on the Firefly

Atlas (<https://www.fireflyatlas.org/threatened-species-fact-sheets/>) (Fallon and Walker 2024).

Threats:

Because this species is nocturnal and associated with wetland and riparian habitats, it is threatened by drought, riparian corridor severance, habitat degradation and direct trampling due to cattle, intrusive recreation, light pollution, and hydrological modification for farming, ranching, and copper mining. The larval stage may be particularly sensitive to environmental change due to restricted dispersal capabilities and vulnerability to desiccation (Fallon *et al.* 2023)

Population:

Population size, trends, and abundance are not available for this species.

References:

- [Protected Planet. 2020. Protected Planet The World Database on Protected Areas \(WDPA\). IUCN and UNEP-WCMC, Cambridge, UK . \[www.protectedplanet.net\]\(http://www.protectedplanet.net\)](#)
- [Buschman, L. 2016. Field Guide to Western North American Fireflies . Draft. <http://entomology.k-state.edu/doc/WesternFireflies%20March%202016a.pdf>](#)
- Owens, A.C.S. and Lewis, S.M.. 2018. The impact of artificial light at night on nocturnal insects A review and synthesis. *Ecology and Evolution* 8: (11337-11358).
- 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).
- Cicero J. M.. 1982. The genus *Bicellonycha* in the United States with descriptions of a new species and subspecies (Coleoptera Lampyridae, Photurinae). *The Coleopterists Bulletin* 36: (270-278).
- [Sky Island Alliance. 2020. The Sky Islands. <https://www.skyislandalliance.org/the-sky-islands/>](#)
- [Gestring, B.. 2019. U.S. operating copper mines Failure to capture and treat wastewater. <https://www.congress.gov/116/meeting/house/110436/documents/HHRG-116-II06-20200205-SD036.pdf>](#)
- [BugGuide. 2020. Species *Bicellonycha wickershamorum*. 2020. <https://bugguide.net/node/view/472177>](#)
- Yanahan, A.D. , W. Moore. 2019. Impacts of 21st-century climate change on montane habitat in the Madrean Sky Island Archipelago. *Diversity and Distributions* 25: (1625-1638).
- [IUCN. 2021. The IUCN Red List of Threatened Species. Version 2021-1. \[www.iucnredlist.org\]\(http://www.iucnredlist.org\)](#)
- [ITIS. 2019. Integrated Taxonomic Information System \(ITIS\). 2019. <https://www.itis.gov/>](#)

More Information

