Mesocapnia werneri (Sabino Snowfly)

No Photo Available

Taxonomy

- **Class**: INSECTA
- **Order**: Plecoptera
- **Family**: Capniidae
- **Genus**: Mesocapnia
- **Scientific Name**: Mesocapnia werneri (Baumann & Gaufin, 1970)
- **Common Name**: Sabino Snowfly
- **Synonyms**:
- **Taxonomic Name Source**:Baumann, R.W. & Gaufin, A.R. (1970) The Capnia projecta complex of western North America (Plecoptera: Capniidae). Transactions of the American Entomological Society, 96, 435–468.

Agency Status

- **NMDGF**:
- **Federal Status**:
- **BLM Sensitive**:
- **USFS**:
- **IUCN Red List**: Not Evaluated
- **Nature Serve Global**:
- **NHNM State**:
- **NM Endemic**:NO

Description

Habitat and Ecology

The species is known from five locations in Arizona and New Mexico (GBIF.org 2024). The stonefly uses montane streams during the early stages of their lifecycle before emerging (Jacobi and Cary 1996) and has been found between elevations of 2,000 and 2,400 m (Jacobi and Cary 1996). A 1979-1995 survey by Jacobi and Cary determined the Sabino Snowfly uses small montante streams characterized by steep, high velocity, with rocky substrate that forms with melting snow as habitat. At one site they were found in an intermediate elevation stream that is perennial or nearly perennial and are characterized by rubble and gravel to house larvae during times of no surface flow (Jacobi and Cary 1996). Little is known about the ecology of the Sabino Snowfly however as a member of Capniidae it is known as a Small Winter Stonefly. The family emerges in late winter after spending spring to fall in diapause. As a whole the family is known to be detritivores as juveniles but will eat plant material as adults (Bugguide.net 2024). The exact emergence date is not known but all occurrences have been from November to March (GBIF.org 2024). More research is needed on the ecology of this species.

Geographic Range:

The Sabino Snowfly occurs in the southwestern United States in the Gila River watershed across Arizona and New Mexico, it is found between elevations of 2,000 and 2,400 m (Jacobi and Cary 1996, GBIF.org 2024). The northern and westernmost part of its range is central Arizona north of 2Sedona, Arizona. The range continues southwest and ends northeast of Silver City, New Mexico (Jacobi and Cary 1996, GBIF.org 2024). The species is known from five locations; there are three in Arizona and two in New Mexico. In Arizona one is near the West Fork Oak Creek Trailhead along the West Fork Oak Creek, one location is near the Baldwin Trail Trailhead along the Oak Creek, one is surrounding the Cave Creek Trailhead near Cave Creek. In New Mexico one location is surrounding the Ben Lilly Memorial along the Cherry Creek and Little Cherry Creek, one location is near the Iron Creek Campground along the Iron Creek.

Conservation Considerations:

There are no known range-wide conservation actions in place for this stonefly but the species. The stonefly was given the rank of “Vulnerable” in a 1999 NatureServe assessment (NatureServe 2024).

Threats:

This stonefly’s range includes the Southwestern United States. which saw its driest 22-year period from 2000 to 2021 since at least 800 CE (the time period used in previous climatic reconstructions) (Williams et al. 2022) and droughts are projected to become more prolonged, severe, and common in the region under future climate change scenarios (USGCRP 2018). Drought conditions over the last few years have severely limited food and resources (Hughes 2020) and environmental stochasticity, especially variation in plant quantity, quality, and phenology (Ehrlich and Murphy 1987). Another threat facing this stonefly is catastrophic fire or lack of fire. The impacts of fire on this species may depend on the intensity and size of the fire, as well as seasonal timing (USFWS et al. 2004). With population numbers in small areas one fire, controlled or wild, could wipe out a large percentage of this species (Cary et al. 2004, Wasserman et. al 2023). On the other hand, with no fire this habitat may grow senescent or be succeeded which will also drive the taxa towards potential extinction (Cary et al. 2004, Wasserman et. al 2023). The impacts of land use on fire intensity and spread may also be consequential. For example, grazing may temper a fire, as grazed meadows carry less fuel load, but the presence of some invasive grasses which are more abundant in grazed areas, such as Cheatgrass (Bromus tectorum), may cause more frequent fires due to invasive grasses adding novel and continuous fuels (USFWS Et al. 2004, Fusco et al. 2019). As a Small Winter Stonefly (Jacobii and Cary 1996) climate change is of concern to the Southwest Willowfly. The species relies on montante streams for habitat meaning rising air temperatures can reduce snowback and extend the duration of summer low flow (Leathers 2024). The Southwest Caddisfly is known to occur in streams characterized by high velocities and reliance on snow melt (Jacobii and Cary 1996). If temperatures continue to rise, the habitat this species relies on will cease to exist and dry out. In the juvenile stages of life the stonefly makes use of streams (Blinn and Ruiter 2006). These Riparian habitats are threatened by drought, riparian corridor severance, damage due to cattle grazing, and hydrological modification for farming, ranching, and industry. In Arizona, for example, From the 1780s to the 1980s, an estimated 36% of wetlands were lost (Dahl 1990), largely due to increased demand for water from agriculture, urbanization, and industry (Fretwell et al. 1996). Many of the major rivers have been dammed, diverted, or otherwise modified and many perennial streams and wetlands have been lost due to groundwater drawdown of aquifers and altered hydrology of drainages (Fretwell et al. 1996). Spending the first stages of their life as an aquatic species leaves them with limited mobility, exposing them to environmental stochastic events such as wildfires and predation. Lastly, stoneflies are partially sensitive to pollution, leading to their use as bioindicators for stream health (McCaffery 2021). Their range occurs on public land (Jacobi and Cary 1996, GBIF.org 2024) leading to pollution from recreation being a possible concern. More research is needed on the threats to this stonefly.

Population:

The population size and trend are not known for this species. Determination of population size and monitoring of population trends is necessary to ensure the population is stable.

References:

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More Information