

Psychoronia brooksi (Brook's Caddisfly)

No Photo Available

Taxonomy

- **Class:** INSECTA
- **Order:** Trichoptera
- **Family:** Limnephilidae
- **Genus:** Psychoronia
- **Scientific Name:** Psychoronia brooksi Ruitter, 1999
- **Common Name:** Brook's Caddisfly
- **Synonyms:**
- **Taxonomic Name Source:** Ruitter, D. E. (1999). A NEW SPECIES AND NEW SYNONYM IN THE GENUS PSYCHORONIA (LIMNEPHILIDAE), WITH SIGNIFICANT RECORDS FOR CADDISFLIES (TRICHOPTERA) FROM WESTERN NORTH AMERICA. *The Great Basin Naturalist*, 59(2), 160–168. <http://www.jstor.org/stable/41713100>

Agency Status

- **NMDGF:**
- **Federal Status:**
- **BLM Sensitive:**
- **USFS:**
- **IUCN Red List:** [Not Evaluated](#)
- **Nature Serve Global:** [G1](#)
- **NHNM State:**
- **NM Endemic:** NO

Description

Habitat and Ecology

The species is known from one location, it is found surrounding the entrance to Ski Apache ski resort on Buck Mountain (3276 m) near Ruidoso, New Mexico (Ruitter 1999, GBIF.org 2024). They are found in the headwaters of high-velocity streams that are around two and a half meters long in width during summer (Ruitter 1999). As larvae they make slightly cured cases out of sand grains. Their pupal case is straight and made out of large rock particles that average 17-20 mm in length. Pupal cases have been known to incorporate live fingernail clams (Ruitter 1999). Pupae collected on May 24 later emerged on June 20 (Ruitter 1999). Pupae are also found in groups of five to ten underneath large rocks just below the water-substrate interface (Ruitter 1999).

Geographic Range:

The species is known from one location, it is found near streams surrounding the entrance to Ski Apache, a ski resort on Buck Mountain (3276 m) near Ruidoso, New Mexico (Ruitter 1999, GBIF.org 2024). It is thought that its range includes the entire mountain but has only been recorded near Ski Apache (Ruitter 1999).

Conservation Considerations:

There are no known range-wide conservation actions in place for this caddisfly but the species was listed in New Mexico Department of Game and Fish's Species of Greatest Conservation Need list in 2005 (New Mexico Department of Game and Fish 2024). Additionally, the Brook's Caddisfly was given the rank of "Critically Imperiled" in a 2010 NatureServe assessment (NatureServe 2024).

Threats:

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 caddisfly 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). In June 2024 the South Fork fire burned more than 20,000 acres surrounding the Ruidoso area, including Ski Apache (CBS 2024). There have been no recorded observations of the Brook's Caddisfly since the fire (GBIF.org 2024) and there have been no known collection efforts. In the larval and pupal stages of life the Brook's Caddisfly makes use of headwaters of high-velocity streams (Ruiter 1999). 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). Catastrophic fires leave the soil with burn scars that create a hydrophobic layer that makes an affected area more susceptible to flash floods (NOAA 2024). This was seen after the South Fork fire in the Ruidoso area. This led to the closure of many roads including the intersection of Ski Run Road and Winter Park (KOAT 2024), the road leading up to Ski Apache This is a concern as the Brook's Caddisfly is found in the headwaters of high-velocity streams (Ruiter 1999). With an excess of water these floods could disrupt natural water systems threatening their larval and pupal stage need for headwaters of streams as habitat. Research in Kremer and Caldwell (2022) showed wildfires also affect the mass and temperature resiliency of caddisfly instars in southwest United States montane grassland streams. They studied the Oslar's Net-spinning Caddisfly (*Hydropsyche oslari*), a generalist caddisfly using montane streams in New Mexico. Wildfires affect the thermal maxima and temperature range of montane streams (Kremer and Caldwell 2022), streams with a higher thermal maxima and a wider temperature range led to reduced mass as larvae, extended instar periods, and reduced mass entering winter dormancy which leads to adults with reduced mass (Kremer and Caldwell 2022). This lowering of mass is associated with altering other vital rates and can lead to reduced survival and lower fecundity (Ruel and Ayres 1999, Angilletta 2009, Dallas and Ross-Gillespie 2015, Kremer and Caldwell 2022), this could alter benthic assemblage structure and function (Kremer and Caldwell 2022). Recreational disturbance is also a threat to this species. All occurrence records of this species come from the Ski Apache ski area (Ruiter 1999, GBIF.org 2024). It is debated how much of a negative effect skiing has on alpine and subalpine fauna, a literature review in Sato Et al. (2013) concluded that winter recreation has negative effects on arthropods however, these results were insignificant. Lastly, occurring in just one location (Ruiter 1999, GBIF.org 2024) leaves the species vulnerable to more stochastic events. 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. More research is needed on the threats to this caddisfly.

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

