

## Chionodes bustosorum (White Sands Twirler Moth)

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Eric Metzler,

### Taxonomy

- **Class:** INSECTA
- **Order:** LEPIDOPTERA
- **Family:** GELECHIIDAE
- **Genus:** Chionodes
- **Scientific Name:** *Chionodes bustosorum* Metzler, 2016
- **Common Name:** White Sands Twirler Moth
- **Synonyms:**
- **Taxonomic Name Source:** Metzler, E.H. and J.-F. Landry. 2016. The Lepidoptera of White Sands National Monument, Otero County, New Mexico, USA 10. A remarkable new white species of *Chionodes* Hübner (Gelechiidae). *Zootaxa* 4109(3): 372-380.

### Agency Status

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

### Description

*Chionodes bustosorum* is a small, all-white moth with elongate fringe-like scales on the hindwing (Metzler and Landry 2016). Because it occurs in gypsum sands, the reflective white coloring likely functions as camouflage against the sand, similarly to many endemics of this ecosystem (Metzler 2021).

### Habitat and Ecology

This species occurs in the Chihuahuan Desert ecoregion. Where it has been recorded at White Sands National Park, it is found in the interdune areas (Metzler and Landry 2016). There are many moth species endemic to the gypsum dunes of White Sands, though this species has also been recorded at Salinas Pueblo Missions National Monument. This site is predominantly pinyon-juniper woodlands and associated shrublands (NPS 2020). Specific habitat needs are

unknown, as the larval form and host plant of *Chionodes bustosorum* is unknown (Metzler and Landry 2016).

## Geographic Range:

This moth is known from the Tularosa Basin of Otero County in southern New Mexico, within White Sands National Park (Metzler and Landry 2016), and has also been identified farther north in Socorro County, within the Salinas Pueblo Missions National Monument (GBIF.org 2024). With increased survey effort, the species may be found in additional occurrences.

## Conservation Considerations:

This species occurs in White Sands National Park, which is the world's largest white gypsum sand field and is completely protected from resource extraction and development (Metzler *et al.* 2009). The neighboring dune area is managed by the Department of Defense (DOD) White Sands Missile Range, so the degree of disturbance affecting this moth's habitat there is unknown. This species is also found at the Salinas Pueblo Missions National Monument, which is also protected from development and resource extraction. However, neither site manages habitat for this species specifically. This species is poorly understood. Research on the distribution, population size and trend, habitat and life history, and the impact of threats is needed.

## Threats:

Threats to this species are not well understood, though there are notable threats to the habitats where the species is found. The White Sands dune field is an ecosystem at risk of instability due to extensive groundwater extraction on the eastern edge of the Tularosa Basin. Hydrologic modeling has shown that increased groundwater pumping in response to increased temperatures and drought conditions will lead to water level decreases up to 1.5 meters. The dune field only exists as a permanent landscape feature because the gypsum sands are held in place at the base by water weight wicked up from the ground, so a decrease in water resources could result in increased sand motility, and therefore instability of the interdune habitats where herbivorous insects live (Bourret 2015).

Groundwater extraction is more heavily utilized in periods of drought and increased temperatures. The Southwestern U.S. 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). Droughts are projected to become more prolonged, severe, and common in the region under future climate change scenarios (USGCRP 2018). The impact of drought on specific Lepidoptera populations is not well understood, though advanced timing to adulthood has been observed in some butterfly species, which may lead to phenological mismatch with plant resources (Forister *et al.* 2018). Drought may also adversely impact larval host plants and nectar sources (Pettorelli *et al.* 2007, Gottfried *et al.* 2012). In addition, *Chionodes bustosorum* is endemic to the state of New Mexico and endemic species are on average at three times higher risk of extinction from threat of climate change than other native species (Manes *et al.* 2021).

White Sands is also threatened by invasive species, in particular Saltcedar (*Tamarix* spp.), which creeps into the interdune areas where the water table is high and outcompetes native plants while increasing soil salinity (Hager 1998). Salinas Pueblo Missions National Monument is also impacted by invasive species; it has an estimated 2.5% exotic plant cover (Korb 2011).

## Population:

The population size and trend are not known for this species. It is rarely collected and there are very few records, but

this has been attributed to under sampling of Lepidoptera in the region where it is found (Metzler *et al.* 2009, Metzler and Landry 2016)

## References:

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## More Information