Andrena vogleri (Vogler's Miner Bee)

No Photo Available

Taxonomy

- **Class**: INSECTA
- **Order**: HYMENOPTERA
- **Family**: ANDRENIDAE
- **Genus**: Andrena
- **Scientific Name**: *Andrena vogleri* Larkin, 2004
- **Common Name**: Vogler's Miner Bee
- **Synonyms**:
- **Taxonomic Name Source**:Integrated Taxonomic Information System (ITIS). 2008. World Bee Checklist Project (version 03-Oct-2008). Integrated Taxonomic Information System: Biological Names. Online. Available: http://www.itis.gov.

Agency Status

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

Description

Like other *Andrena*, this species is a small, slender, delicate looking bee. The female is 11-12 mm in length. She is mostly black, with some reddish coloration on certain body parts, such as the parts of the antenna, mandibles, wings, and legs. Females are similar in morphology to *A. utahensis*, though they have an emarginate, rather than bidentate, labral process. Males are similar to *A. ofella* though they have yellow markings on the supraclypeal prominence (Larkin 2004).

Habitat and Ecology

Little is known about the habitats and ecology of this species. The collection sites range from about 1,400 to 1,875 m and span three arid ecoregions; the Chihuahuan Desert, the Southwest Tablelands, and the New Mexico/ Arizona Mountains. Near Silver City and in the Mimbres Mountains, the habitat is likely xeric foothill habitat characterized as a pine-oak woodland. Vegetation types likely include evergreen oaks, alligator junipers and Mexican pines, with an understory that is typically comprised of perennial grasses (Wood Miller *et al*. 2009). Elsewhere, it appears the species may be found in arid grasslands and shrublands. The species has been collected on cinchweed (*Pectis papposa*) and tansyleaf tansyaster (*Machaeranthera tanacetifolia*), which are both in the family Asteraceae (Larkin 2004). It is likely a specialist on Asteraceae, as nearly all related species are specialists, to some degree, on pollen of Asteraceae.

This species likely nests in the ground, like other species in the genus *Andrena* (Michener 2007). In most cases, members of this genus make individual nests, sometimes in large aggregations (Michener 2007). The nests of most communal species are inhabited by several to many females, and typically have only one entrance, with lateral burrows radiating from the main burrow (Michener 2007). The nest cells, which are at the ends of the lateral burrows, are typically lined with a wax like material, to protect larvae from soil moisture and bacteria (Wilson and Carril 2016). Females fill the bottom of each cell with pollen before inserting a single egg. In most cases, species in the genus *Andrena* produce only one generation per year, with mature adults overwintering in nest cells. Typically, the two sexes emerge at a similar time the following year (Michener 2007). This species appears to be active in the late summer; all

known records were taken in the last week of August (Larkin 2004).

Geographic Range:

This species is known only from three sites in southern New Mexico; a site near Carrizozo, one near Silver City, and one in the Mimbres Mountains (Larkin 20024). It may be more widespread, as survey effort in the region is far from extensive.

Conservation Considerations:

There are no conservation measures in place for this species. Research is needed to better understand the distribution, population size and trend, habitats and ecology, threats and habitat trends.

Threats:

The threats to this species are not well understood, though increased wildfire severity and drought due to climate warming are likely threats. The Mimbres Mountains, where half of the known occurrences have been recorded, is at high risk for catastrophic wildfire. For example, in 2013, a lighting strike near Sawyers Peak, 7.5 km as the crow flies from the type locality of this species, ignited a large wildfire. The fire burned almost 140,000 acres of steep and rugged terrain, ranging from mid-elevation pinyon-juniper scrub to high elevation mixed conifer. While some places within the burn scar were unburned, or burned only moderately, 15% of the area experienced stand replacing fire (US Forest Service 2013). Then again, in 2022, the second largest fire in New Mexico history burned over 325,000 acres of wilderness in the Black Range (Gleason 2022). In other species, such high severity burns result in habitat degradation due to reduction in canopy and organic ground cover across large areas of canyon slopes, direct mortality from fire, and indirect mortality from post-fire erosion or debris flows (Wallace 2021). The incidence of stand replacing fires has increased in the western US, due to climate warming to some extent (Turco *et al*. 2023) but primarily due to the legacy of forest management practices, which have changed forest structure, resulting in shrub encroachment in mid elevation pine-oak and pinyon-juniper woodland and desert grasslands and closed canopy conditions in the higher elevation conifer forests. For example, an assessment of the Upper Mimbres watershed found 95% of the landscape was moderately or highly departed from historical conditions (Wood Miller 2009). In the southeastern US, Hanula *et al*. (2015) found low bee diversity in forests where fire suppression resulted in dense tree stands with high understory shrub cover. Open canopies, with little to no mid-story trees and shrubs and a plant diverse understory are optimal for most bee species.

Climate warming may have other unknown impacts across the range of this species, particularly due to increasing drought conditions. 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). Drought may negatively impact bee species by reducing floral resource availability (Phillips *et al.* 2017). Bees that are oligolectic, like this one, are generally at higher risk of extinction due to reduced host plant availability, especially under climate change scenarios (Roberts *et al*. 2011) and reduced effective population sizes (Packer *et al*. 2005). Additionally, *Andrena* have been reported to have low reproductive output because of the short adult life span, and a low rate of brood cell provisioning (Danforth *et al.* 2019).

While the scope and magnitude of these threats are uncertain, continuing decline in the quality and availability of habitat is inferred. More research is necessary to determine the impacts of these threats on this species.

Population:

The population size and trend are not known for this species. It is known from only 11 specimens, collected at three sites across four collection events. This suggests it may be quite rare and range restricted, though survey effort has not been extensive.

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More Information