Shotwellia isleta (Isleta grasshopper)

No Photo Available

Taxonomy

- **Class**: INSECTA
- **Order**: ORTHOPTERA
- **Family**: ACRIDIDAE
- **Genus**: *Shotwellia*
- **Scientific Name**: *Shotwellia isleta* Gurney, 1940
- **Common Name**: Isleta grasshopper
- **Synonyms**:
- **Taxonomic Name Source**:Cigliano, M.M., H. Braun, D.C. Eades & D. Otte. 2024. Orthoptera Species File. Shotwellia isleta Gurney, 1940. Retrieved on 2025-01-16 at http://orthoptera.speciesfile.org/otus/810966/overview

Agency Status

- **NMDGF**:
- **Federal Status**:
- **BLM Sensitive**:
- **USFS**:
- **IUCN Red List**: Not Evaluated
- **Nature Serve Global**: G2
- **NHNM State**: S1
- **NM Endemic**:NO

Description

Grasshopper, medium size (30-40 mm), long-winged (adults) pale brownish-yellow with olive-greenish-gray tone, no highly distinctive markings. Dorsal and sometimes ventral surface of abdominal segments light tan and black basally, three black marks on dorsal surfaces of hind femora. Hind tibia bright yellow, inner surface of hind femora black with white band apically. Adults (juveniles lacking wings) with wings reaching the tip of the abdomen, one to three faint black patches along the length of the fore wings, hind wings yellow basally. Hind wings yellowish basally with black clouding around the apical portions.

Habitat and Ecology

Shotwellia isleta occurs only among widely scattered and geographically isolated ephemeral freshwater wetland and playa (bare pond and lake beds) basin habitat locations scattered across the Chihuahuan Desert Level III Ecoregion (Omernik and Griffith 2014) from Zacatecas and Durango, Mexico, north to the North Plains of Cibola County, New Mexico, USA, in the southern Arizona-New Mexico Plateau Level III Ecoregion (Omernik and Griffith 2014) (Otte 1984, Richman *et al.* 1993, Edleman *et al.* 2010, Cigliano *et al.* 2025). The geographically scattered distribution of such wetland habitat locations across the Chihuahuan Desert results in the *Shotwellia isleta* meta-population being represented by highly fragmented and widely separated sub-populations, likely with little to no gene-flow between subpopulations. *Shotwellia isleta* is ecologically specialized to live on bare dry or wet mud in association with freshwater wetland vegetation (esp. *Panicum obtusum, Pleuraphis mutica, Ratibida tagetes*, and *Helianthus ciliaris*) that grow on the margins of freshwater playas, and/or in ephemeral freshwater wetlands in Chihuahuan Desert landscapes. While the overall geographic range of *Shotwellia isleta* 's meta-population is large, the actual occupied suitable habitat locations of subpopulations are very small and widely separated from each other, as are the localized wetland environments.

Gurney (1940) reported *Shotwellia isleta* from the Isleta Pueblo as being collected in desert grassland dominated by

Bouteloua eriopoda, Pleuraphrus jamesii, and *Scleropogon brevifolius,* but noted the presence of *Cynodon dactylon* and *Carex* sp. that indicate freshwater wetland habitat within the broader grassland. Gurney (1940) noted that the single specimen from Gomez Palacio, Durango, Mexico was collected in a small area of short grass where irrigation was being used to grow cotton. Otte (1984) reported *Shotwellia isleta* from Zacatecas, Mexico, 60 km NE of Zacatecas City. A basin and small desert lake, El Barril Lake occurs in that area. Otte did not provide habitat information other than the edge of a “salt pan.” However, *Shotwellia isleta* does not occur in saline areas, and El Barril Lake is largely an ephemeral freshwater lake with saline areas on the southwest side. Other saline and freshwater dry lakes occur in that area (Google Earth 2024).

The host food plants for *Shotwellia isleta* are not known, but it was found to be associated with the desert wetland perennial grasses *Panicum obtusum, Pleuraphis mutica, Ratibida tagetes* and *Helianthus ciliaris* at Isaack Lake, Dona Ana County, New Mexico, and with *Panicum obtusum* and *Ratibida tagetes* at the North Plains, Cibola County, New Mexico. Band-winged grasshoppers (Oedipodinae) such as *Shotwellia* are known to be largely mixed grass and forb feeders. *Shotwellia isleta* likely feeds on grasses and forbs in its desert freshwater wetland habitats, such as *Panicum obtusum, Pleuraphis mutica* along with other grasses and likely forbs, especially *Ratibida tagetes* and *Helianthus ciliaris*. All of those four grass and forb species are good suitable habitat indicators for *Shotwellia*, at least in New Mexico.

Individual *Shotwellia isleta* have always been found on open bare clay soil, damp or dry, in suitable freshwater wetland habitats (Lightfoot 2024). As typical for Oedipodinae, individuals have camouflage coloration on the bare soil surfaces. When disturbed by an approaching person, individuals fly 2m – 5 m distance with a low and relatively direct flight, to land again on open bare soil. *Shotwellia isleta* does not live on vegetation, but likely feeds on grasses and forbs at the soil surface, as do most other Oedipodinae. *Shotwellia isleta* are diurnal, and have been found during the mid-day hours when the sun is high in the sky, and when ambient and soil surface temperatures are warm. *Shotwellia isleta* likely has a one-year life cycle based on specimen record dates. Adults have been found from July- late October. One 3rd instar juvenile was reported in October 18, 2008 in BugGuide (D. J. Ferguson 2008). Mating likely occurs in the mid-summer, eggs are likely laid in the soil in the late summer, overwinter in the soil, and hatch the following late spring/early summer. Egg hatch and juvenile survival and development are likely controlled by rainfall and plant production. Lightfoot (pers. comm.) found *Shotwellia isleta* to be present at New Mexico locations during wet summers when wetlands and playas contained some water and damp soil, but absent at the same locations during dry years when soil and vegetation were dry.

At habitat locations where *Shotwellia isleta* has been observed and collected (D.C. Lightfoot pers. comm.), individuals are rare and localized, even within the suitable habitat areas. Considerable pedestrian survey effort has resulted in only a few individuals found over a period of one to several hours of searching. Generally individuals have clumped spatial distributions within suitable habitat. If one individual is found, 1-2 others were often within 30m of that individual. Sexual mate attraction behavior likely accounts for such a clumped spatial distributions. *Shotwellia isleta* is not known to produce sound in flight (i.e., crepitation) as most Oedipodinae do. Other mating sounds and signals are not known.

Geographic Range:

Shotwellia isleta is an ecological specialist known to occur at eight geographic locations since the species was described in 1940 (Gurney 1940) from one of those locations. *Shotwellia isleta* occurs in widely scattered ephemeral fresh water playas (dry lake or pond basins) and in ephemeral wetland areas of the High Plains Ecoregion of southern Colorado, the Arizona-New Mexico Plateau Ecoregion of northwest New Mexico, through the Chihuahuan Desert Ecoregion of New Mexico and southwest Texas, USA, and south to the Mexican states of Durango and Zacatecas (Otte 1984, Richman *et al.* 1993, Edleman *et al.* 2020, Orthoptera Species Files, 2024). The geographically scattered distribution of such wetland habitat locations across the Chihuahuan Desert, High Plains, and Arizona-New Mexico

Plateau results in the *Shotwellia isleta* meta-population being represented by highly fragmented and widely separated sub-populations, likely with little current gene-flow between subpopulations.

The only known and documented specimens are the holotype (male) and allotype (female) specimens reported from the Isleta Pueblo, New Mexico, and a single female paratype specimen from Gomez Palacio, Durango, Mexico, by Gurney (1940; Smithsonian Institution collection); three specimens from Zacatecas, Mexico, 60 km northeast of Zacatecas City (El Barril Lake?) reported by Otte (1984; Philadelphia Academy of Natural Sciences collection), and nine specimens recently (1980's – 2020) collected on the North Plains, Cibola County, New Mexico, and Isaack Lake, Dona Ana County, New Mexico (Richman *et al.* 1993, Edleman *et al.* 2010; University of New Mexico, Museum of Southwestern Biology collection). Additional localities are known from photographs posted on BugGuide (2024) (near Isleta Pueblo, and near Las Cruces, New Mexico; D. Ferguson 2008) and iNaturalist (2024) from Las Animas County, Colorado (J. Shorma 2024) and from Reeves County, Texas (S. McCoshum 2019). Most of the above records are found in GBIF.org (2024), with an addition two from BugGuide.org (2024). The Orthoptera Species File (2024) contains information on all published geographic records, but lacks records from iNaturalist and BugGuide.

Extensive field surveys of Orthoptera across the American Southwest and Mexico by D.C. Lightfoot and colleagues over the past four decades have revealed no other findings of *Shotwellia isleta*, despite thorough surveys of ephemeral freshwater and saline wetlands and playas across the known geographic range of the species (D. Lightfoot pers. comm.). *Shotwellia isleta* is unlikely to be more common or widespread than currently known.

Conservation Considerations:

The primary conservation need for *Shotwellia isleta* is the protection and preservation of natural ephemeral freshwater lakes, ponds and wetlands of the High Plains Ecoregion of southern Colorado, the Arizona-New Mexico Plateau Ecoregion of northwest New Mexico, through the Chihuahuan Desert Ecoregion of New Mexico and southwest Texas, USA, and south to the Mexican states of Durango and Zacatecas. Because such habitats have been historically heavily utilized by domestic livestock as water sources, and continue to be, those habitats are typically in poor ecological condition resulting from the historic and continued use of the fresh water for livestock in otherwise dry landscapes. Those same ephemeral freshwater basin habitats also provide important habitat to many other native plants and animals, and should be high priority environments for protection and conservation. Another conservation need for *Shotwellia isleta* is data on population trends, at least for a few of the known subpopulations, ideally across the geographic range of the species.

Threats:

The key threats to *Shotwellia isleta* are suitable habitat loss from domestic livestock grazing, habitat destruction from hydrological manipulations (stock tank construction in suitable habitat), habitat destruction and water table lowering from oil and gas production, and from ongoing anthropogenic climate change that are all acting in combination to cause accelerated loss of small and fragmented desert freshwater wetland habitats. The few widely scattered ephemeral freshwater playa and wetland habitats that are known to be occupied by *Shotwellia isleta* within the past 30-years, are in poor ecological condition due to the long-term adverse impacts of extensive domestic livestock concentrations in and around those freshwater wetlands. Domestic livestock congregate in such locations, trampling and compacting the soil and the vegetation, consuming the grasses, and defecating on the ground. Most of the known recent *Shotwellia isleta* locations also were impacted by human constructed stock tanks for livestock water that were dug into the wetland or playa beds, likely lowering the surrounding groundwater levels and causing drying of the surrounding ephemeral wetlands and playas.

Population:

No data exist on the meta-population nor on any sub-population trends since *Shotwellia isleta* was discovered in 1938. Despite extensive field survey efforts throughout the known geographic range of *Shotwellia isleta* over the past 80 years, no other records are known. There have been no formal inventory surveys nor population monitoring studies for this species. The species appears to be truly rare in nature and has a highly fragmented geographic distribution across an array of spatially scattered highly specialized desert freshwater wetland habitats surrounded by semi-arid desert grassland and shrubland environments. All known locations and habitats are degraded and adversely impacted by domestic livestock trampling and human altered hydrology. All subpopulations are known to be small (less than 5 individuals have ever been found at one time at any location. Again, long-term monitoring or surveys of sub-populations is needed in order to acquire much needed trend data for the species.

References:

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More Information