

Cicindela willistoni estancia (Torrance Tiger Beetle)



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Taxonomy

- **Class:** INSECTA
- **Order:** COLEOPTERA
- **Family:** CARABIDAE
- **Genus:** Cicindela
- **Scientific Name:** Cicindela willistoni subsp. estancia Rumpff, 1962
- **Common Name:** Torrance Tiger Beetle
- **Synonyms:**
- **Taxonomic Name Source:** C. Barry Knisley, Mark S. Romero, Robert E. Acciavatti. 2023. Tiger Beetles of New Mexico: Identification, Biology, and Conservation.

Agency Status

- **NMDGF:**
- **Federal Status:**
- **BLM Sensitive:**
- **USFS:**
- **IUCN Red List:** [Not Evaluated](#)
- **Nature Serve Global:** [T1](#)
- **NHNM State:** S2
- **NM Endemic:** YES

Description

From Tiger Beetles of New Mexico: (C. Barry Knisley, Mark S. Romero, Robert E. Acciavatti. 2023. Tiger Beetles of New Mexico: Identification, Biology, and Conservation.) "*Cicindela willistoni estancia* adults are very distinctive and clearly distinguished from those of the other subspecies by their almost fully white elytra except for a small, darkly pigmented medial portion along the suture and surrounding scutellum."

Habitat and Ecology

The habitat of the subspecies seems to be exclusively large playas and extensive salt flats in basins with internal drainage (Knisley et al. 2023). Adults were found under alkali encrustation with some in burrows during cloudy and cool weather (Knisley et al. 2023). During sunny periods, they are usually found along the wet shores of playa lakes at times when these hold water but are less likely to be seen when the playa lake shores are dry (Knisley et al. 2023). The Torrance Tiger Beetle is typically a solitary species present in low numbers, but under ideal conditions, as many as 30

or more may be found at a site (Knisley et al. 2023). Torrance Tiger Beetle adults occur from late April to September, however most records are during June and August (Knisley et al. 2023).

Geographic Range:

The Torrance Tiger Beetle is restricted to the Estancia Basin playas, it has been well-established based on many records over the years from one or two larger playas in or adjacent to Laguna del Perro and along Highway 60 (Knisley et al. 2023). The species also occurs in the smaller playas of Pinos Wells south of Highway 60 and it might occur at some of the other smaller playas to the north, but these have not been surveyed because there are no access roads (Knisley et al. 2023).

Conservation Considerations:

Knisley et al. (2023) recommend this subspecies be listed as an Endangered Species in the United States. Because life histories for tiger beetles are so similar, Knisley and Gwiazdowski (2020) outlined numerous conservation strategies which can be applied to most of the taxa: Long term management and monitoring of population size and distribution is one of, if not the most critical activity for assessing the status of rare or threatened tiger beetle species. Biological studies have been able to determine life history, habitat requirements, population dynamics, threats, and guidance for site protection and key conservation strategies, especially captive rearing, translocation, and habitat parameters for many species, which in turn provide direction on specific conservation goals. Acquisition of currently occupied sites and protection of the habitats within them are the most important strategies for combating habitat loss and deterioration which is the major threat to tiger beetles. Required of these sites would be active, annual, or semiannual management to ensure the coequal goal of maintaining sufficient habitat quality. Among the most significant and accomplishable of these management methods for habitat would be reducing vegetation, where encroachment is an issue, to create necessary open space that are necessary for foraging, oviposition, and larval development (Knisley and Gwiazdowski 2020). Many known historic sites for common and threatened tiger beetles have been lost or permanently impacted by development or other anthropogenic impacts; thus, captive rearing and translocation have demonstrated to be proven methods which can efficiently create populations for extirpated sites. A lack of unoccupied sites with suitable habitat can be a significant limitation with this approach as supplementing existing populations in decline without concurrent habitat improvement yields a reduced likelihood of success. However, a century of laboratory work in the study of life history, developmental effects, and physiology of tiger beetles, captive rearing has shown remarkable success and standardization, with few modifications on a species by species basis, to reintroduce rare species to extirpated sites as a preferred alternative to using beetles from an existing population because it mitigates developmental mortality and amplifies the breeding potential of individuals taken from the wild. It is important to recognize that translocations to increase population size will only be a temporary solution if the habitat conditions are not suitable. Tiger beetles will rapidly increase their population size to match the carrying capacity of a site, so the key to maintaining or creating a viable population is management to improve habitat quality.

Threats:

The Estancia Basin is mostly privately-owned and unprotected. This means that the majority surface land use of it, cattle grazing, is widespread and unregulated. It is highly probable that some existing sites along rangelands in the area are impacted by extensive trampling from cattle which either disrupts larval activity or destroys their burrows (Knisley et al. 2023). The occupied area near Pinos Wells is state-managed with evidence of impacts from heavy livestock grazing around several small playas there as well (Knisley et al. 2023). However, the more pressing threat to this habitat might be the permanent drying of surface soils from a lowered water table caused by increased well drilling and irrigation pumping for agriculture. (Knisley et al. 2023). It is known that areas of intense irrigation damage tiger beetles habitats by lowering the water table which desiccates both the critical surface and near surface soil moisture

needed for larvae (Knisley 2011). On top of irrigation related threats to saline habitats, projections of increased droughts in the Southwest, largely due to human caused climate change which will make droughts more prolonged, severe, and common, present a major continuing and future threat to most of and potentially all the New Mexico tiger beetle fauna (USGCRP 2018, Knisley et al. 2023). Increased evaporation due to warmer surface temperatures and decreased precipitation will drive significant reductions in soil moisture depth which is projected to average 3cm/year in the Southwest (Knisley et al. 2023). Lack of water in the soil reduces adult activity time and fecundity while also adversely affecting food availability, oviposition, survival and larval recruitment, all of these ultimately resulting in smaller populations within any given habitat (Knisley 2011, Knisley et al. 2023). There are already species thought to have declined as a direct result of these impacts such as: *Cicindela tranquebarica joaquinensis* in the San Joaquin Valley of California, *C. praetextata* along the lower Colorado and Virgin Rivers, *C. oregona maricopa* in Arizona, and *C. willistoni sulfontis* and *Ellipsoptera nevadica citata* in the Sulphur Springs Valley of Arizona (Knisley 2011). Extensive research has been done on groundwater availability of the Estancia Basin. Researchers have shown that since the development of groundwater resources, beginning in the 1950s, groundwater levels throughout the Estancia Basin have demonstrated a steady decline (Newton et al. 2020). Groundwater accounts for more than 99% of the total withdrawals in the region, most of which are for irrigated agriculture, and the rest of the withdrawals go toward domestic and commercial uses. (Estancia Basin Regional Water Plan 2016). As groundwater levels decline, discharge to the playa lakes decline as well, resulting in a decrease in evaporation (Estancia Basin Regional Water Plan 2016). With continued groundwater discharge rates being greater than estimated recharge rates, current management of water resources in the Estancia Basin with no net depletion of the resource is not possible (Newton et al. 2020). Under current conditions in the Estancia Basin, groundwater is effectively a finite resource that is being mined, with the life expectancy for these resources being 81 to 117 years (Newton et al. 2020). From these water-related threats, there is some evidence of a decline or complete loss of some of the saline habitat species of the Estancia Basin. Knisley et al. (2023) describe experiences over several decades of visiting saline playa sites combined with contacting other collectors and colleagues where saline playa inhabiting tiger beetle species are found less frequently and in lower numbers in recent years than had been found in previous decades. These subspecies are active only when the playa has water, and this has been drastically less frequent in recent years, thus steep declines in populations are expected in the next few years.

Population:

The population size of the Torrance Tiger Beetle is unknown. Past studies with southwestern tiger beetles have found that population trends are mainly determined by rainfall (Knisley et al. 2023). This is concerning as 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) and droughts are projected to become more prolonged, severe, and common in the region under future climate change scenarios (USGCRP 2018). This may be resulting in population declines however, more data is needed to infer or estimate a population trend.

References:

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More Information

