To protect threatened beetle, entomologists hope new colony takes hold

July 7 2020, by Rodger Gwiazdowski

Beach Tiger Beetle. Credit: Rodger Gwiazdowski

As thousands of hopeful coronavirus shut-ins look forward to heading to Atlantic beaches for the July 4 holiday, University of Massachusetts Amherst entomologist Rodger Gwiazdowski and colleagues are also heading to the beach—but they'll visit the last quiet natural one protected by the National Park Service at Sandy Hook, New Jersey.

There, Gwiazdowski and a team of biologists will visit part of the Gateway National Recreation Area to survey the beach above the tide line for what they hope is the beginning of a new population of the federally threatened Northeastern Beach Tiger Beetle. In early May they had released almost 200 grub-like larvae at Sandy Hook, which is about

15 miles south of Staten Island with a clear view of Coney Island. On their early July re-visit, the researchers hope to find the larvae emerged as adult beetles.

In collaboration with the U.S. Fish and Wildlife Service and other agencies, Gwiazdowski and colleagues including Joe Elkinton at UMass Amherst plan three years of relocating larvae that are in the last growth stage before they pupate into adults. "We'll do two pre-surveys in early July," Gwiazdowski says. "If we find some, we'll go back later to see if we can determine a peak number."

He points out, "These insects used to be found on seaward beaches all up and down the East coast but their numbers crashed after 1945. In the 1990s, some were left on Martha's Vineyard and, a few of those were moved to nearby Monomoy Island off Cape Cod. "Now, the Monomoy population has exploded and we're seeing what a pre-discovery population looked like before Henry Hudson and other Europeans arrived."

The white grubs collected in May were about an inch long with a dark brown head, large bug-eyes and huge jaws half the size of the head, Gwiazdowski says. "They are lie-in-wait predators that eat small arthropods like sand fleas. Once prey get within striking distance, they leap out of their burrow, grab it, drag it back and eat it alive."

Sand-colored adults are "fast runners with long legs that tackle prey and sink their jaws into the body wall," he adds. "They look and act like monsters as both adults and larvae, hence the name tiger beetle. The larvae don't crawl far, but they do have a peculiar 'wheeling' behavior that can disperse them pretty fast," Gwiazdowski says.

In this maneuver, the grub snaps up in the air and grabs its hind end in its jaws, turns itself into a wheel, catches the wind and rolls along the sand.

On Monomoy, Gwiazdowski and assistants managed to document the unusual behavior in a short video. "We had no idea that the northern population did this, but we witnessed it on Monomoy," he notes. "Nobody knew they could do this, so it was really fun."

Flying adult beetles are active from late June to mid-August, foraging, mating and laying eggs at a time when human activity is also at its peak, he says. Gwiazdowski says, "Biodiversity loss is happening here, now, and current species extinctions are often from direct human action. So I hope this project not only helps conserve this species, but also promotes empathy for species other than our own."

He notes, "This is a remarkable project for me because I was born and grew up in New Jersey. I came to UMass for my doctoral work in evolutionary biology and entomology. So I'm grateful for this chance to use my relationship with UMass to help a species, and my home state."

Provided by University of Massachusetts Amherst

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