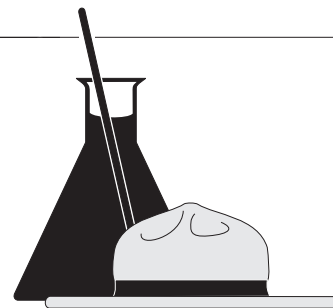




BEETLEMANIA SWEEPS THE HOOK

Federally threatened northeastern beach tiger beetle on comeback at Sandy Hook Unit of Gateway National Recreation Area

By BRUCE LANE

Last October marked the return of the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) to the beaches of the Gateway National Recreation Area Sandy Hook Unit (fig. 1 and fig. 2, page 16). This federally threatened species was once common on sandy, undisturbed beaches from Massachusetts to New Jersey and along portions of Chesapeake Bay. Today, only two small populations exist, one on the Atlantic coast of Martha's Vineyard, Massachusetts, and the other on Chesapeake Bay. Continuous development along ocean beaches, offroad recreational vehicle use, heavy pedestrian traffic, and the effects of storm surges are the principle causes of beetle decline.

The U.S. Fish and Wildlife Service (USFWS) developed a recovery plan for the northeastern beach tiger beetle and sought the expertise of the biology department at Randolph-Macon College in Ashland, Virginia. Researchers were asked to determine the current population status in New Jersey, conduct site evaluations, and develop procedures for beetle restoration. The researchers found that the conditions on Sandy Hook offered the best chance of survival for restoring a population.

During the summer of 1993, USFWS personnel and the Randolph-Macon biologists met at Sandy Hook with park staff to further evaluate the site and discuss the proposal of an experimental restoration. The park expressed some concern regarding potential conflicts between managing a federally threatened species and providing active recreation on the bath-

ing beaches.

We soon agreed that the restoration project could be accomplished within the areas already protected for nesting shorebirds, including the federally threatened piping plover. Despite the current use level, Sandy Hook remained the best possible site for reestablishing a beetle population.

Over the next year we initiated the formal consultation process as required by section 7 of the Endangered Species Act with the U.S. Fish and Wildlife Service. The agency authorized the removal of up to 1,000 tiger beetle larvae from the Chesapeake Bay population to be released at Sandy Hook. A USFWS

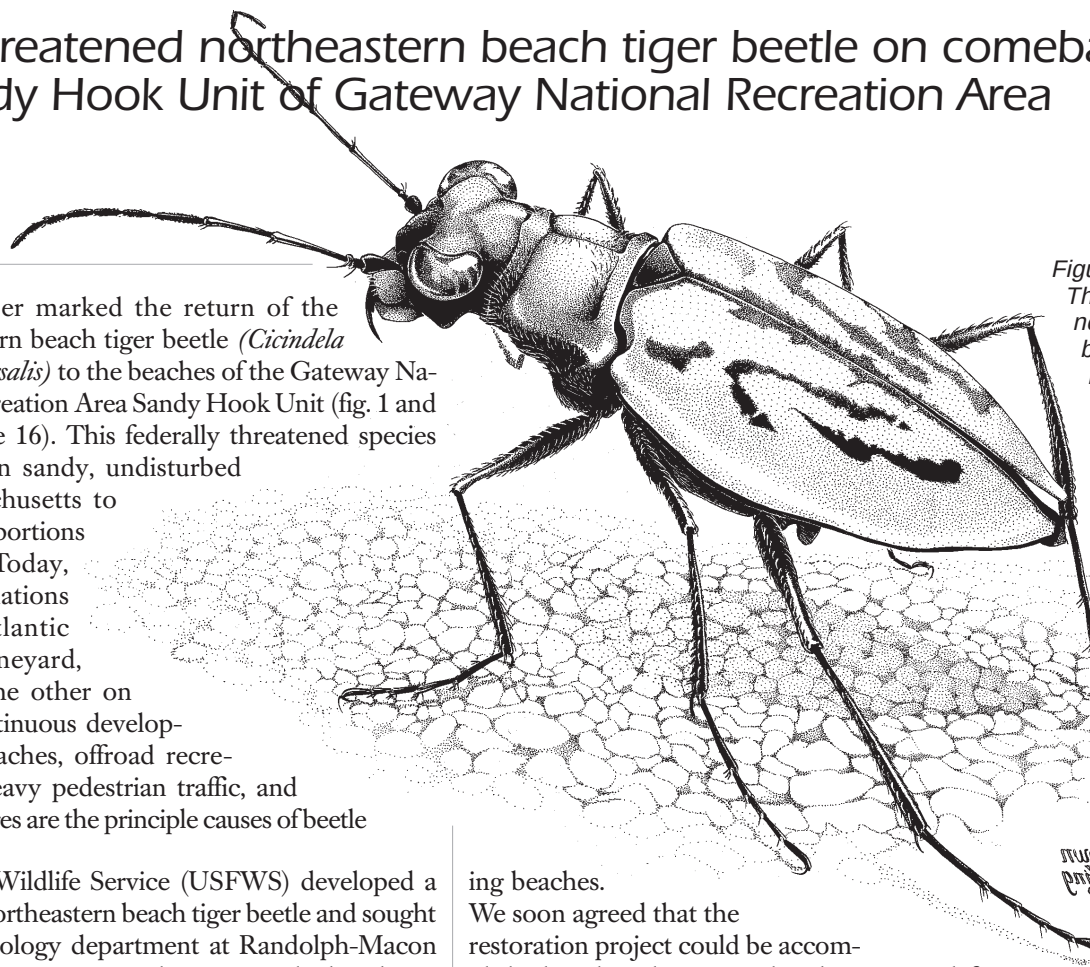


Figure 1.
The adult
northeastern
beach tiger
beetle.

Figure 2. Once resident at Gateway National Recreation Area, the northeastern beach tiger beetle was extirpated as a result of military activity and heavy pedestrian traffic.

Restoration activities to return the beetle to the beaches of Sandy Hook, New Jersey, began last October.

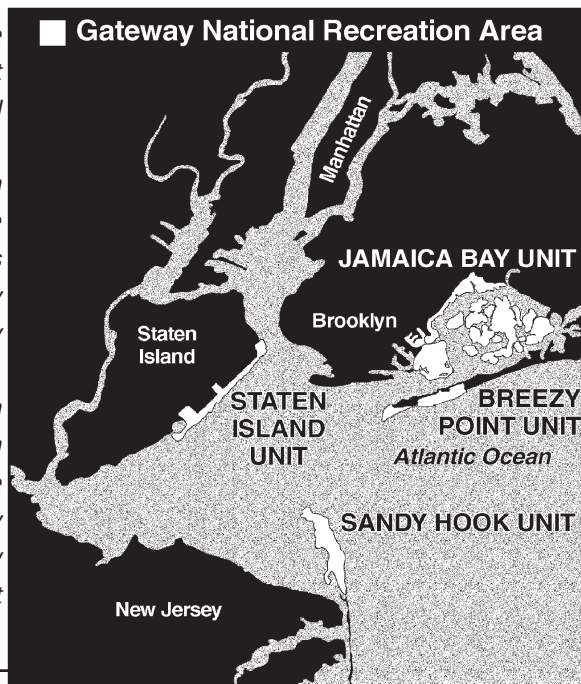


Figure 3 (inset, right). After overwintering twice, the half-inch long tiger beetle larva pupates in the bottom of a sand burrow that is up to 18 inches deep; the winged adult (fig. 1, page 1) emerges during the second summer.

biological opinion concluded that during the restoration process the entire experimental population could be lost due to severe winter storms, accidental trampling, or the species' inability to adapt to relocation. We developed management recommendations and introduction procedures to minimize the possibility of an "incidental take" while establishing the new population.

On a warm night in early October the researchers collected approximately 800 tiger beetle larvae from the Chesapeake Bay population (fig. 3). The larvae, which live in vertical tunnels between the high tide and drift line (highest tide line where wood, vegetation, and other debris are deposited), were located by the reflection of their eyes in a flashlight beam. The larvae wait at the mouth of the burrow to catch small prey as they pass by. Project participants had to dig up each of the 800 larvae since they would drop back into their holes. This was no small task considering the larvae are only about a half-inch long and the burrow can be up to 18 inches deep. The researchers placed the beetle larvae in vials containing some sand and transferred the insects to the park along with 50 vials of laboratory-grown larvae.

Employees of the U.S. Fish and Wildlife Service field office in Pleasantville, New Jersey, volunteers, and park staff from all divisions helped to release the tiger beetle larvae on the park beach (fig. 4). We created eight 10 x 10 m plots and evenly spaced 100 larvae in each plot. As we released them from the vials, we covered the larvae with a small paper cup to protect them until they dug a vertical burrow (fig. 5). Over the following several weeks, the researchers returned to assess survival and to place tiny meal worms in the plots to supplement the larvae food supply.

The northeastern beach tiger beetle larvae pass through three developmental stages during a 2-year life cycle, overwintering twice as larvae, pupating at the bottom of their burrows, and emerging as winged adults during their third summer. Depending on the level of development and the survival rate of the introduced larvae, we hope to see some adult tiger beetles this summer and plan to update *Park Science* readers

Figure 5 (right). Restoration staff placed larvae beneath tiny paper cups until the young insects could dig their own protective burrows.



about our success in a subsequent issue. Beachgoers concerned over the possibility of more insects on the beach were relieved to learn that the tiger beetles rely heavily on greenhead and other biting flies as a primary food source.

Participating in this project gave us an opportunity to contribute to the conservation of a species threatened with extinction. Although some or perhaps all of the larvae may be lost during this attempt to establish a new population, the species will benefit overall because of increased public awareness, our improved knowledge of its habitat requirements, and improved restoration procedures.



Figure 4 (left). The restoration effort required collecting 800 larvae from the Virginia Chesapeake Bay and replacing them evenly in eight restoration plots on the New Jersey beach at Gateway. Staff hopefully await the return of the winged-adult beetle to Sandy Hook this summer.



Gateway beaches have always been a valuable resource. They may become even more valuable with the addition of the northeastern beach tiger beetle to the more remote sections of the park. This important step will bring us closer to recreating a truly natural beach ecosystem with a complete complement of native beach organisms.

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