Survey for *Cicindela marginata* (salt-marsh tiger beetle) at Laudholm Beach, Wells, Maine - July, 2019

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The mandate

At the request of Sue Bickford, Stewardship Director for the Wells Reserve at Laudholm, I came down to determine whether the salt-marsh tiger beetle (*Cicindela marginata*), previously reported at the Reserve (Ward and Mays, 2014), is still to be found in the tiger-beetle fauna of the Laudholm Beach system. Other potential species that could be encountered were the hairy-necked tiger beetle (*Cicindela hirticollis*), the big sand tiger beetle (*Cicindela formosa generosa*), and - less likely - the northeastern beach tiger beetle (*Cicindela dorsalis*). This last species has not yet been reported from Maine, but is known from Massachusetts, in which state it is considered an endangered species (Northeastern Beach Tiger Beetle Fact Sheet [NY]); it is now rare throughout the Northeast.

A 2010 survey by Mark Ward and Jonathan Mays (Ward and Mays, 2014) resulted in documentation of the salt-marsh tiger beetle at what is likely the same beach/backbeach system re-studied here.

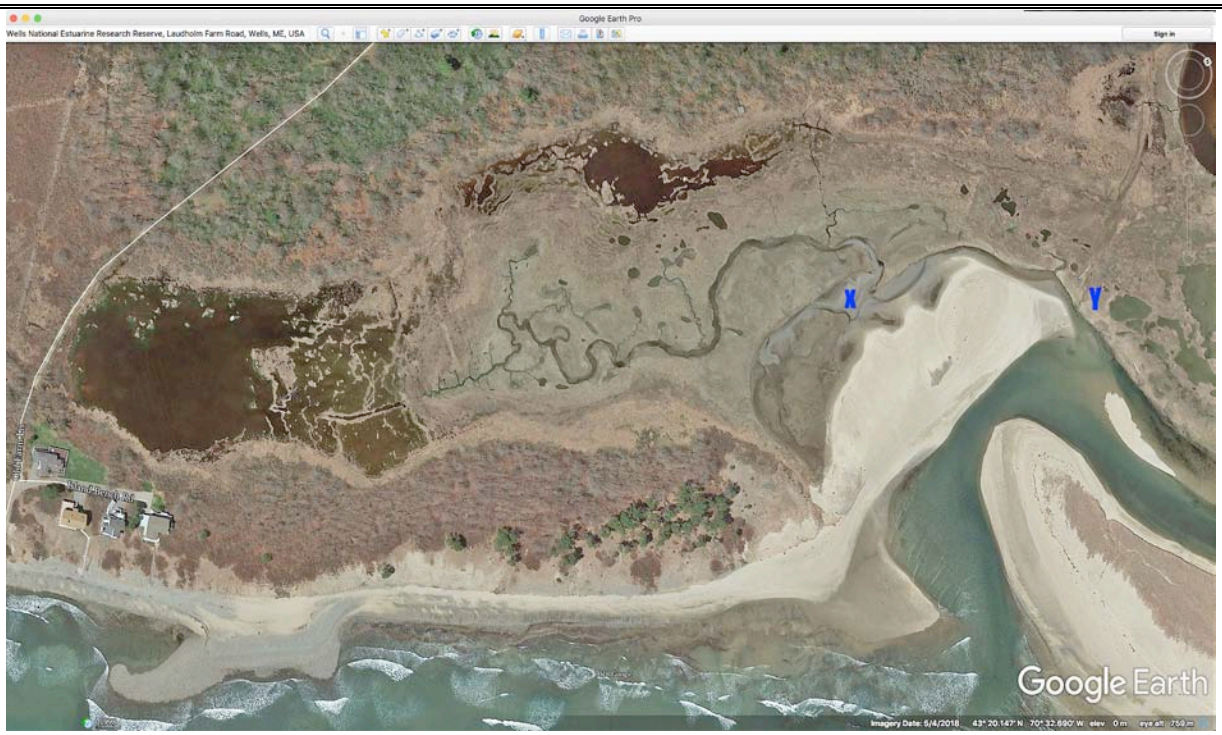

Fig. 1: The Laudholm Beach system surveyed in this study. The central part of the large spit below the "X" in the diagram was partly vegetated and restricted to access during the study, to protect nesting shorebirds. (Google Earth imagery from 4 May, 2018.)

The Methodology

Surveying for tiger beetles requires use of an insect net and visually identifying and stalking specimens. The target species is a large-eyed diurnal predator, and very wary of approaching larger figures. Pitfall-trapping has been also used in some areas, but was not employed here due to logistical difficulties of emplacing traps and recovering them promptly, with the added potential for disruption by human activities.

Surveys were conducted on June 26th, and July 26th, of 2019, when low tide occurred at mid-day. This allowed surveying exposed sandy tidal flats (the area surrounding the "X" on Fig. 1, above), sites similar to those where Ward and Mays (2014) reported the beetle had been found in the past (Figs. 2 and 3, below).

Results

The survey effort in June, 2019, yielded only specimens of the hairy-necked tiger beetle from both the beach and upper sand-flat areas of the back-beach portion of the study area. This was in the area surrounding and below the blue "X", and the supratidal sandy area on Figure 1.

Fig. 2: The back-beach sand area and exposed intertidal sand flats that were surveyed for tiger beetles as they appeared in July, 2019.

Fig. 3: An exposed intertidal sand flat undergoing stabilization by incipient salt marsh grasses, which was also surveyed for tiger beetles.

Extensive surveying of this same area on 26 July, 2019, similarly yielded *only* individuals of the hairy-necked tiger beetle, on the beach, in the beach-proximal intertidal zone, and on sand flat areas that are in the process of becoming stabilized by incipient salt marsh grasses (Figs. 2 and 3). Large specimens, small specimens, and both light- and dark-colored specimens were encountered and captured, but all were of this species, which was abundant at the site, up to 4-5 individuals per square meter. At least several dozen individuals were captured and released, though a small subset showing the variation was retained for voucher purposes; voucher specimens will be deposited in the Maine State Museum collection in Augusta. No specimens of the big sand tiger beetles were found, though this species has previously been found at nearby Ogunquit Beach, where it was associated with at least incipient dune development.

Additional surveying was conducted in open areas underlain by more peaty substrates on the top of the upper salt marsh area, in some areas with modest surficial sands, at and surrounding the blue "Y" on Fig. 1.

Fig. 4. An area atop the high salt-marsh surface where the surficial turf has apparently been stripped by wave action, and a small amount of eolian sand has been deposited. The salt-marsh tiger beetle was first encountered here, but was not accompanied by any other species. The large driftwood tree at the left margin of the photo shows as well above and to the left of the "Y" in the Google Earth imagery of the site (Fig. 1).

These areas atop the high salt marsh surface were also occupied by tiger beetles, though they were more sparse than tiger beetles were found in the areas on the beach and exposed intertidal flats. However, all specimens encountered here - at least a dozen were collected and released - were of the salt-marsh tiger beetle. Not a single hairy-necked tiger beetle was encountered in this area. A single specimen was collected for voucher purposes and will be deposited in the collection of the Maine State Museum in Augusta.

The salt-marsh tiger beetles on these restricted open patches of ground in the salt marsh were not as abundant as the hairy-necked tiger beetles on the beach or intertidal sand flats, but still numbered 1-2 per square meter in these areas. Each site of open ground measuring over one square meter in size was occupied by at least one tiger beetle.

The conclusion to be reached is that the salt-marsh tiger beetle in the salt marsh area behind the sand spit on the Laudholm Farm preserve is not only present, but apparently doing well and supporting a population large enough to be considered stable and secure.

Conservation Recommendations

Given that the salt-marsh tiger beetle's preferred habitat in the Wells Reserve at Laudholm is open areas within the upper, supratidal portion of the salt marshes, any ongoing efforts to preserve these salt marshes for other taxa such as nesting shorebirds and waterfowl should be sufficient to guarantee the long-term survival of the beetles as well at the site.

Fig. 5. A second area atop the high salt-marsh surface, where the surficial vegetation has apparently been killed by natural processes. Salt-marsh tiger beetles were also to be found in this habitat type.

However, what could work to the detriment of the salt-marsh tiger beetles would be any revegetation efforts that could potentially be undertaken to re-establish marsh vegetation in those areas where it has died or been stripped away (Figs. 4 & 5). This is because the open areas devoid of vegetation are the preferred hunting habitats for the salt-marsh tiger beetles.

Significance

The salt-marsh tiger beetle is apparently in decline in some states, and now considered extirpated in the state of New Hampshire (Ward and Mays, 2015). Its presence in what appears to be a relatively large and stable population at the Wells Reserve at Laudholm is a good sign of its tenacity. As long as the habitat remains intact, and is not sprayed with pesticides for control of mosquitoes or other pests, the species should remain part of the special fauna of the Reserve.

References

Northeastern Beach Tiger Beetle Fact Sheet, n.d. (https://www.dec.ny.gov/animals/7116.html); accessed 27 July, 2019.

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