



Horseshoe crab decline 'alarming'

By **Doug Fraser**

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WELLFLEET — University of Massachusetts graduate student Sarah Martinez is careful about drawing non-scientific conclusions about her horseshoe crab research. But, after four years doing population surveys on these dinosaur-age survivors, Martinez, who hails from Yarmouth, can't help herself.

"We both grew up on Cape Cod," Martinez said of herself and fellow graduate student Katherine Terkanian, who is from Wellfleet. "I remember there being more as a kid."

Dan McKiernan, deputy director of the state Division of Marine Fisheries, said state officials believe the combined evidence of spawning surveys such as those conducted by Martinez and Terkanian, as well as trawling surveys, are showing a decline in the state's horseshoe crab population. When spawning surveys turned up few or no crabs at some known spawning sites, McKiernan said state officials worried that they may be managing crabs the wrong way — that it may be just as important where fishermen harvest horseshoe crabs as how many they catch.

"On known spawning beaches, some of these findings appeared to be alarming," McKiernan said.

Largely ignored by both fishery managers and the public for decades, horseshoe crabs hit the news in 1998, when birders worried that a vital link in the ocean food chain was being severed by fishermen harvesting horseshoe crabs for use as bait. Migrating shorebirds, particularly in the Delaware Bay area, depended on crab eggs for nourishment in their long South American migration.

Conservation efforts

By 2000, both the Cape Cod National Seashore and the Monomoy National Wildlife Refuge in Chatham banned the harvest of horseshoe crabs for bait and medical use. Horseshoe crab blood produces a vital medical product that can detect contamination in medical devices such as surgical implants.

The Division of Marine Fisheries also set strict limits on how many of the crabs could be caught. This year, the agency instituted new regulations to guard against localized depletion by protecting spawning crabs that gather in large groups on beaches around the full moon in late April through early July. Fishermen catching crabs for bait and for the medical industry, by taking advantage of these natural aggregations, could, in theory, wipe out a local population.

There has already been some research showing that there may be at least four genetically distinct horseshoe crab populations from Maine to the Gulf of Mexico.

The Division of Marine Fisheries co-sponsored some of Martinez and Terkanian's research at the Massachusetts Audubon Society's Wellfleet Bay Wildlife Sanctuary. The pair has used radio tracking of individual crabs and analysis of genetic samples to determine whether there are even more genetically distinct crab populations in smaller water bodies such as Wellfleet Harbor and the Nauset estuary system.

Looking for answers

With \$50,000 in federal Sea Grant funding, the graduate students fixed radio transmitters on 75 horseshoe crabs this spring in Chatham waters around Stage Harbor, Monomoy and South Beach. They then placed 22 thermos-sized radio receivers moored in large tubs of cement around the area. Each transmitter emits a distinct signal that is caught by the receivers on the crabs and stored. Researchers then go out and download information from the receivers to a laptop computer to study the crabs' movements.

One goal of the research is to determine whether the crabs in each locality mix, or remain separated, during the two-year lifespan of the batteries powering the transmitters. This kind of research helps the Division of Marine Fisheries determine whether the agency needs to craft regulations to protect groups of crabs that stay in one particular area, or whether crabs from other areas just move in and replace those that fishermen catch.

Terkanian is collecting genetic samples from crabs in Wellfleet, Stage Harbor, Duxbury Bay, the Nauset estuary, and Pleasant Bay to determine whether there is any interbreeding. She is still looking for funding to complete the analysis of genetic samples that could show that discrete groups don't intermingle.

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