

UNDER PRESSURE: Horseshoe crabs appear to be dwindling

By Rich Eldred

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HARWICH -Horseshoe crabs have been around Earth since the Paleozoic era, so is there really much left to say about them?

You bet. Scientists haven't been around nearly as long and there is much to learn and much to be concerned about. Indications are that horseshoe crab numbers are not in good shape and there is increasing pressure on the species.

Mass Audubon's Wellfleet Bay Wildlife Sanctuary on Saturday held a conference dedicated to the ancient arthropod. The sanctuary is looking to recruit volunteer crab spotters for a long-term study. They've conducted one study already between 2001 and 2003.

"We want to do another three-year study," said sanctuary director Robert Prescott. "The idea is to redo that study and compare the horseshoe crab population in three embayments – Monomoy, Pleasant Bay and Wellfleet Harbor. It was a population study of crabs per meter of beach."

Quite a bit of detailed data was collected but Prescott would like to see a lot more information on juvenile crabs, "to see where the future leads."

"We'll be in a position to look at horseshoe crabs and say are we managing them right or not and where do we go from here?" he said.

The state has already taken a look and issued an emergency action April 1, chopping Massachusetts' yearly horseshoe crab quota to 165,000 crabs, down from 330,377, lowering the daily catch from 1000 to 400, putting a moratorium on new permits and temporarily closing the fishery on July 1, to allow the state to catch up with counting the crabs.

"This won't change things that much for many fishermen," Alison Leschen of the state Division of Marine Fisheries said on Saturday morning. "Conch fishermen collect them for themselves and only 15 percent fishermen harvest more than 400 crabs a day. Last year a couple of guys went into a few embayments and just hammered them and took thousands of crabs. That's what we are trying to eliminate."

Horseshoe crabs have only been managed since 2000. Before that they were considered abundant and really not much in demand.

"In the 50's they were harvested by the zillions in Delaware Bay for fertilizer and animal feed," Leschen said. "But also people thought they were a pest that ate shellfish, which they are. Most towns had a bounty on horseshoe crab tails. People were encouraged if they saw one to pick it up and throw it above the high tide line."

They do eat a lot of small seed clams.

"But we're only beginning to recognize their value to the ecosystem," Leschen said. "They stir up the sand and free up little critters for the fish to use. Red knots in Delaware Bay eat the eggs and they rely on them to refuel halfway through their spring migration."

The horseshoe crab (*Limulus polyphemus*) is utilized as bait for conch and eel pots, especially in the Delaware Bay area. The numbers there have fallen due to heavy harvests and that has increased the taking of crabs from New England waters. The blood is also extracted to isolate *Limulus* Amoebocyte lysate, which detects gram-negative bacteria that might be in intravenous solutions or on instruments. These crabs are returned to the sea but there is a debate on how the bleeding affects their health and survival. Their mortality is estimated at 10-15 percent.

The emergency quota was instituted in response to intense pressure on Massachusetts crabs after harvest were capped in other states, especially in the Delaware Bay area. New Jersey prohibited all harvests and New York dropped its daily catch limit from 500 to 200.

“Massachusetts is the only (state) that hasn’t done anything different over that period of time (since 2004),” Leschen noted.

Massachusetts set the 330,377-crab quota in 2000 after the Atlantic States Marine Fisheries Commission required states to establish quotas 25 percent below the previous year’s landings. Massachusetts harvesters landed 45,715 crabs in 1999 but state Division of Marine Fisheries officials believed that figure was inflated in order to force a higher quota. The state used 440,500 instead to establish the current quota.

Many crabs are grabbed when they enter the shallows at high tide to spawn during May and June.

It has been estimated that there are 500,000 horseshoe crabs in Pleasant Bay alone so the quota doesn’t seem high but harvest pressure jumped dramatically as the crabs vanished from the Mid-Atlantic.

Horseshoe crab landings had declined from approximately 400,000 per year statewide in the late 1990s to 272,500 in 2000, 125,971 in 2003 and to lows of 68,536 in 2004 and 73,733 in 2005 then jumped to 171,646 in 2006 and 150,858 in 2007.

In Pleasant Bay the number of horseshoe crabs harvested soared from 194 in 2001 to 41,000 during May and June alone in 2006. The crabs were worth \$1.62 apiece as bait so the fishery brought in \$61,560. An emergency order closed the fishery that year and it has stayed shut except for biomedical harvest.

“Pleasant Bay was closed because the numbers were not in line with the sustainable numbers from Ruth Carmichael’s study.”

Anecdotal evidence, presented by the Committee for the Conservation of Horseshoe Crabs, suggests populations are in decline all over Cape Cod, except for off Monomoy where their harvest is prohibited. The survey is available online.

“We certainly know more about horseshoe crabs than when this (concern) first came up in the late ’90s,” Prescott noted. “But given what we know about horseshoe crabs in Delaware Bay and New Jersey – that would indicate we don’t know enough.”

All crabs taken for bait must be sold through two New Bedford dealers. Crabs taken for blood are returned alive so they don’t count against the quota. The crabs used for bait are cut into small pieces and put in fine mesh lobster bags, sometimes mixed with other bait, into the conch and eel traps. The diced bait works as well as whole crabs.

Recent work on Pleasant Bay’s population focused on female crabs, which were considered more important as egg layers but Prescott cautioned against overlooking the males.

“It turns out there was a German study that looked at the percentage of eggs that were fertilized in a nest and if there is only a male and a female, the percentage of fertilized eggs is low. You need the satellite males who are hanging around. Then the number of fertilized eggs increases dramatically. So you have to think through the quota. It isn’t as straightforward as was thought in the 1990s. We just need to know more,” he explained.

Wellfleet Harbor has also been targeted for collection in recent years. Tagging studies have shown that while horseshoe crabs mingle in Cape Cod Bay, they return to certain harbors and estuaries to spawn, so each harbor could represent a separate population.

“If anything, this might argue that each embayment that has a harvest of horseshoe crabs needs to have its own quota,” Prescott said. “Horseshoe crabs need to be treated like quahogs, clams or any other shellfish landed in town.”

The statewide harvest has always been considerably under the quota of 330,377 crabs. But the statewide numbers may not be what matter most.

Prescott, however, noted landing data could be misleading. Crabs taken from Wellfleet Harbor may be landed in Orleans and crabs landed in Wellfleet could be from Cape Cod Bay.

In any case, the sanctuary, Cape Cod National Seashore and University of Rhode Island will need volunteers to help with their planned horseshoe crab study.

“We want to recruit volunteers. This is a very volunteer intensive exercise,” Prescott said. “They have to sample spawning beaches and it’s not easy to go out day and night and get out at midnight and 3 a.m. for two or three days in a row. We already have 50 to 60 people but we know from experience we need a large pool of people.”

“There is so little information on horseshoe crab populations,” Leeschen pointed out. “They are not there all

the time. If you are walking down the beach at the wrong time you're not going to see any even if there are going to be 6,000 there later at night."

Leschen would like fishermen to use alternate baits, such as green crabs, which are an invasive nuisance species.

"That would kill two birds with one stone," she said.

State Rep. Sarah Peake was at the conference as well.

"I've put an earmark in the Environmental Bond bill to channel money to the Division of Marine Fisheries to study horseshow crab populations so we can make informed decisions," she pointed out.