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Scientists track horseshoe crab mating

For 4 months, hordes fill Fla. beaches to spawn

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Warning: This is a story about horseshoe crab mating, but it will zealously avoid such hackneyed attempts at humor as references to sex on the beach or romance under the full moon.

Yes, just before, during and after the full and new moons in March through June, hordes of horseshoe crabs invade Florida beaches to spawn, but the point here is state scientists want to know where these ancient arthropods are doing it.

Anyone who sees horseshoe crabs spawning can fill out an online survey for the Florida Fish and Wildlife Research Institute or report by phone or e-mail.

“There are only nine crustacean biologists in the whole state, so we need to get an idea where the horseshoe crabs are located,” FWRI biologist Angie Machniak. “If you want to go after grants for research, it’s a good idea to know where the animals are. With this data, we can say, ‘Hey, we’ve got horseshoe crabs over here.’”

Technically, horseshoe crabs are not crustaceans; horseshoe crabs and crustaceans (crabs, shrimp, lobsters, crawfish) are both in the phylum arthropoda, but horseshoe crabs are in the subphylum chelicerata, which includes spiders, while crustaceans are in the subphylum crustacea.

In short, horseshoe crabs are more closely related to tarantulas than crabs. They also are what scientists call “living fossils” because the species has remained virtually unchanged for 350 million years.

In Florida, horseshoe crabs have been observed breeding all year, but the peak season is March through June.

When horseshoe crabs are ready to mate, a male climbs onto a female’s back, and, at high tide, the couple scuttles onto a beach, where the female deposits thousands of eggs, which the male fertilizes.

“We haven’t seen as many breeding in the last couple of years,” Machniak said.

“Conditions haven’t been favorable at the right times. It’s been very windy, and they don’t come up on the beach when it’s windy: They’re not good swimmers — they were made to walk along the bottom — and when it’s windy, between the tide and the wind, they get blown over and knocked around.”

Another issue for horseshoe crabs might be human activity on beaches.

“They will come up with people on the beach, but they generally stay away,” Machniak said. “When there’s a lot of splashing around in the beach area, they won’t come up to breed.”

He noted, however, the crowded-beach theory is based on observation, not scientific evidence.

Although Machniak said Sanibel is a horseshoe crab breeding hot spot, Sanibel native Ralph Woodring, 72, said the spawning situation is nothing like what it used to be.

“Those SOBs used to be so thick around here: The crabs wouldn’t keep you awake, but the catfish

would keep you awake, eating the eggs as fast as the crabs could lay them," Woodring said. "Seriously, it used to be nothing to get up in the morning and find crawls all along the beach where they came up and laid their eggs. You don't see that anymore."

Horseshoe crab populations are dropping through much of its range, partly because of overfishing.

From 1998 through 2007, the commercial fishery in the United States landed 29 million pounds of horseshoe crabs worth $8.8 million.

Traditionally, Deleware, Virginia and New Jersey have been the leading horseshoe crab harvesting states.

According to National Marine Fisheries landings data, horseshoe crabs were harvested only once in Florida since 1972: In 1999, fishermen brought in 295,908 pounds worth $58,432.

Most of the harvest becomes eel and whelk bait, curios in seashell shops and aquarium specimens.

On a more scientific level, an extract made from horseshoe crab blood is used to test intravenous drugs, vaccines, needles and heart valves for bacterial contamination.

Among FWRI's concerns is how Florida horseshoe crab spawning affects red knots, a shorebird that relies on horseshoe crab eggs for food during its spring migration — red knot populations have crashed along with the horseshoe crab population, and the bird is a candidate for listing under the Endangered Species Act.

"We get red knots in Florida, and we want to see if they're eating eggs," Machniak said. "They're eating eggs at Cedar Key, but down here in St. Petersburg and Tampa Bay, they're eating whatever they can find because we're not seeing spawning crabs."
So, horseshoe crabs are important for many reasons, from the curio trade to medicine to welfare of migrating shorebirds.

They also make pretty good bait for local fish.

"The small ones in particular," Woodring said. "The best time is when they've just shed, because they're soft. I've caught redfish and snook on them. Those fish just crunch them up and eat them."

Additional Facts

ABOUT THE HORSESHOE CRAB

• Scientific name: Limulus polyphemus
• Range: Gulf of Maine to the Gulf of Mexico
• Habitat: Sandy and muddy bottoms from a few inches to 75 feet deep
• Diet: Clams, worms and other invertebrates
• Growth: Horseshoe crabs grow by molting; they emerge from their old shells 25 percent larger with each molt; after 16 molts, usually 9-12 years, they are fully grown.
• Locomotion: Horseshoe crabs have five pairs of legs; the first four are used for walking, and the last pair is used for pushing; a horseshoe crab uses its tail as a rudder or to flip itself over if it ends up on its back.
• Vision: Horseshoe crabs have four eyes, two small, simple eyes in the front of their shell and two compound eyes, much like a fly's eyes, on the each side of the shell.
• Evolution: The horseshoe crab evolved 350 million years ago during the Paleozoic Era; it is not a crab, but is more closely related to spiders and ticks than crustaceans.