SAVING THE SAWFISH

By: Randolph Fillmore

On a remote part of the rocky western Australian coastline, a 30-foot tide rushes in and sweeps out daily. Shoreline mangroves appear and disappear as if an estuarine Houdini were playing tricks on fishes.

Like master magicians, dwarf Australian sawfish have learned to ride the now-you-see-them-now-you don't waters flooding Collier Bay — one of the few places left on Earth where sawfish are still found in healthy numbers. In an era when sawfish populations around the world, including those in Florida, are dwindling to near-extinction, how is it that those in Australia are maintaining their population?

Mote scientists spent nearly two weeks racing in and out on the tide to find out, in the hope that their research in Australia would help unlock the secrets of the endangered smalltooth sawfish still holding on — barely — in Florida.

Tide and Seek

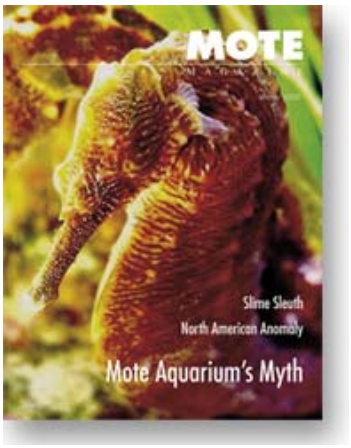
Dwarf Australian sawfish are masters at using the tide to seek out and eat fish. They rest in the mangroves at high tide and hunt on the edges of mud banks at low.

"Australia is about the last place in the world where you can find a healthy population of sawfish," said Dr. Colin Simpfendorfer, senior scientist in Mote's Center for Shark Research. "Our aim was to get down there and learn about sawfish in a fairly pristine state."

American sawfish, once ranging as far north as New York, have rarely been sighted north of Florida since the 1960s. Coastal development and commercial and recreational fishing are largely the cause of their demise.

The smalltooth sawfish, *Pristis pectinata*, was placed on the endangered species list in 2003. Now, Simpfendorfer and nine other scientists are working on a plan to help restore sawfish numbers here through the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service, which helped name the sawfish to the endangered species list and appointed the Sawfish Recovery Team that Simpfendorfer leads.

"There are seven species of sawfish worldwide," said Simpfendorfer. "All are threatened, but the U.S. sawfish population is in danger of



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MOTE MAGAZINE
A Unique Mission

Mote Magazine is published by Mote Marine Laboratory, a nonprofit organization dedicated to advancing the science of the sea. By offering internhips to science journalism students through the Media Lab@Mote, the magazine helps foster a better understanding of sea science in those reporting it. Contributing interns have come from the University of South Florida, Kent State University, the Ringling School of Art and Design, Wesleyen University, the University of Wisconsin-Madison, the University of Kansas and Brown University.

being lost if we are not proactive in protecting them and their environment."

In August, a team of scientists went to Collier Bay to tag, track and observe sawfish. Simpfendorfer wanted to study how the dwarf sawfish, native to tropical Australian waters, use the tides and mangroves in their quest for food and their avoidance of sharks.

Although they look a little bit like sharks, sawfish are rays, with gill slits on the underside of their bodies rather than on the sides, as with sharks. Sawfish, which like shallow, warm water where food is plentiful, are named for the "saw" on their rostrum, or snout, that they use to slash and kill food. They eat schooling fish — in Florida that means mostly mullet and jacks — slashing at the schools, and eating injured fish.

The animal's saw is "self-sharpening," Simpfendorfer said. As the sawfish slashes at prey, the saw's teeth tend to grind on sand and stones. If a tooth breaks off, it grows back from the base, as long as the base isn't damaged. Some adult sawfish species can be up to 20 feet long, including the saw. The dwarf sawfish in Australia grows to 10 to 12 feet long.

Tagged

Working in dinghies launched from an 80-foot research vessel belonging to the Western Australian Fisheries Department, the team of five scientists found, netted and tagged three sawfish. According to Simpfendorfer, a native of Perth, Australia, who worked for the department before joining Mote in 1998, finding and tagging three sawfish was a challenge. Not only are sawfish hard to find, but the work was also made more difficult by massive tidal fluctuations when the incoming tide in Collier Bay races up against mangrove trees and rocky shoreline.

"When the tide rushes out, it leaves a muddy shelf nearly a mile wide. When the tide comes in, it submerges the mangroves," said Simpfendorfer. "The sawfish come and go with the tidal surges, exploiting food trapped in the shallows. We had quite a wild ride."

Because sawfish like to haunt — and hunt in — the mangroves at high tide, and follow the tides when they rush back out, researchers' days were spent riding in and out on the tides and setting and checking 100-yard-long nets. When they netted a sawfish, the researchers' next task was to cut the sawfish free and place an electronic tag on its dorsal fin. The tags emit an acoustic beep that can be monitored by a receiver, and the signals can be used to track the animals' movements for a few weeks before the batteries die.

"To catch three sawfish in just two weeks was amazing," said Tonya Wiley, a Mote senior biologist who was on the Australian expedition. "It might take months to find three sawfish where we work in the Everglades."

Most sawfish in the U.S. are now found only in the 10,000 Islands region of south Florida and in the Everglades. Like those in Collier Bay, the larger American sawfish prefer and exploit shallow waters near the

mangrove trees.

Wiley, hired in 2001 to create a database to help understand what has happened to the U.S. population and get a handle on just where sawfish are still found in the U.S., heads up an extensive, hands-on campaign to educate commercial and recreational fishermen in the U.S. on releasing sawfish when they're caught. As part of her efforts, she speaks to fishing groups about sawfish and keeps the database listing where the animals have been sighted. Since Mote began collecting data in 1999, the Center for Shark Research has received about 730 reports. In 2005, Mote scientists tagged both their largest and their smallest smalltooth sawfish. The largest was just over 16 feet and the smallest was 29 inches, Wiley said.

Turnaround

"It is against the law to catch and keep sawfish," said Simpfendorfer, who emphasized three important objectives in the sawfish recovery plan: "We need to educate the public about releasing caught sawfish, and we need to protect the habitat close in shore where, especially, the young live in the mangroves."

Finally, Simpfendorfer knows that restoration will be aided by continuing research, which means more tagging and tracking to understand how sawfish live and where threats arise. An early result from Collier Bay shows that sawfish behavior there is geared toward avoiding their most deadly natural predator — sharks.

While sharks can be sawfish predators in American waters, the destruction of their natural habitat is the greatest threat now. With additional funding and the use of the research vessel and crew provided by the Western Australian Fisheries Department, Simpfendorfer hopes to go back to Collier Bay soon.

"I think we are doing very well with the recovery effort, but much remains to be done," he said. "We have a long way to go in understanding how the population is doing and knowing if the population is increasing and, if it is increasing, where, and if not, why not?"

The Australian sawfish expedition was funded by Mote Marine Laboratory, The National Marine Fisheries Service and the Western Australian Fisheries Department.

REPORT SAWFISH SIGHTINGS

Information from the public on the capture or sighting of sawfish greatly helps recovery efforts. People who spot or catch sawfish in Florida are urged to call **800-691-6683** or click here to share information that will help scientists understand sawfish movements, distribution and habitat use.

LEARN MORE…

The National Marine Fisheries Service Sawfish Recovery Team has created a plan to help the recovery of the smalltooth sawfish in Florida.

The plan includes future research needs, such as determining how big an estuary sawfish need in order to increase their population, and outreach efforts designed to help minimize human interactions with the species. Sawfish recovery is expected to take four generations of fish — that's about 100 years. Click here to view the draft plan and page down to the sawfish section.

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