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## **Protected Reef Offers Model for Conservation**



**By ERIK OLSEN** GLOVER'S REEF, Belize — As Alex Tilley powers his 15-foot skiff over the turquoise surface, a dark form slips across the white sand floor below. "Sting ray," Mr. Tilley says.

For the next half mile, en route to the <u>Wildlife Conservation Society</u> research station here at Glover's Reef in Belize, at least half a dozen rays are spotted moving beneath the surface. To Mr. Tilley, the presence of so many rays says a lot about the state of the reef here.



Erik Olsen/The New York Times Gilbert Martinez, right, a reef ranger, confronted a local fisherman found "The fish populations at Glover's are still very robust," he said. "This is definitely one of the healthiest reefs in the region."

Mr. Tilley is the station manager and resident scientist here on Middle Caye, one of six small islands within the Glover's Reef atoll. A Ph.D. candidate in marine biology from Bangor University in North Wales, Mr. Tilley leads a reef monitoring program sponsored by the Wildlife Conservation Society, a Bronx-based organization that helped establish the reserve here in 1993.

While his British accent betrays his national origins, Mr. Tilley now lives here year-round managing the research station and conducting studies on the local sharks and rays. With its lush tropical setting and thriving reef, the caye is a kind of tropical paradise. "It beats working in a lab," he said.

Glover's Reef, about 28 miles from the coast of Belize, is one of the only true atolls in the Atlantic Ocean. It is also the site of Belize's largest "no-take" marine reserve, a 17,500-acre zone where all types of fishing are prohibited. The no-take zone makes up about 20 percent of the wider 87,000-acre Marine Protected Area here. Within 75 percent of the reserve, some types of fishing are allowed, although there are restrictions on the type of gear that can be used.

According to scientists here, the marine reserve at Glover's Reef offers a test case for the viability of similar reserves around the world. They are now hoping to apply some of the conservation strategies here to make other places succeed.

"I think Glover's Reef is a model of hope," says Ellen K. Pikitch, a marine biologist at the <u>Stony Brook University</u> School of Marine and Atmospheric Sciences. Dr. Pikitch runs the <u>Institute for Ocean Conservation Science</u>, an organization seeking wider protection for sharks worldwide. She said that the effort at Glover's "shows that marine reserves, even small marine reserves, can work. I think it's very transportable this concept."



## WATCH VIDEO

Dr. Pikitch, a self-professed "shark fanatic," has other reasons to be hopeful. She leads the largest shark population study in the Caribbean here at Glover's Reef, now in its 10th year. Shark populations here have remained stable, while others around the world are in severe decline.

The sharks are an integral part of a healthy reef. Along with other top predators they help keep barracuda populations in check, which is important because barracuda consume algae grazers like parrotfish that prevent runaway algae growth from choking the corals. Other research has shown that over the long term, protected areas can even have a restorative effect on coral populations.

John Bruno, a marine ecologist at the <u>University of North Carolina</u> at Chapel Hill, and Elizabeth Selig, a marine scientist with Conservation International, analyzed a global database of 8,534 live coral cover surveys conducted from 1969 to 2006. They <u>reported</u> <u>their findings</u> in February in the <u>Proceedings of the National Academy of Sciences</u>.

"We found that marine protected areas have an indirect effect that seems to benefit corals," Dr. Bruno said. But, he said, it takes time for these effects to be realized. "People put these parks out there and then run out to see them in five years, but the benefits show up later, sometimes it takes decades," he said.

Dr. Pikitch credits the success of Glover's Reef to the design of the protected area. The notake zone helps fish stocks recover, and those fish then repopulate the nearby fisheries outside the zone. She calls this doing "double duty" and says that these strategies are of particular importance in places like Belize where fishing has been a key means of subsistence since Mayan times.

There are still significant challenges. Enforcement remains a problem. The Wildlife Conservation Society shares its home on Middle Caye with an outpost of the Belize Fisheries Department. The department employs four rangers here whose job is to patrol the reef and catch fishermen who violate the fishing ban or who poach undersized conch and spiny lobster outside the no-take zone.

Recent improvements have made enforcement somewhat easier. Last July, a 40-foot high observation tower was built at the station allowing for a 360-degree panoramic view of the atoll.

Further, the wider Belize reef system is considered one of the most endangered in the world. The effects of pollution, overfishing and <u>global warming</u>, which can lead to coral bleaching, have all conspired to reduce coral cover here. One <u>analysis</u> rated 63 percent of Belize's reefs as being threatened by human activities. Natural disasters have had a major impact as well. Still, because of what they see at places like Glover's Reef, scientists like Dr. Pikitch have been pushing the government to expand the protected areas.

Dr. Pikitch acknowledges that the problems facing reefs here are significant, but she remains optimistic that new information, including data from her shark study, will

increase awareness and prompt action to protect reefs. "We are losing coral reefs at an astounding rate," she said. "It's like death by a thousand cuts. So when you have a success like this in a coral ecosystem you say, 'Wow this is great."