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## WORLD

### Fishing imperils 40 shark species in the Galapagos

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In this June 21, 2008, photo provided by the University of Miami Rosenstiel School of Marine and Atmospheric Science, a whitetip shark swims off Cat Island in the Bahamas.



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GALAPAGOS ISLANDS, Ecuador — The teeming waters that surround the famed Galapagos islands support more shark species than anywhere on Earth. Schools of wide-eyed scalloped hammerheads, 40,000-pound whale sharks, reef-patrolling whitetip sharks, more than 40 species in total, many endangered, are found only here.

Yet, these top marine predators, in an area thought of as the unspoiled wilderness that inspired Charles Darwin’s evolutionary theories, are being preyed upon by thousands of large and small fishing boats eager to sell shark fins to the Asian market where shark fin soup is a prized delicacy.

Just how many sharks are being killed here is unclear, experts say, because so many are caught illegally. But according to one study, about a half million sharks were annually killed in Ecuadoran waters from 1979 to 2004. In the Galapagos, recent research indicates overfishing is causing shark numbers to crash, causing a ripple among marine animals.

Galapagos sharks are apex predators that regulate populations of everything from fish to sea lions, an essential presence in the ecosystem. Known to swim hundreds of miles to hunt and find mates, sharks are susceptible to fishermen trolling the expansive eastern Pacific.

“Sharks control the populations of medium-sized animals from taking over and eating everything that moves,” said Daniel Pauly, a University of British Columbia marine biologist and fisheries professor who has studied these islands since 2000. “Without sharks, there would be no Galapagos.”

While 97 percent of the land in the Galapagos National Park is off-limits to people, less than 1 percent of the 51,000 square miles surrounding the islands are blocked to fishing. This vast area is the Galapagos Marine Reserve.

Although the marine reserve is a protected area, local fishermen are allowed to work there. But there’s often no one monitoring what they take, or the major fishing ships that, despite laws against it, move in and out of the reserve catching fish, Pauly said. Ecuadoran authorities are so strapped financially that they don’t have enough boats to patrol, according to current and former national park and Ecuadoran navy officials.

“It’s like a policeman telling you, ‘We have bandits but we can’t catch them all,’ ” says Xavier Romero, a marine biologist and Galapagos naturalist guide.

Beyond balancing the food chain, live sharks provide regular income for dive operators and attract tourists eager to experience pristine underwater ecosystems.

A 2015 study by National Geographic and the University of California calculated that the average lifetime value of a live Galapagos shark to tourism is \$5.4 million. One shark on average generates about \$34,000 a year from single-day dive tours; the crown jewel for tourism is the hammerhead, whose lifetime value was calculated by the study at \$12 million, making it perhaps the most valuable predator on Earth.

Worldwide shark numbers, including hammerheads, have declined more than 90 percent, says Pauly, largely because of Asia’s appetite for fins — especially in shark fin soup. The appetite for the luxury soup has dropped recently in China, but it has gone up elsewhere in Asia. Sharks need their fins for buoyancy and steering. As a food, the most coveted fins are dorsal, followed by pectorals and the lower lobe of the tail.

Shark fin soup can run \$100 a bowl in China and elsewhere. In Ecuador, shark meat is sold to the public for as little as 75 cents a pound in local fish markets. Fins often pass between middlemen before reaching buyers who pay higher prices throughout East Asia, by some reports going for as much as \$1,000 a kilogram.

Large-scale finning began here in the 1950s. It became illegal to target sharks but permissible to export fins from “incidental” catches. Sharks are usually finned alive and then dumped overboard, unable to swim or survive.

In 2003, Ecuador prohibited shark fishing inside its marine reserve, although it allowed incidental catches there, too. Experts say the incidental catch exception is a huge loophole that allows local fisherman to catch and sell sharks. Park Director Jorge Carrion admits this practice has “a negative impact,” but he says the program was developed “with the participation of the local fishermen” who rely on fishing for their living.

The main threat to sharks, however, is the 45,000 Ecuadoran vessels that fish in and around the reserve - and the international ships beyond that which manage to evade Ecuadoran detection.

In August 2017, for instance, a massive Chinese fishing ship, the Fu Yuan Yu Leng 999, was discovered inside the reserve with 300 tons of endangered marine species, including more than 6,000 sharks killed for their fins. The ship was intercepted only because, unlike many large fishing ships, it had its tracking system on. That's the only way authorities knew it was there, says Oswaldo Rosero, a former Ecuadoran naval officer who spent a decade, until 2015, overseeing surveillance in the reserve.

Rosero says "detection and interception" are "almost nonexistent" because Ecuador uses "old surveillance systems," called AIS which rely on ships turning on their radar, and has only about 70 people and two boats available to monitor the whole reserve.

"When the Fu Yuan Yu Leng crisis happened, they had no boats available, so they had to call the Coast Guard," he said. Willington Renteria, the lieutenant commander of the Ecuadoran Navy's Oceanographic Institute, remembers that day. "It was lucky we caught them," he says.

Meanwhile, "there are more than 600 Chinese ships from Costa Rica to Chile on a permanent basis out there," and most never turn on their tracking systems, said Rosero, who now works in Costa Rica's Cocos Island National Park

Some scientists and conservationists who study the Galapagos said they worry that Ecuador's large debt with China may make the country less inclined to confront Chinese fishing ships near the Galapagos.

Enric Sala, a National Geographic explorer-in-residence whose research helped influence Ecuador's 2016 creation of a second protected marine sanctuary around a pair of islands north of the main Galapagos archipelago, says the problem is not just Chinese and Ecuadoran ships. Many from Peru, Colombia and Panama also come into the archipelago, fish and leave without being seen or stopped.

He and others say they hope the government of Ecuador will soon wake up to how much the country could lose if it doesn't do a better job of protecting the Galapagos.

The islands and waters face many threats: changing climate, invasive species, influxes of tourists and locals. But more than a dozen researchers and biologists interviewed say the biggest may be the loss of sharks.

Among the 40 species found in the Galapagos, 90 percent are on the International Union for Conservation of Nature's Red List of threatened species.

If something isn't done soon, Pauly says, these sharks will vanish. And when that happens, more marine species will also fall, irreparably changing the ecosystem of the Galapagos and the oceans beyond them.

"We tell people not to exploit the place, but there are too many resources around," Pauly says. "At some point, the place will be so degraded that the islands will not even work for tourism."

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