Shark Trouble

It’s the fish that people love to hate. But quite literally, the shark has more to fear from humans than we do from these top predators of the sea. Sharks evolved on the planet some 400 million years ago – way before humans. They survived catastrophic asteroid impacts and wild climatic swings and yet, now as never before, many shark species could be at risk. Scientists estimate that people kill thousands of sharks each year for sport, for meat, for fins and cartilage, for their oil, or by accident in fishing nets intended for other fish.

As top predators in the sea, sharks play an important role in the ocean ecosystem. Unfortunately, their reproduction is slow – it can take nine years for sharks to become sexually mature, and they may produce only one or two offspring every other year. So, their populations do not recover quickly when diminished.

More than 60 shark species are currently listed as endangered on the IUCN (International Union for Conservation of Nature and Natural Resources) Red List, and humans are the main cause. While movies may depict sharks as people-eating monsters, humans are not good shark food, and they’d much rather dine on fish, sea lions, or other sea creatures. Researchers believe that attacks on humans are the result of incidental encounters and prey confusion. Rosenstiel School scientists are hard at work, investigating sharks, their behavior and population trends ultimately to improve the sharks’ world.

Follow the fish

Since the 1950s, scientists and fishermen have been tagging sharks to learn more about where, when, and why they travel. One Rosenstiel School researcher has spent much of his career devoted to the lemon sharks who call the area around his Bimini field station home. He and his team have spearheaded a variety of research protocols to study sharks. Sonic tags attached to sharks’ fins help track shark movement. Additionally, scientist and student collaborators have used satellite imagery and remote sensing to create a shark “neighborhood” map.

Habitat is a critical factor in learning about sharks. From work at the Bimini shark lab and in a Belizean reserve to far beyond, Rosenstiel School researchers use acoustic telemetry to determine how the sharks use their habitat. Tagging studies provide information on shark movement, migration, growth, and habits. DNA data also provides new information on the population structure of a specific species. Several scientists focus on juveniles, in particular, examining how their bodies adjust to temperature changes. They have even developed a tagging device small enough (rice-grain sized) to track these sharks from youth into adulthood. The goal: observe the sharks’ world from all angles and all ages.

It’s all in the math

While observations and field work play an obviously important role in shark research, mathematical modeling is equally significant. Rosenstiel School researchers have developed mathematical models to assess species population size. These models are used to find out whether shark fisheries are sustainable and to find innovative management strategies to conserve and rebuild shark populations.

A shark repellant that saves sharks

Scientists have long looked for ways to deter sharks from attacking humans. One Rosenstiel School scientist has been successful in developing a seemingly effective, environmentally friendly shark repellant. While it may ultimately make its way into swim gear, he sees it more as a way to deter sharks from unsafe environments. If the product is effective as a fishing net coating, it may significantly reduce the number of sharks who die as a result of bycatch. And, it’s this eye toward the future that has Rosenstiel School scientists and students trying to better understand these sharp-toothed fish and help protect them.