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Sharks are dying at alarming rates, mostly due to fishing. Retention bans may help

Despite the fear they may inspire in humans, sharks have far more reason to fear us. Nearly one-third of sharks are threatened with extinction globally, mostly as a result of fishing.

A team led by researchers at UC Santa Barbara discovered that mandates to release captured sharks won't be enough to prevent the continued decline of these important ocean predators. These findings, published in Fish & Fisheries, highlight the importance of monitoring shark populations and combining different strategies for managing their numbers.

Some sharks are targeted by fisheries, but the pressure extends beyond these species. "More than half of sharks that are caught and killed in fisheries are captured incidentally and then discarded," explained Darcy Bradley, co-author of the study and adjunct faculty at the Bren School of Environmental Science & Management and lead scientist at The Nature Conservancy.

Some species are protected by retention bans, issued by regional fisheries management organizations, which require fishermen to release an individual they catch rather than keep it. Currently, 17 oceanic shark species are covered by a

retention ban to protect them from incidental catch in tuna fisheries.

The team had a simple question in mind. “For all shark species that we know are caught in fisheries, how many are dead by the time they are landed or soon after release as a result of capture?” said co-lead author Allie Caughman, a doctoral candidate at the Bren School. They were also curious how certain regulations affected shark survival after.

The authors collated available data from more than 150 published papers and reports that have measured shark mortality upon hauling (at-vessel) or soon after release (post-release). The literature spanned nearly 150 different shark species caught by different fishing gears. Using this information, they could estimate mortality rates for an additional 341 shark species incidentally captured by longlines or gillnets but for which empirical data wasn’t available.

Small sharks and several threatened species were the most likely to die after being caught. These included thresher sharks and hammerheads. Mortality was also higher for smaller species, those that occur in deeper waters and those that rely on constant swimming to breathe.

“Mortality was surprisingly high for some species such as smoothhound sharks,” said co-lead author Leonardo Feitosa, also a doctoral candidate at the Bren School, “ranging from 30 to 65%.” Deep-water species, like sleeper sharks, also fared poorly, likely due to the trauma of the extreme pressure change.

Policy simulations showed that retention bans could reduce shark mortality three-fold, on average, but that this wasn’t enough to reduce mortality to sustainable fishing levels for already heavily fished species, like mako and silky sharks. “Retention bans are a beneficial first step towards addressing shark overfishing,” said Bradley, “but they need to be complemented with other strategies, such as area-based fishing restrictions, catch quotas and fishing gear requirements to sustain populations for many shark species.”

Bans are most likely to benefit species with faster reproductive rates — like blue sharks, bonnetheads and angel sharks — because their populations tend to recover faster. The blue shark is actually the most heavily fished species worldwide. “While it is highly unlikely that retention bans will ever be implemented for such a

commercially important species," Feitosa said, "our results show that this could be a relatively simple and impactful strategy if it becomes necessary to sustain populations."

For other sharks, maintaining healthy populations will require additional strategies. Methods to reduce catch rates to begin with — such as banning the use of steel wire on longlines — could complement retention bans. Spatial regulations could also help bolster shark populations, such as closing off shark nurseries and pupping grounds.

Assembling this study also highlighted the need for more data on mortality rates for other cartilaginous fishes, like stingrays, skates and chimaeras. "Fifty-seven percent of cartilaginous fishes threatened with extinction in the world are not sharks," Caughman explained. The team couldn't include these groups in the paper due to the dearth of data.

Members of the team from The Nature Conservancy are currently meeting with the Inter-American Tropical Tuna Commission's scientific staff to collaborate on this issue. This work will help to advance and inform those dialogues as they work to identify the suite of appropriate strategies required to advance shark conservation.

Tags
Ocean and Beaches

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