



Position Paper on Sea Turtle and Shark Bycatch in Tuna RFMOs

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Shark and sea turtle populations are being decimated globally. Some populations of sharks have declined by as much as 99 percent in the past 35 years, while some sea turtle populations have declined as much as 80 percent in the past 20 years. Both sharks and sea turtles play important roles in the marine ecosystem and have significant economic and cultural value. But some populations are already considered functionally extinct, meaning they can no longer fulfill their role in the ecosystem. One of the major contributors to shark and sea turtle decline is bycatch in fisheries. Due to the large amount of bycatch occurring in high seas longline fisheries, action must be taken at the international level to save these species. Bycatch reduction at Regional Fishery Management Organizations (RFMOs) is key to their continued survival.

Sea Turtles

Sea turtle populations are threatened globally with extinction. Six of the seven sea turtle species are currently listed as globally vulnerable, endangered or critically endangered by the International Union for Conservation of Nature's (IUCN) Red List and some populations continue to decline. For example, Florida beaches, which host the largest nesting population of loggerhead turtles in the Northwest Atlantic, have seen a decline in nesting of more than 40 percent in the past decade.¹ Loggerheads have declined by at least 80 percent over the past 20 years in the North Pacific² and could become functionally or ecologically extinct by the mid-21st century if additional protections are not put into place.³ A recent global status review for the loggerhead sea turtle showed seven of the nine distinct population segments were classified as currently at risk of extinction.⁴

Commercial fishing is annihilating sea turtle populations worldwide. Gillnets, longlines and trawls, three of the most commonly used fishing gears, combine to threaten the future survival of sea turtles. A recent estimate shows millions of sea turtles have been caught in commercial fisheries globally over the past two decades.⁵ While all sea turtle species can be caught in longline fisheries, longline gear poses the greatest threat to loggerhead and leatherback survival. Pelagic longlines have been estimated to catch more than 200,000 loggerhead and 50,000 leatherback sea turtles over the course of one year.⁶ The Canadian longline fishery alone has been estimated to catch roughly 1,200 loggerhead sea turtles a year.⁷ Sea turtle bycatch is a global problem that warrants a global solution. Without additional bycatch reduction and better enforcement of already established protections, many sea turtle populations will be pushed towards extinction. Improved monitoring of sea turtle bycatch is essential to fully understanding the impact of fisheries on sea turtles.

¹ Florida Fish and Wildlife Conservation Commission, FWRI Data. Available from http://research.myfwc.com/features/view_article.asp?id=10690

² Lewison, R. and Crowder, L. 2007. Putting longline bycatch of sea turtles into perspective. *Conservation Biology* 21:79–86.

³ Center for Biological Diversity and Turtle Island Restoration Network. Petition to reclassify the Pacific distinct population segment of the loggerhead sea turtle (*Caretta caretta*) from a threatened to an endangered species under the Endangered Species Act. July 12, 2007.

⁴ Conant, T.A., Dutton, P.H., Eguchi, T., Epperly, S.P., Fahy, C.C., Godfrey, M.H., MacPherson, S.L., Possardt, E.E., Schroeder, B.A., Seminoff, J.A., Snover, M.L., Upton, C.M., and Witherington, B.E. 2009. Loggerhead sea turtle (*Caretta caretta*) 2009 status review under the U.S. Endangered Species Act. Report of the Loggerhead Biological Review Team to the National Marine Fisheries Service, August 2009. 222 pages.

⁵ Wallace, B.P., Lewison, R.L., McDonald, S.L., McDonald, R.K., Kot, C.Y., Kelez, S., Bjorkland, R.K., Finbeiner, E.M., Helmbrecht, S. and Crowder, L.B. 2010. Global patterns of marine turtle bycatch. *Conservation Letters* xx: 1-12.

⁶ Lewison, R.L., Freeman, S.A. and Crowder, L.B. 2004. Quantifying the effects of fisheries on threatened species: the impact of pelagic longlines on loggerhead and leatherback sea turtles. *Ecology Letters* 7:221-231.

⁷ Brazner, J.C. and McMillan, J. 2008. Loggerhead turtle (*Caretta caretta*) bycatch in Canadian pelagic longline fisheries: Relative importance in the western North Atlantic and opportunities for mitigation. *Fisheries Research* 91:310–324.

In 2009, the Food and Agriculture Organization of the United Nations (FAO) published *Guidelines to Reduce Sea Turtle Mortality in Fishing Operations*.⁸ The *Guidelines* outline the best turtle bycatch reduction strategies by fishery gear-type. For the pelagic longline fishery, the FAO recognized the replacement of “J hooks” with the wider “circle hook” and squid bait with fish bait have been shown to limit turtle catches without significantly limiting the catch of target longline species. One study showed the combination of the 18/0 circle hook with mackerel bait reduced loggerhead and leatherback bycatch rates by 90 percent and 65 percent respectively. Deep-set longline fisheries have also been shown to have lower catch rates of sea turtles. Since most turtles forage in less than 100 m, setting longlines deeper than 100 m is an additional method of reducing sea turtle bycatch. Other potential bycatch reduction methods include: avoiding the use of conventional light sticks, reducing total soak time, retrieving gear at daytime and avoiding areas where sea surface temperatures are prime locations for sea turtles, known as hot spots.

Based on the FAO guidelines, RFMOs should, at a minimum, implement requirements to use circle hooks and ban squid bait to reduce the bycatch of sea turtles. In addition to gear modifications, RFMOs need to increase data collection through increased observer coverage and self reporting. By determining the magnitude of bycatch and locating hot spots, RFMOs will be able to better manage their fisheries and reduce bycatch. For example, if hotspots are found for sea turtle bycatch, time/area closures should be implemented to prevent sea turtle bycatch in these high use areas. Sea turtle bycatch in commercial fisheries is a serious threat that demands international attention starting with RFMOs.

Sharks

Globally, three-fourths of oceanic pelagic sharks and rays have an increased risk of extinction as a result of overfishing.⁹ According to the FAO, more than half of the highly migratory oceanic sharks are considered overexploited or depleted. Sharks are extremely vulnerable to overexploitation because of slow growth and low reproduction, and they have been fished, in the Atlantic and elsewhere, without any management for decades. As a result many shark populations continue to decline. For example, some shark populations along the Atlantic coast have declined up to 99 percent in the past 35 years and are likely functionally extinct.¹⁰ Due to their role as apex predators, the loss of sharks from the ocean ecosystem can contribute to drastic and irreversible damage to our oceans.

Commercial pelagic longline fisheries are significant contributors to the mortality of sharks.¹¹ Traditionally, sharks were considered as bycatch in fisheries for highly migratory species such as tuna and swordfish. As those stocks have decreased and the value of certain shark products has increased, this situation has changed. Often, sharks are being targeted for their valuable fins, sold to Asia for shark fin soup. For example, pelagic sharks are now the targeted species of the Spanish and Portuguese surface longline fleets, comprising sometimes up to 80 percent of the caught and commercialized catch. Non-EU fleets like those of Taiwan and Japan also catch sharks. However, even when countries admit that their fisheries are targeting sharks, the sharks are often still not managed as “targeted catch” with catch limits and other fisheries management measures. Sharks caught in commercial fisheries must be clearly distinguished as either targeted catch or bycatch and be appropriately managed as such. For bycatch, mitigation measures should be implemented, but for targeted catches, clear TACs and quotas must be set. As long as this confusion persists, shark fishery management efforts will be hampered.

⁸ Food and Agriculture Organization of the United Nations (FAO), Fisheries Department. *Guidelines to reduce sea turtle mortality in fishing operations*. Rome, FAO. 2009. 128p.

⁹ Dulvy, N. et al. 2008 You can swim but you can't hide: the global status and conservation of oceanic pelagic sharks and rays. *Aquatic Conservation: Marine and Freshwater Ecosystems* 18(5): 459-482.

¹⁰ Myers, Ransom A., Baum, Julia K., Shepherd, Travis D., Powers, Sean P., and Peterson, Charles H. 2007. Cascading Effects of the Loss of Apex Predatory Sharks from a Coastal Ocean. *Science* 315: 1846-1850.

¹¹ Rice, P. A shocking discovery: How electropositive metals work and their effects on elasmobranchs. Pgs. 21- 25 IN Swimmer, Y, Wang, JH, McNaughton, L. 2008. Shark deterrent and incidental capture workshop, April 10-11, 2008. U.S. Dep. Commer. NOAA Tech. Memo. NOAA-TM-NMFS-PIFSC-16, 72p.

The numbers of sharks that are truly caught as bycatch in pelagic longlines can be reduced through alternate fishing methods such as changes in leader material, bait, hook type and fishing depth.¹² Switching from steel leaders to monofilament and from squid to mackerel bait have both been shown to reduce shark bycatch.¹³ While the use of circle hooks has not been shown to reduce the catch of sharks, the decrease in gut-hooking with the use of circle hooks suggests reduced post-release mortality.¹⁴ In addition, sharks tend to be caught at shallow depths, so restricting fishing depth to greater than 100 m would decrease bycatch for most species of sharks as well.¹⁵ Other methods related to metals, electro and chemical repellants are also being studied. RFMOs must require shark bycatch mitigation measures to help reduce the impact of pelagic longline fisheries on shark populations.

IUCN critically endangered and endangered sharks should not be caught, either as bycatch or targeted catch. RFMOs should prohibit targeted fisheries for and the retention of endangered and particularly vulnerable species, such as was recently agreed for thresher sharks in IOTC fisheries. Risk assessment studies by an expert working group have recommended the prohibition of numerous pelagic shark species caught in ICCAT pelagic longline fisheries for tuna and swordfish.¹⁶

In addition RFMOs must increase data collection of sharks through observers and self-reporting to determine the magnitude of bycatch and to look for breeding or feeding hotspots. If hotspots are found, time/area closures should be implemented for the most threatened species. Sharks are being caught in RFMO jurisdictions, requiring the establishment of management measures to reduce the catch of these declining species.

Bycatch Organizational Issues

Bycatch, particularly in longline fisheries, is a serious threat to the continued survival of sea turtles and sharks. For this reason, reducing bycatch of these species needs to become a priority for RFMO management. RFMO meetings should be organized to allow ample time to deal with bycatch issues. For example, ICCAT's Panel 4 covers a wide variety of species including swordfish, sharks, sea birds and sea turtles. As a result there is never enough time to discuss pertinent issues. A separate bycatch panel (for example, Panel 5 at the ICCAT meeting) should be established at every RFMO meeting. Until bycatch is taken seriously, with permanent protections established, shark and sea turtles populations will continue to decline.

Conclusion

Bycatch is a significant problem leading to the decline of ecologically, economically and culturally important species. Action must be taken at an international level to reduce the bycatch of sharks and sea turtles in pelagic longline fisheries. Alterations to fishing methods, recognition of targeted species, increased observers, data collection and time and area closures are all necessary measures to reduce the bycatch of sharks and sea turtles. The outcome from this workshop should be consistent direction to RFMOs, including timelines and concrete goals, that ensures bycatch reduction measures and reporting requirements are adopted. The continued survival of shark and sea turtle populations depend on the reduction of bycatch, including the pelagic longline fisheries operating under RFMO management.

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¹² Swimmer, Y, J. H. Wang, and L. McNaughton. 2008. Shark deterrent and incidental capture workshop, April 10–11, 2008. U.S. Dep. Commer, NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-16, 72 p.

¹³ Grubbs, R.D. An overview of shark bycatch in pelagic fisheries: Conservation and ecology of pelagic sharks. Pgs. 1-8 IN Swimmer, Y, Wang, JH, McNaughton, L. 2008. Shark deterrent and incidental capture workshop, April 10-11, 2008. U.S. Dep. Commer. NOAA Tech. Memo.NOAA-TM-NMFS-PIFSC-16, 72p.

¹⁴ Grubbs, R.D. 2008. pg. 3.

¹⁵ Grubbs, R.D. 2008. pg. 3.

¹⁶ An Integrated Approach to Determining the Risk of Overexploitation for Data-Poor Pelagic Atlantic Sharks..SCRS/2008/140