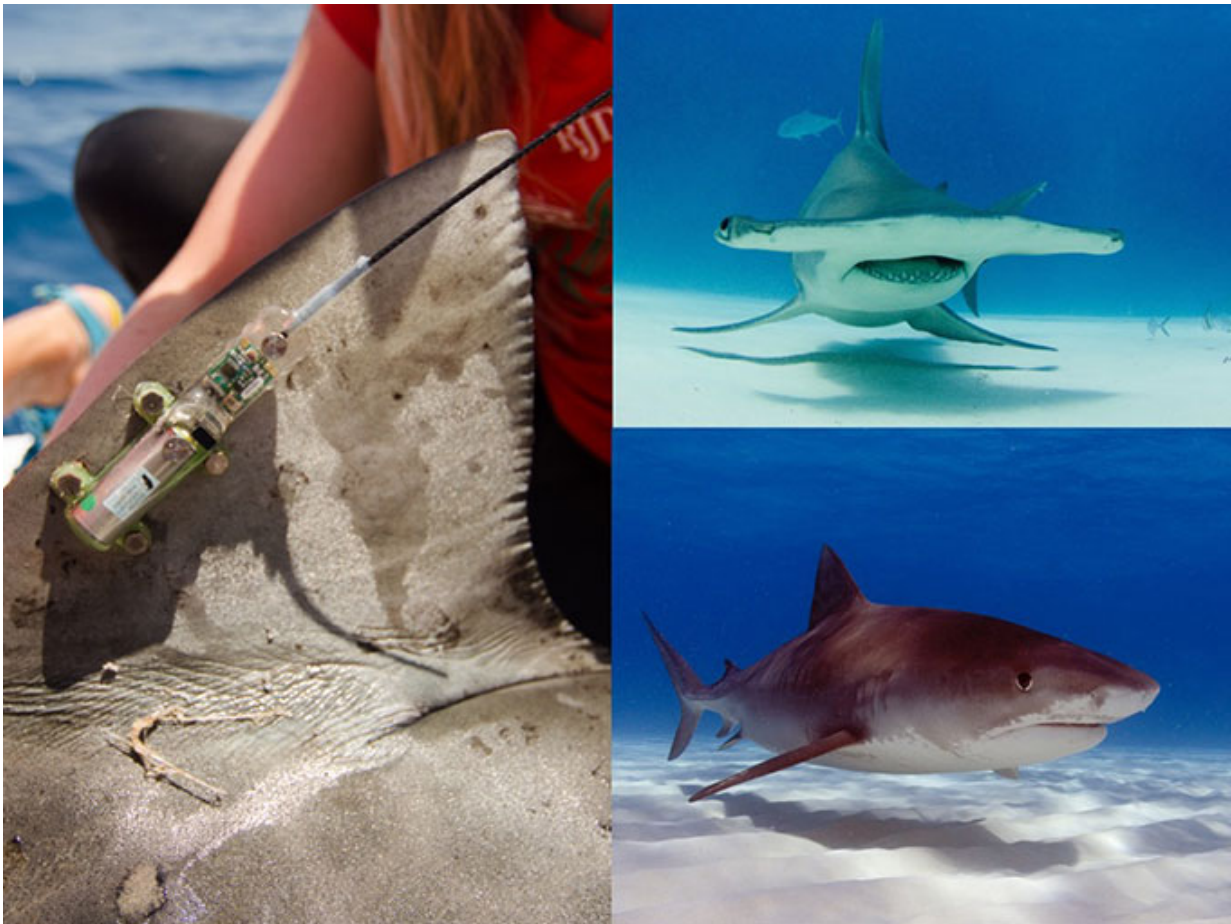


Study says marine protected areas can benefit large sharks

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To study their movements in relation to marine protected areas, satellite tags were affixed to the dorsal fins (left) of great hammerhead sharks, *Sphyrna mokarran* (top right), tiger sharks *Galeocerdo cuvier* (bottom right) Credit: Dorsal fin - Frank Gibson Credit: Hammerhead and Tiger shark - Neil Hammerschlag, Ph.D.

Researchers at the University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science published new findings that suggest the expansion of protected areas into U.S. federal waters would safeguard 100 percent of core home range areas used by three species of sharks tracked in the northwestern Atlantic Ocean.

The study investigated the core home range of 86 bull, great hammerhead and tiger [sharks](#) tagged in waters off south Florida and the northern Bahamas to understand if these highly mobile [shark species](#) might benefit from spatial protection, such as [marine protected areas](#) (MPAs). The team examined shark movements in core habitat use areas, or CHUAs, where the sharks were spending the majority of their time, in relation to zones that prohibited fishing or were these sharks were already fully protected within areas of the U.S. and Bahamas exclusive economic zones (EEZs).

"There are concerns that spatial protections may not benefit large sharks since they are highly mobile and likely to regularly move in and out of MPAs," said study co-author Neil Hammerschlag, a research assistant professor at the UM Rosenstiel Marine School and UM Abess Center for Ecosystem Science and Policy. "While it's not feasible to protect highly mobile species wherever they go, our findings suggest that significant conservation benefits can be achieved if they are protected in areas where they spend the majority of their time, such as their core habitat use areas."

The results show that none of the tracked bull shark's regional CHUAs were in areas that are fully protected from fishing, and for the great hammerhead and tiger sharks tracked, only 18 percent and 35 percent, respectively, of their core use areas were currently protected. The study also found that the majority of the CHUAs utilized by all three shark species were within the U.S. EEZ.

"Our results will help enable policy makers to make more informed decisions when developing conservation plans for these species, particularly when considering a place-based management approach," said UM Rosenstiel School alumna Fiona Graham, the lead author of the study.

In 2011 the Bahamas declared a ban on all commercial shark fishing in its more than 650,000 square kilometers (251,000 square miles) of waters under their federal EEZ. The state of Florida enacted new measures in 2012 to fully protect four shark species, including tiger and great hammerhead sharks, by prohibiting their harvest and possession in state waters. These new findings have important implications for marine conservation and spatial planning, such as to better evaluate the effectiveness of current, and placement of future MPAs, according to the researchers.

Current research has shown that waters off Florida and the Bahamas are important pupping and feeding grounds for several sharks, providing them with the critical habitat required for the conservation of these slow-to-mature ocean animals.

Many shark populations are threatened worldwide due to overfishing, a trend that is largely driven to fuel the shark fin trade as well as from accidental bycatch from fishing operations. Populations of hammerhead sharks in the northwest Atlantic and other areas have declined more than 80 percent over the last two decades, according to some research reports, which has resulted in great hammerheads being listed as globally endangered by the International Union for the Conservation of Nature (IUCN) Red List. Both bull sharks and [tiger sharks](#) are listed as near threatened by the IUCN.

"This is of particular importance for hammerheads sharks since they are experiencing the greatest declines in the region and are of high

conservation concern," said Hammerschlag. However, this species is susceptible to death from capture stress, so effective conservation strategies would also need to prevent great hammerheads from capture in the first place."

More information: Fiona Graham et al. Use of marine protected areas and exclusive economic zones in the subtropical western North Atlantic Ocean by large highly mobile sharks, *Diversity and Distributions* (2016). [DOI: 10.1111/ddi.12425](https://doi.org/10.1111/ddi.12425)

Provided by University of Miami

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