



Shark Science

In meeting its Congressional mandate under the Magnuson-Stevens Fishery Conservation and Management Act to rebuild shark populations in the United States, the National Marine Fisheries Service (NMFS) conducts shark research on a periodic basis to determine the abundance of shark species. The data collected by scientists in these research programs provide fishery managers with critical information they need to monitor shark populations and implement fishery regulations to maintain population levels.



Unfortunately, our scientific data collections lagged behind the rapid technological advancements that allowed fishermen to catch large numbers of sharks in a relatively short period of time. Since the mid-1980s, a number of shark populations in the United States have declined, primarily due to overfishing.

But our knowledge about sharks and shark fisheries is getting better. In 1993, NMFS implemented a management plan for Atlantic sharks that prohibited finning, and limited the amount of sharks that commercial and recreational fishermen could catch per day. Since then, NMFS has continually collected standardized information about the fisheries, such as the average size and age of species caught in certain areas, this helps scientists identify which stocks are depleted and in need of further protection under the law, and helps determine when stocks are rebuilding.

Besides collecting its own scientific data, NMFS has created partnerships with other shark science organizations, universities, and fishermen to collect and analyze the information managers need to adequately manage shark resources. Below are only a few of the research programs that are being conducted.

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Data Collection Programs

Tagging Studies & Bottom Longline Surveys

Partnering fishermen with tagging programs helps scientists determine shark migration patterns and distributions. In one tagging program, between 1962 and 2000, more than 165,000 sharks (40 species) were tagged and more than 9,500 (32 species) were recaptured. Another tagging program using acoustic telemetry has documented that certain shark species return to their birthplace in annual cycles. A satellite archival tagging program in the Pacific Ocean has revealed that white sharks are not restricted to shallow waters but that they are also found in deep pelagic waters.

Bottom longline surveys, using standard commercial fishing gear, help scientists determine the status of the fishery based on effort (the number of hooks on a line and the number of hours the gear is in the water), gear, and catch (how many sharks were caught and how many species). These surveys also help determine if the gear catches untargeted species, such as protected sea turtles.

Commercial Fishermen Logbooks

Fishermen have been keeping records of their fishing activities for decades. Logbooks help them keep track of the best fishing grounds and provide them with an historical account of their catches. Likewise, successful fishery management programs benefit from this kind of information, which tracks the catch trends in fisheries over time. From fishermen's logbooks, NMFS can determine which species are caught in which habitats, what kind of gear is most efficient and catches the least amount of bycatch, and how many non-targeted species are caught dead and thrown back. Logbooks are pertinent for determining over time how many sharks a fisherman can catch based on how many hours he is fishing. If fishermen increase their hours at sea, but find that their catch is decreasing, that signals a problem with the stock abundance.

Habitat

NMFS is participating in a number of studies designed to determine shark habitat needs and essential fish habitat. These studies include shark tagging and reproductive studies. Along the Atlantic coast, the Cooperative Atlantic States Shark Pupping and Nursery Survey is a cooperative program between States and the Federal government that conducts ongoing investigations of shark nursery grounds. Similar habitat studies in the Pacific Ocean has resulted in the designation of essential fish habitat for blue, common thresher, bigeye thresher, pelagic thresher, and shortfin mako.

Observer Programs

Fishermen targeting sharks are required to allow official observers to accompany the vessel on any given fishing trip when NMFS requests observer coverage. By observing fishing activities, scientists can gather information not required in logbooks, such as size and sex of the fish. Observer coverage also helps verify logbook data.

Telephone and Dock-Side Surveys

Information from recreational fishermen is collected via random telephone and dock-side surveys. These surveys provide NMFS with state and regional estimates of recreational catch, effort, and participation in marine fisheries. This information can be used in stock assessments.