Atlantic States & NOAA Fisheries Move Forward with Smooth Dogfish Management

Introduction

Sharks are a vital part of ocean ecosystems all over the world. Considered a keystone species because they generally reside at the top of the food chain, sharks strongly impact other species either directly or indirectly. Removing or reducing shark populations in an area can create imbalance in the food chain and have far reaching negative impacts. Therefore, the health of shark populations in an ecosystem is often an accurate indicator of the overall health of the system.

Most sharks are highly migratory and routinely cross political boundaries. Some make long migrations from the Mid-Atlantic Bight south into the Caribbean and Gulf of Mexico in the summer, or even as far as the northern coast of South America in the winter. Many undertake inshore migrations between state waters to specific inshore nursery areas to pup (give birth).

Though more is known today, fisheries managers did not always fully understand the life cycle and ecological role of sharks. In the mid-1980s, sharks were considered an under-utilized resource and fishermen were encouraged to target them. Over the next few years, fishing effort increased considerably, leading to unregulated harvest on some shark species.

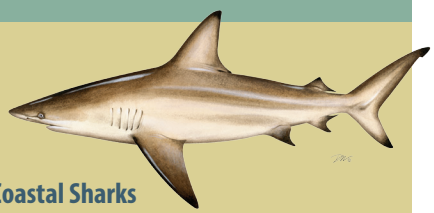
In 1993, NOAA Fisheries implemented a Federal Fishery Management Plan (FMP) for Sharks of the Atlantic Ocean to rebuild depleted stocks and protect healthy stocks from overfishing. In May 2008, the Commission adopted an Interstate FMP for Atlantic Coastal Sharks to complement federal management actions and increase protection of pregnant females and juveniles at inshore nursery areas. Since 2008, the states have continued to work closely with NOAA Fisheries to set and implement complementary management measures.

Life History

Sharks belong to the class Chondrichthyes (cartilaginous fish) that also includes rays, skates, and deepwater chimaeras (ratfishes). Relative to other marine fish, sharks have a very low reproductive potential. Various factors create this low reproductive rate, such as slow growth, late sexual maturity, one to two-year reproductive cycles, a small number of young per brood, and specific requirements for nursery areas. These biological factors leave many shark species vulnerable to overfishing. Sharks have internal fertilization and the embryo of most species spends its entire developmental period protected within its mother's body, although some species lay eggs. Females produce a small number (2 – 25) of large pups, which have an increased chance of survival due to their size and advanced stage of development.

Adults usually congregate in specific areas to mate and females travel to specific nursery areas to pup. These nursery areas are discrete geographic areas, usually in waters shallower than those inhabited by the adults. Frequently, the nursery areas are in highly productive coastal or estuarine waters where abundant small fish and crustaceans provide food for the growing pups. These shallow areas have fewer large predators than deeper waters, thus enhancing the chances of survival of the young sharks.

Species Snapshot



Coastal Sharks

Interesting Facts

- Sharks have no bones; their skeletons are made of cartilage. Their teeth and other hard parts are hardened with calicum phosphate.
- Tagging studies in the North Atlantic have revealed that blue sharks are the champion migrators among sharks—migrations of 1,200 to 1,700 miles are common. The record journey for a tagged blue shark is 3,740 miles from New York to Brazil.
- The thresher shark uses its unique whip-like tail fin to herd fish in tight shoals and then stuns them with powerful swipes of the tail.
- Smooth dogfish (*Mustelus canis*) are the only species of smoothhound (*Mustelus*) occurring in the Atlantic Ocean.
- Great white sharks are the largest predatory fish in the sea. They live along the coasts of all continents except Antarctica.
- Mako sharks are the fastest of all shark species. They can reach speeds of up to 60 miles per hour (mph) when migrating or hunting. They generally swim at a speed of 35 mph.
- The great hammerhead is the largest of the 9 identified hammerhead species. Hammerhead sharks have disproportionately small mouths and tend to bottom-feed on stingrays.
- The Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) survey has monitored nursery grounds along the East Coast since the early 1990s.
- Globally, there are more than 400 species of sharks; ASMFC's FMP addresses 40 sharks in the Atlantic Ocean.

Stock Status

- Varies by species (see table on next page)

Commercial & Recreational Fisheries

The commercial fishery, which uses bottom longlines and gillnets, is generally concentrated in the Southeastern U.S. and Gulf of Mexico. The Atlantic fishery targets both large coastal shark (LCS) and small coastal shark (SCS) species with bottom longline as the primary commercial gear. An Atlantic bottom longline is, on average, 3.4 miles in length and contains about 300 hooks. Skates, other sharks, or various finfish are used as bait. The gear typically consists of a heavy monofilament mainline with lighter weight monofilament gangions, or branch lines, coming off the main line. The Southeast shark gillnet fishery is comprised of several vessels based primarily out of ports in northern Florida.

Vessels typically use nets ranging from 456 to 2,280 meters long and 6.1 to 15.2 meters deep, with about 5.2 inches of stretched mesh.

In 2014, the top commercially harvested sharks included smooth dogfish, blacktip, Atlantic sharpnose, shortfin mako, and the common thresher shark. LCS landings were approximately 503,594 pounds dressed weight (dw), a 14% increase from 2013, and SCS landings were approximately 269,252 pounds dw, a 3% increase from 2013. Total U.S. landings of Atlantic pelagic species were 358,549 pounds dw in 2014, nearly double 2013 landings. This is largely attributed to increased landings of thresher shark as well as blue, porbeagle, and shortfin mako.

The recreational fishery for Atlantic sharks occurs in federal and state waters from New England to the Gulf of Mexico and Caribbean Sea. Once called "the poor man's marlin," recreational shark fishing is now a popular sport at all social and economic levels, largely due to accessibility to the resource. Sharks can be caught by rod and reel virtually anywhere in saltwater, with even large specimens available to surf anglers or small boaters in the nearshore area. Most recreational fishing takes place from small to medium-size vessels. SCS species such as Atlantic sharpnose, bonnethead, and finetooth comprise the majority of the recreational harvest. Short-fin mako and common thresher sharks are generally accessible only to those aboard ocean-going vessels.

Approximately 102,000 sharks were recreationally harvested in 2014 in the Atlantic region, compared to 70,000 sharks in 2013. The SCS complex largely dominated the catch with approximately 91,627 fish harvested in 2014; the largest harvest of the SCS complex since 2009. Sharpnose sharks represented 61% of the this harvest. The LCS complex, including hammerheads, had an estimated 10,785 fish harvested in 2014.

Stock Status

Atlantic shark stock assessments for LCS, SCS, and smoothhound sharks are generally conducted through the Southeast Data, Assessment, and Review (SEDAR) process. However, there have been exceptions where stock assessments were conducted by the International Commission for the Conservation of Atlantic Tunas Standing Committee on Research and Statistics (ICCAT SCRS). In some cases, NOAA Fisheries looks to available resources, including external peer reviewed literature that, if deemed appropriate, could be used for domestic management purposes.

Stock status is assessed by species or by species complex if there is not enough data for an individual assessment. In summary, fourteen species have been assessed domestically, three species have been assessed internationally, and the rest have not yet been assessed. The accompanying table outlines the stock status and associated assessment process for each species or species group.

In 2015, a benchmark stock assessment (SEDAR 39) was conducted for the smoothhound complex, including smooth dogfish, the only species of smoothhound occurring in the Atlantic. The assessment indicates smooth dogfish is not overfished and not experiencing overfishing.

The North Atlantic blue shark (*Prionace glauca*) stock was assessed by ICCAT SCRS in 2015. The assessment indicated the stock is not overfished and not experiencing overfishing, as was also concluded in the 2008 stock assessment. However, scientists acknowledge there is a high level of uncertainty in the data inputs and model structural assumptions; therefore, the assessment results should be interpreted with caution.

SEDAR 34 (2013) assessed the Atlantic sharpnose (*Rhizoprionodon terraenovae*) and bonnethead (*Sphyrna tiburo*) sharks.

Stock Status of Atlantic Coastal Shark Species and Species Groups

Species/Complex Name	Stock Status		References/Comments
	Overfished	Overfishing	
Pelagic			
Porbeagle	Yes	No	Porbeagle Stock Assessment, ICCAT Standing Committee on Research and Statistics Report (2009); Rebuilding ends in 2108 (HMS Am. 2)
Blue	No	No	ICCAT Standing Committee on Research and Statistics Report (2015)
Shortfin mako	No	No	ICCAT Standing Committee on Research and Statistics Report (2012)
All other pelagic sharks	Unknown	Unknown	
Aggregated Large Coastal Sharks (LCS)			
Atlantic Blacktip	Unknown	Unknown	SEDAR 11 (2006)
Aggregated Large Coastal Sharks - Atlantic Region	Unknown	Unknown	SEDAR 11 (2006); difficult to assess as a species complex due to various life history characteristics/ lack of available data
Non-Blacknose Small Coastal Sharks (SCS)			
Atlantic Sharpnose	No	No	SEDAR 34 (2013)
Bonnethead	Unknown	Unknown	SEDAR 34 (2013)
Finetooth	No	No	SEDAR 13 (2007)
Hammerhead			
Scalloped	Yes	Yes	SEFSC Scientific Review by Hayes et al. (2009)
Blacknose			
Blacknose	Yes	Yes	SEDAR 21 (2010); Rebuilding ends in 2043 (HMS Am. 5a)
Smoothhound			
Atlantic Smooth	No	No	SEDAR 39 (2015)
Research			
Sandbar	Yes	No	SEDAR 21 (2010)
Prohibited			
Dusky	Yes	Yes	SEDAR 21 (2010); Rebuilding ends in 2108 (HMS Am. 2)
All other prohibited	Unknown	Unknown	

The Atlantic sharpnose stock is not overfished and not experiencing overfishing. The stock status of bonnethead shark stocks (Atlantic and Gulf of Mexico) is unknown. It is recommended that a benchmark assessment for both stocks be undertaken.

The North Atlantic shortfin mako shark (*Isurus oxyrinchus*) stock was assessed by ICCAT SCRS. According to the 2012 assessment, current levels of catch may be considered sustainable as potential indicators of overfishing identified in the prior assessment have diminished. The stock is not overfished nor experiencing overfishing.

SEDAR 11 (2006) assessed the LCS complex and blacktip sharks (*Carcharhinus limbatus*). The LCS assessment suggested that it is inappropriate to assess the LCS complex as a whole due to the variation in life history parameters, population dynamics, and catch and abundance data among the LCS species. Based on these results, NOAA Fisheries changed the status of the LCS complex from overfished to unknown. As part of SEDAR 11, blacktip sharks were assessed for the first time as two separate populations — Gulf of Mexico and Atlantic. The results indicated that the Gulf of Mexico stock is not overfished and not experiencing overfishing, while the current status of blacktip sharks in the Atlantic region is unknown.

A 2011 benchmark assessment (SEDAR 21) of dusky (*Carcharhinus obscures*), sandbar (*Carcharhinus plumbeus*), and blacknose (*Carcharhinus acrontus*) sharks indicates that both dusky and blacknose sharks are overfished and experiencing overfishing. Sandbar sharks continued to be overfished. As described in the Magnuson-Stevens Act, NOAA Fisheries must establish a rebuilding plan for an overfished stock. As such, the rebuilding date for dusky sharks is 2108, sandbar sharks is 2070, and blacknose sharks is 2043. The Commission's Coastal Sharks Management Board approved the assessment for management use in 2012, and NOAA Fisheries' Highly Migratory Species Division (HMS) is incorporating the assessment results as part of Amendment 5a and 5b to its FMP. Amendment 5a addresses sandbar and blacknose sharks, as well as scalloped hammerhead and Gulf of Mexico blacktip. Amendment 5b addresses dusky sharks.

Porbeagle sharks (*Lamna nasus*) were assessed by ICCAT SCRS in 2009. The assessment found while the Northwest Atlantic stock is increasing in biomass, the stock is considered to be overfished with overfishing not occurring. NOAA Fisheries established a 100-year rebuilding plan for porbeagle sharks; the expected rebuilding date is 2108.

A 2009 stock assessment for the Northwest Atlantic and Gulf of Mexico populations of scalloped hammerhead sharks (*Sphyrna lewini*) indicated the stock is overfished and experiencing overfishing. This assessment was reviewed by NOAA Fisheries and deemed appropriate to serve as the basis for U.S. management decision. In response to the assessment findings, NOAA Fisheries established a scalloped hammerhead rebuilding plan that will end in 2023.
In 2007, SEDAR 13 assessed a number of species including the SCS complex and finetooth (*Carcharhinus isodon*) sharks. The peer reviewers considered the data to be the 'best available at the time'

Fins Naturally Attached Policy

Globally, the largest driver of shark fishing is the demand for fins to make shark fin soup. Often harvesters will 'fin' sharks — a process of removing shark fins at sea and discarding the rest of the shark. The U.S. sought to eliminate the unnecessary waste of shark meat by enacting the Shark Finning Prohibition Act of 2000, which requires shark fins and carcasses to be landed together in U.S. waters. The Interstate Coastal Sharks FMP included these provisions. The practice of 'finning' is therefore illegal in state and federal waters.

Passage of the Shark Conservation Act of 2010 (SCA) instituted additional measures to protect shark species from illegal, unreported, and unregulated fishing activities. The Act requires all sharks in the U.S. to be landed with their fins naturally attached to the carcass, but includes a limited exception for smooth dogfish. Fishermen engaged in commercial fishing for smooth dogfish are allowed to remove fins at sea if minimum requirements are met. Specifically, fishermen must possess a valid state commercial fishing license, be fishing within 50 nautical miles from the baseline of an Atlantic state (Maine through Florida), and the total weight of landed smooth dogfish fins cannot exceed 12% of the total dw of landed smooth dogfish carcasses. At the time the Act's passage, smooth dogfish were only managed in state waters. The Commission and the states implemented the provisions of SCA in 2013 through Addendum II to the Interstate FMP.

In 2016, smooth dogfish became federally-managed, falling under the management authority of NOAA Fisheries HMS Division. NOAA Fisheries interpreted the SCA phrase "commercial fishing for smooth dogfish" to mean a trip where smooth dogfish comprise at least 25% of the total retained catch. As a result, vessels with a federal smoothhound commercial fishing permit must meet the catch composition requirement for at-sea fin removal.

In May 2016, the Commission's Coastal Sharks Board released Draft Addendum IV for public comment. The Draft Addendum proposes to amend the Coastal Sharks FMP, and complement the federal FMP to allow smooth dogfish carcasses to be landed with corresponding fins removed from the carcass as long as the total retained catch, by weight, is composed of at least 25% smooth dogfish. The Commission is accepting public comment on Draft Addendum IV until July 11, 2016. The Board is expected to take final action on the Draft Addendum in August at the ASMFC Summer Meeting.

and determined the status of the SCS complex to be 'adequate.' Finetooth sharks were found to be not overfished and not experiencing overfishing.

Atlantic Coastal Management

In August 2008, the Commission's Coastal Sharks Management Board approved the Interstate FMP for Atlantic Coastal Sharks. The FMP addresses the management of 40 species and establishes a suite of management measures for recreational and commercial shark fisheries in state waters (0 – 3 miles from shore). Prior to this plan, shark management in state waters consisted of disjointed state-specific regulations. The plan allowed for consistency across jurisdictions.

The complementary Interstate FMP also closed loopholes and allowed for joint specification setting throughout the entire Atlantic shark range. In addition, the FMP protects shark nurseries and pupping grounds that are found primarily in state waters. Interstate regulations provide protection to sharks during a particularly vulnerable stage in their life cycle in a location that federal jurisdiction cannot protect. Commercial and recreational fishermen are prohibited from possessing silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead sharks from May 15 – July 15 from Virginia through New Jersey to protect pupping females.

Recreational fishermen are prohibited from harvesting any species that are illegal to land in federal waters. Recreational landings are controlled through gear restrictions, minimum size limits, and possession limits. Scalloped hammerhead, smooth hammerhead, and great hammerhead have a 6.5' fork length size limit, and a 4.5' fork length size limit for all other species. Atlantic sharpnose, finetooth, blacknose, bonnethead, and smooth dogfish are exempt from any minimum size limit. Each recreational angler is allowed a maximum harvest of one shark from the federal recreationally-permitted species per calendar day. Each recreational shore angler may harvest one additional bonnethead, one additional Atlantic sharpnose, and one additional smooth dogfish per calendar day. Recreational anglers can only harvest sharks caught with a handline or rod and reel.

Large tiger shark captured as part of a research survey aboard NOAA Ship OREGON II. Photo (c) Captain Jerry Adams.

The commercial fishery is managed based on maximum sustainable yield, using quotas and possession limits to control harvest level and effort. Addendum III (2013) revised the commercial species groups, which are based on fisheries, biology, and stock status of the various species. They include prohibited, research, non-blacknose small coastal, blacknose, aggregated large coastal, hammerhead, pelagic, and smoothhound species groups (see accompanying table for a list of species by species groups). Fishermen are prohibited from catching or landing any species in either the prohibited or research species groups without a state display or research permit.

The Commission does not set quotas but rather opens and closes the fishery in response to the federal fishery. Fishing effort for aggregated large coastal and hammerhead shark management groups are controlled through commercial retention limits, which can range from zero to 55 sharks per vessel per trip.

The Board established state shares, based on historical landings from 1998-2010, for smooth dogfish via Addendum II (2013). However, implementation was delayed until a benchmark stock assessment and quota were finalized. With completion of the benchmark assessment and implementation of Amendment 9 to the federal FMP, which established a smooth dogfish quota, state shares were implemented in February 2016.

For more information, please contact Ashton Harp, FMP Coordinator, at aharp@asmfc.org or 703.842.0740.

Coastal Shark Management Groups

Species Group	Species within Group
Prohibited	Sand tiger, bigeye sand tiger, whale, basking, white, dusky, bignose, Galapagos, night, reef, narrowtooth, Caribbean sharpnoes, smalltail, Atlantic angel, longfin mako, bigeye thresher, sharpnose sevengill, bluntnose sixgill and bigeye sixgill sharks
Research	Sandbar sharks
Non-Blacknose Small Coastal	Atlantic sharpnose, finetooth, and bonnethead sharks
Blacknose	Blacknose sharks
Aggregated Large Coastal	Silky, tiger, blacktip, spinner, bull, lemon, and nurse
Hammerhead	scalloped hammerhead, great hammerhead and smooth hammerhead
Pelagic	Shortfin mako, porbeagle, common thresher, oceanic whitetip and blue sharks
Smoothhound	Smooth dogfish and Florida smoothhound