FISHERY MANAGEMENT PLAN UPDATE
COASTAL SHARKS
AUGUST 2025

STATUS OF THE FISHERY MANAGEMENT PLAN

Fishery Management Plan History

FMP Documentation:	August 2008	
	Addendum I	September 2009
	Addendum II	May 2013
	Addendum III	October 2013
	Addendum IV	August 2016
	Addendum V	October 2018
Comprehensive Review:	2023: Blue shark (ICCAT)	
	2023: Hammerhead sharks Complex (SEDAR 77)	

The Atlantic States Marine Fisheries Commission (ASMFC) adopted a fishery management plan (FMP) for coastal sharks in 2008 (ASMFC 2008) to complement federal management actions and increase protection of pregnant females and juveniles in inshore nursery areas. Prior to the ASMFC FMP, sharks were domestically managed exclusively under National Marine Fisheries Service (NMFS) FMPs (NOAA Fisheries 1993; NOAA Fisheries 1999; NOAA Fisheries 2006). Atlantic highly migratory species (HMS), which includes sharks, are also managed internationally by the International Commission for the Conservation of Atlantic Tunas (ICCAT). The ASMFC FMP regulates 40 different species of coastal sharks found on the Atlantic coast. The ASMFC does not actively set quotas for any shark species and follows NMFS openings and closures for all shark species and management groups.

Addendum I (ASMFC 2009) modified the FMP to allow limited smooth dogfish processing at sea (removal of fins from the carcass), removed smooth dogfish recreational possession limits, and removed gill net check requirements for smooth dogfish fishermen. The goal of Addendum I was to remove restrictive management intended for large coastal sharks (LCS) from the smooth dogfish fishery and to allow fishermen to continue their operations while upholding the conservation measures of the FMP.

In 2012, NOAA Fisheries created the smoothhound complex for the management of both the Florida smoothhound and smooth dogfish. Addendum II (ASMFC 2013a) modified the FMP to allow year-round smooth dogfish processing at sea and allocated state shares of the smooth dogfish federal quota. The goal of Addendum II was to implement an accurate fin-to-carcass weight ratio and prevent the quota of the smoothhound shark complex from being harvested by one state.

Addendum III (ASMFC 2013b) modified the species groups for hammerhead and blacknose sharks to ensure consistency with NOAA Fisheries. The addendum also increased the recreational size limit for all hammerhead shark species to 78 inches fork length (FL) and blacknose and finetooth sharks to 54 inches FL.

Addendum IV (ASMFC 2016) allows smooth dogfish carcasses to be landed with corresponding fins removed from the carcass if the total retained catch, by weight, is composed of at least 25% smooth dogfish, consistent with federal management measures.

Addendum V (ASMFC 2018a) allows the ASMFC to streamline the process of state implementation of federal shark regulations so that complementary measures are seamlessly and concurrently implemented at the state and federal level whenever possible. Previously, any changes, with the exception of those related to commercial quotas, possession limits and season dates, had to be accomplished through an addendum.

To ensure compliance with interstate requirements, North Carolina also manages the coastal shark complex under the North Carolina Fishery Management Plan for Interjurisdictional Fisheries (IJ FMP). The goal of the IJ FMP is to adopt fishery management plans consistent with North Carolina law, approved by the Mid-Atlantic Fishery Management Council, South Atlantic Fishery Management Council, or the ASMFC by reference and implement corresponding fishery regulations in North Carolina to provide compliance or compatibility with approved fishery management plans and amendments, now and in the future. The goal of these plans, established under the Magnuson-Stevens Fishery Conservation and Management Act (federal council plans) and the Atlantic Coastal Fisheries Cooperative Management Act (ASMFC plans), are like the goals of the Fisheries Reform Act of 1997 to "ensure long-term viability" of these fisheries (NCDMF 2022).

Management Unit

The management unit includes the entire coast-wide distribution of the resources from the estuaries eastward to the inshore boundary of the exclusive economic zone (EEZ). The management unit is split between the Atlantic and Gulf of Mexico regions for aggregated LCS, hammerhead, non-blacknose small coastal sharks (SCS), and blacknose sharks. The management units for pelagic sharks and sandbar sharks (Shark Research Fishery) are not split by region; the respective management units are the Atlantic and Gulf of Mexico combined.

Goal and Objectives

The Interstate FMP for Coastal Sharks (ASMFC 2008) established the following goal and objectives. The goal of the Interstate FMP for Coastal Sharks is to promote stock rebuilding and management of the coastal shark fishery in a manner that is biologically, economically, socially, and ecologically sound.

In support of this goal, the following objectives are in place for the Interstate Shark FMP:

- Reduce fishing mortality to rebuild stock biomass, prevent stock collapse, and support a sustainable fishery.
- Protect essential habitat areas such as nurseries and pupping grounds to protect sharks during particularly vulnerable stages in their life cycle.
- Coordinate management activities between state and federal waters to promote complementary regulations throughout the species' range.
- Obtain biological and improved fishery related data to increase understanding of state water shark fisheries.
- Minimize endangered species bycatch in shark fisheries.

DESCRIPTION OF THE STOCK

Biological Profile

Sharks belong to the class Chondrichthyes (cartilaginous fish) that also includes rays and skates. Relative to other marine fish, sharks produce few young in their lifetime. The low reproductive rates are due to slow growth, late sexual maturity of females, one to two-year reproductive cycles, and small litter size (Musick 1999). These biological factors leave many species of sharks vulnerable to overfishing (Stevens et al. 2000).

Sharks exhibit a number of different reproductive strategies ranging from giving birth to live pups (young) to egg laying (Dulvy and Reynolds 1997). Generally, female sharks produce a small number (2–25) of large-body pups (Simpfendorfer 1992). For some species, an increased gestation period allows for larger pups which is thought to increase juvenile survivorship (Stevens and McLoughlin 1991). Adults usually gather in specific areas to mate although little is known about shark mating behavior for most species. Sharks also exhibit a wide variety of life history traits across species. Some pelagic species such as shortfin

mako (*Isurus oxyrinchus*) or Atlantic thresher (*Alopias vulpinus*), generally remain in offshore ocean environments their whole lives (Casey and Kohler 1992; Smith et al. 2008). Other shark species have an estuarine-dependent component to their life cycle. For example, mature female Atlantic sharpnose sharks (*Rhizoprionodon terraenovae*) and sandbars (*Carcharhinus plumbeus*) travel from near-shore coastal areas into estuarine habitats to pup (Grubbs et al. 2007; Carlson et al. 2008). Coastal shark nursery areas, such as bays and estuaries, are discrete, productive, and highly structured habitats that provide juveniles ample nutrients and refuge from predators (Heupel et al. 2007). Once mature, these shark species will emigrate into coastal ocean environments to continue their life cycle. The variability of life history traits (growth rate, age-at-maturity, reproduction rate, etc.) and highly mobile nature of sharks makes fisheries management across multiple species difficult (Cortés 2002).

Stock Status

Stock status is assessed by individual species when sufficient data is available (Table 1). For species that are data-limited, they are either assessed at the species complex level or have not been assessed. NOAA Fisheries produces an annual Stock Assessment and Fisheries Evaluation (SAFE) Report that reviews the status of Atlantic HMS fish stocks (tunas, swordfish, billfish, and sharks; NOAA Fisheries 2022). These reports are required under the Magnuson-Stevens Fishery Conservation and Management Act and provide the public with information on the latest updates in Atlantic HMS management.

Stock Assessment

Stock status varies between species and species group (Table 1). Most species that have been assessed, and those that have not been assessed, require a benchmark stock assessment due to new data, changing information on stocks, and improved assessment methodologies.

Table 1. Stock status designations for coastal sharks species groups.

Species or Complex Name	Stock overfished?	Stock undergoing overfishing?	Stock assessment year and comments
Pelagic			
Porbeagle	Yes	No	2020: Rebuilding ends in 2108
Blue (North Atlantic)	No	No	2023
Blue (South Atlantic)	No	Yes	2023
Shortfin Mako	Yes	Yes	2017
All other pelagic species	Unknown	Unknown	
Large Coastal Sharks			
Blacktip	No	No	2020
Aggregated Large Coastal Sharks-Atlantic Region	Unknown	Unknown	2006: Difficult to assess as a species complex due to various life history characteristics/lack of available data
Non-blacknose Small Coastal Sharks			
Atlantic Sharpnose	No	No	2013
Bonnethead	Unknown	Unknown	2013
Finetooth	No	No	2007
Hammerhead			
Scalloped	No	No	2024
Smooth	Unknown	No	2024: Stock assessment suggests rebuilding has been occurring since 2000
Great	Yes	No	2024
Blacknose			
Blacknose	Yes	Yes	2010: Rebuilding ends in 2043
Smoothhound			
Smooth Dogfish	No	No	2015
Research			
Sandbar	Yes	No	2017: Rebuilding ends 2070
Prohibited			
Dusky	Yes	Yes	2016: Rebuilding ends in 2107
All other prohibited species	Unknown	Unknown	

The 2007 SEDAR 13 assessed the SCS complex, finetooth (*Carcharhinus isodon*), Atlantic sharpnose (*Rhizoprionodon terraenovae*), and bonnethead (*Sphyrna tiburo*) sharks (SEDAR 2007). The SEDAR 13 peer reviewers considered the data to be the 'best available at the time' and determined the status of the SCS complex to be adequate. Finetooth, Atlantic sharpnose, and bonnethead were all considered to be not overfished and not experiencing overfishing. Atlantic sharpnose and bonnethead were more recently assessed by SEDAR 34 (SEDAR 2013). Atlantic sharpnose status remained as not overfished or undergoing overfishing. Based on SEDAR 34, bonnethead were not overfished or undergoing overfishing. However, the assessment combined the Gulf of Mexico stock and the Atlantic stock for the assessment. Because data shows that they are in fact two separate stocks, the results of the assessment were rejected and the status of the Atlantic stock is officially considered unknown.

SEDAR 11 (2006) assessed the LCS complex and blacktip sharks (*Carcharhinus limbatus*). The LCS assessment suggested that it was inappropriate to assess the LCS complex as a whole due to the variation in life history parameters, different intrinsic rates of increase, and different catch and abundance data for all species included in the LCS complex. 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 was not overfished and overfishing was not occurring, while the status of blacktip sharks in the Atlantic region was unknown. A new stock assessment for Atlantic blacktip sharks was completed in December 2020 (SEDAR 65) and the stock assessment concluded that the stock is not overfished and overfishing is not occurring. A benchmark assessment for Porbeagle sharks was also completed in 2020 and determined that the Northwest Atlantic stock is still overfished but overfishing is not occurring.

In 2017, ICCAT updated a 2012 stock assessment for shortfin mako sharks (*Isurus oxyrinchus*). This assessment used another modeling approach which incorporated more abundance indices, sex-specific life history data, and tagging information. Based on model results, the population was considered overfished with overfishing occurring (ICCAT 2017). The next stock assessment is scheduled for 2024.

The most recent blue shark stock assessment was completed in 2023 ICCAT (ICCAT 2023). The assessment found that domestically, the north Atlantic stock is not overfished and overfishing is not occurring. The international north Atlantic stock is not likely overfished and overfishing is likely occurring. The next stock assessment is not currently scheduled. 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 (Hayes et al. 2009). This assessment was reviewed by NOAA Fisheries and deemed appropriate to serve as the basis for U.S. management decisions (SEFSC 2010). In response to the assessment findings, NOAA Fisheries established a scalloped hammerhead rebuilding plan that would end in 2023. Since the assessment, research has determined that a portion of animals considered scalloped hammerheads in the US Atlantic are actually a cryptic species, recently named the Carolina hammerhead (*Sphyrna gilberti*; Quattro et al. 2013). Little to no species-specific information exists regarding the distribution, abundance, and life history of the two species. Therefore, both species are currently managed under the name scalloped hammerhead. A research track assessment of the hammerhead complex (SEDAR 2024) was completed in 2024. The assessment indicates that the scalloped hammerhead shark was not overfished and overfishing was not occurring in the terminal year (2019). For smooth hammerheads it suggests overfishing most likely is not occurring and the stock has been rebuilding since 2000. The assessment found that for the great hammerhead shark the stock is overfished, and no overfishing is occurring in the terminal year.

DESCRIPTION OF THE FISHERY

Current Regulations

All non-prohibited shark management groups opened in North Carolina on January 1, 2024, (Table 2) reflecting NOAA Fisheries openings. Commercial fishing shark management groups are outlined in Table 3. NOAA Fisheries closes the management groups' fisheries when 80% of their quota is reached. When the fishery closes in federal waters, the Interstate FMP dictates that the fishery also closes in state waters. No harvest or size restrictions are in place for LCS, but there is a retention limit that is set and changed by NOAA fisheries based on available quota.

Table 2. 2024 (1/1/2024–12/31/2024) coast-wide Atlantic coastal shark commercial fishery landings (Atlantic Coastal Cooperative Statistics Program, ACCSP) and annual quota.

Management Group	Region	2024 Quota (lb dw)	2024 Landings (lb dw)
Aggregated LCS	Atlantic	372,552	185,731
Hammerhead		59,736	39,191
Non-Blacknose SCS		582,333	171,377
Blacknose (South of 34° N. latitude only)		37,921	11,852
Smoothhound		3,973,902	735,890
Aggregated LCS (shark research fishery)	No Regional Quotas	110,230	20,016
Sandbar (shark research fishery)		199,943	123,059
Blue		601,856	<2,205
Porbeagle		3,748	<2,205
Other pelagics[1]		1,075,856	35,963

[1] As of July 5, 2022, the shortfin mako shark retention limit in all commercial and recreational Atlantic HMS fisheries is zero (87 FR 39373, July 1, 2022).

It is unlawful to possess any shark (with the exception of smooth dogfish) without tail and fins naturally attached to the carcass through offloading. Commercial fishermen may completely remove the fins of smooth dogfish, if the total retained catch, by weight, is composed of at least 25% smooth dogfish. If fins are removed, the total wet weight of the shark fins may not exceed 12% of the total dressed weight (dw) of smooth dogfish carcasses landed or found onboard a vessel. It is unlawful for a vessel to retain, transport, land, store, or sell scalloped hammerhead, great hammerhead, or smooth hammerhead sharks with pelagic longline gear onboard. It is unlawful for a vessel to retain sandbar sharks unless the vessel is selected to participate in the shark research fishery, subject to retention limits established by NOAA Fisheries and only when a NOAA Fisheries approved observer is onboard. It is unlawful to use gears other than rod and reel, handlines, large and small mesh gill nets, shortlines (maximum of two shortlines, 500 yards each with 50 hooks or less, hooks shall not be corrosion resistant and must be designated by the manufacturer as circle hooks), pound nets/fish traps, and trawl nets. It is unlawful to use a large mesh (stretched mesh size greater than or equal to five inches) gill net more than 2,734 yards in length to capture sharks. It is unlawful to sell sharks to anyone who is not a federally permitted shark dealer. NOAA Fisheries sets quotas for coastal sharks through their 2006 Consolidated Highly Migratory Species Fishery Management Plan (HMS FMP; NOAA Fisheries 2006). As indicated above, the states follow NOAA Fisheries openings and closings, which are based on available quotas (Table 2). In March 2019, NOAA HMS implemented final measures to address the overfishing and overfished condition of Atlantic shortfin mako under Amendment 11 to the HMS FMP (NOAA Fisheries 2019). The rules respond to the determination by ICCAT that all member countries need to reduce shortfin mako landings by 72–79% to prevent further population decline. The final commercial rule as implemented allows for Atlantic shortfin mako commercial retention only by properly permitted operations using pelagic longline and gillnet gear and only if the shark is dead at haul back. Additionally, retention by pelagic longline gear is only allowed if a functional electronic monitoring system is on board the vessel. Recreational measures included an increase in the minimum size limit from 54 inches FL to 71 inches FL for males and to 83 inches FL for females. In April of 2019, the ASMFC Coastal Shark Board adopted complementary size limit measures for the recreational fishery in state waters to provide consistency with size limits in federal waters. In May 2022, the Board approved a zero-retention limit in state waters for Atlantic shortfin mako sharks for both recreational and commercial fisheries. These measures are consistent with those implemented by NOAA Fisheries for federal highly migratory species

(HMS) permit holders based on the International Commission for the Conservation of Atlantic Tunas (ICCAT) recommendation. This action was taken in response to the 2019 Atlantic shortfin mako stock assessment data update that indicates the resource is overfished and experiencing overfishing, with a rebuild date of 2070. This rule took effect federally on July 5, 2022, and at the state level on July 11, 2022. Additionally, in 2019 the Board moved to require non-offset circle hooks for the recreational shark fishery in state waters with an implementation date of July 1, 2020. The Board chose to do so after NOAA Fisheries requested that the states implement a circle hook requirement for the recreational fishery consistent with the measures approved in HMS Amendment 11. Species authorized for recreational harvest are listed in Table 4 based on management group and recreational size and bag limits are described in Table 5.

Table 3. List of commercial shark management groups.

Management Group	Species Within Group
Prohibited	Sand tiger, bigeye sand tiger, whale, basking, white, dusky, bignose, Galapagos, night, reef, narrowtooth, Caribbean sharpnose, smalltail, Atlantic angel, longfin mako, bigeye thresher, sharpnose sevengill, bluntnose sixgill, and bigeye sixgill
Research	Sandbar
Non-Blacknose Small Coastal	Atlantic sharpnose, finetooth, and bonnethead
Blacknose	Blacknose
Aggregated Large Coastal	Silky, tiger, blacktip, spinner, bull, lemon, and nurse
Hammerhead	Scalloped hammerhead, great hammerhead, and smooth hammerhead
Pelagic	Shortfin mako[1], common thresher, oceanic whitetip[3], porbeagle[2],and blue[2]
Smoothhound	Smooth dogfish (referred to as smoothhound throughout this report)

[1]As of July 5, 2022, the shortfin mako shark retention limit in all commercial and recreational Atlantic HMS fisheries is zero (87 FR 39373, July 1, 2022).
[2]Although porbeagle and blue sharks are in the Pelagic Management Group, they each have their own quota.
[3] As of February 2, 2024 the oceanic whitetip shark retention limit in all commercial and recreational Atlantic HMS fisheries is zero (89 FR 278, February 2, 2024)

Table 4. Recreationally permitted species list (as of January 1, 2024).

SPECIES AUTHORIZED FOR RECREATIONAL HARVEST			
Large Coastal Sharks (LCS) (non-ridgeback LCS & tiger)	Small Coastal Sharks (SCS)	Pelagic Sharks	Other
Blacktip Bull Hammerhead, great Hammerhead, scalloped Hammerhead, smooth Lemon Nurse Spinner Tiger	Atlantic Sharpnose Blacknose Bonnethead Finetooth	Blue Oceanic whitetip[1] Porbeagle Thresher	Smoothhound shark (Smooth dogfish) Spiny dogfish

[1] As of February 2, 2024 the oceanic whitetip shark retention limit in all commercial and recreational Atlantic HMS fisheries is zero (89 FR 278, February 2, 2024)

Table 5. Recreational size and bag limits (as of January 1, 2024). Non-listed species are prohibited.

RECREATIONAL SIZE / BAG LIMITS and SEASONS			
Species*	Minimum Size (FL, inches)	Trip Bag Limit/Calendar Day	Season
Atlantic sharpnose	None	1 per person of each species	Jan. 1 – Dec. 31
Bonnethead	None		
Smooth dogfish	None	None	
Spiny dogfish	None	None	
Hammerheads (Great, Smooth and Scalloped)	78”	1 per vessel OR 1 per person for shore-anglers	
Non-Hammerhead LCS, Tiger, Pelagic, Blacknose, and Finetooth Sharks	54”		

*Check DMF proclamations for most current regulations

Commercial Fishery

Table 2 summarizes coast-wide Atlantic commercial landings data from 2024. Shark management groups with Atlantic region quotas are LCS, hammerhead, non-blacknose SCS, blacknose, and smoothhound. Commercial landings of LCS totaled 185,731 pounds, dressed weight (lb, dw) in 2024, which was an decrease from 265,198 lb, dw from 2023. Total commercial landings of hammerhead sharks were 39,191 lb, dw in 2024, which was a decrease from 53,203 lb, dw reported in 2023. Commercial landings of non-blacknose SCS shark species in 2024 totaled 171,377 lb, dw, an slight decrease from 187,938 lb, dw landed in 2023. The commercial landings total of blacknose sharks south of 34º N latitude (Kure Beach, North Carolina) in 2024 was 11,852 lb, dw a slight decrease from 13,104 lb,dw from 2023. Commercial retention of blacknose sharks is prohibited north of 34º N latitude. Commercial landings of smoothhound sharks in 2024 were 735,890 lb, dw, which decreased from the 903,951 lb dw landed in 2023. Shark management groups with no regional quotas are sandbar (shark research fishery), blue, porbeagle, and other pelagics. Commercial landings in 2024 of porbeagle sharks were <2,205 lb, dw. Commercial landings of blue sharks were <2,205 lb, dw. Other pelagic shark landings were 35,963 lb, dw. The shark research fishery landed 123,059 lb, dw of sandbar sharks and 20,016 lb, dw of LCS.

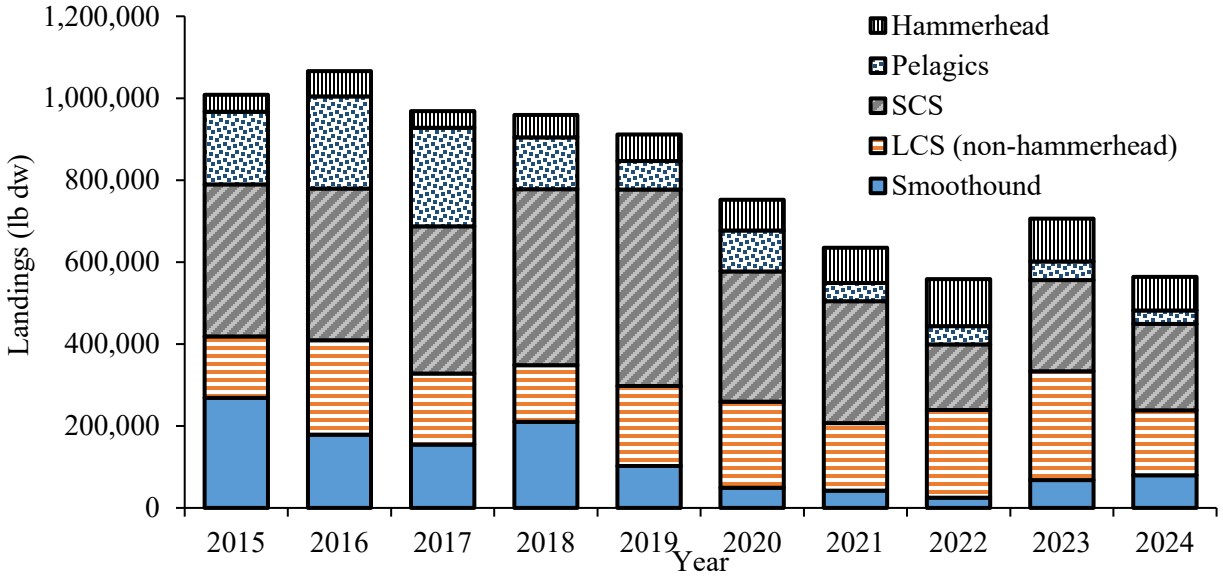

Figure 1. North Carolina commercial shark landings by management group, 2015–2024. In this figure, sandbar shark landings are included with the LCS and SCS includes blacknose landings.

In North Carolina, total shark commercial landings have steadily decreased since 2015 (Figure 1; Table 6). Smoothhound shark landings have steadily decreased from 268,429 lb, dw in 2015 and decreased to a new low of 25,074 lb, dw in 2022 and has increased slightly to 79,376 in 2024. Peak harvest of pelagic sharks was highest in 2017 (240,128 lb, dw) and there has been an overall decreasing trend to 32,596 in 2024. Similarly, peak harvest of SCS was highest in 2019 (479,484 lb, dw) and has decreased since. While total shark landings have decreased, landings of hammerheads have generally increased. LCS (non-hammerhead) harvest has fluctuated annually but has been consistent over the last ten years.

Table 6. Summary of North Carolina commercial landings (pounds) for large coastal sharks (LCS), small coastal sharks (SCS), hammerheads, smoothhound, and pelagics, 2015–2024. In this table, sandbar shark landings are included with the LCS and SCS includes blacknose landings.

Year	LCS (non-hammerhead)	SCS	Hammerhead	Smoothhound	Pelagics	Total
2015	150,394	371,069	41,768	268,429	176,882	1,008,542
2016	230,855	369,948	62,135	178,694	224,746	1,066,378
2017	173,758	359,486	40,743	154,440	240,128	968,555
2018	138,238	430,274	55,004	209,760	125,993	959,269
2019	195,173	479,484	65,104	102,592	69,182	911,535
2020	209,939	318,170	75,339	49,286	99,468	752,202
2021	165,005	297,193	85,966	42,169	44,648	634,981
2022	213,172	160,464	114,848	25,074	44,298	557,856
2023	265,935	222,144	104,056	67,795	45,940	705,870
2024	159,075	210,602	82,267	79,376	32,596	563,916

Recreational Fishery

Recreational harvest estimates for SCS in North Carolina has fluctuated in the past 10 years from a low of 2,545 pounds in 2016 to 106,765 pounds in 2019 (Table 7). The 2024 landings (4,828 pounds) were less than the 10-year average (26,828 pounds). Recreational harvest for LCS in North Carolina tends to be much smaller than for SCS. In 2024, there were an estimated 100 pounds harvested of LCS. From 2015 to 2024, average annual harvest was 3,750 lb, dw (Table 7). The recreational harvest of pelagic sharks in North Carolina is highly variable. Harvest was 0 pounds in 2024 and has ranged from 0 to 479,443 pounds from 2015 to 2024 (Table 7). Recreational harvest of smooth dogfish in North Carolina is also variable and often low, although releases are common. Harvest for smoothhound ranged from 0 to 186,261 from 2015 to 2024 (Table 7). Recreational landing estimates for all shark species across all years have been updated and are now based on the Marine Recreational Information Program (MRIP) new Fishing Effort Survey-based calibrated estimates. Due to small sample sizes and the relatively rare occurrence of landings, the percent standard errors (PSE) is high for many years of recreational shark landings. See NOAA MRIP for more information on methodology.

MONITORING PROGRAM DATA

Fishery-Dependent Monitoring

North Carolina does not collect individual lengths for sharks other than spiny dogfish; sharks arrive at the dock dressed (i.e., gutted with head and tail removed). Landings in pounds dw are recorded by the Trip Ticket Program.

Table 7. North Carolina small coastal sharks (including blacknose), large coastal sharks, pelagics, and smoothhound recreational harvest, discards, and percent standard error (PSE), 2015–2024. Years with blank entries represent an estimated harvest of zero.

Species Group	Year	Number Harvested	PSE	Weight (lb)	PSE	Number Released	PSE
SCS(including blacknose)	2015	6,656	41.3	38,499	44.3	15,866	70.4
	2016	514	66.6	2,545	63.4	133,214	57.0
	2017	5,768	56.5	19,256	42.3	58,440	60.5
	2018	1,678	38.9	9,097	40.9	4,496	39.5
	2019	13,736	70.8	106,765	75.8	34,952	36.1
	2020	5,074	70.2	21,114	56.0	16,563	50.9
	2021	3,556	57.7	24,241	53.9	21,045	44.9
	2022	1,698	49.1	16,909	51.1	30,202	57.1
	2023	3,771	44.5	25,172	50.4	65,203	14.2
	2024	745	61.5	4,683	59.5	40,566	45.6
LCS	2015	10	99.9	-	-	139,486	66.1
	2016	12	101.0	1,100	101.0	27,885	54.3
	2017	910	79.6	27,367	83.4	43041	43.7
	2018	39	84.5	235	95.8	4,916	59.3
	2019	60	72.1	3,745	72.1	30,032	40.5
	2020	26	74.6	551	100.8	8,567	36.0
	2021	6	100.8	594	100.8	22,576	97.5
	2022	-	-	-	-	18,735	98.4
	2023	19	97.9	62	97.9	46,662	2.4
	2024	13	70.7	100	70.7	707	70.7
Pelagics	2015	5,097	76.1	479,443	75.9	987	91.8
	2016	-	-	-	-	3,512	79.0
	2017	66	64.1	4,917	62.2	33	86.2
	2018	2,043	73.1	160,155	73.1	38	63.0
	2019	-	-	-	-	888	65.7
	2020	-	-	-	-	-	-
	2021	111	98.1	-	-	20	96.9
	2022	-	-	-	-	-	-
	2023	-	-	-	-	-	-
	2024	-	-	-	-	-	-
Smoothhound	2015	1,013	71.2	1,964	71.4	119,678	63.7
	2016	10,879	92.6	186,261	97.0	97,256	44.9
	2017	-	-	-	-	34,722	36.2
	2018	-	-	-	-	29,524	49.3
	2019	2,856	95.6	6,926	95.6	15,301	73.6
	2020	1,289	98.9	3,125	98.9	479,933	49.4
	2021	-	-	-	-	10,815	89.9
	2022	1,310	99.8	2,166	99.8	1,560	79.9
	2023	2,808	77.4	11,671	78.7	295,556	85.0
	2024	402	104.1	1,064	104.1	34,399	48.9

*PSE higher than 50 indicates a very imprecise estimate

Fishery-Independent Monitoring

The North Carolina Division of Marine Fisheries (DMF) established a fishery-independent adult red drum longline survey in 2007 (P365) that operates in Pamlico Sound from July to October. Atlantic coastal shark species captured in the survey are measured, tagged, and released. In total, six coastal sharks, one Atlantic

sharpnose, two spinner sharks, and three Sandbar sharks were sampled in 2024. DMF has conducted a fishery-independent gill net survey (P915) which has been conducted in Pamlico Sound since 2001. Sampling was expanded to the Pamlico, Pungo, and Neuse Rivers in 2003 and to the Cape Fear and New Rivers in 2008. Coverage was further expanded to Bogue, Back, and Core Sounds in 2018. The objective of this project is to provide annual indices of relative abundance for key estuarine species in North Carolina estuaries that can be incorporated into stock assessments. Data from this survey are used to improve bycatch estimates, evaluate management measures, and evaluate habitat usage. Results from this project are used by the DMF and other Atlantic coast fishery management agencies to evaluate the effectiveness of current management measures and to identify additional measures that may be necessary to conserve marine and estuarine stocks. Developing fishery independent indices of abundance for target species allows the DMF to assess the status of these stocks without relying solely on commercial and recreational fishery dependent data. The survey employs a stratified random sampling design and utilizes multiple mesh gill nets (3.0 inch to 6.5 inch stretched mesh, by 0.5-inch increments). In 2024, a total of 925 individual coastal sharks were captured in P915 (Table 8), which is much more than the project's annual average of 333 individual sharks.

Table 8. Shark species captured in the DMF 2024 statewide Independent Gill Net Survey (P915).

Species	Total Number Measured	Mean Total Length (inches)	Minimum Total Length (inches)	Maximum Total Length (inches)
Atlantic sharpnose	305	20	11	41
Blacknose	4	48	43	61
Blacktip	21	51	20	67
Bonnethead	97	34	19	61
Bull	168	31	24	79
Finetooth	20	47	21	62
Sand tiger	1	-	-	-
Sandbar	227	32	21	51
Smoothhound	80	25	18	34
Spinner	2	39	38	40

RESEARCH NEEDS

The review of the ASMFC FMP (ASMFC 2022) directs to research needs from the 2018 ASMFC Research Priorities (ASMFC 2018):

Fishery-Dependent Priorities

- Initiate or expand dockside sampling for sharks to verify landings information and species composition.
- The Atlantic menhaden fishery data should be examined to determine shark bycatch estimates, if available.
- Conduct additional length sampling and age composition collection to improve information for developing selectivity.
- Shrimp trawl observer coverage should be expanded to 2 to 5% of total effort, particularly during periods of regulatory or gear changes. The observer coverage program should strive for even spatial coverage (particularly adding more south Atlantic coverage), randomness in vessel selection and full identification of elasmobranch species (continuing on from the 2009 Bycatch Characterization Protocol).
- Increase research on post-release survivorship of all shark species by gear type.
- Continue to acquire better species-specific landings information on number of species, by weight, from dealers.

Fishery-Independent Priorities

- Investigate the appropriateness of using vertebrae for ageing adult sandbar sharks. If appropriate, implement a systematic sampling program that gathers vertebral samples from entire size range for annual ageing to allow tracking the age distribution of the catch as well as updating of age-length keys.
- Develop a fishery-independent porbeagle shark survey to provide additional size composition and catch rate data to calculate an index of abundance.
- All dealers must report landings by species.
- Recent bomb radiocarbon research has indicated that past age estimates based on tagging data for sandbar sharks may be correct and that vertebral ageing may not be the most reliable method for mature individuals.
- Develop a stock wide fishery-independent monitoring program in state coastal waters for
- Dusky sharks that include annual samples of length and age frequencies.

Life History, Biological, and Habitat Priorities

- Re-evaluate finetooth life history in the Atlantic Ocean in order to validate fecundity and reproductive periodicity.
- Develop and conduct tagging studies on dusky and blacknose stock structure with increased international collaboration (e.g., Mexico) to ensure wider distribution and returns of tags.
- Expand research efforts directed towards tagging of individuals in south Florida and Texas/Mexico border to get better data discerning potential stock mixing.
- Examine female sharks during the spawning periods to determine the proportion of spawning females.
- Continue life history studies for all species of the shark complex to allow for additional species specific assessments. Particularly, natural mortality, age, fecundity, and reproductive frequency. Update age, growth, and reproductive studies of blacknose sharks with emphasis on smaller individuals in the Atlantic and larger individuals in the Gulf of Mexico.
- Coordinate a biological study for Atlantic sharpnose so that samples are made at least monthly, and, within each month, samples would be made consistently at distinct geographic locations. For example, sampling locations would be defined in the northern Gulf, west coast of Florida, the Florida Keys (where temperature is expected to be fairly constant over all seasons), and several locations in the South Atlantic, including the east coast of Florida, Georgia, South Carolina, and North Carolina. This same sampling design could be applied to all small coastal sharks.
- Population level genetic studies are needed that could lend support to arguments for stock discriminations using new loci and/or methodology that has increased levels of sensitivity.
- Determine what is missing in terms of experimental design and/or data analysis to arrive at incontrovertible (to the extent that it may be scientifically possible) conclusions on the reproductive periodicity of the sandbar shark stock.

Management, Law Enforcement, and Socioeconomic Priorities

- Conduct species specific assessments for all shark species, with a priority for smooth dogfish.

MANAGEMENT

Most Atlantic shark species are highly mobile and the NOAA Fisheries' HMS Management Division is responsible for managing them under the Magnuson-Stevens Fishery Conservation and Management Act.

In cooperation with an advisory panel, the Division develops and implements FMPs for these species and management groups. The ASMFC adopts NOAA Fisheries regulations in state waters.

LITERATURE CITED

ASMFC (Atlantic States Marine Fisheries Commission). 2008. Fishery Management Report No. 46 of the ASMFC: Interstate Fishery Management Plan for Atlantic Coastal Sharks. Atlantic States Marine Fisheries Commission. Arlington, Virginia. 193 pp.

ASMFC. 2009. Addendum I to the Interstate Fishery Management Plan for Atlantic Coastal Sharks. Atlantic States Marine Fisheries Commission. Arlington, Virginia.

ASMFC. 2013A. Addendum II to the Interstate Fishery Management Plan for Atlantic Coastal Sharks. Atlantic States Marine Fisheries Commission. Arlington, Virginia.

ASMFC. 2013B. Addendum III to the Interstate Fishery Management Plan for Atlantic Coastal Sharks. Atlantic States Marine Fisheries Commission. Arlington, Virginia.

ASMFC. 2016. Addendum IV to the Interstate Fishery Management Plan for Atlantic Coastal Sharks. Atlantic States Marine Fisheries Commission. Arlington, Virginia.

ASMFC. 2018a. Addendum V to the Interstate Fishery Management Plan for Atlantic Coastal Sharks. Atlantic States Marine Fisheries Commission. Arlington, Virginia.

ASMFC. 2018b. Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management. Atlantic States Marine Fisheries Commission. Arlington, Virginia.

ASMFC. 2022. Review of the ASMFC FMP for Coastal Sharks: 2020 Fishing Year. ASMFC, November, 2022.

Carlson, J.K., M.R. Heupel., D.M. Bethea, and L.D. Hollensead. 2008. Coastal habitat use and residency of juvenile Atlantic sharpnose sharks (Rhizoprionodon terraenovae). Estuaries and Coasts. 31(5): 931-940

Casey, J.G., and N.E. Kohler. 1992. Tagging studies on the shortfin mako shark (*Isurus oxyrinchus*) in the western North Atlantic. Marine and Freshwater Research. 43(1): 45-60

Cortés, E. 2002. Incorporating uncertainty into demographic modeling: application to shark populations and their conservation. Conservation Biology. 16(4): 1048-1062

Dulvy, N.K., and J.D. Reynolds. 1997. Evolutionary transitions among egg-laying, live-bearing and maternal inputs in sharks and rays. Proceedings of the Royal Society of London B: Biological Sciences. 264(1386):1309-1315

Grubbs, R.D., J.A. Musick, C.L. Conrath, and J.G. Romine. 2007. Long-term movements, migration, and temporal delineation of a summer nursery for juvenile sandbar sharks in the Chesapeake Bay region. In American Fisheries Society Symposium. 50:87

Hayes, C.G., Y. Jiao, and E. Cortés. 2009. Stock assessment of scalloped hammerheads in the western North Atlantic Ocean and Gulf of Mexico. North American Journal of Fisheries Management. 29(5): 1406-1417

Heupel, M.R., J.K. Carlson, and C.A. Simpfendorfer. 2007. Shark nursery areas: concepts, definition, characterization and assumptions. Marine Ecology Progress Series. 337: 287-297

ICCAT (International Commission for the Conservation of Atlantic Tunas). 2009. Report of the 2009 Porbeagle Stock Assessment Meeting. International Commission for the Conservation of Atlantic Tunas. Copenhagen, Denmark. June 22, 2017.

ICCAT. 2017. Report of the 2017 ICCAT Shortfin Mako Assessment Session. International Commission for the Conservation of Atlantic Tunas. Madrid, Spain. June 16, 2017.

ICCAT. 2020. Report of the 2020 Porbeagle Shark Stock Assessment Meeting. Online, 15-22 June 2020.

ICCAT. 2023. Report of the 2023 ICCAT Blue Shark Stock Assessment Session. International Commission for the Conservation of Atlantic Tunas. Madrid, Spain. June, 2023.

Musick, J.A. 1999. Ecology and conservation of long-lived marine animals. In American Fisheries Society Symposium. 23:1-10

NCDMF (North Carolina Division of Marine Fisheries). 2022. North Carolina Fishery Management Plan for Interjurisdictional Fisheries, 2022 Information Update. North Carolina Division of Marine Fisheries, Morehead City, North Carolina. 19 pp.

NOAA (National Oceanic and Atmospheric Administration). 1993. Fishery Management Plan for Sharks of the Atlantic Ocean. Highly Migratory Species Management Division. NOAA Fisheries. Silver Spring, Maryland. 67 pp.

NOAA. 1999. Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks. Highly Migratory Species Management Division. NOAA Fisheries. Silver Spring, Maryland. 67 pp.

NOAA. 2006. Final consolidated Atlantic Highly Migratory Species Fishery Management Plan. Highly Migratory Species Management Division. NOAA Fisheries. Silver Spring, Maryland. 67 pp.

NOAA. 2013. Highly Migratory Species; Atlantic Shark Management Measures; Amendment 5a. Atlantic Highly Migratory Species Management Division. NOAA Fisheries. Silver Spring, Maryland.

NOAA. 2019. Atlantic Highly Migratory Species; Shortfin Mako Shark Management Measures; Final Amendment 11. Atlantic Highly Migratory Species Management Division. NOAA Fisheries. Silver Spring, Maryland.

NOAA. 2021 Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species. Atlantic Highly Migratory Species Management Division. NOAA Fisheries. Silver Spring, Maryland.

Simpfendorfer, C.A. 1992. Reproductive strategy of the Australian sharpnose shark, *Rhizoprionodon taylori*, (Elasmobranchii: Charcharhinidae) from Cleveland Bay, northern Queensland. Marine and Freshwater Research. 43(1): 67-75

SEDAR (Southeast Data, Assessment, and Review). 2006. SEDAR 11 Stock Assessment Report: Large Coastal Shark Complex, Blacktip and Sandbar shark. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405. 257 pp.

SEDAR. 2007. SEDAR 13 Stock Assessment Report: Small Coastal Sharks, Atlantic Sharpnose, Blacknose, Bonnethead, and Finetooth Shark. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405. 375 pp.

SEDAR. 2011. SEDAR 21 Stock Assessment Reports: Sandbar, Dusky, and Blacknose Sharks. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405. 415 pp.

SEDAR. 2013. SEDAR 34 Stock Assessment Reports: Atlantic Sharpnose and Bonnethead Sharks. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405. 298 pp.

SEDAR. 2015. SEDAR 39 Stock Assessment Report: HMS Atlantic Smooth Dogfish Shark. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405. 325 pp.

SEDAR. 2016. Update assessment to SEDAR 21: HMS Dusky Shark. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405.

SEDAR. 2017. SEDAR 54 Stock Assessment Report: HMS Sandbar Shark. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405.

SEDAR. 2020. SEDAR 65 HMS Atlantic Blacktip Shark Schedule of Events. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405.

SEDAR. 2020. SEDAR 65 Stock Assessment Report: Atlantic Blacktip Shark. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405.

SEDAR. 2021. SEDAR 77 HMS Atlantic Hammerhead Research Track Assessment Milestone Schedule. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405.

SEDAR. 2024. SEDAR 77 HMS Stock Assessment Report: HMS Hammerhead Sharks. SEDAR, 4055 Faber Place Dr, Suite 201, North Charleston, SC 29405.

SEFSC (Southeast Fisheries Science Center). 2010. SEFSC Scientific Review of Scalloped Hammerhead Stock Assessment by Hayes, et al. 2009. SEFSC, 75 Virginia Beach Dr, Miami, Florida 33149. 8 pp.

Smith, S.E., R.C. Rasmussen, D.A. Ramon, and G.M. Cailliet. 2008. The biology and ecology of thresher sharks (Alopiidae). Sharks of the open ocean: biology, fisheries and conservation: 60-68.

Stevens, J.D., and K.J. McLoughlin. 1991. Distribution, size and sex composition, reproductive biology and diet of sharks from Northern Australia. Australian Journal of Marine and Freshwater Research. 42(2): 151-199.

Stevens, J.D., R. Bonfil, N.K. Dulvy, and P.A. Walker. 2000. The effects of fishing on shark, rays, and chimeras (chondrichthyans) and the implications for marine ecosystems. ICES Journal of Marine Science. 57(3): 476-4.

Quattro, J.M., W.B.I. Driggers, J.M. Grady, G.F. Ulrich, and M.A. Roberts. 2013. Sphyrna gilberti sp. nov., a new hammerhead shark (Carcharhiniformes, Sphyrnidae) from the western Atlantic Ocean. Zootaxa. 3702(2): 159-178.