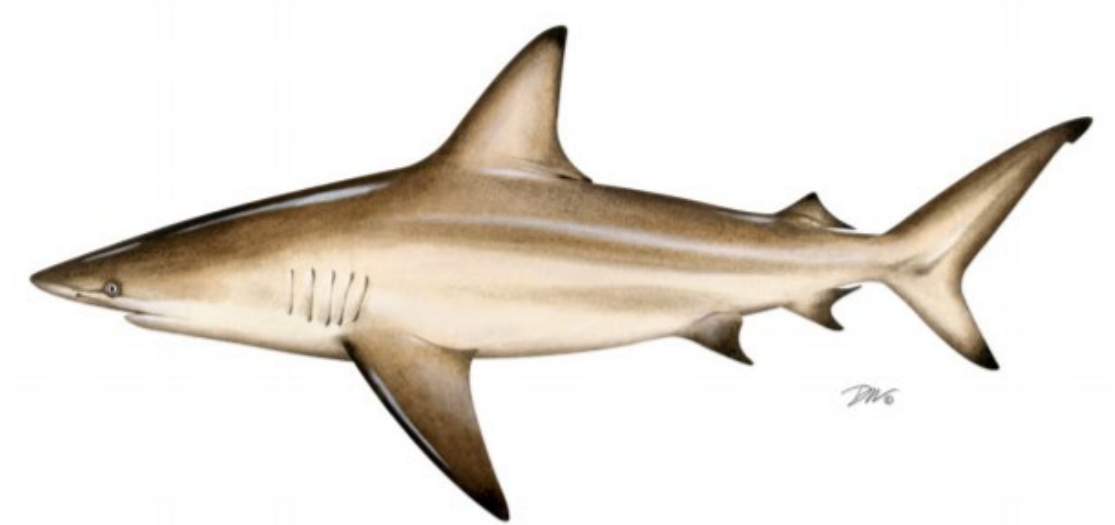


**ATLANTIC STATES MARINE FISHERIES COMMISSION**

**REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN**

**FOR COASTAL SHARKS**

**2015-2016 FISHING YEARS**



Prepared by the Plan Review Team

Approved by the Spiny Dogfish & Coastal Sharks Management Board  
May 2018

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**REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN FOR COASTAL  
SHARKS  
2015 and 2016 FISHING YEAR**

**I. Status of the Fishery Management Plan**

<u>Date of FMP Approval:</u>	August 2008
<u>Amendments</u>	None
<u>Addenda</u>	Addendum I (September 2009) Addendum II (May 2013) Addendum III (October 2013) Addendum IV (August 2016)
<u>Management Unit:</u>	Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ
<u>States With Declared Interest:</u>	Maine, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
<u>Active Boards/Committees:</u>	Coastal Shark Management Board, Advisory Panel, Technical Committee, and Plan Review Team

**a) Goals and Objectives**

The Interstate Fishery Management Plan for Coastal Sharks (FMP) established the following goals and objectives.

**GOALS**

The goal of the Interstate Fishery Management Plan 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.”

**OBJECTIVES**

In support of this goal, the following objectives proposed for the FMP include:

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

## **b) Fisheries Management Plan Summary**

The Atlantic States Marine Fisheries Commission (Commission) adopted its first fishery management plan (FMP) for coastal sharks in 2008. Coastal sharks are managed under this plan as six different complexes: prohibited, research, small coastal, non-sandbar large coastal, pelagic and smooth dogfish. The Board does not actively set quotas for any shark species. The Commission follows National Oceanic and Atmospheric Administration's (NOAA Fisheries) openings and closures for small coastal sharks, non-sandbar large coastal shark, and pelagic sharks. Species in the prohibited category may not be possessed or taken. Sandbar sharks may only be taken with a shark fishery research permit. All species must be landed with their fins attached to the carcass by natural means.

The FMP has been adapted through the following addenda:

Addendum I (2009) modified the FMP to allow limited smooth dogfish processing at sea (removal of fins from the carcass), as long as the total wet weight of the shark fins does not exceed 5 percent of the total dressed weight. In addition, smoothhound recreational possession limits and gill net check requirements for smoothhound fishermen were removed. These restrictions were removed because they were intended for large coastal sharks. The removal allowed smoothhound fishermen to continue operations while upholding the conservation measures of the FMP.

Addendum II (2013) modified the FMP to allow year round smooth dogfish processing at sea. If fins are removed the total wet weight of the shark fins may not exceed 12 percent of the total dressed weight. State-shares of the smoothhound coastwide quota were allocated. The goal of Addendum II was to implement an accurate fin-to-carcass ratio and prevent any one state from harvesting the entire smoothhound quota.

Addendum III (2013) modified the species groups in the FMP to ensure consistency with NOAA Fisheries (Table 1). The recreational size limit for the hammerhead species group was increased to 78" fork length.

Addendum IV (2016) was added to reflect measures outlined in the Shark Conservation Act into state regulations. It amends the Coastal Sharks 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 percent smooth dogfish. Fishermen can retain smooth dogfish in an amount less than 25 percent of the total catch provided the smooth dogfish fins remain naturally attached to the carcass.

**Table 1. List of commercial shark management groups**

<b>Species Group</b>	<b>Species within Group</b>
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

## **II. Status of the Stocks**

Stock status is assessed by species or by species complex if there is not enough data for an individual assessment. Fourteen species have been assessed domestically, three species have been assessed internationally, and the rest have not been assessed. Table 2 describes the current stock status of several shark species along with references for the stock assessment.

The 2017 International Commission on the Convention of Atlantic Tunas (ICCAT) assessment of the North Atlantic population of shortfin mako indicates that the stock is overfished and overfishing is occurring. Multiple models were explored and new data sources integrated. Combined probability of overfishing occurring and the stock being in an overfished state was 90% across all models.

The 2017 Southeast Data and Assessment Review (SEDAR 54) stock assessment for sandbar sharks indicates the stock is overfished and not experiencing overfishing. This assessment used a new approach (Stock Synthesis) instead of the State Space Age Structure Production Model that was used in the previous assessment (SEDAR 21). A replication analysis conducted using the prior model (updated with data through 2015) resulted in the same stock status as the new model (overfished, no overfishing occurring).

The 2016 stock assessment update (SEDAR 21) for Atlantic dusky sharks indicates the stock is overfished and experiencing overfishing. This latest review functioned an update to the 2011

assessment, so no new methodology was introduced. However, all model inputs were updated with more recent data (i.e. 2010-2015 effort, observer, and survey data).

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 Atlantic smooth dogfish (*Mustelus canis*) are not overfished and not experiencing overfishing.

The North Atlantic blue shark (*Prionace glauca*) stock was assessed by ICCAT's Standing Committee on Research and Statistics (SCRS) in 2015. Similar to results of the 2008 stock assessment, ICCAT's 2015 analysis 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 status of Atlantic sharpnose (*Rhizoprionodon terraenovae*) and bonnethead (*Sphyrna tiburo*) sharks. 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. A benchmark assessment is recommended for both stocks.

A 2011 benchmark assessment (SEDAR 21) of dusky (*Carcharhinus obscurus*), sandbar (*Carcharhinus plumbeus*), and blacknose (*Carcharhinus acronotus*) sharks indicates that 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. A dusky stock assessment update is scheduled for 2016.

Porbeagle sharks (*Lamna nasus*) were assessed by the ICCAT's SCRS in 2009. The assessment found the Northwest Atlantic stock is increasing in biomass, however 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.

SEDAR 11 (2006) assessed the Large Coastal Sharks (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, different intrinsic rates of increase, and different catch and abundance data for all species included in the LCS complex.

Based on these results, NMFS 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 overfishing is not occurring, while the current status of blacktip sharks in the Atlantic region is unknown.

**Table 2. Stock Status of Atlantic Coastal Shark Species and Species Groups**

Species or Complex Name	Stock Status		References/Comments
	Overfished	Overfishing	
<b>Pelagic</b>			
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	Yes	Yes	ICCAT Standing Committee on Research and Statistics Report (2017)
All other pelagic sharks	Unknown	Unknown	
<b>Aggregated Large Coastal Sharks (LCS)</b>			
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
<b>Non-Blacknose Small Coastal Sharks (SCS)</b>			
Atlantic Sharpnose	No	No	SEDAR 34 (2013)
Bonnethead	Unknown	Unknown	SEDAR 34 (2013)
Finetooth	No	No	SEDAR 13 (2007)
<b>Hammerhead</b>			
Scalloped	Yes	Yes	SEFSC Scientific Review by Hayes et al. (2009); Rebuilding ends in 2023 (HMS Am. 5a)
<b>Blacknose</b>			
Blacknose	Yes	Yes	SEDAR 21 (2010); Rebuilding ends in 2043 (HMS Am. 5a)
<b>Smoothhound</b>			
Atlantic Smooth Dogfish	No	No	SEDAR 39 (2015)
<b>Research</b>			
Sandbar	Yes	No	SEDAR 54 (2017)
<b>Prohibited</b>			
Dusky	Yes	Yes	SEDAR 21 (2016); Rebuilding ends in 2108 (HMS Am. 2)
All other prohibited sharks	Unknown	Unknown	

### III. Status of the Fishery

#### *Specifications (Opening, closures, quotas)*

NOAA Fisheries sets quotas for coastal sharks through the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan. The opening dates, closures dates and quotas are

detailed in Table 3. All non-prohibited coastal shark management groups, except aggregated large coastal and hammerheads shark groupings, opened on January 1, 2015. NOAA Fisheries closes commercial shark fisheries when 80% of the available quota is reached. Commercial shark dealer reports indicate the following commercial fisheries exceeded 80% of the available quota and had an early closure: blacknose, non-blacknose small coastals, aggregated large coastal and hammerhead fisheries. When the fishery closes in federal waters, the Interstate FMP dictates that the fishery also closes in state waters.

**Table 3. Commercial quotas and opening dates for 2015 and 2016 shark fishing season**

**2015 Season**

<b>Species Group</b>	<b>Region</b>	<b>2015 Annual Quota (mt dw)</b>	<b>Season Opening Dates</b>	<b>Closing Date</b>
Aggregated Large Coastal Sharks (LCS)	Atlantic	168.9	June 1, 2015	
Hammerhead Sharks	Atlantic	27.1	June 1, 2015	
Non-Blacknose Small Coastal Sharks (SCS)	Atlantic	176.1	January 1, 2015	June 7, 2015; Re-opened August 18
Blacknose Sharks	Atlantic	17.5	January 1, 2015	June 7, 2015
Blue Sharks	No regional quotas	273.0	January 1, 2015	
Porbeagle Sharks	No regional quotas	1.7	January 1, 2015	
Pelagic Sharks other than Porbeagle or Blue	No regional quotas	488.0	January 1, 2015	
Shark Research Quota (Aggregated LCS)	No regional quotas	50.0	January 1, 2015	
Sandbar Research Quota	No regional quotas	116.6	January 1, 2015	



**2016 Season**

<b>Species Group</b>	<b>Region</b>	<b>2016 Annual Quota (mt dw)</b>	<b>Season Opening Date</b>	<b>Closing Date</b>
Aggregated Large Coastal Sharks (LCS)	Atlantic	168.9	January 1, 2016	
Hammerhead Sharks	Atlantic	27.1		
Non-Blacknose Small Coastal Sharks (SCS)	Atlantic	264.1		May 29, 2016
Blacknose Sharks	Atlantic	15.7		May 29, 2016
Blue Sharks	No regional quotas	273.0		
Porbeagle Sharks	No regional quotas	1.7		
Pelagic Sharks other than Porbeagle or Blue	No regional quotas	488.0		
Shark Research Quota (Aggregated LCS)	No regional quotas	50.0		
Sandbar Research Quota	No regional quotas	90.7		

*Commercial Landings*

Commercial landings of Atlantic large coastal sharks species in 2016 were 465,936 pounds (lbs) dressed weight (dw), 25% decrease from 2015 landings and 20% decrease from 2014 landings (Table 4). Commercial landings of small coastal shark species in 2016 were 210,067 lbs dw, a 40% decrease from 2015 landings and 21% lower than 2014 landings (Table 5). 2016 Landings are a new low in landings for the time series over the last 9 years. Commercial landings of Atlantic pelagic sharks was 239,655 lbs dw, which represents an increase of 11% from 2015 landings but below the 2014 landings which were a time series peak (Table 6). The increase in pelagic shark landings can be attributed to an increase in the commercial harvest of Atlantic shortfin mako sharks.

**Table 4. Commercial landings of authorized Atlantic large coastal sharks by species (pounds dw), 2008-2016. Source: HMS SAFE Report, 2017.**

	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Great hammerhead</b>	0	0	0	0	371	7,406	13,538	36,892	20,454
<b>Scalloped hammerhead</b>	0	0	0	0	15,800	27,229	24,652	13,197	12,329
<b>Smooth hammerhead</b>		4,025	7,802	110	3,967	1,521	601	304	125
<b>Unclassified</b>	21,631	62,825	43,345	35,618	9,617	0	0	0	0
<b>Hammerhead Total</b>	<b>21,631</b>	<b>66,850</b>	<b>51,147</b>	<b>35,728</b>	<b>29,755</b>	<b>36,156</b>	<b>38,791</b>	<b>50,393</b>	<b>32,908</b>
<b>Blacktip</b>	258,035	229,267	246,617	176,136	215,403	256,277	282,009	229,823	248,470
<b>Bull</b>	43,200	61,396	56,901	49,927	24,504	33,980	32,372	33,737	31,417
<b>Lemon</b>	22,530	30,909	25,316	45,448	21,563	16,791	13,047	18,158	19,205
<b>Nurse</b>	10	0	71	0	81	0	0	24	0
<b>Silky</b>	306	1,386	1,049	992	29	186	289	1,246	446
<b>Spinner</b>	1,265	20,022	13,544	4,113	10,643	26,892	25,716	33,002	55,610
<b>Tiger</b>	14,119	15,172	43,145	36,425	23,245	16,561	29,062	28,460	14,896
<b>Unclassified</b>	187,670	70,894	2,229	50,711	53,705	0	0	0	0
<b>Aggregated LCS Total</b>	<b>527,135</b>	<b>429,046</b>	<b>388,872</b>	<b>363,766</b>	<b>349,345</b>	<b>350,687</b>	<b>382,495</b>	<b>344,450</b>	<b>370,044</b>
<b>Sandbar</b>	63,035	54,141	84,339	94,295	46,446	46,868	82,308	112,610	62,984
<b>Hammerhead, Aggregated LCS, Sandbar Total</b>	<b>611,801</b>	<b>550,037</b>	<b>524,358</b>	<b>493,775</b>	<b>425,374</b>	<b>433,710</b>	<b>464,803</b>	<b>507,453</b>	<b>465,936</b>

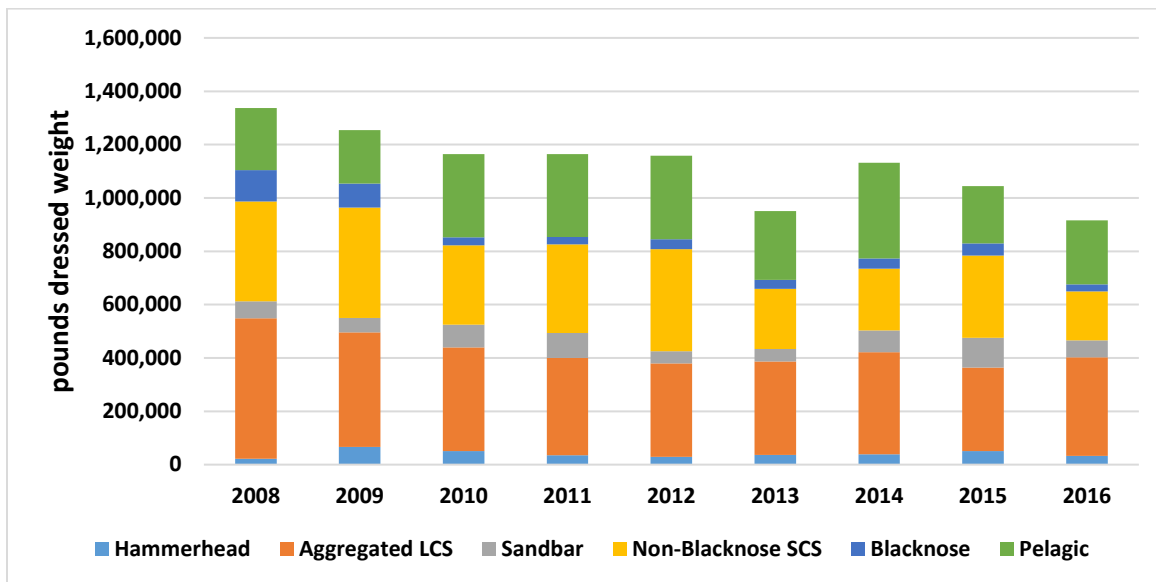
**Table 5. Commercial landings of authorized Atlantic small coastal sharks by species (lbs dw), 2008-2016. Source: HMS SAFE Report, 2017.**

	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Blacknose</b>	117,197	90,023	30,287	28,373	37,873	33,382	38,437	45,405	26,842
<b>Bonnethead</b>	61,549	53,912	9,069	28,284	19,907	22,845	13,221	5,885	1,688
<b>Finetooth</b>	28,872	63,359	76,438	52,318	15,922	19,452	19,026	8,712	5,647
<b>Atl. Sharpnose</b>	261,788	262,508	211,190	214,382	345,625	183,524	198,568	293,128	175,890
<b>Unclassified</b>	23,077	34,429	851	36,639	492	0	0	0	0
<b>SCS Total</b>	<b>490,483</b>	<b>504,231</b>	<b>327,835</b>	<b>359,996</b>	<b>419,819</b>	<b>259,203</b>	<b>269,252</b>	<b>353,130</b>	<b>210,067</b>

**Table 6. Commercial landings of authorized pelagic sharks by species off the Atlantic coast of the United States (lbs dw), 2008-2016. Source: HMS SAFE Report, 2017.**

	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Blue</b>	3,229	4,793	9,135	13,370	17,200	9,767	17,806	1,114	607
<b>Porbeagle</b>	5,259	3,609	4,097	5,933	4,250	54	6,414	0	0
<b>Shortfin Mako</b>	120,255	141,456	220,400	207,630	198,841	199,177	218,295	141,720	160,829
<b>Unclassified</b>	39,661	9,383	0	0	0	0	0	0	0
<b>Oceanic</b>	1,899	933	796	2,435	258	62	22	0	0
<b>Thresher</b>	47,528	33,333	61,290	47,462	63,965	48,768	116,012	72,463	78,219
<b>Unclassified</b>	14,819	6,650	16,160	33,884	28,932	0	0	0	0
<b>Pelagic Total</b>	<b>232,650</b>	<b>200,157</b>	<b>311,878</b>	<b>310,714</b>	<b>313,446</b>	<b>257,828</b>	<b>358,549</b>	<b>215,297</b>	<b>239,655</b>

**Figure 1: Commercial landings of coastal sharks off the east coast of the United States by species complex, 2008-2016. Source: HMS SAFE Report, 2017.**



*Recreational Landings*

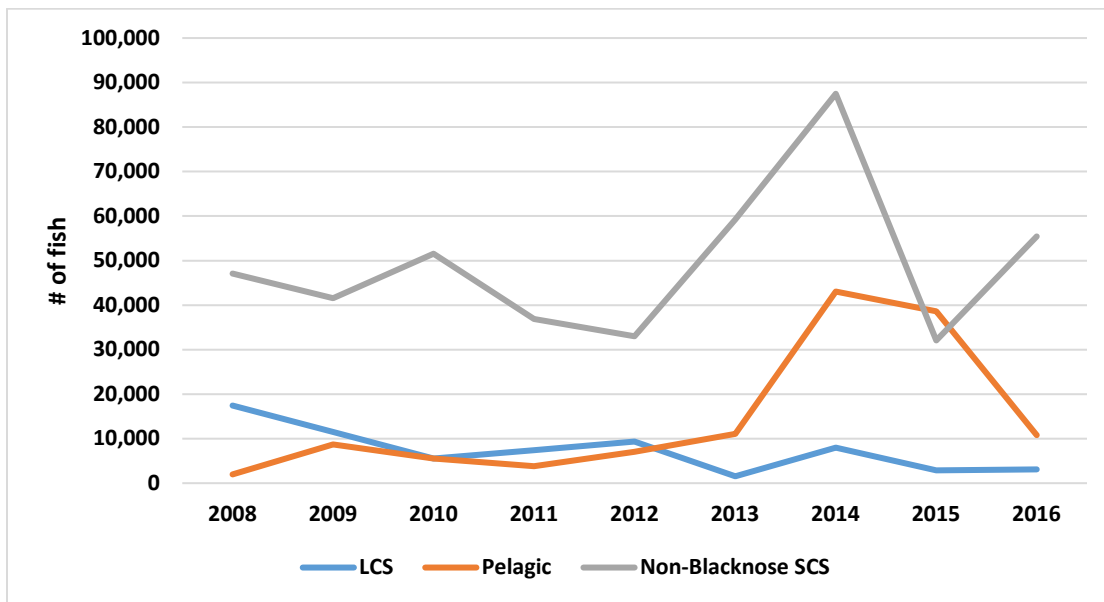
Approximately 69,543 sharks were harvested during the 2016 recreational fishing season, below 2015 landings but similar to 2013 and 2015 harvest levels (Table 7). The non-blacknose small coastal shark group comprised 55% of the overall recreational harvest, specifically Atlantic sharpnose, and bonnethead.

**Table 7. Estimated recreational harvest of all Atlantic shark species by species group in numbers of fish, 2008-2016. Source: Updated based HMS SAFE Report, 2017.**

	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Aggregated LCS</b>	17,441	11,536	5,540	7,397	9,386	1,547	8,010	2,852	3,100
<b>Hammerhead</b>	4	574	13	178	41	600	900	1	0
<b>Pelagic*</b>	1,972	8,694	5,529	3,806	7,034	11,057	43,047	38,470	10,789
<b>Blacknose</b>	2	947	0	573	0	70	4,146	1,211	223
<b>Non-Blacknose SCS</b>	47,059	41,577	51,529	36,851	33,005	59,208	87,480	32,065	55,426
<b>Sandbar</b>	4,210	6,461	2,193	1,125	857	399	1,873	1,252	5
<b>Prohibited</b>	1,502	506	4	23	15	16	2	0	0
<b>Total</b>	72,190	70,295	64,808	49,952	50,338	72,895	145,461	75,983	69,543

\*Pelagic sharks include Gulf of Mexico landings.

**Figure 2: Estimated recreational harvest for LCS, SCS and pelagic species by species group, in numbers of fish, 2008-2016. Source: HMS SAFE Report, 2017.**



#### IV. Status of Research and Monitoring

Under the Interstate Fishery Management for Coastal Sharks, the states are not required to conduct any fishery dependent or independent studies; however, states are encouraged to submit any information collected while surveying for other species. This section describes the research and monitoring efforts through the 2016 fishing year, where available.

The Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) appears in multiple state monitoring efforts, a brief description is below. The survey monitors the presence of young-of-year and juvenile sharks along the east coast. It is managed and coordinated by NOAA's Northeast Fisheries Science Center (NEFSC) through the Apex Predators Program based at the NEFSC's Narragansett Laboratory in Rhode Island. Longline and gillnet sampling, along with mark-recapture techniques are used to determine relative abundance, distribution and migration of sharks utilizing nursing grounds from Massachusetts to Florida. In 2016, COASTSPAN program participants were the University of North Florida (samples Georgia and North Florida state waters) and the South Carolina Department of Natural Resources. In addition, the survey is conducted in summer months in Narragansett and Delaware Bays, and in Massachusetts waters. Standardized indices of abundance from COASTSPAN surveys are used in the stock assessments for large and small coastal sharks.

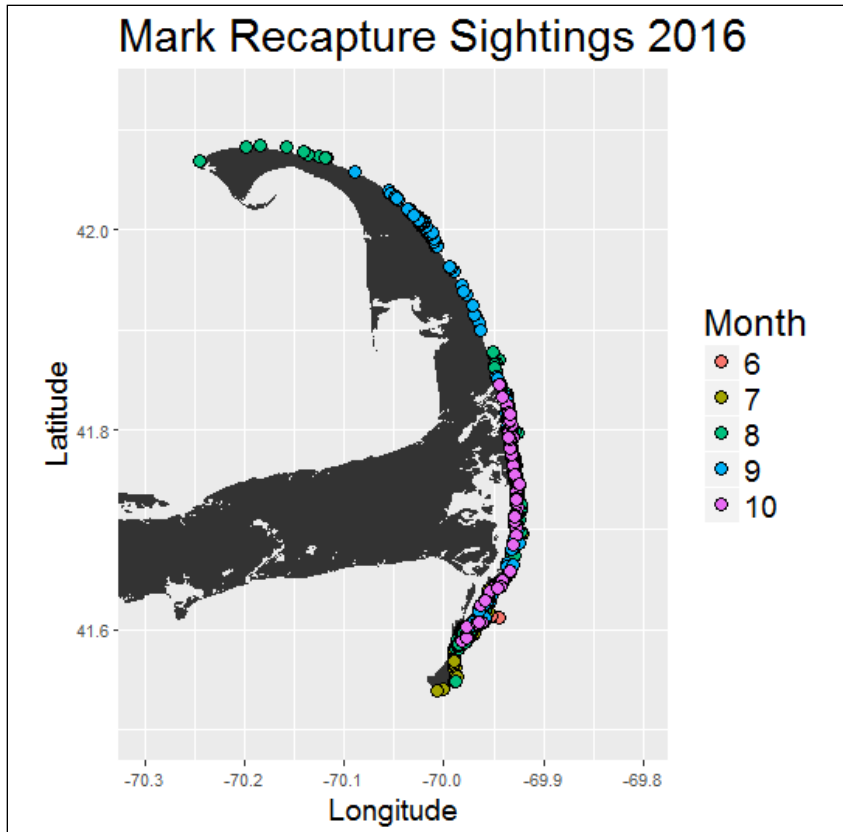
### *Massachusetts*

**Movement and Habitat Studies:** With external funding from private and federal grants, *Marine Fisheries* personnel continued in 2015 and 2016 to collaborate with federal and academic researchers on the study of broad and fine-scale movements of numerous shark species using pop-up satellite tags (PSAT), real-time satellite tags (SPOT), acoustic transmitters, and conventional tags. These species include white (data through 2016), basking, blue, shortfin mako, tiger, and sand tiger sharks (data through 2015).

*Basking Shark:* Since 2004, 57 basking sharks have been tagged with PSAT tags and 10 with SPOT tags. The broad- and fine-scale horizontal and vertical movements of this species are being examined by Tobey Curtis as part of his PhD project at University of Massachusetts–Dartmouth, School for Marine Science and Technology (SMAST). In 2015, Tobey conducted a quantitative analysis of the broad-scale movements of PSAT-tagged basking sharks as they relate to international boundaries and Exclusive Economic Zones.

*White Shark:* Our efforts to study the movement ecology of white sharks off Massachusetts and the eastern seaboard of the US continued in 2016. An additional 23 white sharks were tagged in 2015, bringing the total number tagged since 2009 to 102 individuals. These sharks were tagged with one or more of the following technologies: PSAT, SPOT, coded acoustic transmitters, autonomous underwater vehicle transponders, active acoustic transmitters, and NOAA Fisheries conventional tags. Tagged sharks ranged from roughly 7.5 to 18.5 feet in total length.

Work continued on a five-year study initiated in 2014 to quantify the regional population size and relative abundance of white sharks in Massachusetts waters. With funding and logistical support from local non-profits, aerial and vessel surveys were conducted from mid-June through October off the eastern coast of Cape Cod. During 40 vessel surveys, a total of 572 white sharks comprising 147 individuals were sighted and cataloged in 2016; 40% were re-sighted from previous years. As was the case in 2015, the distribution of white sharks shifted throughout the season in 2016 (Figure 1). Throughout the summer and fall, 36 white sharks were detected by *Marine Fisheries'* acoustic receivers. This quantitative study is being conducted by UMass-SMAST student Megan Winton as part of her PhD research.



**Figure 1. Monthly distribution of white sharks sighted off the coast of Cape Cod in 2016.**

*Blue and Shortfin Mako Sharks:* In cooperation with the MIT/WHOI PhD student Camrin Braun, blue and shortfin mako sharks were tagged with SPOT and PSAT tags during the summer of 2015 to study the fine-scale movements of these species as they relate to eddy fields in the North Atlantic.

**Post-release Survivorship Studies:** In 2015, work continued with University of Massachusetts researcher Diego Bernal and PhD student Heather Marshall to study the physiological effects of longline capture in sandbar and dusky sharks. Funding for the study was obtained from the Saltonstall-Kennedy Program. In 2015, a manuscript resulting from this research was published in *Fisheries Research*:

*Marshall, H, L., G. Skomal , P.G. Ross, and D. Bernal. 2015. At-vessel and post-release mortality of the dusky (Carcharhinus obscurus) and sandbar (C. plumbeus) sharks after longline capture. Fisheries Research. 172:373-384.*

**Life History:** Working with NOAA Fisheries and WHOI researchers, Project personnel generated age and growth estimates for the white shark in the western North Atlantic. Using bomb-produced radiocarbon, vertebral growth bands were counted and validated as annual. In 2015, this research was published in *Marine and Freshwater Research*:

Natanson, L.J. and G.B. Skomal. 2015. Age and growth of the white shark, *Carcharodon carcharias*, in the western North Atlantic Ocean. Marine and Freshwater Research, DOI: dx.doi.org/10.1071/MF14127.

**Publications:** Four other peer-reviewed papers, with *Marine Fisheries* personnel as a co-author, were published in 2015:

Ashe, J.L., K.A. Feldheim, A.T. Fields, E.A. Reyier, E.J. Brooks, M.T. O'Connell, G.B. Skomal, S.H. Gruber, and D.D. Chapman. 2015. Local population structure and context-dependent isolation by distance in a large coastal shark. Marine Ecology Progress Series, 520:203-216, doi: 10.3354/meps11069.

Braun, C.D., et al. 2015. Movements of the reef manta ray (*Manta alfredi*) in the Red Sea using satellite and acoustic telemetry. Marine Biology 162:2351-2362.

Legare, B, J. Kneebone, B. DeAngelis, and G. Skomal. 2015. The spatiotemporal dynamics of habitat use by blacktip (*Carcharhinus limbatus*) and lemon (*Negaprion brevirostris*) sharks in nurseries of St. John, United States Virgin Islands. Marine Biology, DOI 10.1007/s00227-015-2616-x.

Skomal, G.B., E.M. Hoyos-Padilla, A. Kukulya, and R. Stokey. 2015. Subsurface observations of white shark predatory behaviour using an autonomous underwater vehicle. Journal of Fish Biology 87:1293-1312.

### *Rhode Island*

Fishery independent monitoring is limited to coastal shark species taken in the RI Division of Fish & Wildlife, Marine Fisheries Section monthly and seasonal trawl survey. During the 2015 and 2016 calendar year the only coastal shark species captured in the trawl survey was smooth dogfish (*Mustelus canis*). A summary of fishery independent monitoring for coastal sharks is summarized in Table 8 & 9 below.

**Table 8. Total number of smooth dogfish caught per month and during the seasonal trawl surveys during the 2015 fishing year. Smooth dogfish are the only coastal shark captured by the RI DFW trawl survey during the 2015.**

Year	Month	Tows conducted	Total weight (kg)	Total number	Average	
					Number per tow	kg per tow
Monthly Coastal Trawl Survey			-	-	-	-
2015	JAN	12	0	0	0	0
2015	FEB	0	0	0	0	0
2015	MAR	12	0	0	0	0
2015	APR	13	0	0	0	0
2015	MAY	13	0	0	0	0
2015	JUN	13	6.9	4	0.31	0.53
2015	JUL	13	16.4	27	2.08	1.26
2015	AUG	13	23.5	28	2.15	1.81
2015	SEP	13	5.8	7	0.54	0.44
2015	OCT	13	16.4	13	1.00	1.27
2015	NOV	13	0	0	0	0
2015	DEC	13	0	0	0	0
Seasonal Coastal Trawl Survey			-	-	-	-
2015	Spring	43	0	0	0	0
2015	Fall	43	58.98	54	1.26	1.37

**Table 9. Total number of smooth dogfish caught per month and during the seasonal trawl surveys during the 2016 fishing year. Smooth dogfish are the only coastal shark captured by the RI DFW trawl survey during the 2016.**

Year	Time Period	Species	Number of Tows	Total Weight (kg)	Total Number Caught
Monthly Coastal Trawl Survey					
2016	MAY	Smooth Dogfish	13	0.0	0
2016	JUN	Smooth Dogfish	11	0.0	0
2016	JUL	Smooth Dogfish	12	0.0	0
2016	AUG	Smooth Dogfish	13	0.0	0
2016	SEP	Smooth Dogfish	13	11.4	4
2016	OCT	Smooth Dogfish	13	13.5	17
2016	NOV	Smooth Dogfish	13	38.6	52
2016	DEC	Smooth Dogfish	13	5.6	4
2016	JAN	Smooth Dogfish	13	8.4	7
2016	FEB	Smooth Dogfish	13	33.9	23
2016	MAR	Smooth Dogfish	13	0.0	0
2016	APR	Smooth Dogfish	13	0.0	0
Seasonal Coastal Trawl Survey					
2016	Spring	Smooth Dogfish	44	5.0	2
2016	Fall	Smooth Dogfish	44	35.7	26

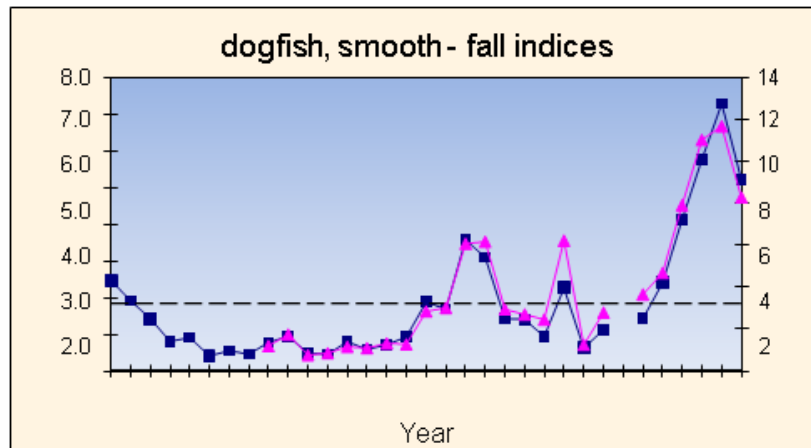


*Connecticut*

The Connecticut Department of Energy and Environmental Protection monitors the abundance of marine resources in nearby coastal waters with the Long Island Sound Trawl Survey. Spring (April, May and June) and fall (September and October) surveys are conducted each year. Other than smooth dogfish, coastal sharks are not encountered by the Long Island Sound Trawl Survey. Smooth dogfish are caught most often in the fall and the fall indices are presented below. See the link below for the latest Long island Sound Trawl Survey report.

Table 10. Long Island Trawl Survey Fall Smooth Dogfish indices (geometric mean catch/tow)

Year	Kg/tow	Count/tow
1996	1.16	0.80
1997	1.09	0.59
1998	1.32	0.72
1999	1.27	0.93
2000	2.85	1.88
2001	3.02	1.69
2002	6.09	3.58
2003	6.18	3.10
2004	2.95	1.44
2005	2.70	1.41
2006	2.46	0.94
2007	6.23	2.27
2008	1.25	0.63
2009	2.8	1.13
2010	-	-
2011	3.66	1.43
2012	4.69	2.41
2013	7.93	4.13
2014	11.05	5.78
2015	11.70	7.30
2016	8.30	5.24



## New York

While NY DEC does not currently conduct fishery-independent monitoring programs for Atlantic Coastal Sharks, a research permit was issued in 2015 and 2016 for the collection of information on sand tiger sharks (*Carcharias taurus*) and blue sharks (*Prionace glauca*). In 2015, 18 sand tiger sharks and two blue sharks were caught and released; in 2016, 23 sand tiger sharks, 1 smooth dogfish, 7 sandbar sharks, 1 shortfin mako, and 1 blue shark were caught and released. In both years, information on each (morphometrics and sex) as well location, date, biological samples collected, telemetry gear deployed, and final disposition of the animals were recorded.

## New Jersey

New Jersey does not currently conduct any fishery-independent monitoring programs specifically for Atlantic Coastal Sharks, but does receive sharks from the State's Ocean Stock Assessment Survey. In 2015, the Survey caught approximately 157lbs of Atlantic Angel Sharks, 59lbs of Atlantic Sharpnose Sharks, 24lbs of Dusky Sharks, 769lbs of Sand Tiger Sharks, 41lbs of Sandbar Sharks, 9,567lbs of Smooth Dogfish, and 451lbs of Thresher Sharks. In 2016, the Survey caught approximately 125lbs of Atlantic Angel shark, 8lbs of Atlantic Sharpnose, 2,015lbs of Sand Tiger, 4,097lbs of Smooth Dogfish, and 22lbs of Thresher. Sharks from the New Jersey Ocean Stock Assessment Survey have collected by a 30-meter otter trawl every January, April, June, August, and October since 1989. Tows are approximately 1 nautical mile and are performed via a stratified random sampling design. Latitudinal strata are identical to those used by the National Marine Fisheries Service groundfish survey. Longitudinal boundaries are defined by the 18-30, 30-60, and 60-90 foot isobaths. Smooth Dogfish are cumulatively weighed and measured by total length in centimeters. All other shark species are sorted by gender, weighed individually, and measured by total length in centimeters.

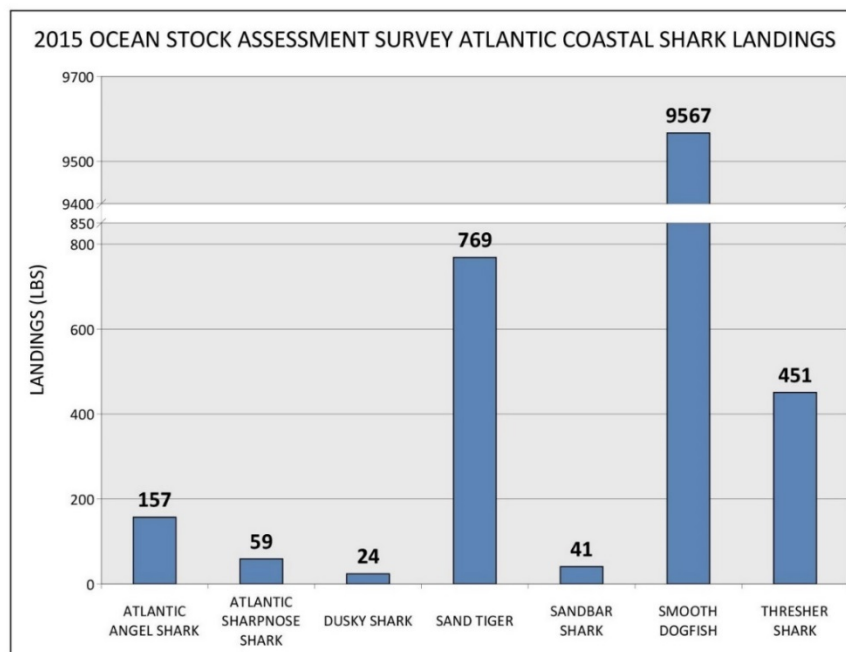


Figure 3. NJ 2015 Ocean Stock Assessment Survey- Atlantic Coastal Sharks

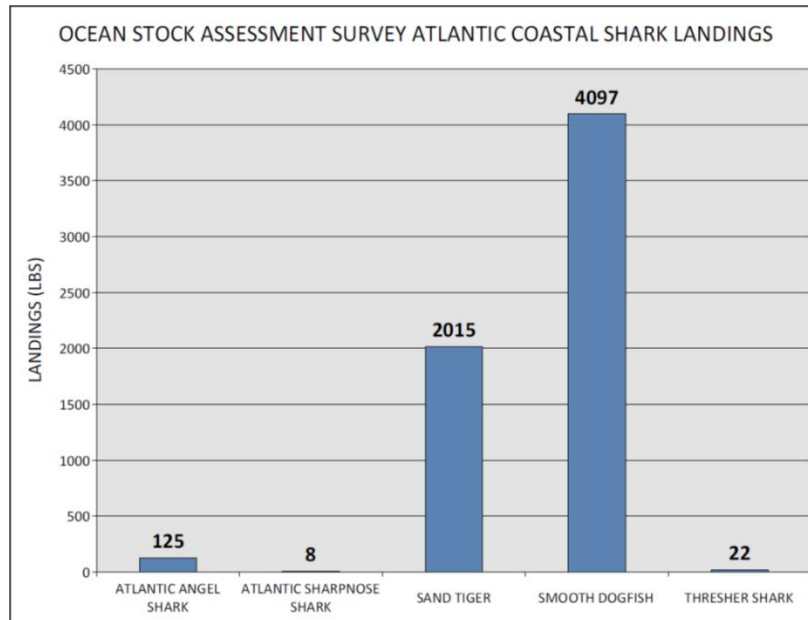


Figure 4. NJ 2016 Ocean Stock Assessment Survey- Atlantic Coastal Sharks

### *Delaware*

Delaware conducts a 30' adult trawl survey and a 16' juvenile trawl survey in the Delaware Bay. In the adult trawl survey, Smoothhound are the most common shark species caught (Figure 5), with Sand Tiger Shark (Figure 6) and Sandbar Sharks (Figure 7) taken in low numbers. Thresher, Atlantic Angel, Atlantic Sharpnose (Figure 8) and Dusky shark were caught in the past, but rarely. Sand Tiger Shark catch per nautical mile increased in 2016 and was the highest number taken since 1983. Sandbar Shark catch per nautical mile increased in 2016 but remained high for the recent time series. Smoothhound catch per nautical mile increased slightly in 2016. In the juvenile trawl, the species caught were sand tiger shark (Figure 9), Sandbar Sharks (Figure 10) and Smoothhound (Figure 11). With the exception of Smoothhound, the capture of coastal sharks in the juvenile trawl is a rare occurrence.

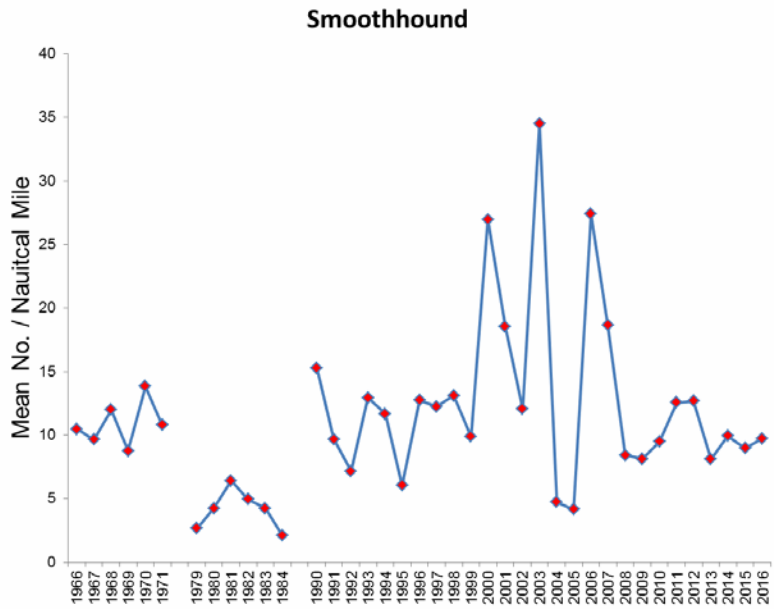


Figure 5. Smoothhound relative abundance (mean number per nautical mile), time series (1966 – 2016) as measured in 30-foot trawl sampling in the Delaware Bay.

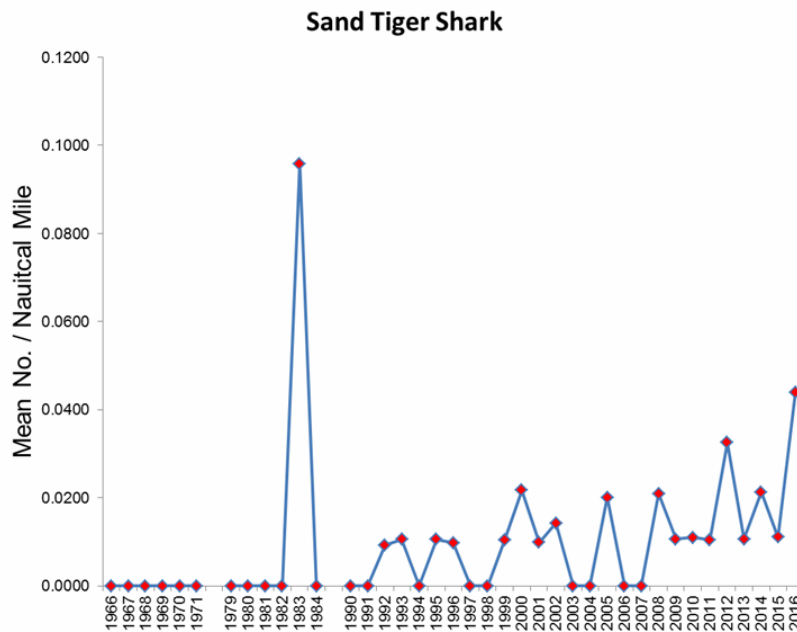


Figure 6. Sand Tiger Shark relative abundance (mean number per nautical mile), time series (1966 – 2016) as measured in 30-foot trawl sampling in the Delaware Bay.

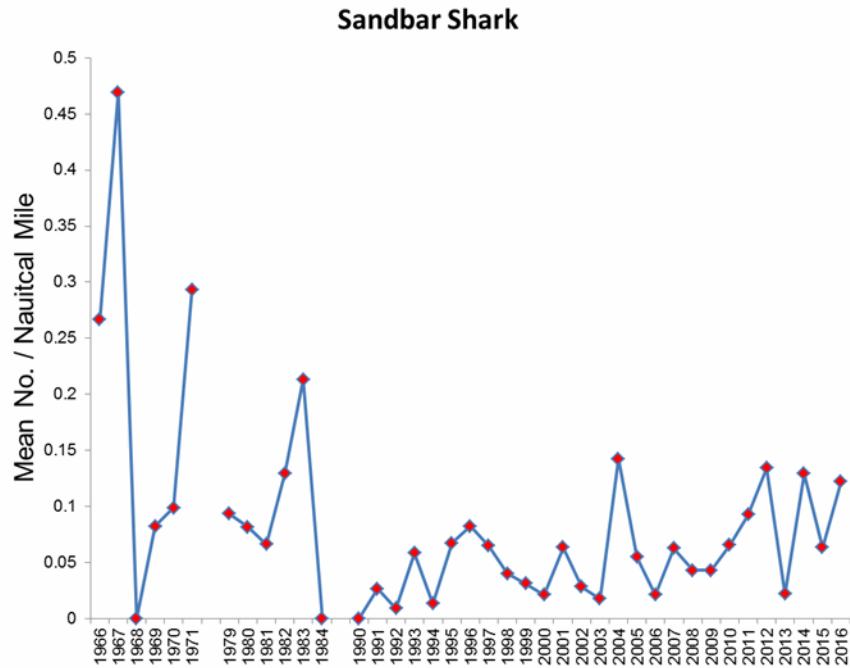


Figure 7. Sandbar Shark relative abundance (mean number per nautical mile), time series (1966 – 2016) as measured in 30-foot trawl sampling in the Delaware Bay.

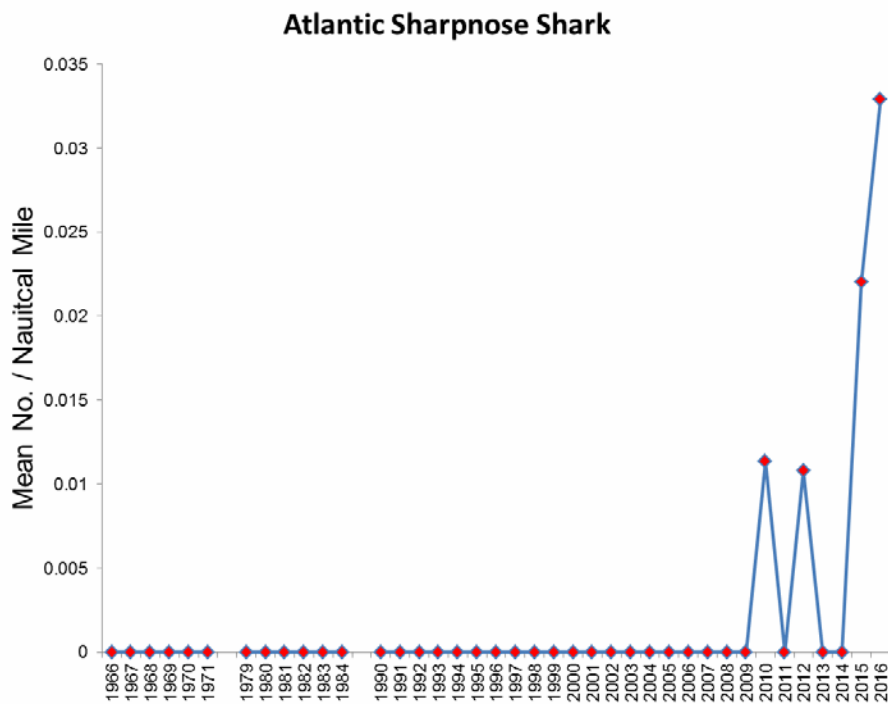


Figure 8. Atlantic Sharpnose Shark relative abundance (mean number per nautical mile), time series (1966 – 2016) as measured in 30-foot trawl sampling in the Delaware Bay.

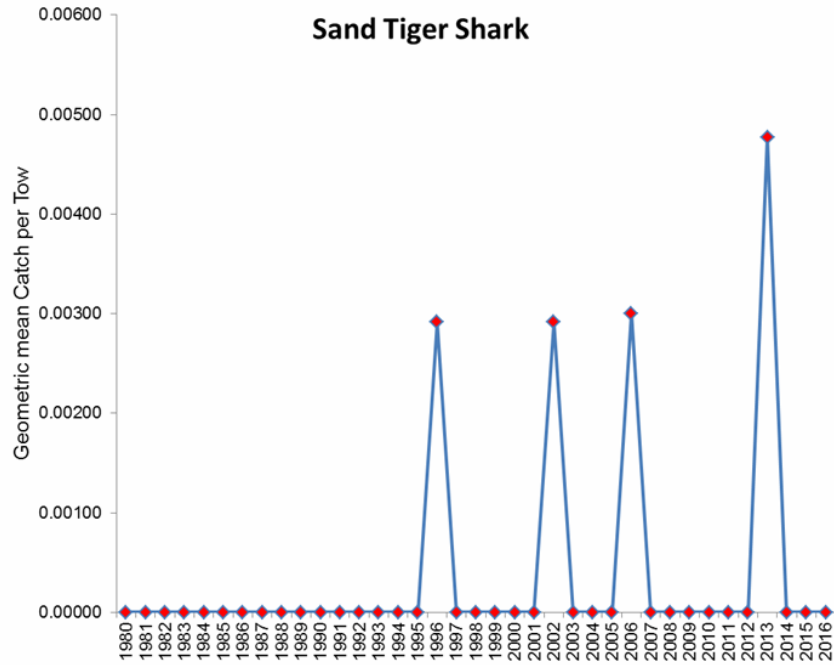


Figure 9. Index of Sand Tiger Shark, time series (1980 – 2016) as measured by 16-foot trawl sampling in the Delaware estuary.

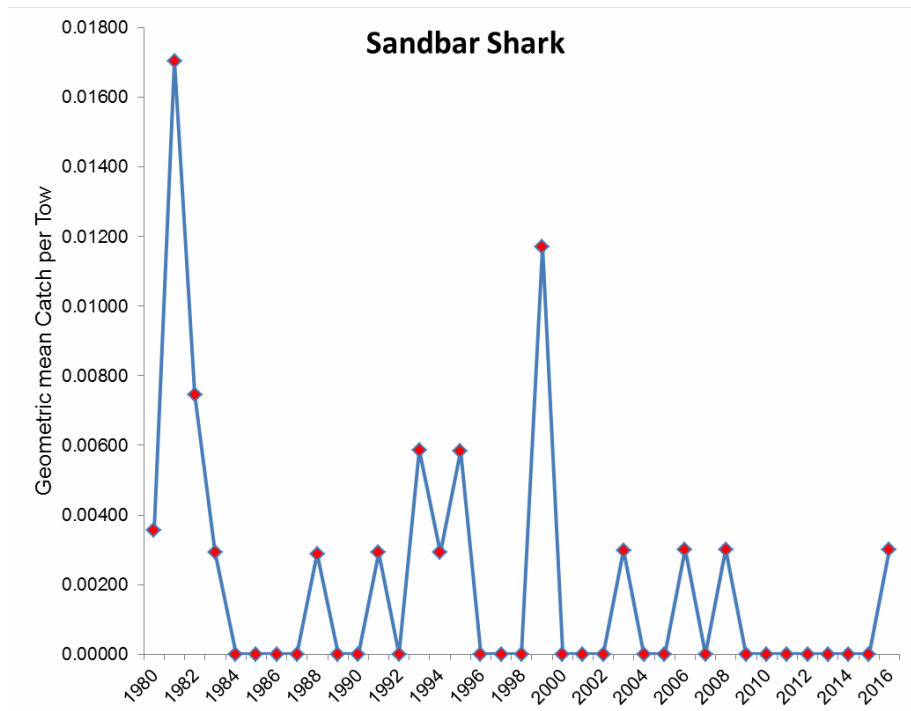


Figure 10. Index of Sandbar Shark, time series (1980 – 2016) as measured by 16-foot trawl sampling in the Delaware estuary.

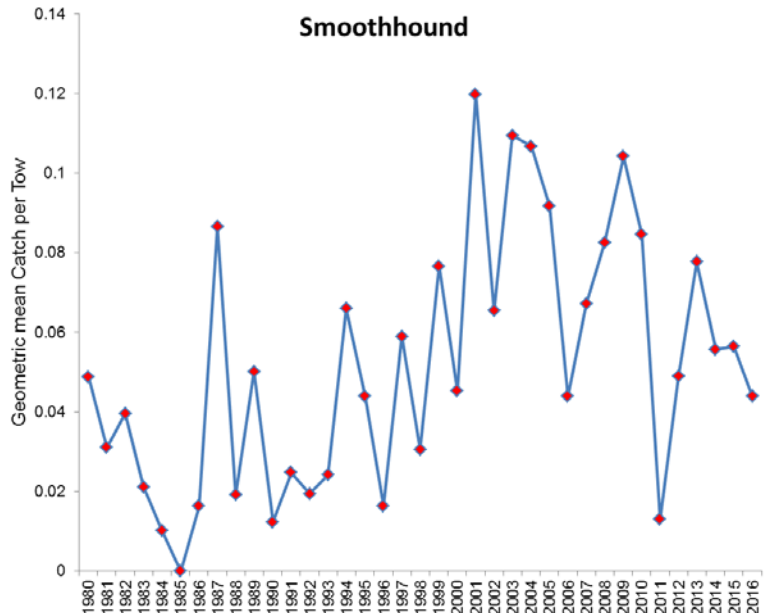


Figure 11. Index of young-of-the-year Smoothhound abundance, time series (1980 – 2016) as measured by 16-foot trawl sampling in the Delaware estuary.

### *Maryland*

There was no specific at sea sampling program for coastal sharks in Maryland. Limited biological sampling of catch onboard a commercial offshore trawler targeting horseshoe crabs occurred at night in June, July, August, and October. While sharks were encountered through a scientific permit, information regarding species and number encountered are confidential.

### *Virginia*

The Virginia Institute of Marine Science Shark Research Program began in 1973 and is one of the longest running longline surveys in the world. The program has provided data on habitat utilization, age, growth, reproduction, trophic interactions, basic demographics, and relative abundance for dominant shark species. Cruise times have been variable over the time series, but generally sampling has occurred monthly from May through October. The survey utilizes a fixed station design with nine core sampling locations, although additional auxiliary locations have been sampled frequently over the years.

Beginning in 2012 a separate longline survey, conducted by the Virginia Institute of Marine Science designed specifically to target YOY sandbar sharks in the lower Chesapeake Bay and Eastern Shore, was initiated. The new survey follows a stratified random sampling design, rather than a fixed survey design, and falls under the broader COASTSPAN umbrella survey.

*North Carolina*

The North Carolina Division of Marine Fisheries (NCDMF) conducts both fishery-dependent and independent sampling within state waters. Fishery-dependent sampling of North Carolina commercial fisheries has been ongoing since 1982 (conducted under Title III of the Interjurisdictional Fisheries Act and funded in part by the U.S. Department of Commerce, National Marine Fisheries Service). Predominate fisheries sampled included the ocean gill net, estuarine gill net, ocean trawl, long haul seine/swipe net, beach seine and pound net fisheries.

A total of 9 fishery-dependent samples containing sharks were collected from the ocean gill net, ocean trawl and estuarine gill net fisheries in 2016 (Table 11). This sample number is down compared to the 64 samples obtained in 2015, this is due in large part to a change in staff in the Manteo office, where most shark catches are landed. Whole weights and lengths for sharks other than spiny dogfish are rarely obtained during sampling. Sharks are typically dressed or processed when sampling occurs therefore the number of processed individuals and aggregate weights are obtained during sampling. Atlantic sharpnose and smoothhound sharks were the most abundant species in dependent sampling by numbers and weight (Table 12).

Table 11. North Carolina fishery-dependent shark sampling summary by month for the 2016 fishing year.

Month	# of Samples
January	2
February	1
March	1
April	1
May	3
June	0
July	0
August	0
September	0
October	0
November	0
December	0
Total	9



Table 12. North Carolina fishery-dependent shark sampling summary by species, number of individuals, and sum of sample weight (lb) for the 2015 fishing year.

Species	# Indv.	Sum of Sample Wgt. (lb)
Atlantic Sharpnose Shark ( <i>R. terraenovae</i> )	29	93
Smoothhound Shark ( <i>M. canis</i> )	41	230
Thresher Shark ( <i>A. vulpinus</i> )	30	502
Total	100	825

Fishery-Independent

The NCDMF initiated a fishery-independent red drum longline survey in 2007 for developing an index of abundance for adult red drum (*S. ocellatus*); this project also allows for capture and tagging of Atlantic coastal sharks in cooperation with the North East Fisheries Science Center’s (NEFSC) Cooperative Shark Tagging Program. The red drum longline survey in the Pamlico Sound resulted in a catch of 3 sharks in 2016. Two species of shark were captured; two blacktip (*C. limbatus*), and one bonnethead (*S. tiburo*). Only one (1) of the blacktip sharks was measured and tagged with M-tags from the NOAA Fisheries Cooperative Shark Tagging Program.

The NCDMF initiated a fishery-independent gill net survey in 2001 and expanded its coverage in 2008 to include the Cape Fear and New Rivers and the near shore (0-3 miles) Atlantic Ocean from New River Inlet south to the South Carolina state line. The Atlantic Ocean portion of the survey was discontinued in June of 2015 due to low catches of target species, none of which were sharks (see next paragraph). The objective of this project is to provide annual, independent, relative abundance indices for key estuarine species in the near shore Atlantic Ocean, Pamlico Sound, Pamlico, Pungo, Neuse, New, and Cape Fear Rivers. The survey employs a stratified random sampling design and utilizes multiple mesh gill nets (3.0 inch to 6.5 inch stretched mesh, by ½ inch increments). Sharks from the 2016 Pamlico Sound independent gill net survey catch included: two (2) smooth dogfish, one (1) Atlantic sharpnose, one (1) bonnethead, six (6) sandbar and 12 bull sharks [(*C. leucas*) Table 13]. Catch from the 2016 Cape Fear, New and Neuse River independent gill net survey catch included: 55 Atlantic sharpnose, and seven (7) bonnethead shark (Table 14).

Table 13. Species, number of individuals, minimum, maximum and average total length [TL (mm)] of sharks caught in the 2016 North Carolina Pamlico Sound gill net survey.

Species	Number Measured	Min of TL (mm)	Max of TL (mm)
Atlantic Sharpnose Shark	1	932	932
Bonnethead Shark	1	714	714
Bull Shark	12	665	1,288
Sandbar Shark	6	448	945
Smooth Dogfish	2	594	861
Total	22		

Table 14. Species, number of individuals, minimum, maximum, and average total length [TL (mm)] of sharks caught in the 2016 North Carolina Cape Fear, Neuse and New River gill net survey.

Species	Number Measured	Min of TL (mm)	Max of TL (mm)
Atlantic Sharpnose Shark	55	290	516
Bonnethead Shark	7	855	1,122
Total	62		

### *South Carolina*

Data related to the presence and movement of sharks in South Carolina’s coastal waters will continue to be collected as encountered within the context of existing fishery dependent or fishery independent programs conducted by the SCDNR. Currently, data are collected from estuarine waters by the SCDNR Cooperative Atlantic States Shark Pupping and Nursery Habitat survey (COASTSPAN) and the SCDNR trammel net survey. The COASTSPAN survey monitors the presence and abundance of young-of-year and juvenile sharks in the estuaries and bays of South Carolina. The survey operates from April-September using gillnets, longlines, and drumlines to sample index stations. Species captured are measured, sexed, tagged, released, and physical and water quality parameters are recorded (Table 14).

The SCDNR trammel net survey is designed to sample recreationally important species in shallow estuarine waters. Sharks are not a target species, but their abundance as well as length and sex data are recorded (Table 15). Stations selected based on suitable habitats are randomly sampled using a multi-panel gillnet to encircle a section of marsh. Species captured are

measured, sexed if possible, select species (no sharks) are tagged and released and physical and water quality data are recorded.

The presence and abundance of juvenile and adult coastal sharks in the bays, sounds and coastal waters of South Carolina are documented by the Adult Red Drum and Coastal Shark Longline survey. This survey uses a stratified-random approach to sample for adult red drum and coastal sharks. The survey operates annually from August to December using longlines to sample suitable habitat for targeted species. Species captured are measured, sexed, tagged and released, and physical and water quality parameters are recorded. Species encountered and tagged for all surveys are reported in Table 15. The data gathered from these programs are shared with the NMFS apex predators program and are utilized in stock assessments and management decisions in South Carolina.

Table 15. Number of sharks captured by South Carolina Department of Natural Resources' Cooperative Atlantic States Shark Pupping and Nursery Habitat Survey (COASTSPAN), the Trammel Net Survey, and Adult Red Drum and Coastal Sharks Longline survey in 2016

Shark Species	COASTSPAN		Trammel Net		Adult Red Drum and Coastal Sharks	
	Captured	Tagged	Captured	Tagged	Captured	Tagged
Atlantic Sharpnose	241	0	188	0	909	0
Blacknose	10	8	0	0	107	103
Blacktip	139	97	20	0	55	46
Bonnethead	144	113	242	0	14	14
Bull	17	16	0	0	7	4
Finetooth	454	271	124	0	69	59
Great Hammerhead	1	1	0	0	1	0
Lemon	17	15	4	0	1	1
Nurse	-	0	0	0	6	0
Sandbar	141	127	1	0	106	94
Sand Tiger	8	8	0	0	0	0
Scalloped Hammerhead	67	2	0	0	3	0
Smooth Dogfish	1	1	0	0	0	0
Spinner	1	0	0	0	26	24
Tiger	15	13	0	0	5	4
Total	1256	672	579	0	1309	349

## Georgia

Although a directed fishery for sharks does not exist in Georgia waters, there are a several fishery dependent sampling surveys conducted by the Coastal Resources Division that could result in the incidental capture of coastal sharks. In 2016, coastal sharks were found in the following fishery independent surveys.

Sampling for the *Adult Red Drum Survey (via SEAMAP)* Sampling occurs in inshore and nearshore waters of southeast Georgia and in offshore waters of northeast Florida. Sampling occurs from mid-May through the end of December. Sampling gear consists of a bottom set 926m, 600lb test monofilament mainline configured with 60, 0.5 m gangions made of 200lb test monofilament. Each gangion consists of a longline snap and a 15/0 circle hook. Thirty hooks of each size are deployed during each set. All hooks are baited with squid or mullet. Soak time for each set is 30 minutes. During 2016, CRD staff deployed 175 sets consisting of 10,500 hooks and 87.5 hours of soak time. A total of 825 sharks, representing 9 species were captured (Table 16).

Sampling for the *Shark Nursery Survey (via COASTSPAN)* The University of North Florida assumed field operations for this survey in 2016. Data for the complete time series are maintained by the National Marine Fisheries Service's Apex Predator Program in Narragansett, RI (contact: Cami McCandless).

Each month the *Ecological Monitoring Trawl Survey (EMTS)*, a 40-foot flat otter trawl with neither a turtle excluder device nor bycatch reduction device is deployed at up to 42 stations across six estuaries. At each station, a standard 15 minute tow is made. During this report period, 482 tows/observations were conducted, totaling 120.41 hours of tow time. A total of 247 sharks, representing 5 species, were captured during 2016 (Table 16).

Monitoring of estuarine finfish and crustaceans in the lower salinity, upriver sectors of selected estuaries is done monthly as part of the *Juvenile Trawl Survey* conducted onboard the research vessel *Navigator*. A 20-foot, semi-balloon otter trawl is towed for 5 minutes at up to 18 stations within three Georgia estuaries. In 2016, 130 tows (observations) were conducted, totaling 10.75 hours of tow time. No sharks were observed during the 2016 season.

The Marine Sportfish Population Health Survey (MSPHS) is a multi-faceted ongoing survey used to collect information on the biology and population dynamics of recreationally important finfish. Currently two Georgia estuaries are sampled on a seasonal basis using entanglement gear. During the June to August period, young-of-the-year red drum in the Altamaha/Hampton River and Wassaw estuaries are collected using gillnets to gather data on relative abundance and location of occurrence. During the September to November period, fish populations in the Altamaha/Hampton River and Wassaw estuaries are monitored using monofilament trammel nets to gather data on relative abundance and size composition. In 2016, a total of 216 gillnet and 150 trammel net sets were made, resulting in the capture of 119 individuals representing five species of coastal sharks (Table 16).

Table 16. Numbers of coastal sharks captured in Georgia fishery independent surveys in 2016 by species and by survey.

	SEAMAP	EMTS	MSPHS
Atlantic sharpnose shark	539	188	21
Blacknose shark	180	---	---
Bonnethead	44	54	82
Blacktip shark	11	2	5
Sandbar shark	22	---	---
Tiger shark	4	---	---
Spinner shark	2	---	---
Scalloped Hammerhead	6	2	---
Lemon shark	---	---	3
Finetooth shark	17	1	8
All Species Combined	825	247	119

## V. Status of Management Measures and Issues

### *Fishery Management Plan*

Coastal Sharks are managed under the Interstate FMP for Coastal Sharks, which was implemented in August 2008, Addendum I (2009), Addendum II (2013), and Addendum III (2013). 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). In 2016, Smooth dogfish was added to NOAA Fisheries’ Atlantic Highly Migratory Species FMP through Amendment 9; as part of the Amendment, a new requirement that smooth dogfish harvest need to make up at least 25% of the retained catch in order for fishermen to be able to remove their fins at sea. The Commission later in the year approved Addendum IV (2016) to maintain consistency between state and federal FMP.

ASMFC will continue to respond to changes in the Atlantic Highly Migratory Species FMP and make changes as necessary to the interstate FMP.

## VI. Implementation of FMP Compliance Requirements for 2015 and 2016

Addendum III to the Coastal Sharks FMP was implemented in March 2014. All states must demonstrate through the inclusion of regulatory language that the following management measures were implemented.

### *i. Recreational Minimum Size Limits*

*This modifies Section 4.2.4 Recreational Minimum Size Limits in the FMP.*

Sharks caught in the recreational fishery must have a minimum fork length of 4.5 feet (54 inches) with the exception of smooth hammerhead, scalloped hammerhead, great hammerhead, smoothhound, Atlantic sharpnose, blacknose, finetooth, and bonnethead.

Smooth hammerhead, scalloped hammerhead and great hammerhead must have a minimum fork length of 6.5 feet (78 inches).

Smoothhound, Atlantic sharpnose, blacknose, finetooth and bonnethead do not have recreational minimum size limits.

**Table 4.4. Recreational minimum size limits, 2015 and 2016.**

No Minimum Size	Minimum Fork Length of 4.5 Feet		Minimum Fork Length of 6.5 Feet
Smoothhound	Tiger	Shortfin mako*	Scalloped hammerhead Smooth hammerhead Great hammerhead
Atlantic sharpnose	Blacktip	Porbeagle	
Finetooth	Spinner	Thresher	
Blacknose	Bull	Oceanic whitetip	
Bonnethead	Lemon	Blue	
	Nurse		

**\*Per emergency rule measures implemented in March 2018 in response to the 2017 Assessment, minimum size limit (fork length) for Shortfin makos is now 83 inches or 6.9 feet**

***ii. Commercial Species Groupings***

*This modifies Section 4.3.3 Commercial Species Groupings (and the appropriate sub-sections, outlined below). Two new species groups ('Blacknose' and 'Hammerhead') are created.*

This FMP establishes eight commercial 'species groups' for management (Table 1): Prohibited, Research, Smoothhound, Non-Blacknose Small Coastal, Blacknose, Aggregated Large Coastal, Hammerhead and Pelagic. These groupings apply to all commercial shark fisheries in state waters.

**VII. PRT Recommendations**

*State Compliance*

All states with a declared interest in the management of sharks have submit compliance reports and have regulations in place that meet or exceed the requirements of the Interstate Fisheries Management Plan for Coastal Sharks and associated addenda.

*De Minimis Status*

This FMP does not establish specific *de minimis* guidelines that would exempt a state from

regulatory requirements contained in this plan. *De minimis* shall be determined on a case-by case basis. *De minimis* often exempts states from monitoring requirements in other fisheries but this plan does not contain any monitoring requirements.

*De minimis* guidelines are established in other fisheries when implementation and enforcement of a regulation is deemed unnecessary for attainment of the fishery management plan's objectives and conservation of the resource. Due to the unique characteristics of the coastal shark fishery, namely the large size of sharks compared to relatively small quotas, the taking of a single shark could contribute to overfishing of a shark species or group. Therefore, exempting a state from any of the regulatory requirements contained in this plan could threaten attainment of this plans' goals and objectives.

States that have been granted *de minimis* status are Maine and Massachusetts. New Hampshire has renounced management interest and is therefore no longer a member of the coastal shark management board. These states do not land sharks in any significant quantity and very few of the species managed by this plan are ever encountered in their state waters. These states can continue to have *de minimis* status until their landings patterns change or they request a discontinuation.

In some cases, it is unnecessary for states with *de minimus* status to implement all regulatory requirements in the FMP.

- A. Massachusetts has implemented all regulations with two exceptions, it is exempt from the possession limit and closures of the aggregated large coastal and hammerhead shark fisheries.
- B. Maine has implemented the following regulations to comply with the goals and objectives of the FMP:
  - Require federal dealer permits for all dealers purchasing a permitted species
  - Prohibit the take or landings of prohibited species
  - Close the fishery for porbeagle sharks when the NMFS quota has been harvested
  - Prohibit the commercial harvest of porbeagle sharks in state waters
  - Require that head, fins and tails remain attached to the carcass of all shark species, except smoothhound, through landing

## **Research Priorities**

### *Species-Specific 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.<sup>1</sup>

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<sup>1</sup> 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. See Andrews *et al.* 2011.



- Determine what is missing in terms of experimental design or/and data analysis to arrive at incontrovertible conclusions on the reproductive periodicity of sandbar sharks
- Continue work on reconstruction of historical catches of sandbar sharks, especially catches outside of the US EEZ
- Investigate the length composition of the F3 Recreational and Mexican fisheries for sandbar sharks more in depth as this fishery is estimated to have a large impact on the stock mainly due to selecting age-0 fish.
- Research to estimate the degree of connectivity between the portions of the sandbar stock within the US and outside of the US EEZ. •
- Study the distribution and movements of the sandbar stock relative to sampling coverage. It is possible that none of the indices alone track stock-wide abundance trends.
- 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.

#### *General Priorities*

- Generally update age and growth and reproductive studies for all species currently assessed, especially for studies with low sample sizes or over 20 years old.
- Determine gear-specific post-release mortality estimates for all species currently assessed
- Determine life history information for data-poor species that are currently not assessed
- Examine female sharks during the pupping periods to determine the proportion of reproductive females. Efforts should be made to develop non-lethal methods of determining pregnancy status
- Expand or develop monitoring programs to collect appropriate length and age samples from the catches in the commercial sector by gear type, from catches in the recreational sector, and from catches taken in research surveys to provide reliable length and age compositions for stock assessment
- Continue investigations into stock structure of coastal sharks using genetic, conventional and electronic tags to determine appropriate management units
- Evaluate to what extent the different CPUE indices track population abundance (e.g., through power analysis)
- Explore modeling approaches that do not require an assumption that the population is at virgin level at some point in time.
- Increase funding to allow hiring of additional HMS stock assessment scientists. There are currently inadequate staff to conduct stock assessments on more than one or two stocks/species per year.

## References

Andrews et al. 2011. Bomb radiocarbon and tag-recapture dating of sandbar shark (*Carcharhinus plumbeus*). Fisheries Bulletin. 109: 454-465.

Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species. 2014. NOAA Fisheries, December 18, 2015.

< [http://www.nmfs.noaa.gov/sfa/hms/hmsdocument\\_files/SAFEreports.htm](http://www.nmfs.noaa.gov/sfa/hms/hmsdocument_files/SAFEreports.htm)>

## **APPENDIX 1. OVERVIEW OF COASTAL SHARK REGULATIONS**

### *Coastal Sharks FMP Regulatory Requirements*

1. Recreational seasonal closure (Section 4.2.1)
  - a. Recreational anglers are prohibited from possessing silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead in the state waters of Virginia, Maryland, Delaware and New Jersey from May 15 through July 15—regardless of where the shark was caught.
  - b. Recreational fishermen who catch any of these species in federal waters may not transport them through the state waters of VA, MD, DE, and NJ during the seasonal closure.
2. Recreationally permitted species (Section 4.2.2)
  - a. Recreational anglers are allowed to possess aggregated large coastal sharks, hammerheads, tiger sharks, SCS, and pelagic sharks. Authorized shark species include: aggregated LCS (blacktip, bull, spinner, lemon, and nurse); hammerhead (great hammerhead, smooth hammerhead, scalloped hammerhead); tiger sharks; SCS (blacknose, finetooth, Atlantic sharpnose, and bonnethead sharks); and, pelagic sharks (blue, shortfin mako, common thresher, oceanic whitetip, and porbeagle). Sandbar sharks and silky sharks (and all prohibited species of sharks) are not authorized for harvest by recreational anglers.
3. Landings Requirements (Section 4.2.3)
  - a. All sharks (with exception) caught by recreational fishermen must have heads, tails, and fins attached naturally to the carcass. Anglers may still gut and bleed the carcass by making an incision at the base of the caudal peduncle as long as the tail is not removed. Filleting sharks at sea is prohibited.
  - b. All sharks (with exception) harvested by commercial fishermen within state boundaries must have the tails and fins attached naturally to the carcass through landing. Fins may be cut as long as they remain attached to the carcass (by natural means) with at least a small portion of uncut skin. Sharks may be eviscerated and have the heads removed. Sharks may not be filleted or cut into pieces at sea.
  - c. Exception: Fishermen holding a valid state commercial permit may process smooth dogfish sharks at sea out to 50 miles from shore, as long as the total weight of smooth dogfish shark fins landed or found on board a vessel does not exceed 12 percent of the total weight of smooth dogfish shark carcasses landed or found on board.
4. Recreational Minimum Size Limits (Section 4.2.4)
  - a. Sharks caught in the recreational fishery must have a fork length of at least 4.5 feet with the exception of Atlantic sharpnose, blacknose, finetooth, bonnethead

and smoothhound which have no minimum size. Hammerhead species must have a fork length of 6.5 feet.

5. Authorized Recreational Gear (Section 4.2.5)
  - a. Recreational anglers may catch sharks only using a handline or rod & reel. Handlines are defined as a mainline to which no more than two gangions or hooks are attached. A handline must be retrieved by hand, not by mechanical means.
6. Possession limits in one twenty-four hour period (Section 4.2.7 and 4.3.6)
  - a. Recreational and commercial possession limits as specified in Table 9.
  - b. Smooth dogfish harvest is not limited in state waters and recreational shore-anglers may harvest an unlimited amount of smooth dogfish.
7. Commercial Seasonal Closure (Section 4.3.2)
  - a. All commercial fishermen are prohibited from possessing silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead in the state waters of Virginia, Maryland, Delaware and New Jersey from May 15 through July 15. Fishermen who catch any of the above species in a legal manner in federal waters may transit through the state waters listed above is allowed if all gear is stowed.
8. Quota Specification (Section 4.3.4)
  - a. When NOAA Fisheries closes the fishery for any species, the commercial landing, harvest, and possession of that species will be prohibited in state waters until NOAA Fisheries reopens the fishery.
9. Permit requirements (Section 4.3.8)
  - a. State: Commercial shark fishermen must hold a state commercial license or permit in order to commercially catch and sell sharks in state waters.
  - b. Federal: A federal Commercial Shark Dealer Permit is required to buy and sell any shark caught in state waters.
  - c. Display and research permit is required to be exempt from seasonal closure, quota, possession limit, size limit, gear restrictions, and prohibited species restrictions. States are required to include annual information for all sharks taken for display throughout the life of the shark.
10. Authorized commercial gear (Section 4.3.8.3)
  - a. Commercial fishermen can only use one of the following gear types (and are prohibited from using any gear type not listed below) to catch sharks in state waters.

- i. **Rod & reel**

- ii. **Handlines.** Handlines are defined as a mainline to which no more than two gangions or hooks are attached. A handline is retrieved by hand, not by mechanical means, and must be attached to, or in contact with, a vessel.
- iii. **Small Mesh Gillnets.** Defined as having a stretch mesh size smaller than 5 inches.
- iv. **Large Mesh Gillnets.** Defined as having a stretch mesh size equal to or greater than 5 inches.
- v. **Trawl nets.**
- vi. **Shortlines.** Shortlines are defined as fishing lines containing 50 or fewer hooks and measuring less than 500 yards in length. A maximum of 2 shortlines are allowed per vessel.
- vii. **Pounds nets/fish traps.**
- viii. **Weirs.**

11. Bycatch Reduction Measures (Section 4.3.10)

- a. Any vessel using a shortline must use corrodible circle hooks. All shortline vessels must practice the protocols and possess the recently updated federally required release equipment for pelagic and bottom longlines for the safe handling, release, and disentanglement of sea turtles and other non-target species; all captains and vessel owners must be certified in using handling and release equipment.

12. Smooth Dogfish

- a. Each state must identify their percentage of the overall quota (Addendum II, 3.1)
- b. Smooth dogfish must make up at least 25%, by weight, of total catch on board at time of landing. Trips that do not meet the 25% catch composition requirement can land smooth dogfish, but fins must remain naturally attached to the carcass. (Addendum IV, 3.0; modifies Addendum II Section 3.5)

**Table 10. Possession/retention limits for shark species in state waters**

<b>Recreational</b>	<i>Shore-angler</i>	1 shark (of any species except prohibited) per person per day; plus one Atlantic sharpnose, bonnethead and smoothhound
	<i>Vessel-fishing</i>	1 shark (of any species except prohibited) per vessel per trip; plus one Atlantic sharpnose, bonnethead and smoothhound per person, per vessel
<b>Commercial</b>	<i>Directed permit</i>	Variable possession limit for aggregated large coastal sharks and hammerhead shark management groups, the Commission will follow NMFS for in-season changes to the possession limit. The possession limit range is 0-55, the default is 45 sharks per trip. No limit for SCS or pelagic sharks.
	<i>Incidental permit</i>	3 aggregated LCS per vessel per trip, 16 pelagic or SCS (combined) per vessel per trip