NOAA FISHERIES

2020 Stock Assessment and Fishery Evaluation Report

ATLANTIC HIGHLY MIGRATORY SPECIES

MARCH 2021

U.S. Department of Commerce | National Oceanic and Atmospheric Administration | National Marine Fisheries Service

For HMS Permitting Information and Regulations

- HMS recreational fishermen, commercial fishermen, and dealer compliance guides: www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-hms-fishery-compliance-guides
- Regulatory updates for tunas: hmspermits.noaa.gov

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Southeast Regional Office	Commercial Caribbean Small Boat, Smoothhound Shark	(727) 824-5326 www.fisheries.noaa.gov/southeast/resources-fishing/southeast-fisheries-permits
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Southeast Regional Office	Atlantic Shark Dealer and Atlantic Swordfish Dealer	(727) 824-5326 www.fisheries.noaa.gov/southeast/resources-fishing/southeast-fisheries-permits

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- Safety alerts, news bulletins and regulatory information: mariners.coastguard.blog

For Copies of HMS SAFE Reports

- 2014–present: www.fisheries.noaa.gov/content/atlantic-hms-stock-assessment-and-fisheries-evaluation-reports
- 2000–2013: Send email to: nmfs.sf.webmaster@noaa.gov

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List of Commonly Used Acronyms

Acronym	Definition
1999 FMP	1999 Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan
ABC	Acceptable Biological Catch
ACL	Annual catch limit
APAIS	Access Point Angler Intercept Survey
ASMFC	Atlantic States Marine Fisheries Commission
ATCA	Atlantic Tunas Convention Act
ATR	Atlantic Tournament Registration and Reporting
B	Biomass
BAYS	Bigeye, northern albacore, yellowfin, and skipjack tunas
BFT	Bluefin tuna
BiOp	Biological opinion
B_{MSST}	Biomass of the minimum stock size threshold
B_{MSY}	Stock biomass needed for maximum sustainable yield
B_{OY}	Stock biomass needed for optimum yield
CFL	Curved fork length
CFR	Code of Federal Regulations
CITES	Convention on International Trade in Endangered Species of Wild Fauna, Flora
COASTSPAN	Cooperative Atlantic States Shark Pupping and Nursery survey
CPUE	Catch per unit effort
DPS	Distinct population segment
dw	Dressed weight
eBCD	Electronic international bluefin tuna catch documentation system
eBFT	Electronic bluefin tuna dealer landings database
eDealer	Electronic dealer reporting program
EEZ	Exclusive Economic Zone
EFH	Essential fish habitat
EFP	Exempted fishing permit
ESA	Endangered Species Act
F	Fishing mortality
FES	Fishing Effort Survey
FHS	For-Hire Survey
FL	Fork length
FMP	Fishery management plan
F_{MSY}	Instantaneous fishing mortality rate expected to yield max sustainable yield

Acronym	Definition
F_{OY}	Fishing mortality rate expected to yield optimum yield
FR	Federal Register
GARFO	Greater Atlantic Regional Fisheries Office
GOM	Gulf of Mexico
GULFSPAN	Cooperative Gulf of Mexico States Shark Pupping and Nursery survey
GRA	Gear restricted area
HAPC	Habitat Areas of Particular Concern
HMS	Highly migratory species
HTS	Harmonized Tariff Schedule
IBQ	Individual bluefin [tuna] quota
ICCAT	International Commission for the Conservation of Atlantic Tunas
ITP	International Trade Program
ITS	Incidental Take Statement
LCS	Large coastal sharks
LJFL	Lower-jaw fork length
LPS	Large Pelagics Survey
MAB	Mid-Atlantic Bight area
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MMPA	Marine Mammal Protection Act
MRIP	Marine Recreational Information Program
MSST	Minimum stock size threshold
MSY	Maximum sustainable yield
mt	Metric tons
NCA	North Central Atlantic area
NED	Northeast Distant Waters
nmi	Nautical mile
NOAA	National Oceanographic and Atmospheric Administration
OY	Optimum yield
PLL	Pelagic longline
PLTRP	Pelagic Longline Take Reduction Plan
RPMs	Reasonable and prudent measures
SAB	South Atlantic Bight area
SAFE	Stock assessment and fishery evaluation
SAFIS	Standard Atlantic Fisheries Information System
SCRS	Standing Committee on Research and Statistics
SCS	Small coastal sharks

Acronym	Definition
SDC	Status Determination Criteria
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SSB	Spawning stock biomass
SSF	Spawning stock fecundity
TAC	Total allowable catch
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VMS	Vessel monitoring system
ww	Whole weight

Executive Summary

This 2020 Stock Assessment and Fisheries Evaluation (SAFE) Report is produced by the NOAA Fisheries Atlantic Highly Migratory Species (HMS) Management Division. It contains a review of the current status of Atlantic HMS stocks and describes the year's accomplishments in managing these tunas, swordfish, billfishes, and sharks. Atlantic HMS SAFE Reports provide the public with information on the latest developments in Atlantic HMS management and fulfill Magnuson-Stevens Fishery Conservation and Management Act requirements.

Since the 2019 SAFE Report was issued, the Atlantic HMS Management Division accomplished the key actions listed below. The referenced amendments are to the 2006 Consolidated Atlantic HMS Fishery Management Plan (FMP).

- Held three virtual Atlantic HMS Advisory Panel meetings.
- Published a final rule that adjusted regulatory measures that manage incidental catch of Atlantic bluefin tuna in the pelagic longline fishery (the "GRA-Weak Hook Rule").
- Published a proposed rule to adjust the current regulations for North Atlantic swordfish and shark retention limits for certain permit holders in U.S. Atlantic and Caribbean waters.
- Published a Notice of Availability for Draft Amendment 12 to the 2006 Consolidated Atlantic HMS FMP, related to 2016 revisions to the National Standards 1, 3, and 7 Guidelines and other national NOAA Fisheries policy directives.
- Published a Notice of Availability for Draft Amendment 14 to the 2006 Consolidated Atlantic HMS FMP, which relates to implementation of updated 2016 National Standard 1 Guidelines as they relate to catch limits for sharks.
- Published a temporary rule prohibiting the retention of Atlantic blue marlin, white marlin, and roundscale spearfish in the Atlantic HMS recreational fisheries, given catch levels and applicable limits.
- Published rules adjusting the U.S. Atlantic bluefin tuna, northern albacore, and swordfish quotas and establishing quotas, opening dates, and retention limits for all 2021 Atlantic shark fisheries.
- Took responsive management action through 20 inseason actions for Atlantic HMS, particularly for Atlantic bluefin tuna, swordfish, and large coastal and hammerhead shark fisheries.

The International Commission for the Conservation of Atlantic Tunas (ICCAT) held virtual negotiations in place of their 27th Regular Meeting previously scheduled to take place on November 23-30, 2020 in Antalya, Turkey, given concerns and travel restrictions related to the ongoing pandemic. The goals for the United States in these negotiations were focused primarily on adoption of critical conservation measures for priority stocks while maintaining access to ICCAT-managed fisheries for U.S. recreational and commercial fishermen. The U.S. delegation developed recommendations aimed at promoting the conservation, management, and rebuilding of Atlantic HMS stocks, including those important to U.S. interests. During the correspondence process, the United States advocated for needed conservation and management measures for bluefin tuna, albacore, bigeye tuna and other tropical tunas, and shortfin mako sharks.

The ICCAT Standing Committee on Research and Statistics (SCRS) completed stock assessments in 2020 for Atlantic albacore, bluefin tuna, and porbeagle shark. One stock assessment was completed in 2020 through the Southeast Data, Assessment, and Review (SEDAR) process for Atlantic blacktip shark (SEDAR 65). NOAA Fisheries partners continued research on shark nursery grounds and studies on essential fish habitat along the U.S. Atlantic, Gulf of Mexico, and Caribbean through the Cooperative Atlantic States Shark Pupping and Nursery and Gulf of Mexico Shark Pupping and Nursery surveys.

Much of the information in this report is based on final reports of 2019 data that were completed or published in

2020. Domestic fishery landings and bycatch data are obtained from the U.S. Annual Report to ICCAT, Fisheries of the United States 2020, and directly from NOAA Fisheries program databases. These include commercial landings from the HMS and coastal fisheries vessel logbook programs, Pelagic Longline, Northeast Fisheries, and Southeast Gillnet and Bottom Longline Observer Programs, the electronic dealer reporting program (known as eDealer), the vessel online catch reporting system at hmspermits.noaa.gov, and the Standard Atlantic Fisheries Information System. Recreational landings come from the Marine Recreational Information Program (MRIP), the Large Pelagics Survey (LPS), the Recreational Billfish Survey, North Carolina and Maryland recreational tagging programs, and the HMS recreational reporting program. In 2017, the Recreational Billfish Survey was combined with the HMS tournament database registry and was renamed the Atlantic Tournament Registration and Reporting system.

International landings data are taken from the ICCAT SCRS' annual report. International trade data are acquired from the National Seafood Inspection Laboratory's Bluefin Tuna Catch Documentation and Swordfish Statistical Document programs, the U.S. Census Bureau, and U.S. Customs and Border Protection.

NOAA Fisheries permit information is collected from several databases: the Office of Science and Technology's International Fisheries Trade Permit (IFTP) database, the permit databases managed by the Greater Atlantic Regional Fisheries Office (GARFO) and Southeast Regional Office (SERO), the HMS dealer permits database, the HMS-managed database containing permit information for exempted fishing, display, and scientific research, and the Atlantic HMS Tournament Registration and Reporting system.

Some of the resources and references used for this report can be found at www.fisheries.noaa.gov. Feedback and comments on this SAFE Report are encouraged and should be sent to:

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1 Introduction

1.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) is the primary federal legislation governing the management of marine fisheries of the United States. The guidelines for National Standard 2 of the Magnuson-Stevens Act (50 CFR 600.315) require NOAA Fisheries to prepare a Stock Assessment and Fishery Evaluation (SAFE) Report (as specified at 50 CFR 600.315(d)), or similar document. NOAA Fisheries is also required to summarize, on a periodic basis, the best scientific information available concerning the condition of the stocks, essential fish habitat (EFH), marine ecosystems, and fisheries being managed under federal regulation. SAFE Reports are updated or supplemented as necessary when new information is available to inform management decisions.

This document constitutes the 2020 SAFE Report for the Atlantic highly migratory species (HMS) (Table 1.1) managed under the 2006 Consolidated Atlantic HMS Fishery Management Plan (FMP) and subsequent amendments.

Table 1.1 Species Managed under the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan and Amendments

Common Name	Scientific Name
Skipjack tuna	*Katsuwonus pelamis*
Albacore tuna	*Thunnus alalunga*
Yellowfin tuna	*Thunnus albacares*
Bigeye tuna	*Thunnus obesus*
Bluefin tuna	*Thunnus thynnus*
Swordfish	*Xiphias gladius*
Sailfish	*Istiophorus platypterus*
White marlin	*Kajikia albida*
Blue marlin	*Makaira nigricans*
Roundscale spearfish	*Tetrapturus georgii*
Longbill spearfish	*Tetrapturus pfluegeri*
Bigeye thresher shark	*Alopias superciliosus*
Thresher shark	*Alopias vulpinus*
Blacknose shark	*Carcharhinus acronotus*
Bignose shark	*Carcharhinus altimus*
Narrowtooth shark	*Carcharhinus brachyurus*
Spinner shark	*Carcharhinus brevipinna*
Silky shark	*Carcharhinus falciformis*
Galapagos shark	*Carcharhinus galapagensis*
Finetooth shark	*Carcharhinus isodon*
Bull shark	*Carcharhinus leucas*

Common Name	Scientific Name
Blacktip shark	*Carcharhinus limbatus*
Oceanic whitetip shark	*Carcharhinus longimanus*
Dusky shark	*Carcharhinus obscurus*
Caribbean reef shark	*Carcharhinus perezii*
Sandbar shark	*Carcharhinus plumbeus*
Smalltail shark	*Carcharhinus porosus*
Night shark	*Carcharhinus signatus*
Sand tiger	*Carcharias taurus*
White shark	*Carcharodon carcharias*
Basking shark	*Cetorhinus maximus*
Tiger shark	*Galeocerdo cuvier*
Nurse shark	*Ginglymostoma cirratum*
Sevengill shark	*Heptranchias perlo*
Sixgill shark	*Hexanchus griseus*
Bigeye sixgill shark	*Hexanchus nakamurai*
Shortfin mako	*Isurus oxyrinchus*
Longfin mako	*Isurus paucus*
Porbeagle	*Lamna nasus*
Smooth dogfish	*Mustelus canis*
Florida smoothhound	*Mustelus norrisi*
Gulf smoothhound	*Mustelus sinusmexicanus*
Lemon shark	*Negaprion brevirostris*
Bigeye sand tiger	*Odontaspis noronhai*
Blue shark	*Prionace glauca*
Whale shark	*Rhincodon typus*
Caribbean sharpnose shark	*Rhizoprionodon porosus*
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*
Scalloped hammerhead	*Sphyrna lewini*
Great hammerhead	*Sphyrna mokarran*
Bonnethead	*Sphyrna tiburo*
Smooth hammerhead	*Sphyrna zygaena*
Atlantic angel shark	*Squatina dumerili*

Consistent with the National Standard 2 Guidelines, this SAFE Report provides a comprehensive summary of the most recent data on the condition of Atlantic HMS stocks, EFH, marine ecosystems, and fisheries managed under federal regulations from a variety of sources across a wide range of disciplines. This includes information from the latest stock assessment data and a summary of recommendations and resolutions from the International Commission for

the Conservation of Atlantic Tunas (ICCAT) and its Standing Committee on Research and Statistics (SCRS). It also provides updated information regarding the economic status of HMS fisheries, fishing communities, and industries, as well as the socioeconomic and environmental impacts of recently implemented regulations.

In 2020, coronavirus disease 2019 (COVID-19; a disease caused by a novel coronavirus) spread around the world. In response to the COVID-19 pandemic many national, regional, and local governments instituted actions to curb the spread of the disease, including restrictions on travel and group gatherings. Thus, preliminary 2020 data or fishery information reported in this SAFE Report may reflect the effects of the pandemic (e.g., reduced fishing effort because of travel restrictions). An analysis of such potential effects is not included in this SAFE Report, given that the 2020 data are preliminary.

1.2 Agency Activities and Regulatory Actions for HMS in 2020

Since the publication of the 2019 SAFE Report, NOAA Fisheries proposed or implemented a number of actions with regard to Atlantic HMS. These actions were published in the Federal Register (FR) and are listed in Table 1.2. The major actions are also discussed below. Most documents related to these and previous actions are available on the Atlantic HMS website at www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species or by calling the Atlantic HMS Management Division at (301) 427-8503.

NOAA Fisheries held three virtual Atlantic HMS Advisory Panel meetings in 2020 on May 19, September 9-10, and December 7. These meetings provided valuable opportunities for comments on management actions that NOAA Fisheries pursued or considered in 2020. Meeting presentations and transcripts are posted online at the Atlantic HMS website.

On April 2, 2020, NOAA Fisheries published the "Pelagic Longline Bluefin Tuna Area-Based and Weak Hook Management Measures" final rule to adjust regulatory measures that manage incidental catch of Atlantic bluefin tuna (BFT) in the pelagic longline (PLL) fishery (85 FR 18812). This action modified the requirement to use weak hooks in the Gulf of Mexico from a year-round requirement to a seasonal (January-June) requirement, removed the Cape Hatteras Gear Restricted Area (GRA) and converted the Northeastern United States Closed Area and the Spring Gulf of Mexico Gear Restricted Area to monitoring areas. For the monitoring areas, until December 31, 2022, fishing is allowed at times when these areas were previously closed to pelagic longline fishing provided the annual Individual Bluefin Quota (IBQ) allocation threshold for the monitoring area is not exceeded. If the amount is exceeded, the relevant monitoring area will be closed indefinitely. If, by the end of 2022, the IBQ allocation threshold has not been exceeded, vessels using pelagic longline gear may continue to deploy pelagic longline gear in that area.

On April 27, 2020, NOAA Fisheries published a proposed rule to adjust the current regulations for North Atlantic swordfish and shark retention limits for certain permit holders in the U.S. Atlantic and Caribbean waters (85 FR 23315). Through this action, NOAA Fisheries is considering modifying swordfish retention limits from the default trip limit of two swordfish to six swordfish per vessel per trip for HMS Commercial Caribbean Small Boat, Swordfish General Commercial, and HMS Charter/Headboat permit holders with a commercial sale endorsement. These changes could apply to all regions except the Florida Swordfish Management Area, which would remain at zero swordfish per vessel per trip. Additionally, if finalized as proposed, this rule would establish a combined default trip limit of three smoothhound and/or tiger sharks per vessel per trip for HMS Commercial Caribbean Small boat permit holders and establish inseason adjustment procedures for the HMS Commercial Caribbean Small Boat permit swordfish and shark retention limits. The public comment period ended on June 26, 2020, and NOAA Fisheries will consider public comments before finalizing any related action.

On August 25, 2020, NOAA Fisheries published a Notice of Availability of Draft Amendment 12 to the 2006 Consolidated Atlantic HMS FMP (85 FR 52329) (for more details see https://www.fisheries.noaa.gov/action/amendment-12-2006-consolidated-hms-fishery-management-plan-msa-guidelines-and-national). This amendment is related to the 2016 revised National Standards 1, 3, and 7 Guidelines and other national policy directives (81 FR 71858; October 18, 2016). Issues considered in Draft Amendment 12 include: revisions to the objectives of the

2006 Consolidated Atlantic HMS FMP; adoption of ICCAT stock status determination criteria or ICCAT-managed HMS; review and update of HMS standardized bycatch reporting methodology; establishment of triggers for review of allocations of quota-managed HMS; and modifications to the timing for release of the Atlantic HMS SAFE Report. Draft Amendment 12 does not contain a proposed rule or regulatory text, nor does it change any fishery quotas or implement any new HMS fishery management measures. The public comment period ended on October 26, 2020.

On September 16, 2020, NOAA Fisheries published a temporary rule which prohibited the retention of Atlantic blue marlin, white marlin, and roundscale spearfish in the Atlantic HMS recreational fisheries. This action limited these fisheries to catch-and-release only for the remainder of 2020. This action resulted from preliminary information suggesting that the recreational landings limit for Atlantic blue marlin, white marlin, and roundscale spearfish may have been reached or exceeded for 2020 (85 FR 57783). Continued Quality Assurance/Quality Control review conducted by NOAA Fisheries resulted in the revision of landings calculations on December 3, 2020. Released fish reported through a new external data source were mistakenly counted as landed fish within the HMS database. The source of the error was identified and corrected. With this revision, NOAA Fisheries estimated that 233 Atlantic blue marlin, white marlin, and roundscale spearfish combined were landed as of September 30, 2020. This is the closest the United States has come to reaching the 250-marlin landings limit. Given the low margin between the revised landings estimate through September 2020 and the 250-marlin landings limit, NOAA Fisheries maintained the catch-and-release fishery through December 31, 2020, to avoid exceeding the landings limit.

On September 24, 2020, NOAA Fisheries published a Notice of Availability for Draft Amendment 14 to the 2006 Consolidated Atlantic HMS FMP (85 FR 60132). This amendment relates to implementation of updated 2016 National Standard 1 Guidelines as they relate to catch limits for sharks (81 FR 74858; October 18, 2016). This action would revise the mechanism or "framework" used in establishing the acceptable biological catch (ABC) and allowable catch limits (ACLs) for Atlantic sharks and the process used to account for carryover and underharvest of quotas. Additionally Draft Amendment 14 would establish an option to phase-in ABC catch control rules and adopt multi-year overfishing status determination criteria (SDC) in certain circumstances. The public comment period ended on December 31, 2020. NOAA Fisheries will consider public comments before finalizing any related action.

Table 1.2 Atlantic Highly Migratory Species Federal Management Actions for January 1–December 31, 2020

Fisheries Affected	Published	Rule or Notice	Citation
General	2/27/2020	Notice of Atlantic Shark Identification Workshops and Safe Handling, Release, and Identification Workshops	85 FR 11346
General	3/03/2020	Notice of Public Meeting for the Atlantic Shark Research Fishery	85 FR 12540
General	4/01/2020	Notice of Atlantic Shark Identification Workshops and Safe Handling, Release, and Identification Workshops	85 FR 18194
General	5/06/2020	Notice of Public Meeting of the Atlantic Highly Migratory Species Advisory Panel	85 FR 26939
General	6/02/2020	Notice of Dates for Atlantic Shark Identification Workshops and Safe Handling, Release, and Identification Workshops)	85 FR 33631
General	6/17/2020	Notice of Dates for Atlantic Shark Identification Workshops and Safe Handling, Release, and Identification Workshops	85 FR 36565
General	7/29/2020	Notice of Dates for Atlantic Shark Identification Workshops and Safe Handling, Release, and Identification Workshops	85 FR 45596
General	8/10/2020	Notice of Nominations for the Southeast Data, Assessment, and Review (SEDAR) Workshops Advisory Panel	85 FR 48226
General	8/12/2020	Notice of Public Meeting of the Atlantic Highly Migratory Species Advisory Panel.	85 FR 48676

Fisheries Affected	Published	Rule or Notice	Citation
General	8/24/2020	Notice of Dates for Atlantic Shark Identification Workshops and Safe Handling, Release, and Identification Workshops	85 FR 52094
General	8/25/2020	Notice of Availability of Draft Amendment 12 to the 2006 Consolidated Atlantic Highly Migratory Species FMP	85 FR 52329
General	11/13/2020	Notice to Solicit Nominations for the Atlantic Highly Migratory Species Advisory Panel	85 FR 72630
General	11/17/2020	Notice of Public Meeting of the Atlantic Highly Migratory Species Advisory Panel.	85 FR 73263
General	11/27/2020	Notice of Intent to Issue Exempted Fishing Permits, Scientific Research Permits, Display Permits, Letters of Acknowledgment, and Shark Research Fishery Permits	85 FR 76030
Bluefin tuna	1/02/2020	General Category Fishery Inseason Transfer of 19.5 Metric Tons to January 2020 Subquota Period from December 2020 Subquota Period	85 FR 17
Bluefin tuna	2/06/2020	Annual Adjustment of the Atlantic Bluefin Tuna Purse Seine and Reserve Category Quotas; General Category Fishery Inseason Transfer of 51 Metric Tons Atlantic Bluefin Tuna Quota from Reserve Category	85 FR 6828
Bluefin tuna	2/24/2020	Closure of Atlantic Bluefin Tuna Angling Category Southern Area Trophy Fishery	85 FR 10341
Bluefin tuna	2/26/2020	Closure of General Category for Large Medium and Giant Atlantic Bluefin Tuna	85 FR 10993
Bluefin tuna	4/02/2020	Final Rule to Adjust Atlantic Bluefin Tuna Pelagic Longline Area-Based and Weak Hook Measures	85 FR 18812
Bluefin tuna	4/20/2020	Closure of Atlantic Bluefin Tuna Angling Category Gulf of Mexico Trophy Fishery	85 FR 21789
Bluefin tuna	5/04/2020	Daily Retention Limit Adjustment to Atlantic Bluefin Tuna Angling Category May 1 -- December 31	85 FR 26365
Bluefin tuna	5/26/2020	Closure of Atlantic Bluefin Tuna Angling Category Northern Area Trophy Fishery	85 FR 31414
Bluefin tuna	7/16/2020	Harpoon Category Fishery Inseason Transfer of 30 Metric Tons Atlantic Bluefin Tuna From Reserve Category	85 FR 43148
Bluefin tuna	8/10/2020	Closure of Atlantic Bluefin Tuna Harpoon Category Fishery	85 FR 48120
Bluefin tuna	9/22/2020	General Category Fishery Inseason Transfer of 111.6 Metric Tons Atlantic Bluefin Tuna From Reserve Category	85 FR 59445
Bluefin tuna	9/30/2020	Closure of Atlantic Bluefin Tuna General Category Fishery for September Subquota Period	85 FR 61638
Bluefin tuna	10/13/2020	General Category Fishery Inseason Transfer of 40 Metric Tons Atlantic Bluefin Tuna October--November 2020 Period From Reserve Category; Closure of Atlantic Bluefin Tuna General Category Fishery for October--November Subperiod	85 FR 64411

Fisheries Affected	Published	Rule or Notice	Citation
Bluefin tuna	10/30/2020	General Category Fishery Inseason Transfer of 68.7 Metric Tons Atlantic Bluefin Tuna October--November 2020 Period from Reserve Category; Reopening General Category Fishery for Two Days	85 FR 68798
Bluefin tuna	11/9/2020	Reopening of the Atlantic Bluefin Tuna General Category Fishery for Two Days Within the October--November 2020 General Category Subquota Period	85 FR 71270
Bluefin tuna	11/27/2020	General Category Fishery Inseason Transfer of 19.5 Metric Tons Atlantic Bluefin Tuna December 2020 Period from Reserve Category	85 FR 75918
Bluefin tuna	12/17/2020	Closure of Atlantic Bluefin Tuna General Category Fishery for December Subquota Period	85 FR 81837
Bluefin tuna	12/23/2020	General Category Fishery Inseason Transfer of 19.5 Metric Tons Atlantic Bluefin Tuna to Januay--March 2021 General Category Subquota from December 2021 Subquota Period	85 FR 83832
Bluefin tuna, northern albacore tuna, and swordfish	10/1/2020	Adjustment of 2020 Northern Albacore, North and South Atlantic Swordfish, and Atlantic Bluefin Tuna Reserve Category Quotas	85 FR 61872
Swordfish	1/02/2020	Adjustment of Swordfish General Commercial Permit Retention Limit	85 FR 14
Swordfish	4/27/2020	Proposed Rule to Adjust Retention Limits for North Atlantic Swordfish and Sharks in U.S. Atlantic and Caribbean	85 FR 23315 85 FR 38091
Swordfish	6/25/2020	Adjustment of Swordfish General Commercial Permit Retention Limit	
Swordfish	12/9/2020	Adjustment of Swordfish General Commercial Permit Retention Limit	85 FR 79136
Sharks	3/16/2020	Closure of Commercial Aggregated Large Coastal Shark and Hammerhead Shark Management Group in the Western Gulf of Mexico	85 FR 14802
Sharks	6/22/2020	Adjustment of Commercial Aggregated Large Coastal Shark and Hammerhead Shark Management Group Retention Limit	85 FR 37390
Sharks	9/24/2020	Notice of Availability of Draft Amendment 14 to Implement New National Standard 1 Guidelines as They Relate to Annual Catch Limits for Sharks	85 FR 60132
Sharks	9/29/2020	Proposed Rule to Adjust Quotas and Retention Limits for Atlantic Commercial Shark Fisheries	85 FR 60947
Sharks	11/30/2020	Notice to Solicit Applications for the 2021 Shark Research Fishery	85 FR 76533
Sharks	12/1/2020	Final Rule to Establish Quotas, Opening Dates, and Retention Limits for the 2020 Atlantic Shark Commercial Fishing Season	85 FR 77007
Billfishes	9/16/2020	Temporary Rule Restricting Recreational Fishing for Atlantic Blue Marlin, White Marlin, and Roundscale Spearfish to Catch and Release Fishing	85 FR 57783

1.3 International Commission for the Conservation of Atlantic Tunas 2020 Accomplishments

ICCAT is a regional fishery management organization with 53 members as of 2020, also referred to as CPCs (Contracting Parties, Cooperating Non-Contracting Parties, Entities, or Fishing Entities). The United States is one of these. Due to the global COVID-19 pandemic, decisionmaking by ICCAT for the 2020 annual meeting was conducted via correspondence rather than in-person, with document review and consideration of essential business occurring virtually. Under these circumstances, the United States' priority was to ensure no lapse in management measures where existing measures were expiring at the end of 2020. Recognizing the challenges presented by the correspondence process and the absence of in-person negotiations on complicated management issues, the United States maintained the goal of adopting critical conservation measures for priority stocks while maintaining access to ICCAT-managed fisheries for U.S. recreational and commercial fishermen. The U.S. delegation developed recommendations aimed at promoting the conservation, management, and rebuilding of Atlantic HMS stocks, including those important to U.S. interests. ICCAT made progress on compliance with existing ICCAT measures and the illegal, unreported, and unregulated (IUU) fishing vessel list. Measures also were adopted for the conservation and management of tropical tunas, bluefin tuna, and albacore as well as for application of the electronic international bluefin tuna catch documentation system (eBCD) system. ICCAT publishes recommendations from annual meetings online at this website by ICCAT: https://www.iccat.int/en/RecRes.asp

1.3.1 Temperate Tunas

Temperate tunas include Atlantic bluefin tuna and North Atlantic albacore.

Bluefin tuna: A stock assessment update was conducted for western Atlantic bluefin tuna in 2020. The 2020 assessment report for western Atlantic bluefin tuna noted that the official status of the stock is "not undergoing overfishing" but that due to declines in recruitment, the stock population has declined since the 2017 assessment. Following negotiations via correspondence, ICCAT adopted Recommendation 20-06 for the western Atlantic bluefin tuna stock. This Recommendation, which was based on the Panel 2 Chair's proposal, was instrumental in finding a compromise approach that ensures there is no gap in management. The measures reflect the current best scientific information available, based on the SCRS stock assessment's management scenario 3, while recognizing that a new stock assessment is needed in 2021 in light of the scientific issues identified with certain data after the 2020 assessment — issues that could have an important impact on the Commission's understanding of the stock status. At the same time, the Recommendation ensures that the important work of the SCRS on bluefin tuna management strategy evaluation will not be negatively impacted by the new assessment, and it ensures that management measures in Rec. 17-06 will continue. No action is needed with regard to the codified U.S. quotas for 2021 as the Recommendation maintains the 2,350 mt total allowable catch (TAC) and CPC-specific quotas for 2021.

North Atlantic Albacore: ICCAT adopted Recommendation 20-04, a one-year recommendation that establishes a new TAC of 37,801 mt for 2021 (a 12.5 percent increase from the prior TAC of 33,600 mt), based on the existing harvest control rule. The TAC allocation percentages among ICCAT parties did not change and result in a U.S. quota of 711.5 mt. ICCAT also updated other aspects of northern albacore management for 2021 in Recommendation 20-03 and plans to consolidate relevant provisions of Rec. 20-03 and Rec. 20-04 into a single recommendation at the 2021 annual ICCAT meeting.

For eastern Atlantic and Mediterranean bluefin tuna stocks, Recommendation 20-07 maintained the TAC at the 2020 level of 36,000 mt for 2021 and 2022 and rolled over the current management recommendation provisions

1.3.2 Tropical Tunas

Tropical tunas include bigeye, albacore, yellowfin, and skipjack (BAYS) tunas. During the 2020 annual meeting correspondence process, ICCAT adopted Recommendation 20-01, a one-year recommendation, which was a rollover measure amending and extending measures (including TAC and catch limits) in Recommendation 19-02

set to expire at the end of 2020 to 2021 for tropical tunas. The TAC and catch limits are expected to be revisited in 2021, including at multiple intersessional meetings of Panel 1.

1.3.3 Sharks

In 2020, ICCAT assessed porbeagle sharks. The Northwest Atlantic stock status did not change—overfished with overfishing not likely occurring. No changes in management were proposed, and Recommendation 15-06 remains in place. Recommendation 15-06 was adopted by ICCAT to reduce fishing mortality of porbeagle sharks caught in association with ICCAT fisheries. This measure will assist in rebuilding stocks that are currently overfished. Recommendation 15-06 requires, among other things, fishing vessels to promptly release unharmed, to the extent practicable, porbeagle sharks caught in association with ICCAT fisheries when brought alive alongside for taking on board the vessel.

In addition, ICCAT Recommendation 19-06 remains in place for North Atlantic shortfin mako sharks. ICCAT is expected to revisit the North Atlantic shortfin mako shark measure in 2021, beginning at an intersessional meeting of Panel 4. During the 2020 annual meeting correspondence process, the United States advocated for conservation and management measures to be adopted by ICCAT that were on par with U.S. measures put in place to implement Recommendation 17-08, which preceded Recommendation 19-06, that have resulted in substantial reductions in U.S. catch of shortfin mako.

1.3.4 Compliance

ICCAT completed compliance review as part of the 2020 annual meeting correspondence process, including review and endorsement of the Chair's recommendations and compliance tables. The two-day special Compliance Committee session, originally planned to take place just before the 2020 annual meeting, was rescheduled for 2021.

1.4 State Regulations

The Atlantic Tunas Convention Act (ATCA) requires that NOAA Fisheries periodically review state tuna regulations for federal consistency. Atlantic bluefin and BAYS tunas are under federal jurisdiction from the outer boundary of the Exclusive Economic Zone to the shoreline. Federal regulations for Atlantic tunas apply in state waters of the U.S. Atlantic, Gulf of Mexico, and Caribbean, with the exception of the state waters of Maine, Connecticut, and Mississippi, which previously were determined to have regulations at least as restrictive as federal regulations. (50 CFR 635.1(b)). In a letter dated October 5, 2020, the Maine Department of Marine Resources requested that NOAA Fisheries consider a regulatory change to 50 CFR 635.1(b) that would incorporate Maine into the list of states where federal tuna regulations are applied in state territorial waters, and that this change apply to regulations for all tuna species managed under the Atlantic Tunas Convention Act. NOAA Fisheries is determining next steps for addressing this request.

State fishery management measures for Atlantic sharks, as well as migratory coastal species, largely are coordinated through commissions. These commissions create consistent regulations and ensure stocks are protected across state boundaries. The Atlantic States Marine Fisheries Commission (ASMFC) is composed of 15 member states along the U.S. Atlantic coast. The Gulf States Marine Fisheries Commission (GSMFC) is composed of five member states along the U.S. Gulf of Mexico coast.

In August 2008, the ASMFC approved the Interstate FMP for Atlantic Coastal Sharks, effective as of January 1, 2010. This FMP was modified via Addendum I in September 2009 to allow for limited at-sea processing of smoothhound sharks and to remove recreational smoothhound shark possession limits. The ASMFC Interstate FMP was also modified via Addendum II in May 2013 to establish state shares of any future federal smoothhound shark quota and to allow smoothhound sharks to be fully processed at sea provided the fin to carcass ratio does not exceed 12 percent. In October 2013, the Interstate FMP was further modified through Addendum III to reorganize some shark complexes consistent with federal regulations. Most recently, in August 2016, Addendum IV was finalized, which amended the smooth dogfish at-sea processing requirements consistent with federal regulations. Under

Addendum IV, which states were required to implement by January 1, 2017, smooth dogfish fins may be removed at sea provided that at least 25 percent of the retained catch is smooth dogfish. All other requirements such as the 12 percent fin to carcass ratio are still applicable. Addendum V, which was implemented in October 2018, allows the ASMFC Coastal Shark Board to respond to changes in the stock status of coastal shark populations and adjust regulations through Board action rather than an addendum, ensuring greater consistency between state and federal shark regulations. Two ASMFC motions of note were approved in 2019. On April 30, 2019, the Commission approved a motion to implement minimum sizes consistent with federal regulations for shortfin mako sharks starting January 1, 2020. On October 30, 2019, ASMFC also approved a requirement in state waters for fishermen to use non-offset, corrodible, non-stainless steel circle hooks when fishing for sharks recreationally, except when fishing with flies or artificial lures. Member states must implement the requirement no later than July 1, 2020. All management measures for coastal sharks in the interstate FMP and its addendums have been implemented by ASMFC members unless they have been granted *de minimus* status (as in Maine, Massachusetts, and New Hampshire) or they have equivalent conservation measures already in place. Member states can implement more restrictive management measures or, after ASMFC Board approval, alternative compliance measures.

Also of note are legislative bans on the possession and trade of shark fins in Delaware, Maryland, Massachusetts, New York, Texas, Florida, and New Jersey, although some of these states allow limited exemptions for species such as smoothhound sharks and, in the case of Florida, exempt some federal commercial shark permit holders. Some states on the West Coast of the United States, several U.S. territories, and Illinois have similar restrictions.

State rules and regulations pertaining to Atlantic HMS as of October 27, 2020, are listed in Table 1.3. While the Atlantic HMS Management Division updates this table annually, regulations are subject to change. Individuals interested in the current regulations for any state should contact that state directly.

Table 1.3 State Rules and Regulations Pertaining to Atlantic Highly Migratory Species

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Maine	X			X	Tuna: ME Rev. Stat. Ann. tit. 12, 6001, 6502, and 6551 Sharks: 13-188 CMR Ch. 50, §50.02	Tuna: Recreational retention limit is one tuna/year and requires a non-resident special tuna permit; unlawful to fish for tuna with gear other than harpoon or hook and line or to possess tuna taken in unlawful manner. Sharks: Taking of coastal sharks in state waters is prohibited; when state waters are open, it is unlawful to harvest, land or possess more than 5,000 pounds of spiny dogfish per calendar day or 24-hour period commercially; one dogfish per day for personal use; porbeagle sharks shall only be taken recreationally from state waters when open; finning is prohibited; coastal sharks, porbeagle or spiny dogfish harvested elsewhere but landed in Maine, or sharks landed recreationally, must have the head, fins and tail attached naturally to the carcass through landing; dealers who purchase sharks must obtain a federal dealer permit; recreational anglers must obtain a federal HMS angling permit.	Maine Department of Marine Resources Amanda Ellis Regulations Officer Phone: (207) 624-6573 Fax: (207) 624-6024

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
New Hampshire	X		X	X	Billfish: N.H. Code Admin. R. Fis 603.13 Sharks: N.H. Code Admin. R. Fis 603.20 Bluefin Tuna: N.H. Code Admin. R Fis 603.25	Billfish: Possession limit is one billfish/trip with a minimum size (LJFL) of 99" for blue marlin, 66" for white marlin, and 57" for sailfish; may be taken by rod and reel only; unlawful to sell blue or white marlin, sailfish, and longbill spearfish; personal use only. Sharks: No take, landings, or possession of prohibited shark species allowed (see Fis 603.20 list at http://gencourt.state.nh.us/rules/state_agencies/fis600.html); wholesale Marine Species License and federal dealer permit required for all dealers purchasing listed sharks; porbeagle only taken by recreational fishing from state waters; head, fins, and tail must remain attached to all shark species through landing; persons recreationally fishing for sharks must use non-offset, corrodible circle hooks; recreational minimum size limit for North Atlantic shortfin mako of 71" FL for males and 83" FL for females. Bluefin tuna: Recreational size limit is 27" CFL (20" PFCFL); commercial size limit is 73" CFL (54" PFCFL); possession and seasonal limits are listed in 50 CFR § 635.	New Hampshire Fish and Game Department Cheri Patterson Renee Zobel Phone: (603) 868-1095 Fax: (603) 868-3305
Massachusetts	X			X	Bluefin Tuna: 322 CMR 6.04 Sharks: 322 CMR 6.37	Bluefin tuna: References ATCA and federal regulations; bluefin tuna may be retained if caught in trap as incidental catch; fishing for bluefin tuna by means of any net prohibited prior to September 1; fishing for tuna by means of purse seine allowed in state waters if vessel is compliant with registration requirements in 322 CMR 6.04(4); purse seining for bluefin tuna prohibited in Cape Cod Bay. Sharks: ASMFC Coastal Shark Plan—no shark species, except smooth dogfish in some instances, may be landed with tails or fins removed (322 CMR 6.37(3)(d)); permitted species that are allowed to be harvested, and prohibited species that are protected may not be harvested unless specifically authorized by director of NOAA Fisheries. All commercial and recreational fishing regulations are at www.mass.gov/marine-fisheries-regulations.	Massachusetts Division of Marine Fisheries Jared Silva Phone: (617) 626-1534 Fax: (617) 626-1509

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Rhode Island				X	Sharks: RI Code of Regulations 250-RICR-90-00-3.19	Sharks: ASMFC Coastal Shark Plan, with additional measures to complement Atlantic HMS regulations; commercial fishing license or landing permit required to harvest or land sharks; no person fishing commercially shall possess shortfin mako or species listed in the prohibited or research commercial species groups; no person fishing recreationally shall possess a shark listed in prohibited or research species groups; minimum FL size of 54," with exception of 78" for scalloped, smooth, and great hammerhead sharks and 83" for shortfin mako; no minimum FL sizes for Atlantic sharpnose, bonnethead, and smoothhound; any person fishing recreationally for sharks with rod and reel must use corrodible circle hooks and maximize gear removal as safely as possible when releasing sharks. All commercial and recreational marine fisheries regulations are at www.dem.ri.gov/pubs/regs/regs/fishwild/rimftoc.htm.	Rhode Island Department of Environment Management, Division of Marine Fisheries Conor Mcmanus, Ph.D. Phone: (401) 423-1941 Fax: (401)423-1925 Conor.McManus@dem.ri.gov
Connecticut				X	Sharks: Regulations of Connecticut State Agencies §26-159a-1; Connecticut General Statutes §26-102, Declaration 19-10	Sharks: Prohibited species are same as federal regulations; possession of sandbar sharks prohibited except by permit for research and display purposes. No commercial fishing for LCS; no commercial small coastal shark fishing until further notice.	Connecticut Department of Energy and Environmental Protection Justin Davis Phone: (860) 447-4322 Fax: (860) 434-6150

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
New York			X	X	Billfish: NY Environmental Conservation 13-0339 (5) Sharks: NY Environmental Conservation 13-0338; State of NY Codes, Rules and Regulations (Section 40.7)	Billfish: Blue marlin, white marlin, sailfish, and longbill spearfish shall not be bought, sold, or offered for sale; striped marlin, black marlin, and shortbill spearfish shall not be bought, sold, or offered for sale unless tagged and identified prior to entry into the state. Sharks: ASMFC Coastal Shark Plan; separate requirement that no person shall possess, sell, offer for sale, trade, or distribute a shark fin, provided, however, that this prohibition shall not apply to any shark fin that was taken from a spiny dogfish (Squalus acanthias) or a smooth dogfish (Mustelus canis) lawfully caught by a licensed commercial fisherman; a shark fin may be possessed by any person if shark was lawfully caught and person has recreational marine fishing registration or license or permit from the department for bona fide scientific research or educational purposes; non-stainless, non-offset circle hooks must be used when taking sharks with baited hooks; commercial shark fishermen must attend NOAA Fisheries' Safe Handling, Release, and Identification Workshop.	New York Department of Environmental Conservation Christopher Scott Phone: (631) 444-0429 Fax: (631) 444-0449
New Jersey				X	Sharks: NJ Admin Code, Title 7. Dept of Environmental Protection, NJAC 7:25-18.1 and 7:25-18.12	Sharks: Sharks may be harvested in the recreational fishery only by angling with a handline or rod and reel. Sharks may be harvested in the commercial fishery only by gillnets, trawl nets, and pound nets. State waters are closed to possession of species belonging to the aggregated large coastal shark and hammerhead groups from May 15 through July 15. A shark or dogfish may be eviscerated prior to landing. The fins may not be removed from a shark or spiny dogfish until fishing has ceased and such shark or spiny dogfish has been landed, except that commercial fishermen may completely remove the fins of any of the species in the smoothhound shark group prior to landing if the total wet weight of the fins does not exceed 12 percent of the dressed weight of the carcasses and at least 25 percent of the total retained catch of all marine species, by weight, is comprised of smooth dogfish. Effective January 1, 2021 the possession and sale of shark fins is prohibited.	New Jersey Division of Fish and Wildlife Greg Hinks Phone: (609)748-2020 Fax: (609) 748-2032

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Delaware			X	X	Billfish: DE Code Ann. titl. 7, 1310 Sharks: DE Code Regulations 3541	Billfish: Prohibition on sale of Atlantic sailfish and blue, white, and striped marlin. Sharks: ASMFC Coastal Shark Plan. Shark fins may be possessed, but cannot be sold.	Delaware Division of Fish and Wildlife John Clark Phone: (302) 739-9914
Maryland	X	X	X	X	Bluefin Tuna: Code of Maryland Regulations 08.02.05.23 Swordfish: Md. Code. Regs. 08.02.05.27 Billfish: Md. Code Regs. 08.02.05.26 Sharks: Md. Code Regs. 08.02.22. 01-04	Bluefin tuna/Billfish/Swordfish: Federal regulations used to control size and seasons; recreational catch required to be tagged and reported using catch cards. Sharks: ASMFC Coastal Shark Plan, with additional measures to complement Atlantic HMS regulations. Recreational: Except when fishing with artificial flies or artificial lures, an angler must use corrodible, non-offset circle hooks and have in possession at least one device capable of quickly cutting either leader or hook; any shark, except smooth dogfish, not being kept must be released in water; for any shark that will be released, an individual may not (a) sit on shark, (b) hold shark's mouth open, (c) put shark on dry sand, (d) the shark on a boat deck, or (e) use a gaff; catch must be tagged and reported using catch cards; all recreationally harvested sharks must have heads, tails, and fins attached naturally to carcass through landing. Commercial: If smoothhound fins are removed, the total wet weight of caudal fins may not exceed 4 percent of total dw of smoothhound carcasses landed or found on board vessel, and dorsal and pectoral fins may not exceed 8 percent of the total dw of smoothhound carcasses landed or found on board a vessel. Shark fin prohibition: no person shall possess, sell, offer for sale, trade or distribute a shark fin, excluding spiny dogfish and smooth dogfish. Commercial fishermen with a license and permit issued by the State to take or land sharks for commercial purposes may possess or distribute, but not sell within Delaware. Recreational fishermen may possess shark fins for personal use.	Maryland Department of Natural Resources Sarah Widman Phone: (410) 260-8266

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Virginia			X	X	Billfish: 4 VA Admin Code 20-350-10 Sharks: 4 VA Admin Code 20-490-10	Billfish: Prohibition on sale of billfish. Sharks: ASMFC Coastal Shark Plan.	Virginia Marine Resources Commission Robert O'Reilly Phone: (757) 247-2247 Fax: (757) 247-2002
North Carolina	X		X	X	Tunas: 15A N.C. Admin. Code 3M.0520 Billfish: 15A N.C. Admin. Code 3M.050 Sharks: 15A N.C. Admin. Code 3M.0505	Tuna: Commercial and recreational CFL minimum size of 27" for yellowfin tuna, 27" for bigeye tuna, and 73" for bluefin tuna; recreational bag limit of three yellowfin tuna/day. Billfish: It is unlawful to take blue marlin, white marlin, roundscale spearfish or sailfish, except by hook and line or for recreational purposes; recreational possession limit of one blue marlin, white marlin, or roundscale spearfish/vessel/trip; one sailfish/person/day; minimum size of 99" for blue marlin, 66" for white marlin and roundscale spearfish, and 63" for sailfish; unlawful to sell or offer for sale blue marlin, white marlin, roundscale spearfish, and sailfish. Sharks: Director may impose restrictions for size, seasons, areas, quantity, etc. via proclamation; ASMFC Coastal Shark Plan, plus longline in the shark fishery shall not exceed 500 yards or have more than 50 hooks.	North Carolina Division of Marine Fisheries Steve Poland Phone: (252) 808-8011 Fax: (252) 726-0254

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
South Carolina	X	X	X	X	Tuna/Swordfish: SC Code Ann 50-5-2725 and 2730 Billfish: SC Code Ann 50-5-1700, 1705, 2725 and 2730; 50-1-30 (7) Sharks: SC 50-5-2725, 2730	Tuna: CFL minimum size of 27” for bigeye, 27” for yellowfin, and 27–73” for bluefin. Billfish: Minimum size of 99” for blue marlin, 66” for white marlin, 63” for sailfish, and 47” for swordfish; spearfish possession prohibited; unlawful to sell billfish; hook and line gear only; unlawful to possess while transporting gillnets, seines, or other commercial gear. Sharks: See list for prohibited sharks; gillnets may not be used in the shark fishery in state waters; state commercial permit required for shark fishing in state waters.	South Carolina Department of Natural Resources Wallace Jenkins Phone: (843) 953-9835 Fax: (843) 953-9386

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Georgia			X	X	Gear Restrictions/ Prohib: GA Code Ann 27-4-7; Billfish: GA Comp. R. & Regs. 391-2-4-.04 Sharks: GA Comp. R. & Regs. 391-2-4-.04	Gear restrictions: Use of gillnets and longlines prohibited in state waters. Possession and landing restrictions: It is unlawful to transfer at sea in state waters from a fishing vessel to any other vessel or person any fish caught which are subject to the restrictions specified in this Rule. GA. Comp. R. & Regs. 391-2-4-.04(5)(b). Billfish: Possession prohibited in state waters except for catch and release. Sharks (commercial/recreational): Prohibited species same as federal, plus silky and oceanic whitetip sharks; non-offset, non-stainless, corrodible circle hooks required in the recreational shark fishery; small Shark Composite (bonnethead, Atlantic sharpnose, spiny dogfish) retention limit one/person with minimum size of 30" FL; hammerheads retention limit (great, scalloped and smooth) one/person or boat (whichever less) with minimum size of 78" FL; shortfin mako retention limit one/person or boat (whichever less) with minimum size of 83" FL (regardless of sex); other sharks retention limit one shark/person or boat (whichever is less) with minimum size of 54" FL; all species must be landed head and fins intact; sharks may not be landed if harvested with gillnets; ASMFC Coastal Shark Plan.	Georgia Department of Natural Resources Carolyn Belcher Phone: (912) 264-7218 Fax: (912) 262-3143

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Florida		X	X	X	Sharks: FL Administrative Code 68B-44, 68B-4400 Billfish and Spearfish: FL Administrative Code 68B-33 Swordfish: FL Administrative Code 68B-58	Billfish: Longbill and Mediterranean spearfish harvest, possession, landing, purchase, sale, and exchange prohibited; blue and white marlin, roundscale spearfish, and sailfish sale prohibited, with aggregate possession of one fish/person/day; gear restriction (hook and line only); LJFL minimum size of 99" for blue marlin, 66" for white marlin, 66" for roundscale spearfish, and 63" for sailfish; all recreational landings must be reported to NOAA within 24 hours unless harvested as participant in fishing competition in which participants must register or an award is offered for catching or landing a billfish; must land in whole condition (gutting allowed). Swordfish: Minimum size of 47" LJFL/25" CK; authorized fishing gear hook and line in state waters; recreational possession limit for private boats of one fish/person/day or four fish/vessel/day (with four or more persons onboard), for hire-boats of one fish/paying customer/day up to 15 fish/vessel/day, and captain/crew on for-hire vessels of zero bag limit; commercial harvest and sale allowed only with FL saltwater products license, restricted species endorsement, and federal commercial swordfish permit (i.e., federal regulations apply in state waters unless state regulations are more restrictive); wholesale dealers must possess federal swordfish dealer permit; all recreational landings must be reported to NOAA Fisheries within 24 hours unless harvested as a participant in a fishing competition in which participants must register or an award is offered for catching or landing a swordfish. (Continued on next page)	Florida Fish and Wildlife Conservation Commission Martha Guyas Phone: (850) 487-0554 Fax: (850) 487-4847

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Florida (Continued from previous page)		X	X	X	Sharks: FL	Sharks (commercial/recreational): Prohibited species same as federal regulations plus prohibition on harvest of spiny dogfish, lemon, sandbar, silky, tiger, great hammerhead, smooth hammerhead, and scalloped hammerhead sharks; hook and line only; unlawful to harvest any shark with the use of any multiple hook in conjunction with live or dead natural bait and unlawful to harvest shark by snagging (snatch hooking); minimum size of 54," except no minimum size on blacknose, blacktip, bonnethead, smooth dogfish, finetooth, Atlantic sharpnose and a minimum size of 83" for shortfin mako as of January 1, 2020; possession limit of one shark/person/day and maximum of two sharks/vessel on any vessel with two or more persons on board; finning, removing heads and tails, and filleting prohibited (gutting allowed); state waters close to commercial harvest when adjacent federal waters close; federal permit required for commercial harvest (i.e. federal regulations apply in state waters unless state regulations are more restrictive); direct and continuous transit through state waters to place of landing for spiny dogfish, lemon, sandbar, silky, tiger, great hammerhead, smooth hammerhead, and scalloped hammerhead sharks legally caught in federal waters is allowed; a no-cost, annual shore-based shark fishing permit is mandatory for all shore-based shark fishing anglers ages 16 and up; shore anglers are prohibited from chumming and delaying the release of prohibited sharks; all shore- and vessel-based shark fishermen are required to keep prohibited sharks in the waters, use circle hooks in state waters, and possess/use appropriate cutters. Effective Jan 1, 2021, the possession, import, export, and sale of shark fins are prohibited with the following 2 exceptions: 1) shark fins may be sold by commercial fishermen who harvested sharks from a vessel holding a valid federal shark fishing permit on January 1, 2020 and 2) shark fins may be exported and sold by any wholesale dealer holding a valid federal Atlantic shark dealer permit on January 1, 2020.	Florida Fish and Wildlife Conservation Commission Martha Guyas Phone: (850) 487-0554 Fax: (850) 487-4847

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Alabama	X	X	X	X	Tunas/Swordfish/ Billfish: AL Administrative Code r.220-3-.30 Sharks: AL Administrative Code r.220-3-.30, r.220-3-.37, and r.220-3-.77	All Atlantic HMS: Reference to federal landing form regulations; any vessel or individual required to possess federal permit to harvest or retain marine aquatic species must have such permit to possess or land such marine aquatic species in Alabama. Tuna: Recreational and commercial fishermen must have federal permit to fish for tunas; minimum size of 27" CFL for yellowfin and bigeye; yellowfin retention limit 3/person/day. Sharks: Prohibited species are Atlantic angel, basking, bigeye sand tiger, bigeye sixgill, bigeye thresher, bignose, Caribbean reef, Caribbean sharpnose, dusky, Galapagos, largetooth sawfish, longfin mako, narrowtooth, night, sand tiger, smalltooth sawfish, smalltail, sevengill, sixgill, spotted eagle ray, whale, white, sandbar (unless fishermen possess a federal shark research fishery permit), and silky (unless fishermen possess a federal Atlantic shark permit). Recreational: Bag limit of one sharpnose/person/day and one bonnethead/person/day with no minimum size; great, smooth, scalloped hammerheads bag limit of one/person/day with 78" FL minimum size; male shortfin mako bag limit of one/person/day with 71" FL minimum size; female shortfin mako bag limit of one/person/day with 83" FL minimum size; all other sharks bag limit of one/person/day with minimum size of 54" FL or 30" dressed. When using natural bait in state waters to fish for sharks, anglers must use non-offset non-stainless-steel circle hooks Commercial: No minimum size or possession limit on non-prohibited species; restrictions of chumming and shore-based angling if creating unsafe conditions for beach goers, sun bathers, swimmers, or any other person; commercial-state waters close when federal season closes; no commercial shark fishing on weekends, Memorial Day, Independence Day, or Labor Day; regardless of open or closed season, gillnet fishermen targeting other fish may retain sharks with dw not exceeding 10 percent of total catch; anglers fishing for, retaining, possessing, or landing sharks must use non-offset non-stainless-steel circle hooks when using natural bait.	Alabama Department of Conservation and Natural Resources, Marine Resources Division Director Scott Bannon Phone: (251) 861-2882 www.outdooralabama.com

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Mississippi	X		X	X	Tunas: MS ADC 43 000 040 Billfish: MS Code Title-22 part 7 Sharks: MS Code Title-22 part 7	Tunas: No directed bluefin tuna fishing; recreational anglers can retain incidentally caught bluefin tuna up to one/boat/week; recreational and commercial minimum size of 27” CFL for yellowfin and bigeye; recreational retention (possession) limit for yellowfin is three/person. Billfish: Unlawful to sell blue and white marlin and sailfish without proper federal documentation; recreational LJFL minimum size of 99” for blue marlin, 66” for white marlin, and 63” for sailfish; no possession for longbill spearfish; no limit for recreational take. Sharks: Recreational TL minimum size of 37” for LCS and 25” for SCS; possession limit for LCS and pelagics one/person up to three/vessel; possession limit for SCS is four/person; unlawful for commercial and/or recreational fishermen to possess sandbar, silky, or dusky sharks; prohibition on finning. Commercial fishery developed in 2019 with identical size regulations to the recreational fishery. Bag limit is 25 small and large coastal sharks in aggregate per endorsed individual per day. Seasons are set to run concurrently with the federal shark fisheries. To qualify for a Commercial Shark Endorsement, anglers must attend an ID and Safe Handling Course and pass an exam.	Mississippi Department of Marine Resources Matt Hill Phone: (228) 374-5000

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Louisiana	X	X	X	X	Tunas: LA Administrative Code Title 76, Pt. VII, Ch. 3, §361 Swordfish/Billfish: LA Administrative Code Title76, Pt. VII, Ch. 3, §355 Sharks: LA Administrative Code Title 76, Pt. VII, Ch. 3, §357	Tunas: Recreational and commercial minimum size of 27" CFL for yellowfin and bigeye; recreational bag limits of three yellowfin/person; recreational minimum size of 73" CFL for bluefin tuna and bag limit of one/vessel/year; recreational and commercial tuna fishing requires federal permit; LA Admin Code States, "No person who, pursuant to state or federal law, is subject to the jurisdiction of this state shall violate any federal law, rule or regulation particularly those rules and regulations enacted pursuant to the Magnuson-Stevens Act and published in the Code of Federal Regulations (FR) as amended Title 50 and 15, for tunas while fishing in the EEZ, or possess, purchase, sell, barter, trade, or exchange tunas within or without the territorial boundaries of Louisiana in violation of any state or federal law, rule or regulation particularly those rules and regulations enacted pursuant to the Magnuson-Stevens Act and published in the Code of FR as amended Title 50 and 15 law." Billfish/Swordfish: Minimum size of 99" LJFL for blue marlin, 66" LJFL for white marlin, 63" LJFL for sailfish, and 29" carcass length or 33 lb dw for swordfish (47" LJFL if not dressed); recreational creel limit for swordfish of five/vessel/trip; federal swordfish permit required for commercial swordfish fishing; dealers must have federal permit to buy swordfish; state swordfish fishery closes with federal fishery; reference to federal billfish regulations; sale or purchase of sailfish, blue marlin, black marlin, striped marlin, hatchet marlin, and white marlin prohibited. Sharks: Recreational/Commercial: Commercial and recreational harvest prohibited April 1–June 30; prohibited species are same as federal regulations; fins must remain naturally attached to carcass though off-loading. Recreational: Minimum size of 54" FL, except Atlantic sharpnose and bonnethead, which have no size limit; male shortfin mako sharks must be at least 71 inches fork length and female mako sharks must be at least 83 inches fork length; bag limit for sharks, except sandbar, silky, and all prohibited sharks of one/ vessel/ trip in aggregate, in addition, no person shall possess more than one Atlantic sharpnose shark and one bonnethead shark per person per trip. Commercial: No minimum size; limit 45/permit holder/day; requires annual state shark permit; owners/operators of vessels other than those taking sharks in compliance with state or federal commercial permits are restricted to no more than one shark from either the LCS, SCS, or pelagic group per vessel per trip within or outside Louisiana waters, except Atlantic sharpnose and bonnethead, which are allowed at one/person/day.	Louisiana Department of Wildlife and Fisheries Jason Adriance Phone: (504) 284-2032 or 225 765-2889 Fax: (504) 284-5263 or (225) 765-2489

State	Tunas Regs	Swordfish	Billfishes	Sharks	Citation Reference	Regulatory Details	Contact Information
Texas		X	X	X	Billfish/Swordfish/ Sharks: TX Administrative Code Title 31, Part 2, Parks and Wildlife Code Title 5, Parks and Wildlife Proclamations 57.971, 57.973 and 57.981	General: Blue marlin, white marlin, sailfish, sharks, longbill spearfish, and broadbill swordfish are gamefish and may only be taken with pole and line (including rod and reel); blue marlin, white marlin, sailfish, and longbill spearfish may not be sold for any purpose. Billfish: No bag limit; minimum TL size of 131" for blue marlin, 86" for white marlin, and 84" for sailfish. Sharks (commercial/recreational): Bag limit of one/person/day; possession limit is twice daily bag limit; minimum TL size of 24" for Atlantic sharpnose, blacktip, and bonnethead sharks, 99" for great, smooth, and scalloped hammerhead sharks, and 64" for all other lawful sharks; prohibited species include all federally prohibited species and sandbar sharks; buying, selling, offering to buy or sell, or possessing a shark fin for the purpose of sale, transport, or shipment is prohibited; non-offset, non-stainless steel circle hooks must be used when fishing for sharks in state waters.	Texas Parks & Wildlife Department Perry Trial Phone: (361) 729-2328 Fax: (361) 729-1437 (fax)
Puerto Rico	X	X	X	X	Regulation #7949 Article 13—Commercial Fishing Limits Article 18—Recreational Fishing Limits	Billfish/Marlin: Illegal to sell, offer for sale, or traffic, whole or processed, those captured in jurisdictional waters of Puerto Rico. All Atlantic HMS: Covered under the federal Atlantic HMS regulations (50 CFR, Part 635), which also apply in territorial waters; fishermen who capture these species required to comply with said regulation; billfish captured incidentally with longline must be released by cutting the line close to hook and avoiding removal of fish from water; tuna and swordfish fishermen shall obtain permit according to requirements of federal government. Sharks: Nurse sharks year-round closed season. Federal regulations and permit requirements apply in territorial waters.	Puerto Rico Department of Natural and Environmental Resources Grisel Rodriguez-Ferrer Email: grodriguezf@drna.pr.gov Phone: (787) 999-2200 ,x 3211
U.S. Virgin Islands	X	X	X	X	V.I.C., Title 12, Chapter 9A.	Federal regulations and federal permit requirements apply in territorial waters.	6291 Estate Nazareth St. Thomas, VI 00802 Phone: (340) 775-6762 45 Mars Hill Complex Frederiksted, St. Croix, VI 00840 Phone: (340) 773-1082

State regulations are subject to change. Please contact the appropriate state personnel to ensure that the regulations listed above are current. States are listed in geographic order, descending from the north. X = Regulations in effect. FL = Fork length. CL = Carcass length. TL = Total length. LJFL = Lower-jaw fork length. CFL = Curved fork length. PFCFL = Pectoral fin curved fork length. EEZ = Exclusive Economic Zone. dw = Dressed weight. SCS = Small coastal shark. LCS = Large coastal shark. ATCA = Atlantic Tunas Convention Act. ASMFC = Atlantic States Marine Fisheries Commission

2 Status of the Stocks

2.1 Status Determination Thresholds

The term "stock of fish" means a species, subspecies, geographical grouping, or other category of fish capable of management as a unit (Magnuson-Stevens Act §3(42) 16 U.S.C. 1802(42)). "Stock" may also refer to a multispecies complex managed as a single unit due to the occurrence of two or more species being harvested together (50 CFR 600.310(d)). Stock assessments measure the impact of fishing on stocks and project harvest levels that maximize the number of fish that can be caught sustainably while preventing overfishing and, where necessary, rebuilding depleted stocks.

The thresholds NOAA Fisheries uses to determine the status of Atlantic HMS are presented in Figure 2.1. These thresholds are fully described in Chapter 3 of the 1999 Atlantic Tunas, Swordfish, and Sharks Fishery Management Plan (1999 FMP) and in Amendment 1 to the Billfish FMP. The thresholds were also carried over in full to the 2006 Consolidated Atlantic HMS FMP. They are based on those described in a paper providing the initial technical guidance for implementing National Standard 1 of the Magnuson-Stevens Act (Restrepo et al. 1998).

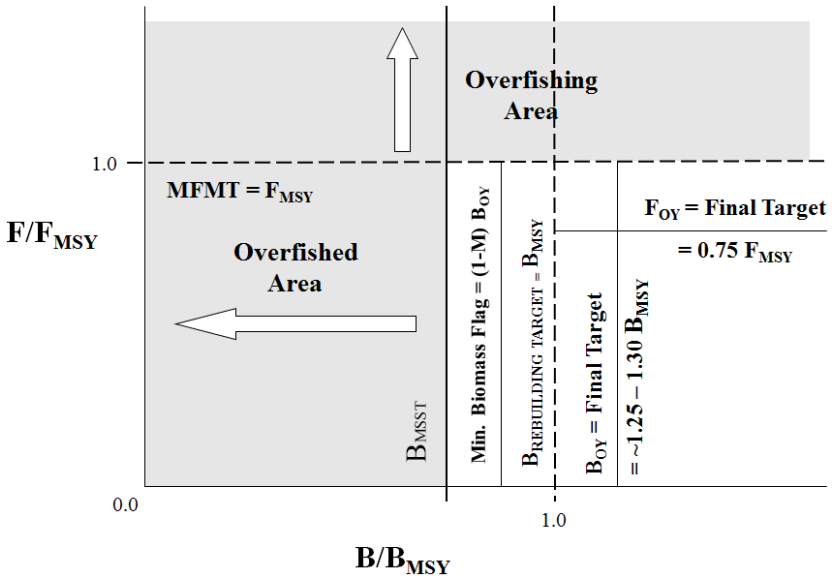

Figure 2.1 Illustration of the Status Determination Criteria and Rebuilding Terms

Images like Figure 2.1, also known as a Kobe plot, are frequently used by stock assessment scientists to summarize the results of various stock assessment models. Generally, model results in the white portion of the figure represent a healthy stock with a status of "not overfished" and "overfishing is not occurring." Similarly, model results in the gray portions of the figure are not desirable, generally representing a stock with a status of "overfished," "overfishing is occurring," or both.

Domestically, a stock is considered overfished when the current biomass (represented by a "B" in the above figure and in stock modeling equations) is less than the biomass for the minimum stock size threshold (MSST). Thus, an overfished stock would be represented mathematically as $B < B_{MSST}$ where B_{MSST} is the Biomass of the minimum stock size threshold. MSST is determined based on the biomass at maximum sustainable yield (B_{MSY}) and the natural mortality of the stock. Maximum sustainable yield (MSY) is the maximum long-term average yield that can be produced by a stock on a continuing basis. The biomass, or B, can fall below B_{MSY} without causing the stock to be declared overfished as long as it still remains above B_{MSST}.

If a stock is declared overfished, action to rebuild the stock is required by law. A stock is considered rebuilt once

the biomass in a given year, or B_{year}, is greater than B_{MSY}, as defined by ICCAT. It is important to note that the ICCAT definition is different than the domestic definition for an overfished stock status. ICCAT defines an overfished status as B_{year} relative to B_{MSY}, while the domestic definition of an overfished status is B_{year} relative to B_{MSST}.

In draft Amendment 12 to the 2006 Consolidated HMS FMP, NOAA Fisheries discussed the appropriateness and applicability of international status determination criteria for ICCAT-managed species and proposed adopting international SDC for ICCAT-managed Atlantic HMS stocks, including some sharks that are assessed through ICCAT and caught in association with ICCAT fisheries and for which ICCAT management measures exist. If Amendment 12 is finalized as proposed, the overfished thresholds and status would be the same domestically and internationally for the species in Table 2.1. The international thresholds are more conservative than domestic thresholds for identifying a stock as overfished; therefore the overfished status for some species could change.

In general, the change to use of international SDC could reduce confusion that sometimes occurs when NOAA Fisheries uses different domestic SDC than used by ICCAT for the same stock. The adoption of the ICCAT SDC would not have *immediate* fishery management implications. Over the longer term, the change to use of the ICCAT SDC could potentially result in a different status for a stock than would have been adopted domestically. That could result in different management actions than what would have to be adopted domestically, depending on the differences between the two determinations. In that scenario, however, NOAA Fisheries would analyze the subsequent management action taken at the time of implementation and analyze any potential effects. The comment period for Amendment 12 ended on October 26, 2020.

In the case of fishing mortality (F), the maximum fishing mortality threshold is represented by F_{MSY}. If current fishing mortality exceeds the maximum sustainable fishing threshold ($F > F_{MSY}$) it may be determined that overfishing is occurring for that stock. That determination legally requires actions to end overfishing and improve the fishery status. For Atlantic HMS, the status determination criteria for overfishing are the same for ICCAT and NOAA Fisheries.

A stock is considered healthy when B is greater than or equal to the biomass at optimum yield (B_{OY}) and F is less than or equal to the fishing mortality at optimum yield (F_{OY}). This situation is represented in the white portion of the Kobe plot above.

The domestic thresholds used to calculate the status of Atlantic HMS as described in the 1999 FMP and Amendment 1 to the Atlantic Billfish FMP are:

- Maximum fishing mortality threshold = $F_{limit} = F_{MSY}$.
- Overfishing is occurring when $F_{year} > F_{MSY}$.
- MSST = $B_{limit} = (1\text{-}M)B_{MSY}$ when $M < 0.5$ or MSST = $0.5B_{MSY}$ when $M \geq 0.5$, M = natural mortality. Formula exceptions include blue marlin ($0.9B_{MSY}$), white marlin ($0.85B_{MSY}$), and West Atlantic sailfish ($0.75B_{MSY}$). In many cases, an average M across age classes or sensitivity runs from a stock assessment model is used to calculate MSST. Domestically, an overfished status is defined as B_{year} relative to $B_{MSST.}$
- Biomass target during rebuilding = B_{MSY}.
- Fishing mortality during rebuilding < F_{MSY}.
- Fishing mortality for healthy stocks = $0.75F_{MSY}$ (final target = F_{OY}).
- Biomass for healthy stocks = $B_{OY} \approx 1.25$ to $1.30B_{MSY}$.
- Minimum biomass flag = $(1\text{-}M)B_{OY}$.
- Level of certainty of *at least* 50 percent but depends on species and circumstances.
- For some stocks (e.g., bluefin and albacore tuna), spawning stock biomass is used as a proxy for biomass.

For sharks, in some cases, spawning stock fecundity (SSF) or number of fish can be used as a proxy for biomass since biomass does not influence pup production in sharks. SSF is the sum of the number of mature sharks at age multiplied by pup-production at age.

2.2 Stock Assessment Determinations

Table 2.1 and Table 2.2 present the stock assessment information and the current stock statuses of Atlantic HMS as of November 2020 under the domestic thresholds and, when applicable, international thresholds. In some cases, these statuses are preliminary, as NOAA Fisheries is still reviewing the most recent stock assessment results and has not yet issued formal stock status determinations. This is the case for the most recent stock assessments completed by ICCAT (e.g., 2020 ICCAT SCRS stock assessments for North Atlantic albacore, Atlantic bluefin tuna, and Northwest Atlantic porbeagle) and the Atlantic blacktip shark stock assessment, which was completed in December 2020.

NOAA Fisheries updates the status of fish stocks managed under federal fishery management plans quarterly based on stock assessments completed during that quarter (https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates) and provides an annual Status of U.S. Fisheries Report to Congress (https://www.fisheries.noaa.gov/feature-story/2019-report-congress-status-us-fisheries). NOAA Fisheries recently launched the Stock Status, Management, Assessment, and Resource Trends (i.e., Stock SMART) web tool, which can be found here: https://www.st.nmfs.noaa.gov/stocksmart?app=homepage. The site has applications to search, view, compare, and download the results of assessments for stocks managed by NOAA Fisheries.

Table 2.1 Domestic and International Stock Statuses for Overfished and Not Overfished Atlantic Highly Migratory Species

Species	Current Relative Biomass Level	B_{MSY}	International Threshold	Domestic Minimum Stock Size Threshold	International Stock Status	Domestic Stock Status	Years to Rebuild	Rebuilding Start Date (End Date)
West Atlantic bluefin tuna	Unspecified*1	Unspecified*1, *2	B_{MSY}	0.86 SSB_{MSY}	Unspecified*1	Unknown*1		
Atlantic bigeye tuna	B_{2017}/B_{MSY} = 0.59 (0.42–0.80)	Unspecified*2	B_{MSY}	0.6 B_{MSY}	Overfished	Overfished	Not available*3	1/1/1999
Atlantic yellowfin tuna	B_{2018}/B_{MSY} = 1.17 (0.75–1.62)	Unspecified*2	B_{MSY}	0.5 B_{MSY} (age 2+)	Not overfished	Not overfished		
North Atlantic albacore tuna	B_{2018}/B_{MSY} = 1.32 (1.13–1.51)	B_{MSY} = 392,556 mt (349,403–405,097)	B_{MSY}	0.7 B_{MSY} (274,789 mt)	Not overfished	Not overfished (rebuilt)		
West Atlantic skipjack tuna	B_{2013}/B_{MSY}: Probably close to 1.3	30,755 mt	B_{MSY}	Unknown	Not overfished	Not overfished		
North Atlantic swordfish	B_{2015}/B_{MSY} = 1.04 (0.82–1.39)	82,640 mt (51,580–132,010)	B_{MSY}	0.8 B_{MSY} (52,048 mt)	Not overfished	Not overfished		
South Atlantic swordfish	B_{2015}/B_{MSY} = 0.72 (0.53–1.01)	52,465 mt (35,119-80,951)	B_{MSY}	0.8 B_{MSY} (41,972)	Overfished	*4	Not available*3	6/11/2018
Blue marlin	SSB_{2016}/SSB_{MSY} = 0.69 (0.52–0.91)	Unspecified*2	B_{MSY}	0.9 B_{MSY}	Overfished	*5	Not available*3	6/1/2001
White marlin (and roundscale spearfish)	B_{2017}/B_{MSY} = 0.58 (0.27–0.87)	Unspecified*2	B_{MSY}	0.85 B_{MSY}	Overfished	Overfished	Not available*3	6/1/2001
West Atlantic sailfish	SSB_{2014}/SSB_{MSY} = 1.81 (0.51–2.57)*6 SSB_{2014}/SSB_{MSY} = 1.16 (0.18–1.69)*7	1,438–1,636 mt*6,*7	B_{MSY}	0.75 B_{MSY}	Not likely overfished	Not overfished (rebuilding)		
Longbill spearfish	Unknown	Unknown	B_{MSY}	Unknown	Unknown	Unknown		
Northwest Atlantic porbeagle sharks	B_{2018}/B_{MSY} = 0.57*8	Unspecified*2,*9	B_{MSY}	(1-M)B_{MSY} *10	Overfished	Overfished	100	7/24/2008 (2108)
North Atlantic blue shark	B_{2013}/B_{MSY} = 1.35–3.45	Unspecified*2	B_{MSY}	(1-M)B_{MSY}	Not likely overfished	Not Overfished		

Species	Current Relative Biomass Level	B_{MSY}	International Threshold	Domestic Minimum Stock Size Threshold	International Stock Status	Domestic Stock Status	Years to Rebuild	Rebuilding Start Date (End Date)
North Atlantic shortfin mako shark	B_{2015}/B_{MSY} = 0.57–0.95	62,555 mt–123,475 mt*11	B_{MSY}	(1-M)B_{MSY}*10	Overfished	Overfished	*12	*12
Sandbar shark	SSF_{2015}/SSF_{MSY} = 0.77	SSF_{MSY} = 681,000 (numbers of sharks)	NA	595,000 (1-M)SSF_{MSY}	NA	Overfished	66	1/1/2005 (2070)
Gulf of Mexico blacktip shark	SSF_{2016}/SSF_{MSY} = 2.73	SSF_{MSY} = 14,400,000 (numbers of sharks)	NA	12,200,000 (1-M)SSF_{MSY}	NA	Not overfished		
Atlantic blacktip shark	Unknown	Unknown	NA	(1-M)B_{MSY}	NA	Unknown		
Dusky shark	SSF_{2015}/SSF_{MSY} = 0.41–0.64	Unknown*2	NA	(1-M)SSB_{MSY}	NA	Overfished	~100	7/24/2008 (2107)
Scalloped hammerhead shark	N_{2005}/N_{MSY} = 0.45	N_{MSY} = 62,000 (numbers of sharks)	NA	(1-M)N_{MSY}	NA	Overfished	10	7/3/2013 (2023)
Atlantic bonnethead shark	Unknown	Unknown	NA	Unknown	NA	Unknown		
Gulf of Mexico bonnethead shark	Unknown	Unknown	NA	Unknown	NA	Unknown		
Atlantic sharpnose shark—Atlantic stock	SSF_{2011}/SSF_{MSY} = 2.07	SSF_{MSY} = 4,860,000 (numbers of sharks)	NA	(1-M)SSF_{MSY}	NA	Not overfished		
Atlantic sharpnose shark—Gulf of Mexico stock	SSF_{2011}/SSF_{MSY} = 1.01	SSF_{MSY} = 17,900,000	NA	(1-M)SSF_{MSY}	NA	Not overfished		
Atlantic blacknose shark—Atlantic stock	SSF_{2009}/SSF_{MSY} = 0.43–0.64	SSF_{MSY} = 77,577–288,360 (numbers of sharks)	NA	62,294–231,553 (1-M)SSF_{MSY}	NA	Overfished	30	7/3/2013 (2043)

Species	Current Relative Biomass Level	B_{MSY}	International Threshold	Domestic Minimum Stock Size Threshold	International Stock Status	Domestic Stock Status	Years to Rebuild	Rebuilding Start Date (End Date)
Atlantic blacknose shark—Gulf of Mexico stock	Unknown	Unknown	NA	$(1\text{-}M)B_{MSY}$	NA	Unknown		
Finetooth shark	N_{2005}/N_{MSY} = 1.80	N_{MSY} = 3,200,000 (numbers of sharks)	NA	2,400,000 $(1\text{-}M)N_{MSY}$	NA	Not overfished		
Atlantic smooth dogfish	SSF_{2012}/SSF_{MSY} = 1.96–2.81	SSF_{MSY} = 4,746,000	NA	3,701,000 $(1\text{-}M)SSF_{MSY}$	NA	Not overfished		
Gulf of Mexico smoothhound shark complex	N_{2012}/N_{MSY} = 1.68–1.83	N_{MSY} = 7,190,000	NA	5.53E+06 $(1\text{-}M)N_{MSY}$	NA	Not overfished		

B = Biomass (may include 95% confidence intervals). MSY = Maximum sustainable yield. SSB = Spawning stock biomass. SSF = Spawning stock fecundity. N = Number of fish. M = Natural mortality. NA = Not assessed internationally. mt = Metric ton. CPUE = Catch Per Unit Effort.

*[1]In the 2018 bluefin tuna stock assessment and the 2020 stock assessment update, the Standing Committee on Research and Statistics reiterated that it is not possible to calculate biomass-based reference points (e.g., B_{MSY}) absent additional knowledge or a basis for assumptions regarding how future recruitment potential relates to spawning stock biomass.

*[2]A value for BMSY (or its proxy) was not provided in the 2020 stock assessment.

*[3]There is insufficient information to estimate how many years it will take this stock to rebuild.

*[4]South Atlantic swordfish are managed by the International Commission for the Conservation of Atlantic Tunas, and domestic stock status is not determined or reported in the U.S. stock status report.

*[5]A new assessment has been completed and domestic status has yet to be determined at the time of publication.

*[6]Stock synthesis estimate based on increasing CPUE trends, with approximate 95 percent confidence intervals.

*[7]Stock synthesis estimate based on decreasing CPUE trends, with approximate 95 percent confidence intervals.

*[8]Value obtained with the Incidental Catch Model. The reference point used (SPRmer) is a proxy for BMSY.

*[9]No value is available because spawning potential ratio (SPR) is a relative amount. The SPR measures the reproductive potential of a fished stock relative to that of an unfished stock.

*[10]M is unknown.

*[11]Only the BSP2-JAGS and JABBA models provided BMSY values in biomass. The BMSY range encompasses the eight scenarios run of the BSP2-JAGS and JABBA models. The SS3 model provided BMSY values in numbers.

*[12]ICCAT will reconsider in 2020 or 2021.

Source: Standing Committee on Research and Statistics reports (SCRS 2007, 2008, 2009a, 2009b, 2010, 2011, 2012a, 2012b, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020); Gibson and Campana 2005; NOAA Fisheries (2006, 2007); Hayes et al. 2009; Southeast Data, Assessment, and Review (SEDAR 2011a, 2011b, 2011c, 2011d, 2013a, 2013b, 2015a, 2015b, 2016, 2018a, 2018b, 2020).

Table 2.2 Domestic and International Stock Statuses for Atlantic Highly Migratory Species Stocks Declared as "Overfishing is Occurring" and "Overfishing is Not Occurring"

Species	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Threshold	International Stock Status	Domestic Stock Status
West Atlantic bluefin tuna	$F_{current\ (2015\text{-}2017)}$ = 0.088 (0.076–0.10) $F_{0.1}$ = 0.112 (0.089–0.135) $F_{current}/F_{0.1}$ = 0.079)	*1	Overfishing is not occurring	Overfishing is not occurring
Atlantic bigeye tuna	F_{2017}/F_{MSY} = 1.63 (1.14–2.12)	*2	Overfishing is occurring	Overfishing is occurring
Atlantic yellowfin tuna	F_{2018}/F_{MSY}= 0.96 (0.56–1.50)	*2	Overfishing is not occurring	Overfishing is not occurring
North Atlantic albacore tuna	F_{2018}/F_{MSY} = 0.62 (0.52–0.74)	F_{MSY} = 0.093 (0.091–0.108)	Overfishing is not occurring	Overfishing is not occurring
West Atlantic skipjack tuna	F_{2013}/F_{MSY}: probably close to 0.7	F_{MSY} = 1.02 (0.78–1.25)	Overfishing is not occurring	Overfishing is not occurring
North Atlantic swordfish	F_{2011}/F_{MSY} = 0.78 (0.62–1.01)	F_{MSY} = 0.17 (0.10 - 0.27)	Overfishing is not occurring	Overfishing is not occurring
South Atlantic swordfish	F_{2015}/F_{MSY} = 0.98 (0.70–1.36)	F_{MSY} = 0.28 (0.17–0.44)	Overfishing is not occurring	*3
Blue marlin	F_{2016}/F_{MSY} = 1.03 (0.74–1.50)	*2	Overfishing is occurring	Overfishing is occurring
White marlin (and roundscale spearfish)	F_{2017}/F_{MSY} = 0.65 (0.45-0.93)	*2	Overfishing is not occurring	Overfishing is not occurring
West Atlantic sailfish	F_{2014}/F_{MSY} =0.33 (0.25–0.57)*4 F_{2014}/F_{MSY} =0.63 (0.42–2.02)*5	*2	Overfishing is not likely occurring	Overfishing is not occurring
Longbill spearfish	Unknown	Unknown	Unknown	Unknown
Northwest Atlantic porbeagle shark	$F_{2010\text{-}2018}/F_{MSY}$ = 0.413	F_{MSY} = 0.049	Overfishing is not likely occurring	Overfishing is not occurring
North Atlantic blue shark	F_{2013}/F_{MSY} = 0.04–0.75	F_{MSY} = 0.19–0.20	Overfishing is not likely occurring	Overfishing is not occurring
North Atlantic shortfin mako shark	F_{2015}/F_{MSY} = 1.93–4.38	F_{MSY} = 0.015–0.056*6	Overfishing is occurring	Overfishing is occurring
Sandbar shark	F_{2015}/F_{MSY} = 0.58	F_{MSY} = 0.07	NA	Overfishing is not occurring

Species	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Threshold	International Stock Status	Domestic Stock Status
Gulf of Mexico blacktip shark	$F_{2016}/F_{MSY} = 0.023$	$F_{MSY} = 0.087$	NA	Overfishing is not occurring
Atlantic blacktip shark	Unknown	Unknown	NA	Unknown
Dusky shark	$F_{2015}/F_{MSY} = 1.08–2.92$	$F_{MSY} = 0.015–0.046$	NA	Overfishing is occurring
Scalloped hammerhead shark	$F_{2005}/F_{MSY} = 1.29$	$F_{MSY} = 0.11$	NA	Overfishing is occurring
Bonnethead shark—Atlantic stock	Unknown	Unknown	NA	Unknown
Bonnethead shark—Gulf of Mexico stock	Unknown	Unknown	NA	Unknown
Atlantic sharpnose shark—Atlantic stock	$F_{2011}/F_{MSY} = 0.23$	$F_{MSY} = 0.184$	NA	Overfishing is not occurring
Atlantic sharpnose shark—Gulf of Mexico stock	$F_{2011}/F_{MSY} = 0.57$	$F_{MSY} = 0.331$	NA	Overfishing is not occurring
Atlantic blacknose shark—Atlantic stock	$F_{2009}/F_{MSY} = 3.26–22.53$	$F_{MSY} = 0.01–0.15$	NA	Overfishing is occurring
Atlantic blacknose shark—Gulf of Mexico stock	Unknown	Unknown	NA	Unknown
Finetooth shark	$F_{2005}/F_{MSY} = 0.17$	$F_{MSY} = 0.03$	NA	Overfishing is not occurring
Atlantic smooth dogfish	$F_{2012}/F_{MSY} = 0.61–0.99$	$F_{MSY} = 0.129$	NA	Overfishing is not occurring
Gulf of Mexico smoothhound shark complex	$F_{2012}/F_{MSY} = 0.07–0.35$	$F_{MSY} = 0.106$	NA	Overfishing is not occurring

F = ishing mortality. MSY = Maximum sustainable yield. NA = Not assessed internationally, CPUE = Catch per unit effort.

*[1]F_{year} refers to the geometric mean of the estimates for 2015–2017 (a proxy for recent F levels). In the 2018 bluefin tuna stock assessment and the 2020 stock assessment update, the SCRS reiterated that it is not possible to calculate biomass-based reference points (e.g., F_{MSY}) given the inability to resolve differing possible recruitment scenarios. In the absence of such knowledge, SCRS considers F0.1 to be a reasonable proxy for the western stock. F0.1 is the fishing mortality rate where the slope of the yield per recruit curve is 10 percent of the slope of the curve at its origin. It is derived from the yield per recruit curve and does not assume a stock-recruitment relationship.

*[2]A value for F_{MSY} was not provided in the stock assessment.

*[3]South Atlantic swordfish are managed by the International Commission for the Conservation of Atlantic Tunas, and domestic stock status is not determined or reported in the U.S. stock status report.

*[4]Stock synthesis estimates are based on increasing CPUE trends, with approximate 95 percent confidence intervals.

*[5]Stock synthesis estimates are based on decreasing CPUE trends, with approximate 95 percent confidence intervals.

*[6]Range is derived from eight Bayesian production and one SS3 model runs. The value from SS3 is spawning stock fecundity at MSY. The low value is the lowest value from four production model (JABBA and BSP2JAGS) runs and the high value is from the SS3 base run.

Source: Standing Committee on Research and Statistics reports (SCRS 2007, 2008, 2009a, 2009b, 2010, 2011, 2012a, 2012b, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020); Gibson and Campana 2005; NOAA Fisheries (2006, 2007); Hayes et al., 2009; Southeast Data, Assessment, and Review (SEDAR 2011a, 2011b, 2011c, 2011d, 2013a, 2013b, 2015a, 2015b, 2016, 2018a, 2018b, 2020).

With the exception of many Atlantic shark stocks, stock assessments for Atlantic HMS are conducted by ICCAT's SCRS. Information on these assessments is available at www.iccat.int/en/assess.html.

In 2020, the SCRS completed assessments for Atlantic bluefin tuna (i.e., a stock assessment update), North Atlantic albacore tuna, and porbeagle sharks. A history of Atlantic HMS stock assessments conducted by the SCRS is shown in Table 2.3.

Table 2.3 International Highly Migratory Species Stock Assessments Conducted by Standing Committee on Research and Statistics

Stock	Last Assessment Year	Upcoming Assessment*	Notes
Western Atlantic bluefin tuna	2020	2021	The 2020 assessment was a restricted update assessment.
Atlantic bigeye tuna	2018	2021	
Atlantic yellowfin tuna	2019	2023	
North Atlantic albacore tuna	2020	2023	
Western Atlantic skipjack tuna	2014	2022	
North Atlantic swordfish	2017	2022	
South Atlantic swordfish	2017	2022	
Blue marlin	2018	2024	
White marlin (and roundscale spearfish)	2019	2025	
West Atlantic sailfish	2016	2022	
Longbill spearfish	1997	TBD	
Porbeagle	2020	TBD	
Shortfin mako	2017	TBD	In 2019, SCRS updated projections from the 2017 assessment.
Blue shark	2015	2022	

* Tentative dates; reflects information known as of December 2020. TBD = To be determined.

Atlantic shark stock assessments for large coastal, small coastal, and smoothhound sharks are generally completed through the Southeast Data, Assessment, and Review (SEDAR) process. SEDAR uses several different approaches in assessing stocks. The benchmark approach has been used to develop first-time assessments for stocks and to incorporate new datasets or new analytical methods into existing assessments. This has been the most time-consuming and intensive approach for developing assessments. SEDAR is now moving away from benchmark assessments to research track assessments. Although still time consuming, research track assessments allow scientists to select the best approach to assess the stocks or species groupings under review. Within the research track assessment, SEDAR may incorporate recent information into existing assessments. For this approach, existing input datasets are updated, and new information and changes in model configuration may be considered for incorporation as well. With regard to stocks/species group management, the results from research track assessments cannot be directly used for management as these assessments require significant time and may not use the most recent data. In the past, for species that had been assessed before, SEDAR has either used an "update" assessment, where data is updated with recent years and no changes are made to the model or data streams, or a "standard" assessment, where minor changes to the data streams or model could be made. SEDAR is now moving

to instead have "operational" assessments. For stocks that have just finished a research track, managers would wait for the results of an operational assessment. This assessment would use the approach approved in the research track and use up-to-date data. Future assessments of that stock would be operational assessments until such a time it was determined that a new research track would be required. The first Atlantic HMS stocks to be assessed using this approach will be the hammerhead shark complex in 2021-2023. More information on how SEDAR assessments are conducted can be found at sedarweb.org/sedar-process.

A benchmark assessment for Atlantic blacktip sharks (SEDAR 65) began in 2019 and was completed in December 2020.

In some cases, NOAA Fisheries looks to other available resources, such as peer reviewed literature, for external assessments that, if deemed appropriate, could be used to determine stock status. NOAA Fisheries followed this process in determining the stock status of scalloped hammerhead sharks based on an assessment for this species completed by Hayes et al. (2009). A history of domestic Atlantic HMS stock assessments is shown in Table 2.4-Table 2.7.

Table 2.4 Domestic Small Coastal Shark Stock Assessments

Shark Stock	Last Assessment Year	Last Assessment Type	Upcoming Assessment	Upcoming Assessment Type	Notes
Small coastal sharks complex	2007	Benchmark	N/A	N/A	Future assessments will focus on each individual stock within the complex due to life history differences.
Finetooth	2007	Benchmark	TBD	Research	Next assessment is expected to split this species into two stocks.
Blacknose—Atlantic	2011	Benchmark	TBD	Research	
Blacknose—Gulf of Mexico	2011	Benchmark	TBD	Research	Most recent assessment rejected by NOAA Fisheries.
Bonnethead—Atlantic	2013	Standard	TBD	Research	Last assessment assessed at the species level and not the stock level. Plan to assess each stock individually.
Bonnethead—Gulf of Mexico	2013	Standard	TBD	Research	
Atlantic Sharpnose—Atlantic	2013	Standard	TBD	Research	Last assessment focused on the species. Plan to assess next at stock levels.
Atlantic Sharpnose—Gulf of Mexico	2013	Standard	TBD	Research	

TBD = To be determined. N/A = None available.

Table 2.5 Domestic Large Coastal Shark Stock Assessments

Shark Stock	Last Assessment Year	Last Assessment Type	Upcoming Assessment	Upcoming Assessment Type	Notes
Large coastal sharks complex	2006	Benchmark	N/A	N/A	Future assessments will focus on individual stocks due to life history differences.
Blacktip—Atlantic	2020	Benchmark	TBD	Operational	
Scalloped hammerhead	2009	Outside SEDAR	2021	Research	
Sandbar	2018	Standard	TBD	Operational	
Blacktip—Gulf of Mexico	2018	Update	TBD	Operational	
Great hammerhead	N/A	N/A	2021	Research	Individual species have not been assessed, although these species were included in the original large coastal shark complex assessment.
Smooth hammerhead	N/A	N/A	2021	Research	
Bull	N/A	N/A	TBD	Research	
Lemon	N/A	N/A	TBD	Research	
Nurse	N/A	N/A	TBD	Research	
Silky	N/A	N/A	TBD	Research	
Spinner	N/A	N/A	TBD	Research	
Tiger	N/A	N/A	TBD	Research	

TBD = To be determined. N/A = None available. SEDAR = Southeast Data, Assessment, and Review.

Table 2.6 Domestic Smoothhound and Pelagic Shark Stock Assessments

Shark Stock	Last Assessment Year	Last Assessment Type	Upcoming Assessment	Upcoming Assessment Type	Notes
Smoothhounds—Atlantic	2015	Benchmark	TBD	Operational	
Smoothhounds—Gulf of Mexico	2015	Benchmark	TBD	Operational	
Thresher	N/A	N/A	N/A	N/A	Individual species have not been assessed.
Oceanic whitetip	N/A	N/A	N/A	N/A	

TBD = To be determined. N/A = None available.

Table 2.7 Domestic Prohibited Shark Stock Assessments

Shark Stock	Last Assessment Year	Last Assessment Type	Upcoming Assessment	Upcoming Assessment Type	Notes
Dusky	2016	Benchmark	TBD	Research	Next assessment expected to be a research track to consider issues raised after the last update assessment.
Atlantic angel	N/A	N/A	N/A	N/A	Individual species have not been assessed; some species may have been included in some of the early large coastal shark complex assessments.
Basking	N/A	N/A	N/A	N/A	
Bigeye sand tiger	N/A	N/A	N/A	N/A	
Bigeye sixgill	N/A	N/A	N/A	N/A	
Bigeye thresher	N/A	N/A	N/A	N/A	
Bignose	N/A	N/A	N/A	N/A	
Caribbean reef	N/A	N/A	N/A	N/A	
Caribbean sharpnose	N/A	N/A	N/A	N/A	
Galapagos	N/A	N/A	N/A	N/A	
Longfin mako	N/A	N/A	N/A	N/A	
Narrowtooth	N/A	N/A	N/A	N/A	
Night	N/A	N/A	N/A	N/A	
Sand tiger	N/A	N/A	N/A	N/A	
Sevengill	N/A	N/A	N/A	N/A	
Sixgill	N/A	N/A	N/A	N/A	
Smalltail	N/A	N/A	N/A	N/A	
Whale	N/A	N/A	N/A	N/A	
White	N/A	N/A	N/A	N/A	

TBD = To be determined. N/A = None available.

2.3 Stock Assessment Report References

SCRS reports are available online at www.iccat.int/en/assess.html. All SEDAR reports are available online at sedarweb.org. Detailed stock assessments for the species in Table 2.1 and Table 2.2 are available at these links listed below.

- Western Atlantic bluefin tuna: http://www.iccat.int/Documents/Meetings/Docs/2020/REPORTS/2020_2_BFT_ENG.pdf
- North Atlantic albacore tuna: http://www.iccat.int/Documents/Meetings/Docs/2020/REPORTS/2020_ALB_ENG.pdf
- Atlantic bigeye tuna: www.iccat.int/Documents/SCRS/DetRep/BET_SA_ENG.pdf
- West Atlantic skipjack tuna: www.iccat.int/Documents/SCRS/DetRep/SKJ_SA_ENG.pdf
- Atlantic yellowfin tuna: www.iccat.int/Documents/SCRS/DetRep/YFT_SA_ENG.pdf
- Blacknose shark, Atlantic and Gulf of Mexico: sedarweb.org/sedar-21
- Atlantic blacktip shark: http://sedarweb.org/sedar-65
- Gulf of Mexico blacktip shark: sedarweb.org/sedar-29u
- North Atlantic blue sharks: www.iccat.int/Documents/SCRS/DetRep/BSH_SA_ENG.PDF
- Bonnethead shark, Atlantic and Gulf of Mexico: sedarweb.org/sedar-34
- Dusky shark: sedarweb.org/sedar-21u
- Finetooth shark: sedarweb.org/sedar-13
- Scalloped hammerhead shark: Assessed in Hayes et al. (2009).
- North Atlantic shortfin mako shark: www.iccat.int/Documents/Meetings/Docs/2017_SMA_ASS_REP_ENG.pdf; www.iccat.int/Documents/SCRS/DetRep/SMA_SA_ENG.pdf (update)
- Northwest Atlantic porbeagle shark: https://www.iccat.int/Documents/Meetings/Docs/2020/REPORTS/2020_POR_SA_ENG.pdf
- Sandbar shark: sedarweb.org/sedar-54
- Atlantic sharpnose shark, Atlantic and Gulf of Mexico: sedarweb.org/sedar-34
- Smoothhound shark, Atlantic and Gulf of Mexico: sedarweb.org/sedar-39
- Swordfish, North Atlantic and South Atlantic: www.iccat.int/Documents/Meetings/Docs/2017_ATL_SWO_ASS_REP_ENG.pdf
- West Atlantic sailfish: www.iccat.int/Documents/Meetings/Docs/2016_SAI_REPORT_ENG.pdf
- Longbill spearfish: www.iccat.int/Documents/SCRS/DetRep/DET-SAI.pdf
- Blue marlin: www.iccat.int/Documents/SCRS/DetRep/BUM_SA_ENG.pdf
- White marlin and roundscale spearfish: www.iccat.int/Documents/SCRS/DetRep/WHM_SA_ENG.pdf

2.4 Chapter 2 References

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NOAA Fisheries. 2007. SEDAR 13 Stock Assessment Report: small coastal sharks, Atlantic sharpnose, blacknose, bonnethead, and finetooth shark. Silver Spring (MD): Atlantic HMS Management Division.

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SEDAR. 2011c. SEDAR 21 Stock Assessment Report: HMS Gulf of Mexico blacknose shark. North Charleston (SC): SEDAR.

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SEDAR. 2013a. SEDAR 34 Stock Assessment Report: HMS Atlantic sharpnose shark. North Charleston (SC): SEDAR.

SEDAR. 2013b. SEDAR 34 Stock Assessment Report: HMS bonnethead shark. North Charleston (SC): SEDAR.

SEDAR. 2015a. SEDAR 39 Stock Assessment Report: HMS Atlantic smooth dogfish. North Charleston (SC): SEDAR.

SEDAR. 2015b. SEDAR 39 Stock Assessment Report: HMS Gulf of Mexico smoothhound sharks. North Charleston (SC): SEDAR.

SEDAR. 2016. Update assessment to SEDAR 21: HMS dusky shark. North Charleston (SC): SEDAR.

SEDAR. 2018a. SEDAR 54 Stock Assessment Report: HMS Sandbar Shark. North Charleston (SC): SEDAR.

SEDAR. 2018b. Update assessment to SEDAR 29: HMS Gulf of Mexico Blacktip Shark Addendum and Post-Review Updates. North Charleston (SC): SEDAR.

SEDAR. 2020. SEDAR 65: Atlantic Blacktip Shark Stock Assessment Report. North Charleston (SC): SEDAR.

3 Essential Fish Habitat

3.1 Current Essential Fish Habitat Boundary Data Sources

NOAA Fisheries compiles essential fish habitat (EFH) maps and provides the most recently designated EFH data to the public. The designated boundaries can be viewed online through the NOAA Fisheries EFH Mapper at www.habitat.noaa.gov/protection/efh/efhmapper. Downloadable EFH boundary spatial files (shapefiles) for all federally managed species, including Atlantic HMS, are available at https://www.habitat.noaa.gov/application/efhinventory/index.html.

3.2 Essential Fish Habitat Designations in the 2006 Consolidated Atlantic HMS Fishery Management Plan and Its Amendments

The Magnuson-Stevens Act requires NOAA Fisheries to identify and describe EFH, minimize the adverse effects of fishing on EFH to the extent practicable, and identify other actions to encourage the conservation and enhancement of those habitats. EFH is defined in NOAA Fisheries implementing regulations as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (50 CFR 600.10). A review of information available on EFH for federally managed species must be completed at least once every five years, and habitat provisions must be revised or amended as warranted (50 CFR 600.815(a)(10)).

On September 7, 2017, NOAA Fisheries published Final Amendment 10 (82 FR 42329). This amendment revised EFH boundary designations based on new observer, survey, and tag/recapture data collected by the agency and the public, new literature, and public comments filed since 2009 in response to requests for information. It also modified the Habitat Areas of Particular Concern (HAPC) for bluefin tuna and sandbar shark, and created new HAPCs for juvenile and adult lemon sharks and sand tiger sharks. The Notice of Availability for Amendment 10 and supporting documents are available at www.fisheries.noaa.gov/action/amendment-10-2006-consolidated-hms-fishery-management-plan-essential-fish-habitat.

The Atlantic HMS Management Division is planning to undertake the next five-year EFH review starting in 2022. The Division has recently identified management-based research priorities (https://www.fisheries.noaa.gov/resource/document/atlantic-highly-migratory-species-management-based-research-needs-and-priorities?utm_medium=email&utm_source=govdelivery) that will assist in refining EFH designations: developing a framework for analysis that would allow for EFH boundary designations to be based on more than species presence/absence data; to examine the influence of climate change and variability on oceanographic conditions on stock productivity, range, seasonal distribution, migration, and spawning or nursery habitat; and to expand the use of species distribution and habitat modeling to address spatial management priorities.

Currently, a species distribution modeling framework, the Atlantic HMS Predictive Spatial Modeling (HMS-PRiSM) framework, is being developed to evaluate the effectiveness of existing spatial management, as appropriate. This framework could also support the development of EFH designations, and could potentially be useful as a tool to advance Ecosystem Based Fisheries Management and to examine climate change adaptation and resilience of Atlantic HMS. The Atlantic HMS Management Division is currently developing the model, with a formal review of the modeling methodology employed by HMS-PRiSM expected to begin in early 2021.

A summary of the management history of Atlantic HMS EFH is provided in Table 3.1.

Table 3.1 Management History for Atlantic Highly Migratory Species Essential Fish Habitat

Fishery Management Plan or Amendment	Essential Fish Habitat and Species
1999 FMP for Atlantic Tunas, Swordfish, and Sharks	EFH first identified and described for Atlantic tunas, swordfish, and sharks; HAPCs designated for sandbar sharks.
1999 Amendment 1 to 1988 FMP for Billfish	EFH first identified and described for Atlantic billfishes.
2003 Amendment 1 to the FMP for Atlantic Tunas, Swordfish and Sharks	EFH updated for blacktip, sandbar, finetooth, dusky, and nurse sharks.
2006 Consolidated Atlantic HMS FMP	Comprehensive review of EFH for all Atlantic HMS. EFH for all Atlantic HMS consolidated into one FMP; no changes to EFH descriptions or boundaries.
2009 Amendment 1 to the 2006 Consolidated Atlantic HMS FMP	EFH updated for all federally managed Atlantic HMS. HAPC for bluefin tuna spawning area designated in the Gulf of Mexico.
2010 Amendment 3 to the 2006 Consolidated Atlantic HMS FMP	EFH first defined for smoothhound sharks (smooth dogfish, Florida smoothhound, and Gulf smoothhound).
2010 White Marlin/ Roundscale Spearfish Interpretive Rule and Final Action	EFH first defined for roundscale spearfish (same as white marlin EFH designation in Amendment 1 to the 2006 Consolidated Atlantic HMS FMP).
2015 Atlantic HMS EFH Five-Year Review	Comprehensive review of EFH for all Atlantic HMS. Determined that changes to some EFH descriptions and boundaries were warranted.
2017 Amendment 10 to the 2006 Consolidated Atlantic HMS FMP	EFH updated for all federally managed Atlantic HMS. Existing HAPCs for sandbar shark and bluefin tuna adjusted and new HAPCs for sand tiger shark and lemon shark created to reflect recommendations in the 2015 five-year review.

HAPC = Habitat Areas of Particular Concern.

3.3 Shark Nursery Grounds and Essential Fish Habitat Studies

NOAA Fisheries continues to study EFH for Atlantic HMS to refine understanding of their important habitat areas. NOAA Fisheries has funded two cooperative survey programs designed to delineate shark nursery habitats in the Atlantic and Gulf of Mexico. The Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) and the Cooperative Gulf of Mexico States Shark Pupping and Nursery (GULFSPAN) surveys are designed to assess the geographical and seasonal extent of shark nursery habitat, determine which shark species use these areas, and gauge the relative importance of these coastal habitats to provide information that can then be used in EFH determinations. Shark nursery habitat is defined in Heupel et al. (2007) as habitats in which 1) juvenile sharks are more commonly encountered in the area; 2) juvenile sharks remain or return to the area over an extended period; and 3) the same area is repeatedly utilized across years compared to other areas.

3.3.1 Cooperative Atlantic States Shark Pupping and Nursery Survey Results

The COASTSPAN program, administered by the NOAA Fisheries Northeast Fisheries Science Center Narragansett, Rhode Island, laboratory, has been collecting information on shark nursery areas along the U.S. Atlantic coast since 1998. It involves NOAA Fisheries scientists, along with state and university researchers in New Jersey, Delaware, Virginia, South Carolina, Georgia, and Florida. Areas sampled during the 2019 COASTSPAN survey, the most recent year for which data is available, are shown in Figure 3.1. Results by region from this survey (McCandless, pers comm) are described below, and shark species found by sampling location are summarized in Table 3.2.

Figure 3.1 Regions Sampled During the 2019 COASTSPAN Survey

Regions include, from north to south, New Jersey and Delaware, Virginia, South Carolina, Georgia, and the Atlantic coast of Florida.

3.3.1.1 New Jersey and Delaware

COASTSPAN sampling in 2019 encompassed the entire bay, from the mouth of the Delaware River to the mouth of Delaware Bay, using bottom longline gear in a random stratified design based on depth and geographic location. Additional sampling was also conducted at historical fixed stations throughout the bay.

Sandbar sharks dominated the catch (67 percent) in 2019, as in previous years, followed by sand tigers and smooth dogfish. Four adult male Atlantic sharpnose sharks were also caught during July in Delaware Bay: two near the shipping channel both north and south of Brandywine Shoal and two in the southern portion of the anchorage area. Additionally, one adult male finetooth shark was caught off Primehook Beach in July. As in previous years, the majority (98 percent) of sandbar sharks were immature, with 14 percent of the juveniles being young of the year. The remaining sandbar sharks were considered mature females based on length and girth measurements. Most smooth dogfish caught were immature in 2019, with young of the year dominating the catch. Only four mature male smooth dogfish were caught, all during the June survey in the deeper, cooler waters near the shipping channel. Sixty percent of sand tigers caught were immature sharks, with the remaining considered mature based on clasper calcification for males and length and girth measurements for females.

Delaware Bay continues to provide important nursery habitat for sandbar sharks, smooth dogfish, and sand tigers. The extensive use of the bay by all life stages of sand tigers continues to highlight the seasonal importance of this essential shark habitat.

3.3.1.2 Virginia

COASTSPAN sampling in 2019, conducted by the Virginia Institute of Marine Science, encompassed the main stem of the lower Chesapeake Bay, as well as coastal inlet and lagoon habitats along the Eastern Shore of Virginia.

Sampling was conducted using bottom longline gear in a stratified random design, with stratification based on depth and geographic location.

Sandbar sharks continued to dominate the catch (97 percent) in the bay, lagoon, and inlet habitats of Virginia in 2019. All sandbar sharks caught were juveniles and the majority of were young of the year: 89 percent along the Eastern Shore and 94 percent within Chesapeake Bay. Total catches were similar between regions, although over 95 percent of the catch in the Bay was at depths of at least 30 feet, which is greater than the depths for the majority of sampling locations along the Eastern Shore. In addition to sandbar sharks, both male and female, mature Atlantic sharpnose sharks were found within the Bay and along the Eastern Shore in July and August. One juvenile smooth dogfish was also caught within the Bay in July. Additionally, one juvenile of each blacknose shark, bull shark, and scalloped hammerhead was caught in July along the Eastern Shore. Virginia's estuarine waters continue to provide important nursery habitat for sandbar sharks.

3.3.1.3 South Carolina

COASTSPAN sampling in 2019, conducted by the South Carolina Department of Natural Resources, took place using bottom longline, drumline, and gillnet gear in both nearshore and estuarine waters along the South Carolina coast: Bulls Bay, Charleston Harbor, North Edisto, Port Royal Sound, St. Helena Sound, and Winyah Bay.

Sixteen species of sharks were captured; the most abundant, at 35 percent of the total catch, was Atlantic sharpnose. Other sharks captured, in order of abundance, were sandbar, finetooth, bonnethead, blacktip, blacknose, scalloped hammerhead, spinner, lemon, bull, Carolina hammerhead, tiger, nurse, and great hammerhead sharks. There was also one each of hybrid scalloped/Carolina hammerhead and sand tiger sharks. Bulls Bay had the greatest species diversity; all but four species (tiger, nurse, great hammerhead, and sand tiger sharks) were encountered in 2019. All South Carolina estuaries sampled provided nursery habitat for Atlantic sharpnose, sandbar, blacktip, and spinner sharks. Finetooth sharks were found in all estuaries sampled, but the northernmost estuary, Winyah Bay, primarily contained mature finetooth sharks caught near the bay entrance. Scalloped hammerheads were found in four of the regions sampled (Bulls Bay, Charleston Harbor, North Edisto, and St. Helena Sound) but in higher salinity areas primarily outside of the estuaries. The exception was Five Fathom Creek in Bulls Bay, which has a higher salinity (>33 parts per thousand) and accounted for 94 percent of the juvenile scalloped hammerheads caught in 2019 as in the previous year. The majority of sharks captured in all locations were immature, but the following species primarily consisted of mature individuals: Atlantic sharpnose, bonnethead, and blacknose sharks.

These findings continue to highlight the importance of South Carolina estuarine and nearshore waters as nursery habitat for many small and large coastal shark species and indicate the extensive use of these waters as habitat for several adult small coastal shark species.

3.3.1.4 Georgia

COASTSPAN sampling in 2019, conducted by the University of North Florida, took place using bottom longline gear in the estuarine waters of the Altamaha, St. Simons, and St. Andrew sound systems.

Of the nine species of shark captured, bonnethead and Atlantic sharpnose sharks were the most abundant, accounting for 33 and 31 percent of the catch, respectively. Other sharks, in order of abundance, were sandbar, blacktip, bull, scalloped hammerhead, and blacknose sharks. There was also one juvenile finetooth shark caught in the Altamaha sound system in June and one mature lemon shark caught in the St. Andrew sound system in July. The Altamaha sound system also provided nursery habitat for young-of-the-year bull sharks in 2019. St. Simons and St. Andrew sound systems provided nursery habitat for bonnethead, Atlantic sharpnose, sandbar, and blacktip sharks. The majority of sharks captured were immature, highlighting the importance of these areas as nursery habitat for both small and large coastal shark species. Many of the bonnethead and Atlantic sharpnose sharks captured were mature and all blacknose sharks were mature, indicating these areas continue to provide important adult habitat for these small coastal shark species.

3.3.1.5 Atlantic Coast of Florida

COASTSPAN sampling in 2019, conducted by the University of North Florida, used bottom longline and drumline gear within Cumberland Sound, Nassau Sound, and the Tolomato River and in the coastal waters off Mayport Beach. Species in the 2019 catch included, in order of abundance, Atlantic sharpnose, sandbar, scalloped hammerhead, blacknose, blacktip, finetooth, bonnethead, lemon, and bull sharks. There was also one large female tiger shark (estimated at 9 feet before it bit through the line) caught in the coastal waters off Mayport Beach. Cumberland Sound and the Tolomato River had the greatest species diversity, providing nursery habitat for seven of the 10 species encountered: Atlantic sharpnose, sandbar, scalloped hammerhead, blacktip, finetooth, bonnethead, and bull sharks. Nassau Sound was also used as nursery habitat in 2019 by scalloped hammerhead, blacktip, bonnethead, and Atlantic sharpnose sharks, but in much lower numbers. Large juvenile and mature lemon sharks were caught in the Cumberland and Nassau sound systems. Mature bonnethead and Atlantic sharpnose sharks were also encountered in the estuarine sampling areas. The coastal catch off Mayport primarily consisted of large juvenile and mature sharks including Atlantic sharpnose, blacktip, and blacknose sharks. These findings highlight the importance of the estuarine waters as nursery habitat for several small and large coastal shark species and note the continued use of these areas and the nearshore coastal waters by adult small coastal sharks.

Florida Atlantic University surveyed the Indian River Lagoon from Sebastian Inlet to Saint Lucie Inlet and the nearshore waters along the Atlantic coast in this region using bottom longline and gillnet gear in 2019. Species encountered in the 2019 survey in this area included, in order of abundance, bull, Atlantic sharpnose, bonnethead, finetooth, blacktip, sandbar, nurse, blacknose and spinner sharks. Of the nine shark species caught, bull and Atlantic sharpnose sharks accounted for 73 percent of the catch, 49 and 24 percent, respectively. Captured bull sharks were all juveniles, with young-of-the-year and small juveniles primarily caught over mud bottom within the lagoon and larger juveniles caught over sand bottom in the nearshore coastal waters. Seventy-four percent of Atlantic sharpnose sharks were juveniles and were caught during the spring in coastal waters; whereas the adults caught during this time were males and primarily found within the lagoon. All blacktip, finetooth, and sandbar sharks were juveniles and were only encountered in the lagoon system over mud bottom. Bonnetheads were also only encountered in the lagoon system, but as large juveniles and adults over a variety of habitat types (mud, sand, and oyster reef). Only three of both blacknose and nurse sharks were caught, both species were found in the lagoon and the coastal waters as either large juveniles or adults. Only two young-of-the-year spinner sharks were caught in 2019 during July in the ocean. Continued monitoring of this region will help to refine EFH for species encountered here.

Table 3.2 Shark Species and Sampling Locations in the 2019 Cooperative Atlantic States Shark Pupping and Nursery Survey

Sampling Region	Shark Species	Sampling Locations
Delaware/New Jersey	Atlantic sharpnose, finetooth, sandbar, sand tiger, and smooth dogfish	Entire bay from the mouth of the Delaware River to the mouth of the Delaware Bay
Virginia	Atlantic sharpnose, blacknose, bull, sandbar, scalloped hammerhead, and smooth dogfish	Main stem of the lower Chesapeake Bay and the coastal inlets and lagoons of the Eastern Shore
South Carolina	Atlantic sharpnose, blacknose, blacktip, bonnethead, bull, finetooth, Carolina hammerhead, great hammerhead, hybrid scalloped/Carolina hammerhead, lemon, nurse, sand tiger, sandbar, scalloped hammerhead, spinner, and tiger	Nearshore and estuarine waters, including Bulls Bay, Charleston Harbor, North Edisto, Port Royal Sound, St. Helena Sound, and Winyah Bay.
Georgia	Atlantic sharpnose, blacknose, blacktip, bonnethead, bull, finetooth, lemon, sandbar, and scalloped hammerhead	Estuarine waters of the Altamaha, St. Simons and St. Andrew Sound systems
Florida (Atlantic Coast)	Atlantic sharpnose, blacknose, blacktip, bonnethead, bull, finetooth, scalloped hammerhead, lemon, nurse, sandbar, spinner, and tiger sharks	Nearshore and estuarine waters, including Cumberland Sound, Nassau Sound, Tolomato River, off Mayport Beach, and the Indian River Lagoon from Sebastian Inlet to Saint Lucie Inlet

Source: Northeast Fisheries Science Center (C. McCandless, pers comm).

3.3.2 Gulf of Mexico States Shark Pupping and Nursery Survey Results

NOAA Fisheries initiated the GULFSPAN program in 2003 to expand upon the COASTSPAN survey. The NOAA Southeast Fisheries Science Center (SEFSC) Panama City Laboratory administers the GULFSPAN program. The GULFSPAN survey examines the distribution and abundance of juvenile sharks in coastal areas of the Gulf of Mexico to continue to describe and further refine shark EFH. This cooperative program includes NOAA Fisheries scientists, the University of Southern Mississippi Gulf Coast Research Laboratory, the Florida State University Coastal and Marine Laboratory, and New College of Florida.

The following is a summary of the 2019 GULFSPAN catch and noted habitat associations (Moncrief-Cox et al. 2019). Shark species found by sampling locations are summarized in Table 3.3. GULFSPAN sampling in 2019, the most recent year for which data is available, covered four areas (Figure 3.2):

- Mississippi Sound
- St. Andrew Bay to St. Vincent Island, Florida
- St. George Sound to Anclote Keys, Florida, known as the Big Bend of Florida
- Southern Tampa Bay and Sarasota Bay, Florida

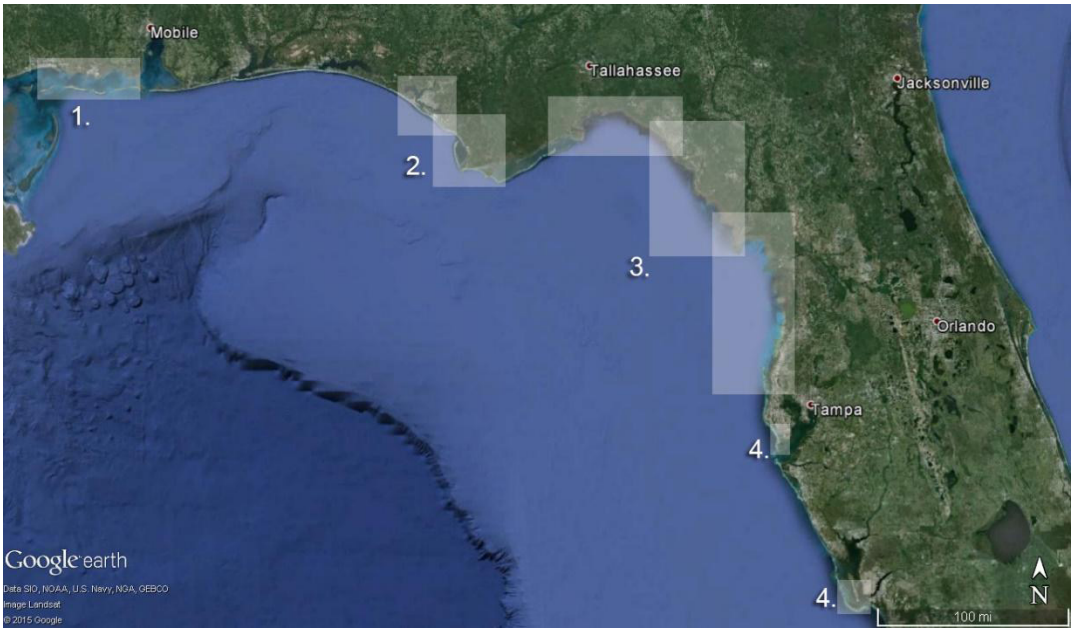

Figure 3.2 Regions Sampled During the 2019 GULFSPAN Survey

1 = Mississippi Sound. 2 = St. Andrew Bay to St. Vincent Island, Florida. 3 = St. George Sound to Anclote Keys, Florida, known as the Big Bend of Florida. 4 = Southern Tampa Bay and Sarasota Bay, Florida.

3.3.2.1 Mississippi Sound

In 2019, GULFSPAN sampling by the University of Southern Mississippi Gulf Coast Research Laboratory divided the coastal waters into eastern, central, and western regions that were allotted seven randomly generated stations inshore (depths of 2.0–2.9 meters) or offshore (depths of 3.0–10.0 meters). Three stations from at least two regions were sampled monthly between April and October.

A total of 21 gillnet sets were made, capturing 57 elasmobranchs representing nine species. Six shark species (finetooth, Atlantic sharpnose, spinner, bull, blacktip, and scalloped hammerhead) and 48 individual sharks were captured. The survey team also captured three species of rays (Brazilian cownose ray, Atlantic cownose ray, and Atlantic stingray) totaling 9 individuals. Approximately 84 percent of the elasmobranchs encountered were juvenile or young of the year.

Finetooth sharks were the most abundant shark caught. Finetooth sharks were found only in the offshore depth strata, and no individuals were caught in the western or central regions of the sampling area. Catch of finetooth sharks was dominated by juveniles (95.2 percent), which were exclusively caught in water ranging from 4.0 to 4.1 meters in depth. The final individual caught was of undetermined life stage.

The Atlantic sharpnose shark was the next most abundant shark caught. All but one Atlantic sharpnose caught were young of the year, the final shark being in the adult life stage. Atlantic sharpnose sharks were primarily caught in the offshore depth strata and no individuals were caught in the western region of the sampling area. This pattern is consistent with the idea that the Mississippi Sound is used by Atlantic sharpnose sharks as a nursery.

Spinner sharks accounted for 16.7 percent of the total shark catch, and were encountered only within the central sampling region at both depth strata. Environmental conditions at sites where spinner sharks were caught were similar, and sampling at both stations occurred later in the year (October). All of the individuals in which the life stage was determined were juveniles. Salinity and temperature range at the site was typical of areas where

finetooth sharks were caught.

Catches of bull sharks occurred in all inshore regions, with this species occurring in offshore depth strata only in the west region. Juveniles were the only life stages encountered. With exception to 2018, bull sharks were typically caught in lower salinity areas than other species; and in the 2019 survey, that habitat preference was demonstrated with bull sharks being present in the lowest average salinity of any species.

One blacktip shark was caught during the 2019 sampling season. The individual was caught in the east region in offshore depth stratum. The salinity and temperature where this individual juvenile was caught were on the higher end of any sampled site. One scalloped hammerhead (a juvenile) was also caught in the east sampling region in offshore depth stratum.

Overall, the dominance of juvenile and young-of-the-year elasmobranchs (84 percent of the catch) suggests the Mississippi Sound may act as a nursery area for several species. When young of the year for a species were encountered, it was often in numbers greater than one, which could point to a recent pupping event or a maintained affiliation by a recently pupped cohort.

Due to the sample design requirements established in 2012, the same sites cannot be sampled monthly. Therefore, it is important to note that these results are only representative of the conditions at the time of sampling and likely do not reflect the species assemblage throughout the year. As the Mississippi Sound is a very dynamic environment, seasonal and monthly shifts in abundances and size classes are likely. In 2019, for the first time in history, the Bonnet Carre spillway was opened twice in the same year, which resulted in higher than normal freshwater influx to the region. This may have been a contributing factor to the lower elasmobranch catch in 2019 compared to other years.

3.3.2.2 St. Andrew Bay to St. Vincent Island, Florida

Sampling by NOAA Fisheries SEFSC Panama City Laboratory typically covers four major areas along the panhandle of Florida: St. Andrew Bay, Crooked Island Sound, St. Joseph Bay, and the Gulf of Mexico side of St. Vincent Island. However, inclement weather and scheduling conflicts prevented sampling throughout the sampling season and no sites were sampled in the month of October.

A total of 80 gillnet sets were made, capturing seven species of shark (Atlantic sharpnose, scalloped hammerhead, blacktip, bonnethead, spinner, blacknose, and finetooth) and three species of batoid (cownose ray, spotted eagle ray, and Atlantic stingray). Atlantic sharpnose was the most abundant species caught at 53.7 percent of the total catch. Scalloped hammerhead shark was the second-most encountered species (11.9 percent), followed by blacktip shark (9.3 percent), bonnethead shark (8.8 percent), and spinner shark (7.6 percent). Blacknose and finetooth sharks comprised 2.6 and 1.0 percent of the total catch, respectively. The most abundant batoid captured was the cownose ray, making up 4.7 percent of the total catch. Other species of batoids encountered that made up less than 1 percent of the total catch included spotted eagle ray and Atlantic stingray.

Important habitats in these sampling areas include seagrass (*Thallassia testudinum* and *Halodule wrightii*), sand, and mud, as well as a mix of the three. Atlantic sharpnose were associated with the widest range of abiotic factors and depths and were captured over all bottom types across all areas. Immature scalloped hammerhead (all but one being young of the year) were captured in deeper water depths at a high mid-water temperature and salinity; however, water clarity values varied greatly. The majority of immature blacktip sharks were collected in Crooked Island Sound and St. Vincent Island over muddy, sandy habitat. Bonnethead sharks were also associated with a wide range of each abiotic factor in all areas, with young of the year found over sandy bottoms and adults found more primarily over muddy habitat. Young-of-the-year spinner sharks were caught in high numbers during a single haul at Crooked Island Sound, so there is no variation in abiotic data. Young-of-the-year blacknose sharks were captured in Crooked Island Sound and St. Joseph Bay across all bottom types in similar salinity and temperature, variable depth and turbidity. Finetooth sharks were caught in a large range of salinities and low water clarity.

3.3.2.3 Big Bend of Florida

Sampling by Florida State University Coastal and Marine Laboratory covered more than 300 km of Florida's coastline from St. George Sound to Anclote Keys. A total of 860 elasmobranchs comprising 13 species were caught. Shark species encountered included Atlantic sharpnose sharks, bonnethead, blacktip, blacknose, spinner, lemon, bull, tiger, great hammerhead, and nurse. Batoid species included bluntnose stingray, Atlantic stingray, giant oceanic manta ray. Of the 852 sharks caught on longline and in gillnet sets, 361 individuals were tagged and released.

Bonnethead and Atlantic sharpnose sharks were a combined 92.5 percent of the shark catch in gillnets. Atlantic sharpnose sharks were primarily adult males and juveniles of both sexes, while catch of bonnetheads included juveniles and adults of both sexes. Five other species of shark were caught in gillnets: blacktip sharks (3.2 percent of catch, comprised of both young of the year and juvenile life stages), blacknose sharks (2.3 percent of catch, comprised of young of the year and juveniles), bull sharks (1 individual of each young-of-the-year and juvenile life stages), and one each of spinner and lemon sharks (young-of-the-year life stages).

Atlantic sharpnose sharks dominated the catch of the longline sets. All but two of the 51 adult Atlantic sharpnose sharks were males, and the majority of young of the year and juveniles were also male. Blacktip sharks were caught second most frequently (27.3 percent of shark catch) on longlines, with all life stages and both sexes represented. Blacknose sharks accounted for 5.6 percent of the total shark catch on longline. Seven other species were also caught on longlines: 10 juvenile tiger sharks, five young-of-the-year and two juvenile spinner sharks, five adult nurse sharks, two juvenile bull sharks, two juvenile lemon sharks, three adult and one juvenile bonnetheads, and one adult great hammerhead.

Sampling in 2019 continued to indicate that this region provides important primary and secondary nursery habitat for Atlantic sharpnose, blacknose, and blacktip sharks. Habitats sampled included seagrass (*T. testudinum, H. wrightii, and Syringodium filiforme*), drift algae-dominated bottom, mud bottom, sandy ridges, and hard bottom reefs dominated by soft corals and sponges. Seagrass habitats in this region were in waters shallower than 4 meters, and most effort occurred in this habitat type. All life stages of Atlantic sharpnose, except adult females, were found in all habitats sampled, although very few were captured over hard bottom reefs. Juvenile and adult bonnethead sharks were most common in seagrass habitats. All life stages of blacktip sharks were typically captured on the edges of muddy channels and sandy ledges adjacent to seagrass habitats. Young-of-the-year and juvenile blacknose were usually captured in sandy seagrass habitat, while adults were captured on the edges of muddy channels adjacent to seagrass habitats.

Sampling in St. George Sound occurred from April 22 to October 14, 2019. Water temperatures ranged from 20.5 to 32.9°C and salinity ranged from 28.8 to 32.9 parts per thousand. Sampling from Apalachee Bay to Anclote Key occurred over June, July, and August when water temperatures were high. Salinity ranged from 12.1 to 33.1 parts per thousand. Salinity at most stations was above 20.0 parts per thousand. No environmental associations were noted for the dominantly caught species; however, blacknose sharks were most frequently captured in salinities above 30.0 parts per thousand. Atlantic sharpnose sharks, bonnethead sharks, and blacktip sharks were captured across nearly the full range of temperatures and salinities sampled.

3.3.2.4 Southern Tampa Bay, Florida

In 2019, New College of Florida conducted GULFSPAN sampling in two coastal embayments, Terra Ceia Bay and Sarasota Bay, and in the estuarine portion of the Manatee River. Sampling was conducted monthly from April to October in all areas.

A total of 167 sets were made (113 gillnet sets and 54 longline sets) capturing 354 elasmobranchs from 14 species. Of these, eight shark species (bonnethead, Atlantic sharpnose, blacktip, blacknose, bull, great hammerhead, scalloped hammerhead, and nurse) and six batoid species (cownose ray, Atlantic stingray, roughtail stingray, bluntnose ray, southern stingray, spotted eagle ray) were represented. Immature animals made up 63 percent of the total catch, with 19 percent of these being young of the year and 81 percent over a year old. Seven neonate blacktip

sharks were caught. Less than 4 percent of the catch was not assigned a life stage.

Abundance and size trends differed slightly by area. The bonnethead was the most abundant species encountered, comprising 42 percent of the total elasmobranch catch. Catch of this species was composed of approximately equal numbers of juvenile and mature animals of both sexes. The Atlantic sharpnose shark, comprising 17 percent of the total elasmobranch catch, was the second most abundant species encountered overall. Catch of this species was primarily juvenile and adult males. The cownose ray, at 16 percent of the total elasmobranch catch, was the third most abundant species encountered overall. Catch of this species consisted primarily of juveniles of both sexes; relatively few adults and no young of the year were encountered. The blacktip shark and Atlantic stingray were the next most abundant species, at 13 and 4 percent of the catch, respectively.

The three systems differed in abiotic profiles. Temperature and salinity were consistently higher in Sarasota Bay than Terra Ceia Bay or the Manatee River. Salinity in the Manatee River was highly dynamic, particularly in the eastern portion of the river. These data suggest that these systems serve as primary and secondary nursery areas for several species of sharks and rays. Habitats sampled included seagrass-, sand-, and mud-dominated bottom types, as well as a mix of all three. A few areas included patchy oyster beds.

Bonnethead sharks were associated with a broad range of abiotic factors, and primarily associated with shallower depths and a mixture of sandy and seagrass bottoms. Atlantic sharpnose sharks were also encountered across a broad range of abiotic factors, but were also found across all water depths and bottom types. Young-of-the-year Atlantic sharpnose sharks were associated with higher salinity than juveniles and adults, which were encountered across a broader range of salinity. Blacktip sharks were associated with warm, moderate to high salinity waters and were captured across a wide variety of depths, primarily over sandy to muddy bottom. Immature blacknose sharks were also associated with moderate to high salinities and sandy to muddy bottoms; but were caught exclusively in the western portion of the Manatee River in cooler, deeper waters. One adult blacknose shark was caught in Terra Ceia Bay over a mixture of sand and seagrass. Small (< one meter fork length) bull sharks were only associated with a lower salinity in the Manatee River, though one larger subadult bull shark was encountered in Terra Ceia Bay in higher salinity. Juvenile great hammerheads were caught in deeper, higher clarity waters. The single young-of-the-year scalloped hammerhead and adult nurse shark were caught in Sarasota Bay and Terra Ceia Bay, respectively; both in high salinity water over a sandy bottom mixed with seagrass.

Table 3.3 Shark Species and Sampling Locations in the 2019 Cooperative Gulf of Mexico States Shark Pupping and Nursery Survey

Sampling Region	Shark Species	Sampling Locations
Mississippi	Finetooth, Atlantic sharpnose, spinner, bull, blacktip, and scalloped hammerhead	Mississippi Sound
Florida—St. Andrew Bay to St. Vincent Island	Atlantic sharpnose, scalloped hammerhead, blacktip, bonnethead, spinner, blacknose, and finetooth	St. Andrew Bay, Crooked Island Sound, St. Joseph Bay, and the Gulf of Mexico side of St. Vincent Island
Florida—Big Bend	Atlantic sharpnose, bonnethead, blacktip, blacknose, spinner, lemon, bull, tiger, great hammerhead, nurse	St. George Sound, Apalachee Bay, Suwanee Sound, Waccasassa Bay, Anclote Keys
Florida—Southern Tampa Bay	bonnethead, Atlantic sharpnose, blacktip, blacknose, bull, great hammerhead, scalloped hammerhead, and nurse	Terra Ceia Bay, Estuarine Manatee River, and Sarasota Bay

Source: Moncrief-Cox et al. 2019.

3.3.3 Conclusion

The COASTSPAN and GULFSPAN surveys provide comprehensive information that is incorporated into the Atlantic HMS EFH five-year review and associated amendments (i.e., Amendment 1 and Amendment 10). These surveys continue to provide data needed to identify new EFH areas and to further refine areas already designated as EFH by determining specific habitat characteristics associated with these habitats for shark nurseries and pupping. Time series data from both surveys are useful in the stock assessments for large and small coastal shark species, essential for monitoring these populations and their habitat use, and needed for habitat consultations completed by NOAA Fisheries' Office of Habitat Conservation.

3.4 Chapter 3 References

Heupel MR, Carlson JK, Simpfendorfer CA. 2007. Shark nursery areas: concepts, definition, characterization, and assumptions. Mar Ecol Prog Ser. 337:287-297.

Moncrief-Cox HE, Deacy BM, Carlson JK, Graham PM, Hendon JM, Peterson C, Grubbs RD, Gardiner JM, Domenech S, Beaver JA, Wiley TR. 2019. Shark Nursery Grounds and Essential Fish Habitat Studies. GULFSPAN Gulf of Mexico-FY2019. Internal Report to NOAA Fisheries, Highly Migratory Species Management Division. Panama City Laboratory Contribution 20-03.

4 Permits and Tournaments

Atlantic HMS permits are issued for vessels, dealers, scientific research, and aquarium displays. Types of HMS permits, the numbers issued, and the distribution of these permits are presented in this chapter. Detailed information about Atlantic HMS permits and associated regulations are available in the most recent Atlantic HMS recreational, commercial, and dealer compliance guides.

Information summarizing the regulations for Atlantic HMS tournaments and number of registered Atlantic HMS tournaments is included in Section 4.4.

4.1 Atlantic HMS Vessel Permits

4.1.1 Limited Access Permits

Atlantic HMS limited access permits can only be obtained by transferring an existing permit from a current permit holder. New permits are not issued. The Atlantic HMS limited access permit program is made up of the following:

- Swordfish Directed permit.
- Swordfish Incidental permit.
- Swordfish Handgear permit.
- Shark Directed permit.
- Shark Incidental permit.
- Atlantic Tunas Longline category permit.
- Atlantic Tunas Purse Seine category permit.

Several of these permits were designed to be held in combination to reduce regulatory discards and monitor bycatch in the pelagic longline fishery. Requiring a combination allows for limited retention of species that might otherwise have to be discarded due to regulations not allowing fishermen to retain the fish. For example, tunas and sharks are commonly caught when pelagic longline fishing for swordfish; if only a swordfish permit was held, then discarding tunas and sharks would be required. Therefore, Swordfish Directed and Swordfish Incidental permits are valid only if the permit holder also holds both an Atlantic Tunas Longline category and a Shark Directed or Incidental permit. This minimizes tuna and shark regulatory discards.

As of October 2020, approximately 177 Swordfish Directed, 71 Swordfish Incidental, 213 Shark Directed, and 256 Shark Incidental limited access permits have been issued. In addition, approximately 81 Swordfish Handgear permits and 281 Atlantic Tunas Longline category permits have been issued.

The purse seine fishery is managed under a limited entry system with transferable individual vessel quotas among existing fishery participants. New entrants are excluded from the Atlantic Tunas Purse Seine category. There were no active vessels permitted for this category in 2020.

The number of limited access permits issued over the last five years is presented by permit type in Table 4.1 and the number of limited access permits issued in 2019 is tabulated by state in Table 4.2. Maps showing the distribution of these permits are presented in Figure 4.1 through Figure 4.6.

Table 4.1 Annual Numbers of Limited Access Shark, Swordfish, and Atlantic Tunas Longline Vessel Permits and Permit Holders in 2015–2020

Year	Swordfish Directed	Swordfish Incidental	Swordfish Handgear	Shark Directed	Shark Incidental	Atlantic Tunas Longline Category	Permit Holders (Permits Issued)
2015	188	72	83	224	275	280	540 (1,122)
2016	186	72	83	223	271	280	540 (1,115)
2017	185	72	83	221	269	280	588 (1,110)
2018	185	72	83	220	268	280	537 (1,108)
2019	183	71	82	218	263	280	527 (1,097)
2020*	177	71	81	213	256	281	513 (1,079)

Note: Number of permits and permit holders in each category subject to change as permits are renewed or expire. *As of October 2020. Source: Southeast Regional Office.

Table 4.2 Numbers of Limited Access Shark, Swordfish, and Atlantic Tunas Longline Category Vessel Permits and Permit Holders by State in 2020*

State	Swordfish Directed	Swordfish Incidental	Swordfish Handgear	Shark Directed	Shark Incidental	Atlantic Tunas Longline Category	Permit Holders (Permits)
Maine	3	1	1	1	6	4	8 (16)
Massachusetts	9	2	4	4	12	14	24 (45)
Rhode Island	-	-	10	-	2	1	10 (13)
Connecticut	1	2	1	-	3	3	4 (10)
New York	11	4	3	7	13	16	23 (54)
Pennsylvania	1	-	-	1	1	1	2 (4)
New Jersey	20	10	4	19	23	40	51 (116)
Delaware	2	-	1	2	2	2	5 (9)
Maryland	4	-	-	2	2	4	2 (12)
Virginia	1	-	-	1	2	3	5 (7)
North Carolina	10	8	-	22	9	18	27 (67)
South Carolina	4	1	-	6	8	5	14 (24)
Georgia	-	1	-	3	3	1	6 (8)
Florida	78	31	56	116	123	118	255 (522)
Alabama	1	-	-	4	3	1	5 (9)
Louisiana	26	4	1	20	29	34	53 (114)
Texas	1	7	-	3	12	-	13 (23)
California	-	-	-	-	-	1	1 (1)
Washington	2	-	-	1	1	2	2 (6)

State	Swordfish Directed	Swordfish Incidental	Swordfish Handgear	Shark Directed	Shark Incidental	Atlantic Tunas Longline Category	Permit Holders (Permits)
Hawaii	1	-	-		1	1	1 (3)
Trinidad/ Tobago	1	-	-	1	-	1	1 (3)
Dominican Republic	1	-	-	-	1	1	1 (3)

Note: Number of permits and permit holders in each category, state, and year are subject to change as permits are renewed or expire. *As of October 2020. Source: Southeast Regional Office.

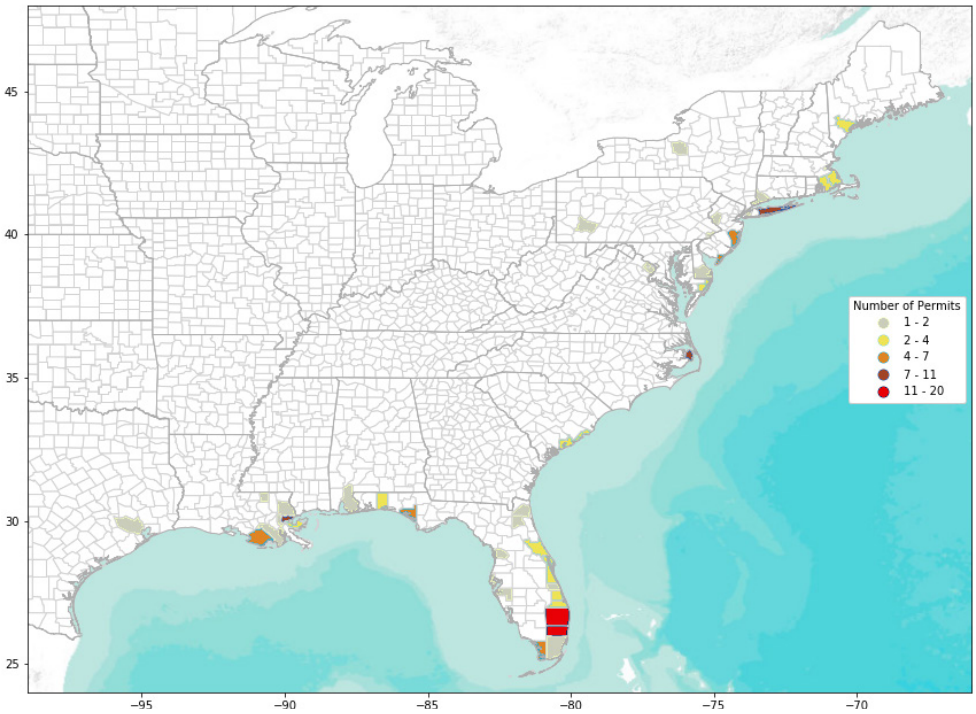

Figure 4.1 **Distribution of Swordfish Directed Permits as of October 2020**

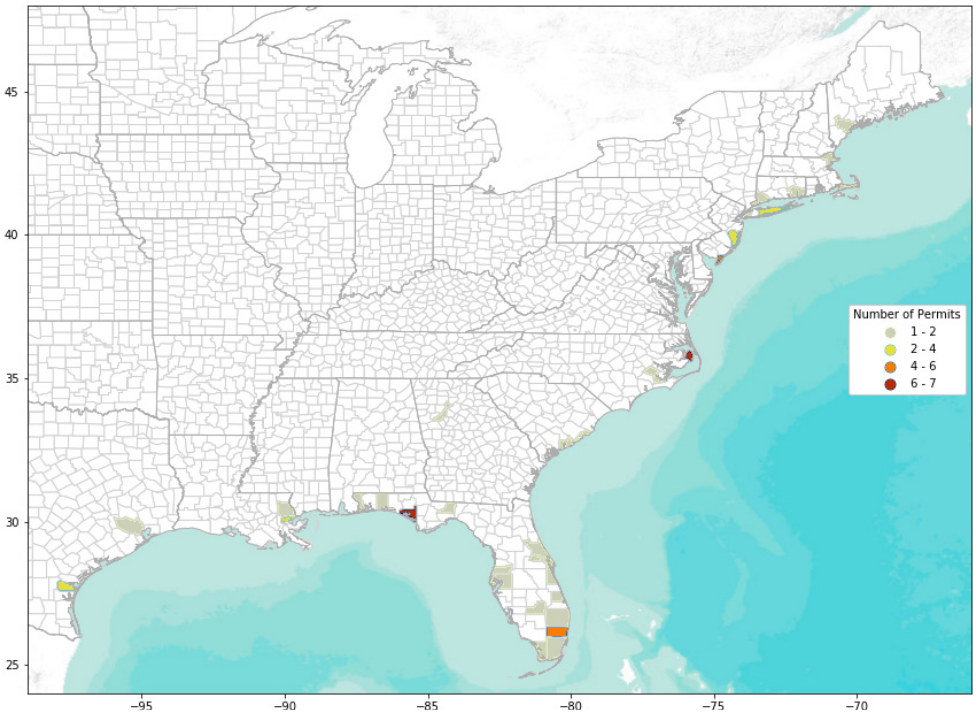

Figure 4.2 **Distribution of Swordfish Incidental Permits as of October 2020**

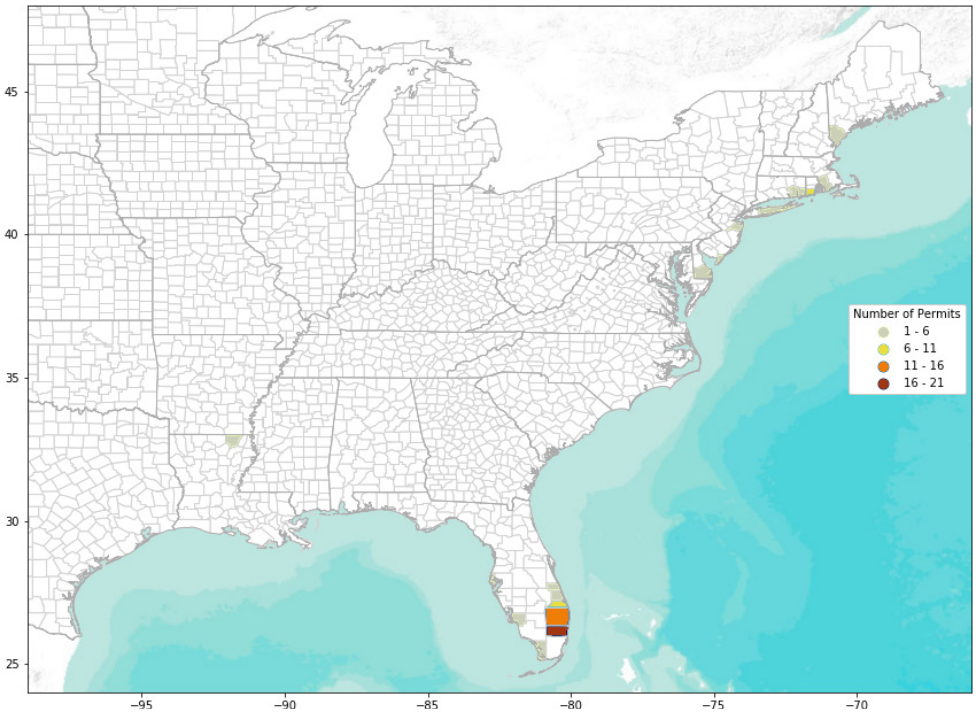

Figure 4.3 **Distribution of Swordfish Handgear Permits as of October 2020**

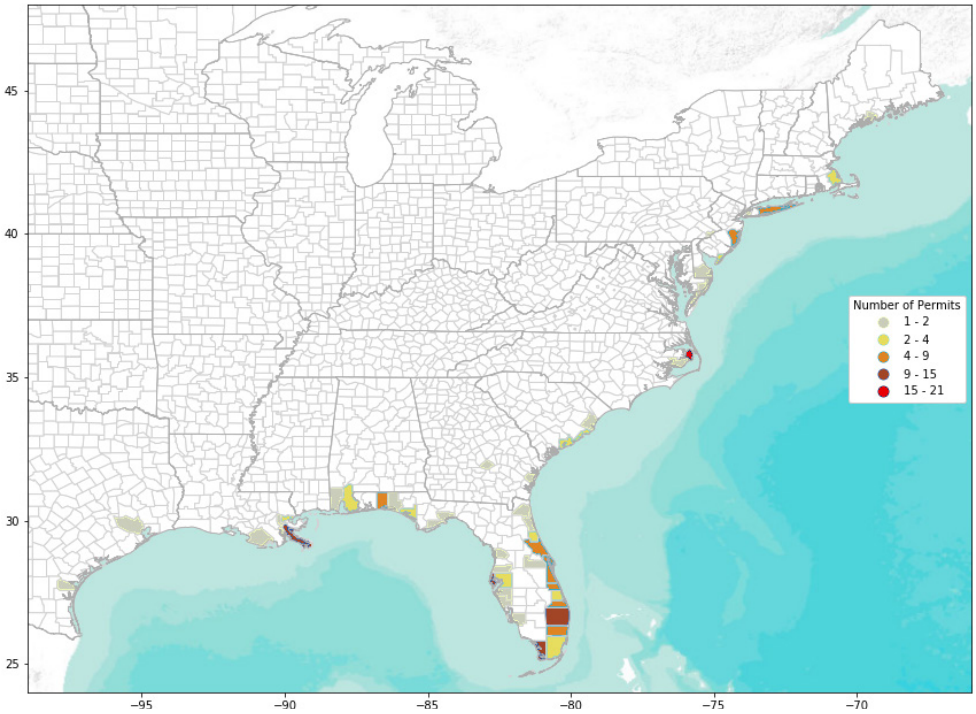

Figure 4.4 **Distribution of Shark Directed Permits as of October 2020**

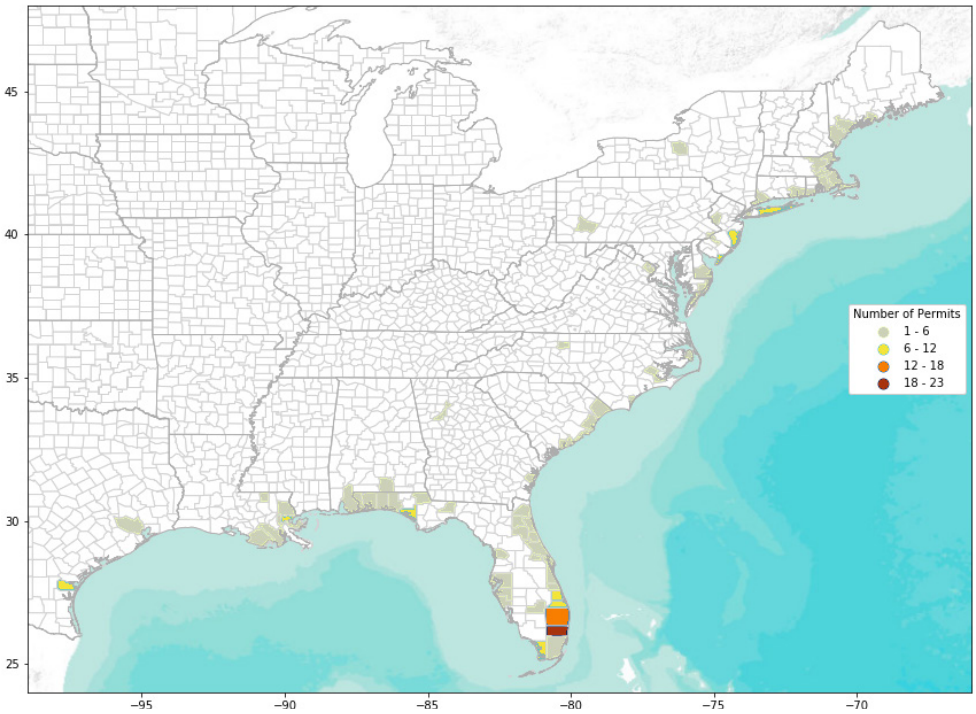

Figure 4.5 **Distribution of Shark Incidental Permits as of October 2020**

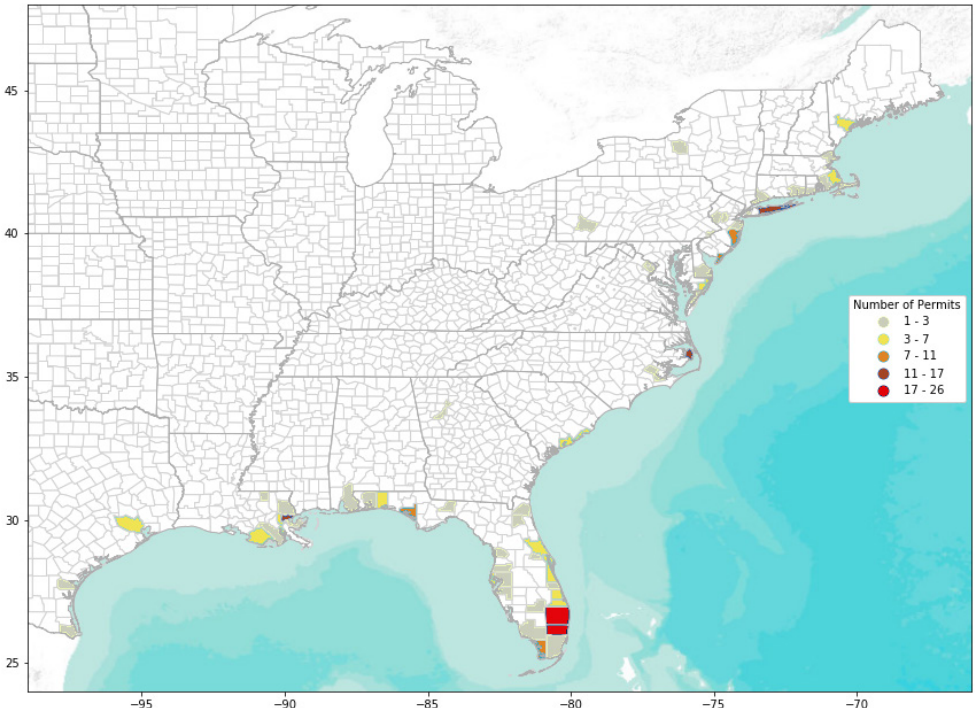

Figure 4.6 **Distribution of Atlantic Tunas Longline Permits as of October 2020**

4.1.2 Incidental HMS Squid Trawl Permit

The Incidental HMS Squid Trawl permit is a commercial permit available only to valid *Illex* squid moratorium permit holders (August 10, 2011; 76 FR 49368). The permit authorizes the retention of up to 15 North Atlantic swordfish caught incidentally using trawl gear per trip, as long as squid constitutes at least 75 percent of the total weight of catch on board. The distribution of Incidental HMS Squid Trawl permits among Atlantic states is presented in Table 4.3.

Table 4.3 Number of Incidental Highly Migratory Species Squid Trawl Permits by State in 2020*

State	Issued Permits
Maine	1
Massachusetts	9
Rhode Island	13
Connecticut	3
New York	5
New Jersey	27
Virginia	5
North Carolina	4
2020 total*	67
2019 total	69

Note: Number of permits and permit holders in each category and state is subject to change as permits are renewed or expire. *As of October 2020. Source: Greater Atlantic Regional Fisheries Office.

4.1.3 Open Access Permits

Unlike limited access permits, open access permits are not limited in the number issued, can be issued to new permit holders, and may not be transferred from one permit holder to another permit holder. The Atlantic HMS open access permit program includes the following:

- Commercial Caribbean Small Boat permit.
- Swordfish General Commercial permit.
- Smoothhound Shark permit.
- Atlantic Tunas General category permit.
- Atlantic Tunas Harpoon category permit.
- Atlantic Tunas Trap category permit.
- HMS Charter/Headboat permit.
- HMS Angling permit.

4.1.3.1 Commercial Caribbean Small Boat Permit

The Commercial Caribbean Small Boat permit is valid only in the U.S. Caribbean region on vessels that are less than 45 feet long (October 1, 2012; 77 FR 59842). This permit allows the commercial retention of tunas, swordfish,

and sharks. The current default retention limit for bigeye, northern albacore, yellowfin, and skipjack tunas is 10 fish, and the retention limit for North Atlantic swordfish is two fish. The shark retention limit is zero; however, if the retention limit were increased, permit holders would be allowed to retain and sell non-prohibited species of sharks. In 2020, NOAA Fisheries published a proposed rule that would modify the swordfish and shark retention limits for this permit (85 FR 23315, April 27, 2020). The comment period for this rule ended on June 26, 2020.

The distribution of these permits among the states and territories is presented in Table 4.4.

Table 4.4 Number of Commercial Caribbean Small Boat Permits By State in 2020*

State	Issued Permits
South Carolina	1
Florida	9
Louisiana	13
Texas	3
Puerto Rico	5
U.S. Virgin Islands	27
2020 total*	30
2019 total	35

Note: These permits are only valid when used in the U.S. Caribbean region. Also, the number of permits and permit holders in each category and state is subject to change as permits are renewed or expire. *As of October 2020. Source: Southeast Regional Office.

4.1.3.2 Swordfish General Commercial Permit

The Swordfish General Commercial permit (August 21, 2013; 78 FR 52012) authorizes holders to retain and sell a limited number of swordfish caught on rod and reel, handline, harpoon, green-stick, or bandit gear. This permit can be held in conjunction with the Atlantic Tunas Harpoon and General category permits. It also authorizes vessel occupants to fish recreationally for any Atlantic HMS when participating in a registered Atlantic HMS tournament.

The swordfish retention limit under this permit may be set between zero and six fish per vessel per trip. The default retention limits for North Atlantic swordfish are three in the northwest Atlantic and Gulf of Mexico, two in the U.S. Caribbean, and zero in the Florida Swordfish Management Area. The swordfish retention limits were maintained at six fish throughout 2020 by two inseason actions published in January (85 FR 14; January 2, 2020) and June (85 FR 38091; June 25, 2020). In 2020, NOAA Fisheries published a proposed rule that would modify the swordfish retention limit for this permit (85 FR 23315, April 27, 2020). The comment period for this rule ended on June 26, 2020. The distribution of Swordfish General Commercial permits is presented in Table 4.5 and mapped in Figure 4.7.

Table 4.5 **Number of Swordfish General Commercial Permits By State in 2020***

State	Issued Permits
Maine	125
New Hampshire	22
Massachusetts	158
Rhode Island	40
Connecticut	11
New York	38
Pennsylvania	2
New Jersey	24
Delaware	4
Maryland	8
Virginia	17
North Carolina	100
South Carolina	7
Florida	72
Alabama	5
Mississippi	1
Louisiana	12
Texas	4
California	1
Puerto Rico	12
U.S. Virgin Islands	2
2020 total*	665
2019 total	667

Note: Number of permits and permit holders in each category and state is subject to change as permits are renewed or expire. *As of October 2020. Source: Southeast Regional Office.

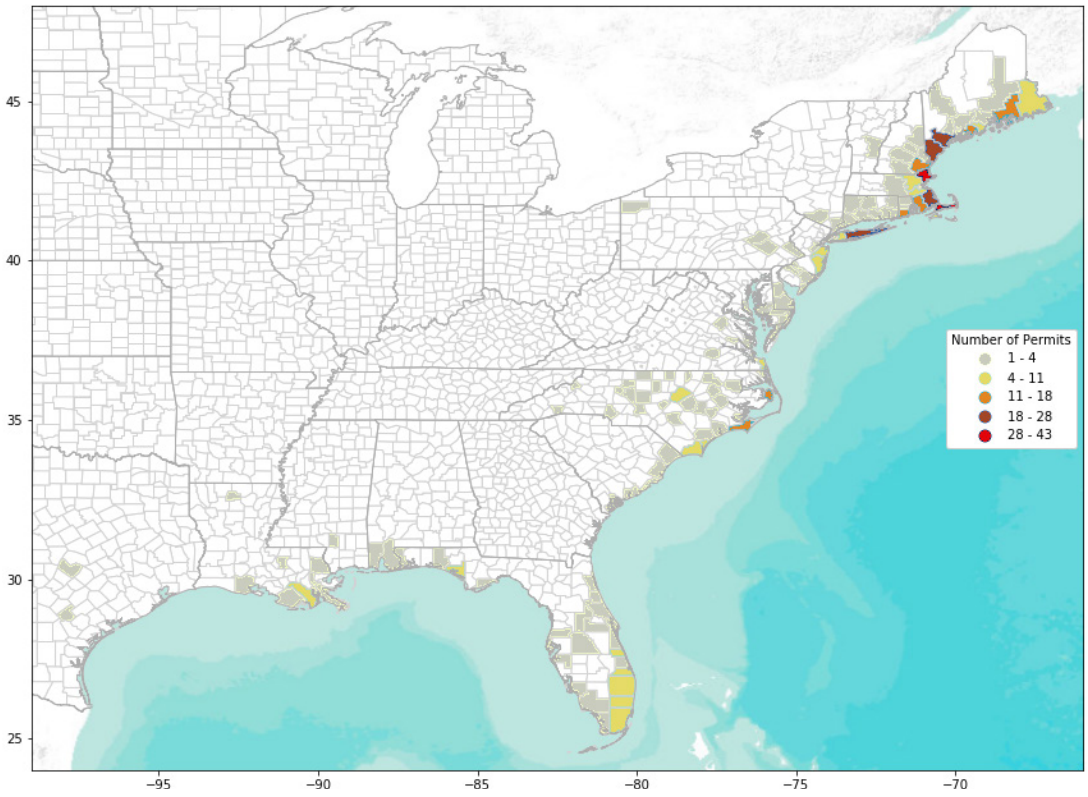

Figure 4.7 Distribution of Swordfish General Commercial Permits as of October 2020

4.1.3.3 Smoothhound Shark Permit

The commercial Smoothhound Shark permit has been required since March 15, 2016 (80 FR 73128; November 24, 2015) in order to land and sell smoothhound sharks, including smooth dogfish, Florida smoothhound, and Gulf smoothhound. Table 4.6 provides the number of permit holders by state. The distribution of Smoothhound Shark permits is mapped in Figure 4.8.

Table 4.6 **Number of Smoothhound Shark Permits By State in 2020***

State	Issued Permits
Maine	1
Rhode Island	6
New York	11
New Jersey	30
Delaware	2
Maryland	4
Virginia	16
North Carolina	57
South Carolina	7
Florida	21
Louisiana	3
Illinois	2
2020 total*	665
2019 total	667

Note: Number of permits and permit holders in each category and state is subject to change as permits are renewed or expire. *As of October 2020. Source: Southeast Regional Office.

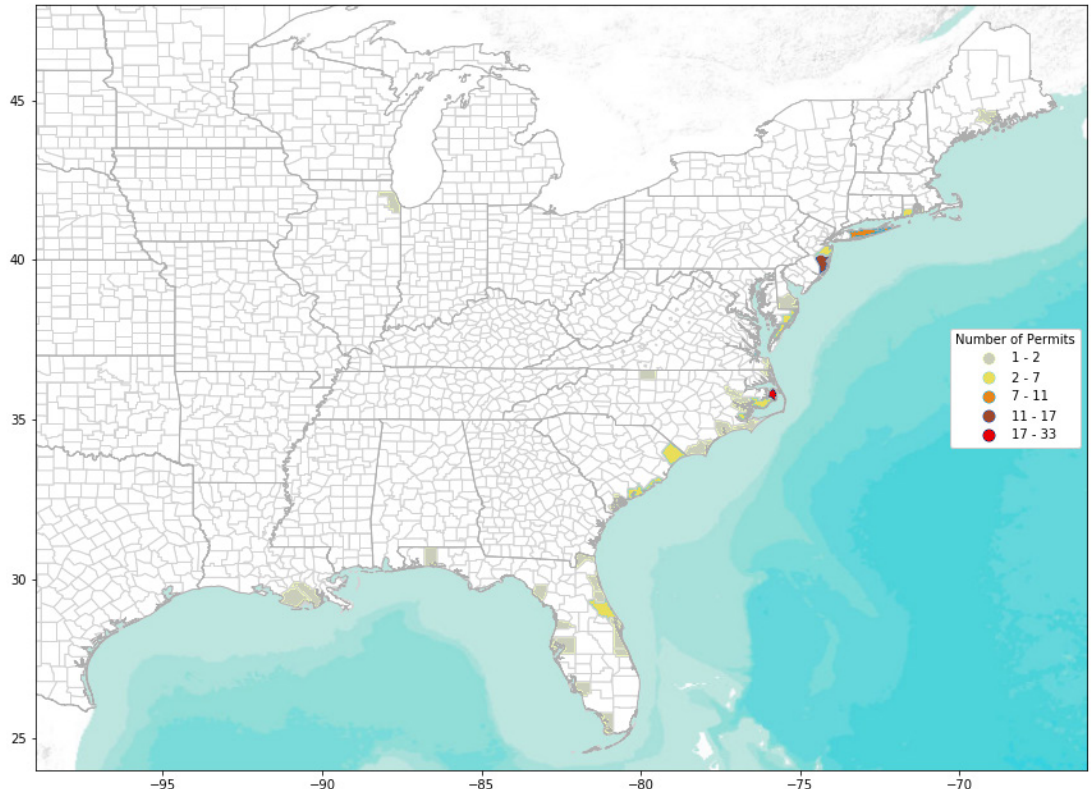

Figure 4.8 Distribution of Smoothhound Shark Permits as of October 2020

4.1.3.4 Atlantic Tunas Permit

Background

Commercial fisheries targeting U.S. Atlantic tuna are currently managed through an open access vessel permit program, which includes the Atlantic Tunas permit and the HMS Charter/Headboat permit with a commercial sales endorsement (see Section 4.1.3.5). Vessels that wish to sell their landings under the Atlantic Tunas permit must obtain a permit in one of the following categories:

- **General:** Authorizes the use of handgear, including rod and reel, harpoon, handline, bandit gear, and green-stick. This permit also authorizes individuals on a permitted vessel to fish for all Atlantic HMS when participating in a registered Atlantic HMS tournament.
- **Harpoon:** Authorizes the use of harpoon gear only.
- **Trap:** Authorizes the use of pound net and fish weir for incidentally caught bluefin tuna.

Vessels may also need permits from the states from which they operate in order to land and sell their catch. Federally permitted vessels are allowed to sell Atlantic tunas only to federally permitted Atlantic tunas dealer.

Open access tuna permits are listed by category in Table 4.7. For more information on the limited access Longline and Purse Seine permit categories, Section 4.1.1.

Table 4.7 Number of Commercial Atlantic Tunas Permits By Category in 2015–2020

Category	2015	2016	2017	2018	2019	2020*
Harpoon	23	9	11	21	20	7
Trap	4	-	1	-	2	5
General	3,230	2,910	2,940	2,942	2,721	2,645
Total	3,542	3,204	3,237	3,248	3,023	2,948

Notes: The General and Harpoon categories listed include those held in conjunction with a Swordfish General Commercial permit. The actual number of 2020 permit holders in each category is subject to change as individuals renew their permits or allow them to expire. *As of October 2020. †Number of available permits. Source: Southeast Regional Office.

NOAA Fisheries manages a bluefin tuna quota for each of these categories, as established in Amendment 7 to the 2006 Consolidated Atlantic HMS FMP in 2015. In addition, there is a Reserve category quota that can be used for research or for inseason or annual quota adjustments (i.e., transfers to other quota categories).

General Category

Vessels with this permit fish under the General category rules and regulations. For instance, vessels with this permit can retain an agency-specified daily bag limit of 1–5 bluefin tuna measuring 73 inches or greater curved fork length (CFL) per vessel per day while the General category bluefin tuna fishery is open. The General category bluefin tuna fishery opens on January 1 of each year and remains open until March 31 or until the General category quota allocation has been caught, whichever comes first. The fishery then reopens on June 1 and remains open until December 31 or until the quota is filled.

The bluefin tuna quota for the General category is divided into multiple subquotas associated with specific periods of the year. NOAA Fisheries has the authority to transfer quota from one subquota period to another, including earlier in the calendar year. In accordance with the 2006 Consolidated Atlantic HMS FMP, the General category receives approximately 47 percent of the U.S. bluefin tuna quota.

The number of General category permits by state can be found in Table 4.8 and illustrated in Figure 4.9.

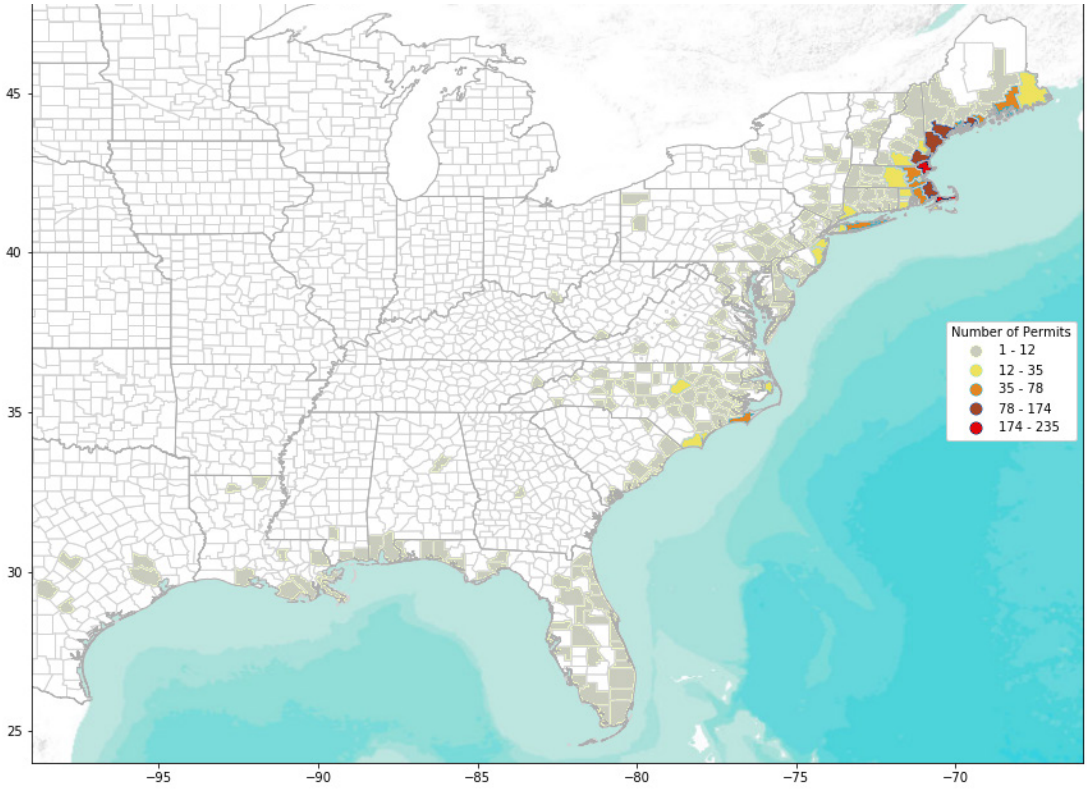

Figure 4.9 Distribution of Atlantic Tunas General Category Permits as of October 2020

Table 4.8 **Number of Atlantic Tunas General Category Permits By State/Territory in 2020***

State	Issued Permits
Maine	565
New Hampshire	171
Vermont	1
Massachusetts	956
Rhode Island	100
Connecticut	41
New York	95
Pennsylvania	4
Ohio	1
New Jersey	77
Delaware	11
Maryland	17
Virginia	39
North Carolina	306
South Carolina	15
Florida	117
Alabama	25
Mississippi	7
Louisiana	16
Texas	10
Puerto Rico	65
U.S. Virgin Island	3
California	3
2020 total*	2,645
2019 total	2,721

Note: Number of permits and permit holders in each category and state is subject to change as permits are renewed or expire. *As of October 2020. Source: Greater Atlantic Regional Fisheries Office.

Harpoon Category

The Harpoon category provides different rules and regulations for vessels permitted to fish exclusively with harpoon gear than for vessels fishing with harpoon gear under the General category, who may also use other gear types. The default retention limit under the Harpoon Category permit for bluefin tuna measuring 73 inches to less than 81 inches curved fork length (CFL) is two fish per vessel trip per day, and NOAA Fisheries has the authority to set the limit in the 2–4 fish range. There is no limit on the number of bluefin tuna that can be retained measuring longer than 81 inches CFL as long as the Harpoon category season is open. The season opens on June 1 of each year and closes November 15 if the quota has not already been filled. The Harpoon category bluefin tuna quota is approximately 3.9 percent of the U.S. quota.

The homeport states for the 26 Atlantic Tunas Harpoon category permits issued in 2020 were Maine (12 vessels) and Massachusetts (14 vessels). A map showing the distribution of Harpoon category permits is illustrated in Figure 4.10.

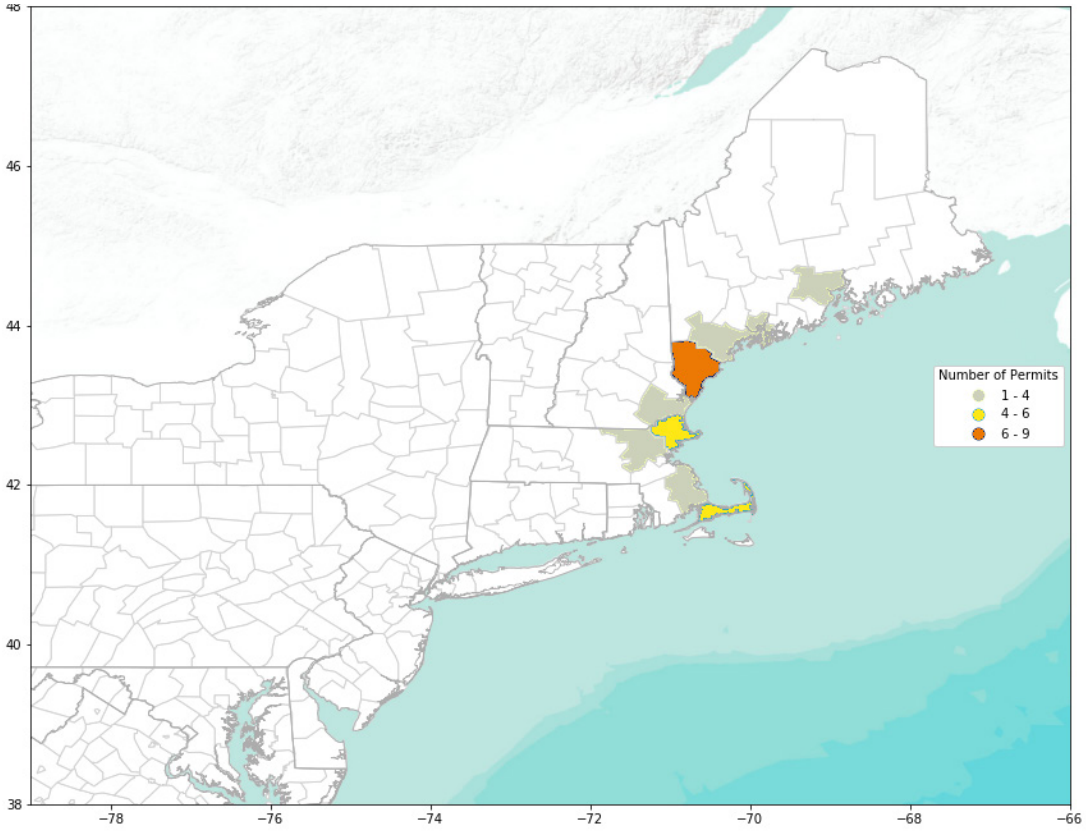

Figure 4.10 Distribution of Atlantic Tunas Harpoon Category Permits as of October 2020

4.1.3.5 HMS Charter/Headboat Permit

The HMS Charter/Headboat permit authorizes recreational fishing for all Atlantic HMS. It also allows for the sale of Atlantic tunas and swordfish when combined with a commercial sale endorsement (82 FR 57543; December 6, 2017). Swordfish can only be sold on non-for-hire trips. Those vessels with a commercial sale endorsement are required to abide by the U.S. Coast Guard (USCG) commercial fishing vessel safety requirements.

Starting in 2018, vessel owners issued an HMS Charter/Headboat permit who intend to fish for sharks are also required to obtain a shark endorsement (82 FR 16478; April 4, 2017). See Section 4.1.4 for information on issued endorsements.

The distribution of 2019 HMS Charter/Headboat permits is presented in Table 4.9 and in Figure 4.11.

Table 4.9 **Number of Atlantic Highly Migratory Species Charter/Headboat Permits By State in 2020**

State	Issued Permits
Maine	127
New Hampshire	101
Massachusetts	729
Rhode Island	142
Connecticut	78
New York	327
Pennsylvania	7
Ohio	2
New Jersey	487
Delaware	101
Maryland	134
Virginia	64
North Carolina	349
South Carolina	122
Georgia	27
Florida	754
Alabama	59
Mississippi	16
Louisiana	86
Texas	83
Puerto Rico	16
U.S. Virgin Island	15
Oklahoma	1
California	4
Idaho	1
Wisconsin	2
Michigan	3
Alaska	1
Hawaii	1
2020 total*	3,839
2019 total	3,769

Note: Number of permits and permit holders in each category and state is subject to change as permits are renewed or expire. *As of October 2020. Source: Southeast Regional Office.

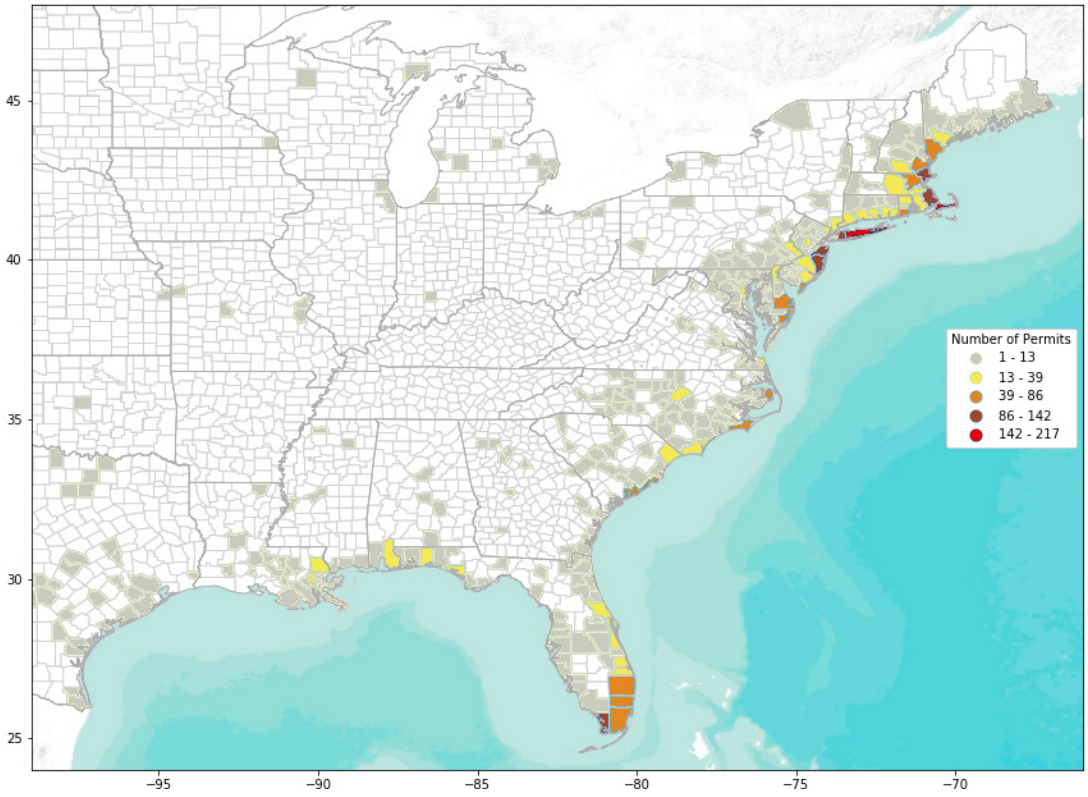

Figure 4.11 Distribution of Atlantic Highly Migratory Species Charter/Headboat Category Permits as of October 2020

4.1.3.6 HMS Angling Permit

The HMS Angling permit is required to recreationally fish for, retain, or possess any federally regulated Atlantic HMS. This requirement includes catch-and-release fishing. The permit does not authorize the sale or transfer of HMS to any person for a commercial purpose. Starting in 2018, vessel owners issued an HMS Angling permit intending to fish for sharks are required to obtain a shark endorsement.

HMS Angling permit distribution is reported Table 4.10 and in Figure 4.12.

Table 4.10 Number of Highly Migratory Species Angling Permits By State or Country in 2020†

State/Country	Permits by Home Port*	Permits by Residence**
Alaska	1	1
Alabama	467	467
Arkansas	9	9
California	3	3
Colorado	4	4
Connecticut	802	802
District of Columbia	1	1

State/Country	Permits by Home Port*	Permits by Residence**
Delaware	910	910
Florida	4,454	4,453
Georgia	96	96
Hawaii	2	2
Iowa	1	1
Idaho	1	1
Illinois	8	8
Indiana	3	3
Kansas	2	2
Kentucky	3	3
Louisiana	461	461
Massachusetts	2,593	2,591
Maryland	1,205	1,205
Maine	449	449
Michigan	22	22
Minnesota	1	1
Missouri	8	8
Mississippi	183	183
Montana	2	2
North Carolina	1,439	1,436
New Hampshire	283	283
New Jersey	3,886	3,884
Nevada	1	1
New York	2,396	2,396
Ohio	10	10
Oklahoma	10	10
Oregon	1	1
Pennsylvania	183	183
Puerto Rico	243	243
Rhode Island	650	650
South Carolina	519	518
Tennessee	25	25
Texas	618	618
Utah	1	1
Virginia	814	814

State/Country	Permits by Home Port*	Permits by Residence**
U.S. Virgin Islands	23	23
Vermont	14	14
Washington	5	5
Wisconsin	5	5
West Virginia	7	7
Canada†	7	7
2020 totals, by port and by residence*	22,833	22,833
2019 totals, by port and by residence	21,407	21,407

†As of October 2020. *The vessel port or other storage location. **The permit holder's billing address. Source: Southeast Regional Office.

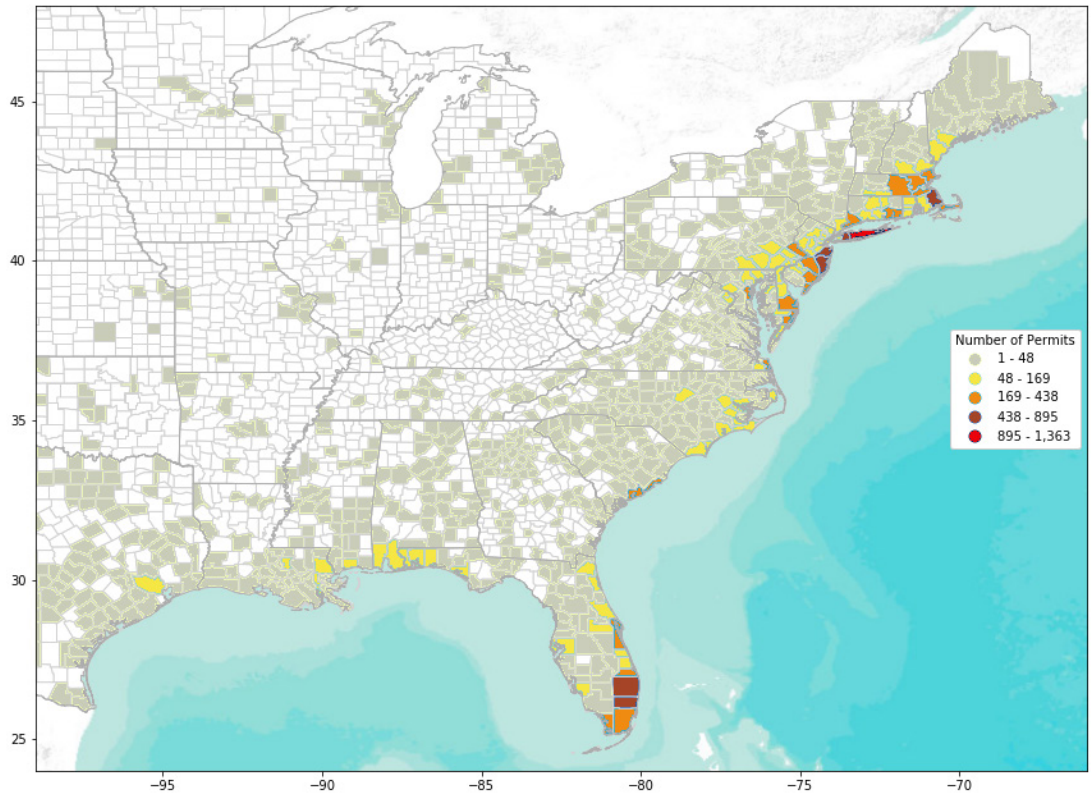

Figure 4.12 Distribution of Atlantic Highly Migratory Species Angling Category Permits as of October 2020

4.1.4 Atlantic HMS Permit Endorsements

Two permit endorsements are available for the HMS Angling and HMS Charter/Headboat permits. A shark endorsement is required for all vessel owners who intend to fish for sharks and who have been issued an HMS Angling permit or an HMS Charter/Headboat permit, or who have been issued an Atlantic Tunas General or Swordfish General Commercial category permit and are fishing in a registered tournament for sharks. A commercial sale endorsement, when combined with the HMS Charter/Headboat permit, allows for the sale of Atlantic tunas and swordfish in certain situations (see Section 4.1.3.5 and 4.1.4).

Table 4.11 summarizes the number of permits issued and the number of commercial and shark endorsements for each permit category.

Table 4.11 Summary of Permit Endorsements Issued in 2020*

Permit Category	Total Permits Issued	Shark Endorsements	Commercial Sale Endorsement
HMS Charter/Headboat	3,839	2,840	1,681
HMS Angling	22,833	12,912	-
Atlantic Tunas General	2,025	914	-
Swordfish General Commercial	26	7	-
Atlantic Tunas General and Swordfish General Commercial	620	377	-

*As of October 2020. Source: Southeast Regional Office.

4.2 Exempted Fishing Permits, Display Permits, Letters of Acknowledgement, Scientific Research Permits, and the Shark Research Fishery

Exempted fishing permits, scientific research permits, and display permits authorize the collection of tunas, swordfish, billfishes, and sharks from federal waters in the Atlantic Ocean and Gulf of Mexico for the purposes of scientific data collection and public display. Exempted fishing permits are issued to individuals for the purpose of conducting research or other fishing activities aboard vessels that are not affiliated with NOAA Fisheries, whereas scientific research permits are issued to agency scientists conducting research aboard NOAA vessels. Letters of Acknowledgement are issued to acknowledge activity as "scientific research" but do not authorize any particular activity. These are issued to individuals conducting research from "bona fide" research vessels on species that are only regulated by the Magnuson-Stevens Act and not ATCA; these laws differ on the treatment of scientific research activity. Display permits are issued to individuals who are fishing for, catching, and then transporting Atlantic HMS to certified aquariums for public display.

The number of exempted fishing permits, display permits, and scientific research permits issued from 2015 to 2020 by category and species are listed in Table 4.12. In 2020, NOAA Fisheries received 11 applications for the shark research fishery permit. Based on the qualification criteria and random selection process, five permits were issued.

Table 4.12 Number of Atlantic Highly Migratory Species Exempted Fishing Permits, Display Permits, Letters of Acknowledgement, and Scientific Research Permits in 2015–2020*

Permit Type	Reason for Permit	2015	2016	2017	2018	2019	2020*
Exempted fishing permit	Sharks for display	3	3	5	6	5	6
	Atlantic HMS** for display	1	0	2	2	2	2
	Tunas for display	0	0	0	0	0	0
	Shark research***, non-scientific vessel	11	12	4	4	4	3
	Tuna research, non-scientific vessel	2	4	2	2	1	1
	Atlantic HMS** research, non-scientific vessel	4	4	4	2	8	10
	Billfish research, non-scientific vessel	0	0	0	0	0	0
	Shark fishing	0	0	0	0	0	0
	Tuna fishing	1	0	0	0	1	1
Total EFPs issued		22	23	17	16	21	23
Scientific research permit	Shark research***	4	5	1	1	1	2
	Tuna research	1	1	0	1	0	0
	Billfish research	0	0	0	0	0	0
	Atlantic HMS** research	1	1	3	6	4	1
Total SRPs issued		6	7	4	8	5	3
Letters of acknowledgement	Shark research***	8	9	12	15	15	5
Total LOAs issued	Total	8	9	12	15	15	5

*As of October 2020. **Multiple species. Source: Atlantic HMS Management Division. ***Does not include research conducted as part of the Shark Research Fishery (for information on the Shark Research Fishery see Section 6.3.6.1).

4.3 Dealer Permits for Atlantic Tunas, Swordfish, and Shark

Atlantic HMS dealer permits are open access and required for the "first receiver" of Atlantic tunas, swordfish, and sharks. A first receiver is any entity, person, or company that takes, for commercial purposes other than solely transport, immediate possession of the fish or any part of the fish as the fish are offloaded from a fishing vessel.

Annual totals of Atlantic tunas, swordfish, and shark dealer permits are reported in Table 4.13. Totals by state for 2020 are in Table 4.14. The distribution of Atlantic swordfish dealer permits (Figure 4.13) and Atlantic shark dealer permits (Figure 4.14) issued in 2020 are mapped below.

Table 4.13 Number of Domestic Atlantic Dealer Permits for Tunas, Swordfish, and Sharks in 2015–2020*

Year	Bluefin Only	BAYS Only	Bluefin and BAYS	Atlantic Swordfish	Atlantic Sharks	Total
2015	33	79	289	184	102	687
2016	29	74	291	182	111	687
2017	32	70	291	189	113	695
2018	30	70	287	193	108	698
2019	34	65	278	200	104	681
2020*	101	66	335	200	92	794

Note: The actual number of permits per state may change as permit holders move or sell their businesses. BAYS = Bigeye, albacore, yellowfin, and skipjack tunas. *As of October 2020. Source: Southeast Regional Office; Greater Atlantic Regional Fisheries Office.

Table 4.14 Number of Domestic Dealer Permits for Atlantic Tunas, Swordfish, and Sharks by State in 2020*

State/Territory	Bluefin Only	BAYS Only	Bluefin and BAYS	Atlantic Swordfish	Atlantic Sharks	Total
Maine	55	-	31	-	-	86
New Hampshire	14	-	9	2	-	25
Vermont	-	-	1	-	-	1
Massachusetts	20	11	91	17	5	144
Rhode Island	1	3	20	5	2	31
Connecticut	-	1	3	1	-	5
New York	4	21	48	9	13	95
Pennsylvania	-	-	3	1	-	4
New Jersey	1	8	42	9	9	69
Delaware	-	-	5	1	-	6
Maryland	-	-	10	4	3	17
Virginia	-	5	10	4	2	21
North Carolina	3	3	29	26	16	77
South Carolina	-	2	4	10	7	23
Georgia	-	-	1	1	1	3
Florida	1	7	15	91	27	141
Alabama	-	1	-	6	2	9
Louisiana	-	1	6	6	3	16
Texas	-	1	2	3	2	8
Puerto Rico	-	1	1	1	-	3
U.S. Virgin Islands	-	1	1	-	-	2
Missouri	-	-	-	1	-	1

State/Territory	Bluefin Only	BAYS Only	Bluefin and BAYS	Atlantic Swordfish	Atlantic Sharks	Total
Illinois	-	-	-	1	-	1
California	2	-	1	1	-	4
Hawaii	-	-	2	-	-	2

Note: The actual number of permits per state may change as permit holders move or sell their businesses. BAYS = Bigeye, albacore, yellowfin, and skipjack tunas. *As of November 2020. Source: Southeast Regional Office; Greater Atlantic Regional Fisheries Office.

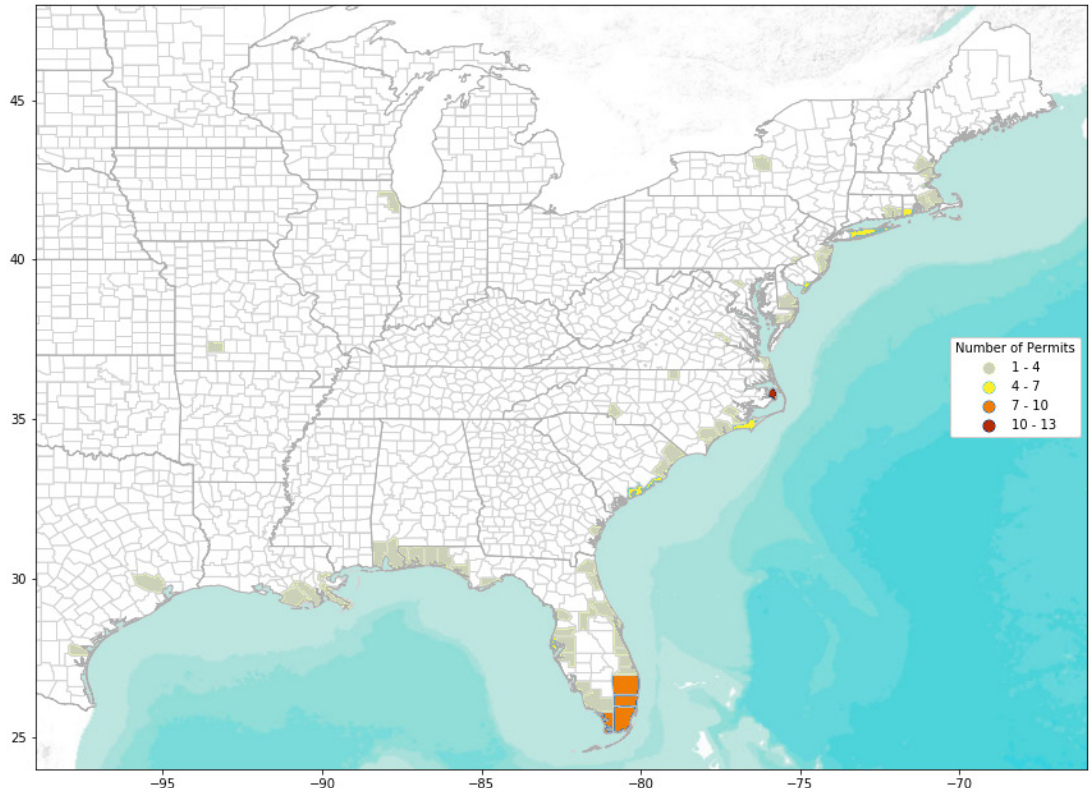

Figure 4.13 Distribution of Swordfish Dealer Permits as of October 2020

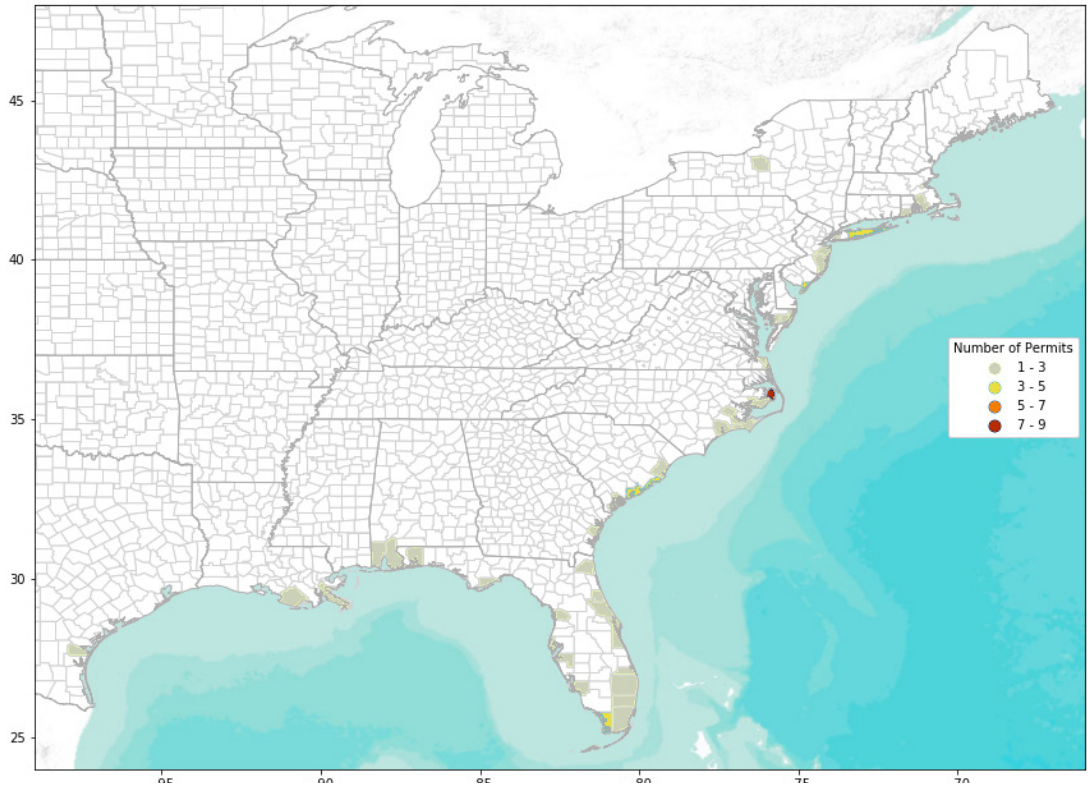

Figure 4.14 Distribution of Shark Dealer Permits as of October 2020

4.4 Atlantic HMS Tournaments

4.4.1 Background

An Atlantic HMS tournament is defined at 50 CFR 635.2 as any fishing competition involving Atlantic HMS in which participants must register or otherwise enter or in which a prize or award is offered for catching or landing such fish. Atlantic HMS tournaments vary by size and are conducted from ports along the U.S. Atlantic coast, Gulf of Mexico, and U.S. Caribbean. They may range from relatively small "members-only" club events with as few as 10 participating boats (40–60 anglers) to larger, statewide tournaments with 250 or more participating vessels (1,000–1,500 anglers). Larger tournaments often involve corporate sponsorship from tackle manufacturers, marinas, boat dealers, marine suppliers, beverage distributors, resorts, radio stations, publications, chambers of commerce, restaurants, and other local businesses. It is estimated that Atlantic HMS tournaments support approximately 1,000 jobs and over $130 million in total economic output, according to data from the Atlantic HMS Tournament Economic Study (2016).

Since 1999, federal regulations have required that tournaments register with NOAA Fisheries at least four weeks prior to the start of tournament fishing activities. Some foreign tournaments (e.g., those held in the Bahamas, Bermuda, and the Turks and Caicos) voluntarily register with NOAA Fisheries because many of their participants are U.S. citizens. Tournament registration information and forms are available at www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-tournaments.

On January 1, 2019, NOAA Fisheries announced that all Atlantic HMS tournaments are required to report tournament catch and effort data to NOAA Fisheries within seven days of the tournament's conclusion. Prior to that announcement, only Atlantic billfish and swordfish tournaments were required to report due to limited resources for data collection. The data collected are used to estimate the total annual catch of Atlantic HMS and the impact of

tournament operations in relation to other types of fishing activities.

Selecting all Atlantic HMS tournaments for reporting provides NOAA Fisheries with additional information that will improve domestic fishery management decision making and augment data reporting for species managed by ICCAT. Improved tournament data on recreational tuna fisheries is especially important when the United States negotiates catch limits and quota shares internationally. Several ICCAT shark recommendations, including Recommendation 19-06 on shortfin mako sharks, recognize the need for parties to strengthen their monitoring and data collection efforts, and while the United States has longstanding recreational data collection programs, the expanded tournament reporting requirement contributes to improved U.S. recreational shark data.

Anglers fishing from an Atlantic HMS-permitted vessel in any tournament awarding points or prizes for Atlantic billfish are required to deploy only non-offset circle hooks when using natural bait or natural bait/artificial lure combinations. The use of non-offset circle hooks increases the likelihood of post-release survival for billfish. For more information on studies of post-release survival on other Atlantic HMS with this gear, as well as brochures and videos provided by NOAA Fisheries describing benefits and safe-handling-and-release procedures, consult Section 6.3.5 of this report.

Tournament operators may request Atlantic HMS regulation booklets and other outreach materials (e.g., shark identification guides and "Careful Catch and Release" brochures) to distribute to tournament participants. In 2019, more than 164 tournaments requested and received over 9,853 copies of these materials from the Atlantic HMS Management Division.

4.4.2 Registration Data

The number of Atlantic HMS tournaments registered from 2015 to 2019 is reported in Figure 4.15, and the average distribution of Atlantic HMS fishing tournaments across the U.S. Caribbean and along Atlantic and Gulf of Mexico coastal states is represented in Figure 4.16. Since 2015, an average of 267 Atlantic HMS tournaments have registered each year. The number of Atlantic HMS tournaments registered as of November 20, 2020, is below that average at 198 tournaments. The largest number of Atlantic HMS tournament registrations for a given year (287) was in 2017. This was possibly due to an increase in outreach and compliance monitoring and may have been influenced by an improving U.S. economy and lower fuel prices.

Summary data from the HMS Atlantic Tournament Registration and Reporting (ATR) database are presented in Figure 4.15-Figure 4.19 and in Table 4.15. Tournament landings of billfishes and swordfish are presented in Section 5.3.5.2.

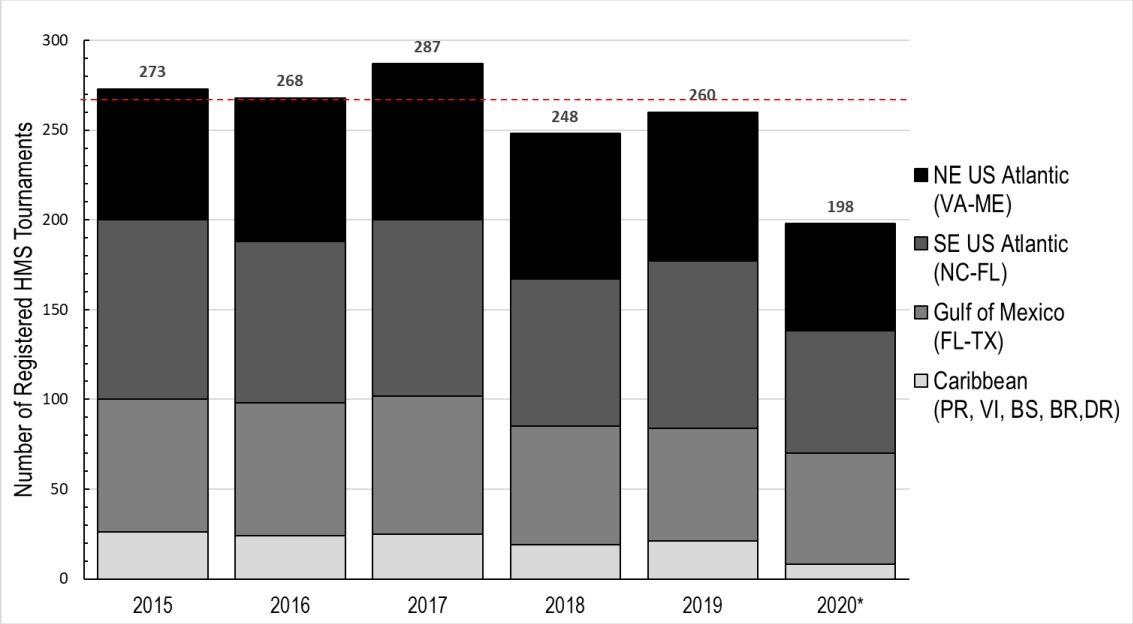

Figure 4.15 Annual Number of Registered Atlantic Highly Migratory Species Tournaments by Region in 2015–2020

*As of mid-December 2020. 2020 data are considered preliminary and do not represent a complete year. Source: Atlantic Tournament Registration and Reporting database.

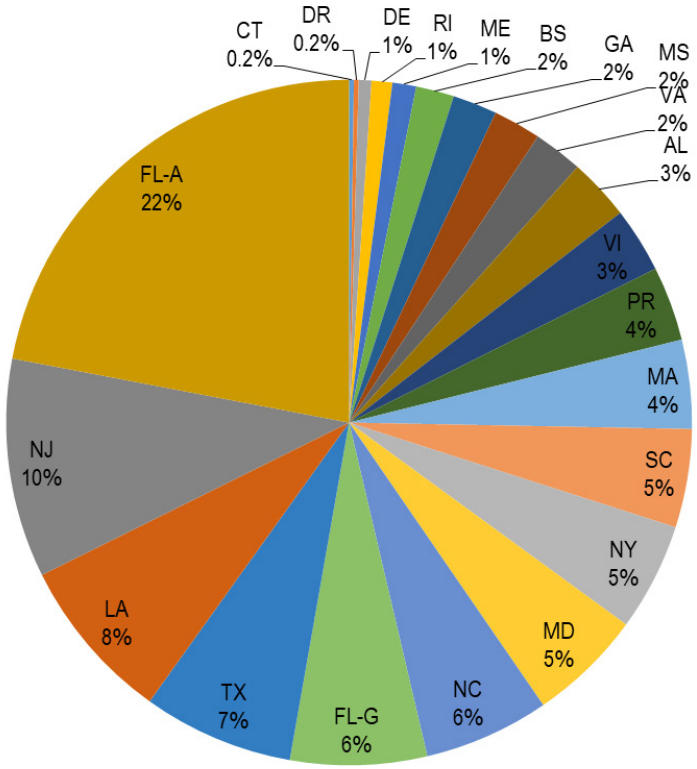

Figure 4.16 Percent of Atlantic Highly Migratory Species Tournaments Held in Each State in 2015–2019

Note: Total number of tournaments is 1,336. Source: Atlantic Tournament Registration and Reporting database.

Participants may target one or more Atlantic HMS in a tournament. Most tournaments register to catch multiple Atlantic HMS. In 2019, 68 percent of the Atlantic HMS tournament registrations indicated multiple Atlantic HMS. Billfish and tuna, followed by swordfish and sharks, were listed most frequently as the target species in the 38 percent of tournaments that registered for only one species group. Often, a tournament targets a primary species, and other species are caught for entry in separate categories. The secondary species vary by region as these species are ones present during the local fishing season at the time of the tournament. Figure 4.17 gives a breakdown of the percent of tournaments in each state registered for billfish, sharks, swordfish, or tuna species in 2019 (respectively indicated by A, B, C, or D). The total numbers of tournaments by state for each species group were 177 for billfish (A), 65 for shark (B), 78 for swordfish (C), and 167 for tuna species (D). Some states or areas with few tournaments were excluded due to confidentiality of the fisheries data. These areas, presented as separate items for each pie chart, include:

- Five areas representing less than 4 percent of total tournaments that registered for billfish (Delaware, Georgia, Dominican Republic, Rhode Island, and the U.S. Virgin Islands) (A).
- Seven areas representing less than 14 percent of total tournaments that registered for sharks (Alabama, Delaware, Florida (Gulf-side), Maine, Mississippi, North Carolina, and Rhode Island) (B).
- Seven areas representing less than 12 percent of total tournaments that registered for swordfish: Alabama, Delaware, Mississippi, New York, Rhode Island, South Carolina, and Virginia (C).
- Three areas representing less than 4 percent of total tournaments that registered for tunas: Delaware , Georgia, and Rhode Island (D).

Table 4.15 provides the total numbers of Atlantic HMS tournaments from 2015 to 2020 that registered to award points or prizes for the catch or landing of each Atlantic HMS. Marlin, sailfish, and yellowfin tuna continue to be the most sought-after species, which is further illustrated in Figure 4.18.

A significant number of blue marlin, white marlin, and sailfish tournaments are “catch-and-release fishing only,” utilizing observers, angler affidavits, polygraph tests, photographs, or digital video camcorders to document the live release of billfish. All billfish tournaments must report all caught fish, including numbers of released fish, to the ATR system. This reporting was previously reported to the Recreational Billfish Survey.

Figure 4.19 depicts the time of year that billfish tournaments are most prevalent in regions of the U.S. Atlantic, Gulf of Mexico, and Caribbean. All billfish tournaments occurring from January through February in 2018 targeted sailfish along the Atlantic coast of Florida.

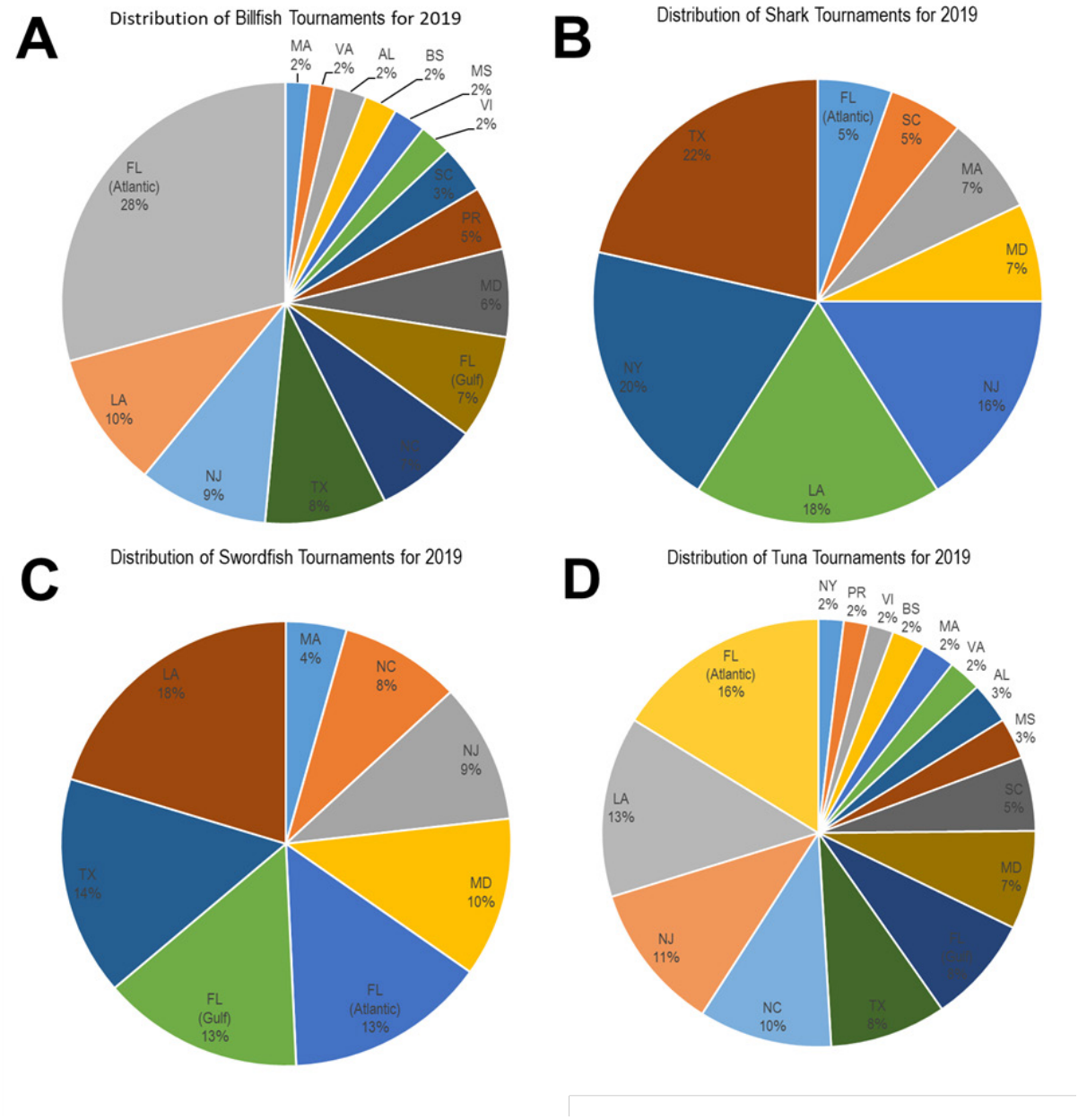

Figure 4.17 Percent of Atlantic Highly Migratory Species Tournaments in Each State

(A) Billfish (blue marlin, white marlin, roundscale spearfish, and sailfish), (B) Shark (not specified), (C) Swordfish, or (D) Tuna (bluefin, bigeye, albacore, yellowfin, and skipjack) Species in 2019. Source: Atlantic Tournament Registration and Reporting database.

Table 4.15 Number of Atlantic Highly Migratory Species Tournaments by Targeted Species in 2015–2020*

Species	2015	2016	2017	2018	2019	2020*
Blue marlin	161	158	174	160	144	143
White marlin	146	144	165	148	130	133
Longbill spearfish	67	55	65	42	40	50
Roundscale spearfish	61	45	102	77	61	57
Sailfish	161	155	175	155	143	130
Swordfish	89	89	71	81	77	81
Bluefin tuna	96	98	87	117	88	75
Bigeye tuna	75	78	96	108	96	95
Albacore tuna	48	41	57	55	49	40
Yellowfin tuna	166	172	183	173	156	149
Skipjack tuna	38	41	56	59	54	36
Smoothhounds†	-	0	0	8	10	11
Small coastal sharks	16	12	17	20	10	15
Large coastal sharks	32	27	23	30	31	27
Pelagic sharks	79	72	75	68	55	39

Note: Tournaments may be represented more than once if registration included more than one highly migratory species. *As of December 2020. †Smoothhounds includes smooth dogfish, Florida smoothhound, and Gulf smoothhound. Smoothhound shark quota monitoring became effective March 15, 2016 (80 FR 73128; November 24, 2015). Source: Atlantic Tournament Registration and Reporting database.

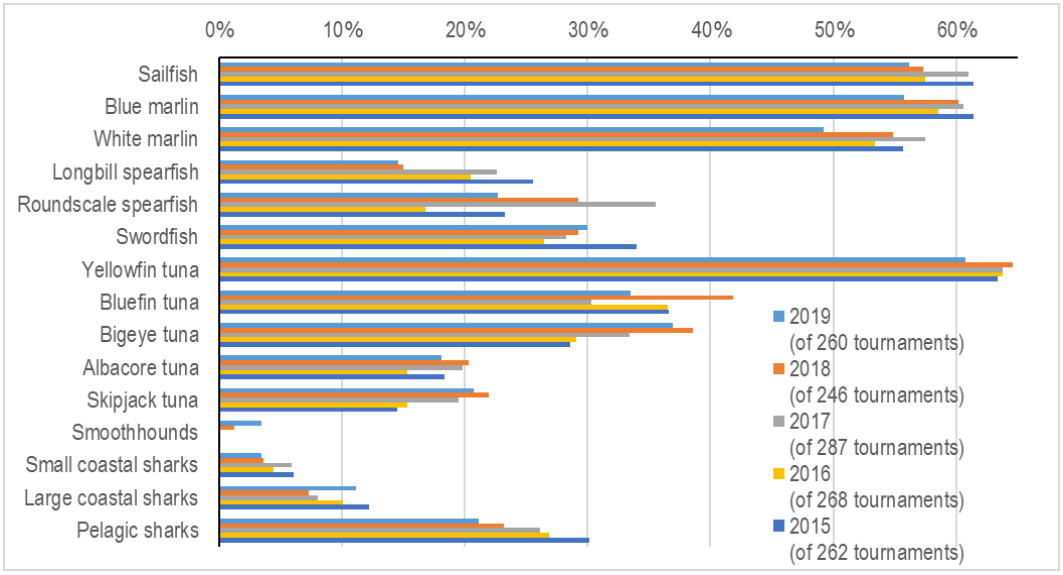

Figure 4.18 Percent of Highly Migratory Species Tournaments Registered for Each Species or Group in 2015–2019

Source: Atlantic Tournament Registration and Reporting database.

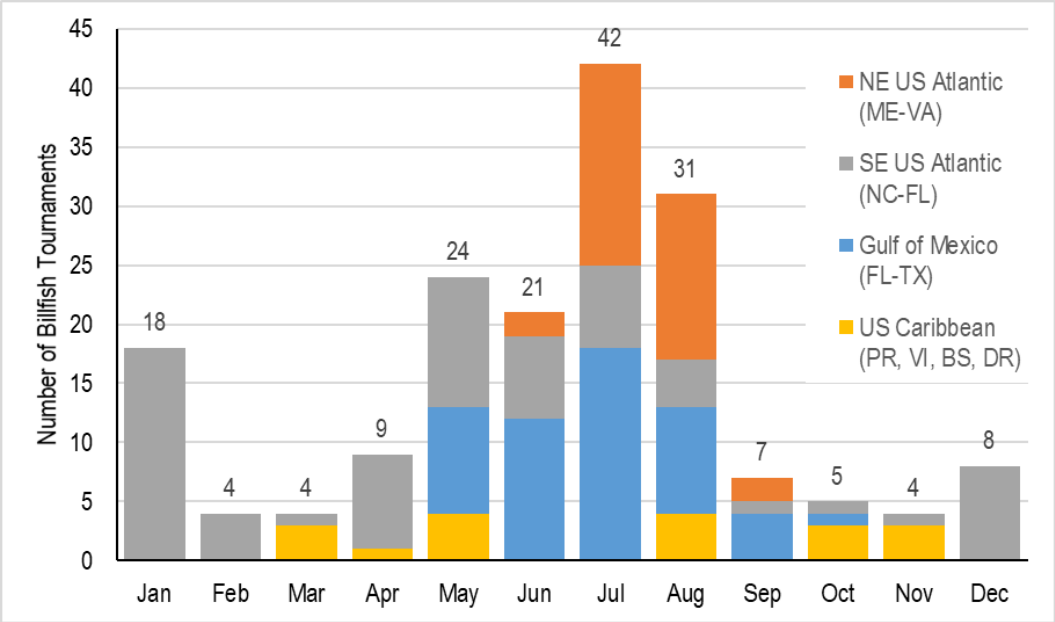

Figure 4.19 Number of Billfish Tournaments by Region and Month in 2019

Source: Atlantic Tournament Registration and Reporting database.

5 Fishery Landings Data

5.1 Background

Information on trips, fishing effort, catch, and landings are presented both by species, in Section 5.2, and by gear, in Section 5.3. Note that landings data are presented in metric tons (mt) or pounds (lb) for whole weight (ww) or dressed weight (dw), as appropriate.

Details on bycatch, incidental catch, and protected resource interactions by these gears are provided in Chapter 6. Data and regulations pertaining to the safety of fishermen at sea are included in Chapter 7.

Under the Magnuson-Stevens Act and other statutes, NOAA is authorized to collect and maintain certain information, although some data are subject to confidentiality requirements.Some otherwise confidential data may be released in"any aggregate or summary form which does not directly or indirectly disclose the identity or business of any person who submits such information." NOAA Fisheries presents such information only if it can be aggregated or summarized at a temporal and/or spatial level to maintain confidentiality of individuals, businesses, and related business information.

5.2 Data By Species

5.2.1 Total Allowable Catch and Annual Catch Limits for Atlantic HMS Management Groups

ICCAT has established total allowable catches (TACs) for certain Atlantic tunas, billfishes, and swordfish. The SCRS conducts international stock assessments of these species (Table 2.3). After reviewing the SCRS stock assessment, ICCAT often establishes an appropriate Atlantic-wide TAC for each species and usually thenallocates that TAC among Contracting Parties, Non-Contracting Parties, Entities, or Fishing Entities.

The Magnuson-Stevens Act includes an exception to the requirements in Section 303(a)(15) for annual catch limits (ACLs) where stocks are managed under international agreements in which the United States participates (Pub. L. 109-479, Section 104(b)(1)). The 2016 updated National Standard 1 Guidelines (81 FR 71858; October 18, 2016) stated that the exception, "applies to stocks or stock complexes subject to management under an international agreement, which is defined as 'any bilateral or multilateral treaty, convention, or agreement which relates to fishing and to which the United States is a party.'" The guidelines also state that status determination criteria, maximum sustainable yield, and optimum yield still need to be specified for such stocks (see 50 CFR 600.310 (h)(1)(ii)). Thus, for species managed by ICCAT, NOAA Fisheries has not specified ACLs as defined under the Magnuson-Stevens Act. Atlantic-wide TACs negotiated by ICCAT and the portion allocated to the United States are delineated by year in Table 5.1.

Table 5.1 ICCAT-Negotiated Atlantic-Wide Total Allowable Catch and U.S. Allocation (mt) for Highly Migratory Species Other Than Sharks in 2015–2019

Species	2015 Atlantic TAC	2015 U.S. Allocation	2016 Atlantic TAC	2016 U.S. Allocation	2017 Atlantic TAC	2017 U.S. Allocation	2018 Atlantic TAC	2018 U.S. Allocation	2019 Atlantic TAC	2019 U.S. Allocation
Bluefin tuna	2,000	1,058.8†	2,000	1,058.8†	2,000	1,058.8†	2,350	1,247.9†	2,350	1,247. 9†
Bigeye tuna	85,000	-	65,000	-	65,000	-	65,000	-	65,000	-
Albacore tuna	28,000	527.0	28,000	527.0	28,000	527.0	33,600	632.4	33,600	632.4
Yellowfin tuna	110,000	-	110,000	-	110,000	-	110,000	-	110,000	-
Skipjack tuna	-	-	-	-	-	-	-	-	-	-
Swordfish	13,700	3,907.0	13,700	3,907.0	13,700	3,907.0	13,700	3,907.0	13,700	3,907.0
Blue marlin	2,000	250 fish, combined*	2,000	250 fish, combined*	2,000	250 fish, combined*	2,000	250 fish, combined*	2,000	250 fish, combined*
White marlin & spearfish	400	250 fish, combined*	400	250 fish, combined*	400	250 fish, combined*	400	250 fish, combined*	400	250 fish, combined*
Sailfish	-	-	-	-	1,030	-	1,030	-	1,030	-

Note: Species without entries do not have established TACs or the U.S. does not have a specified limit. Information provided in metric tons unless indicated otherwise. mt = Metric tons. †NOAA Fisheries implements 25 mt set aside by ICCAT to account for bycatch of bluefin tuna in pelagic longline fisheries in the Northeast Distant Waters. This 25 mt is not included in these totals. *Blue marlin, white marlin, and spearfish have a combined annual U.S. allocation of 250 fish.

Directed fisheries for Atlantic highly migratory shark species currently are not managed by ICCAT, although ICCAT has conservation and management measures for some species caught in association with ICCAT fisheries. NOAA Fisheries establishes TACs and ACLs for shark species consistent with Section 303(a)(15) of the Magnuson-Stevens Act. These TACs and ACLs are generated from information provided through stock assessments.

For sharks assessed through the SEDAR process, NOAA Fisheries establishes an overfishing limit equal to the TAC. Discard, recreational, and research catch estimates are deducted from the TAC and constitute their respective sector ACLs. The remaining TAC is considered the commercial quota or the commercial sector ACL. More details on these calculations and the establishment of TACs and ACLs can be found in amendments to the 2006 Consolidated Atlantic HMS FMP that focus on shark management: Amendment 2 (NOAA Fisheries 2008), Amendment 3 (NOAA Fisheries 2010), Amendment 5a (NOAA Fisheries 2013), Amendment 6 (NOAA Fisheries 2015a), Amendment 9 (NOAA Fisheries 2015b), and Amendment 5b (NOAA Fisheries 2017b).

NOAA Fisheries released Draft Amendment 14 to the 2006 Consolidated Atlantic HMS FMP on September 24, 2020, and accepted comments through December 31, 2020 (85 FR 60132). Draft Amendment 14 was undertaken to consider revising the mechanism or "framework" used in establishing quotas and related management measures for Atlantic shark fisheries. The current framework was established in Amendment 3 to the 2006 Consolidated Atlantic HMS FMP. The revised framework would modify the procedures followed in establishing the ABC and ACLs for Atlantic sharks and the process used to account for carryover or underharvests of quotas. It would also allow the option to phase-in ABC catch control rules and to adopt multi-year overfishing status determination criteria in some circumstances. Amendment 14 would not make changes to the current quotas or other management measures. Such changes would be adopted through subsequent rulemaking. Specific ACLs for sharks are in Table 5.2.

Table 5.2 **Total Allowable Catches and Annual Catch Limits of Current Shark Management Groups (mt dw)**

Fishery	TAC = ACL	Commercial Sector ACL	Recreational Sector ACL	Dead Discard Sector ACL
Aggregated LCS—Atlantic	346.2	204.6	141.7	N/A[1]
Aggregated LCS—Eastern Gulf of Mexico	175.2	103.6	71.7	N/A
Aggregated LCS—Western Gulf of Mexico	147.6	87.2	60.4	N/A
LCS shark research fishery	50.0	50.0	N/A	0
Blacktip—Gulf of Mexico	413.4	256.6	60.3	96.2
Blacktip—Eastern Gulf of Mexico	40.5	25.1	5.9	9.4
Blacktip—Western Gulf of Mexico	372.9	231.5	54.4	86.7
Hammerhead—Atlantic	41.2	27.1	2.5	11.4
Hammerhead—Eastern Gulf of Mexico	20.4	13.4	1.3	5.6
Hammerhead—Western Gulf of Mexico	18.1	11.9	1.1	5.0
Sandbar	158.3	90.7	39.7	25.9
Non-blacknose SCS—Atlantic	489.3	264.1	100.6	122.4
Non-blacknose SCS—Gulf of Mexico	999.0	112.6	66.2	818.7
Blacknose—Atlantic	21.2	17.2	0.4	3.5
Blacknose—Gulf of Mexico	34.9	0	2.6	32.3
Prohibited species[2]	0	0	0	0

Fishery	TAC = ACL	Commercial Sector ACL	Recreational Sector ACL	Dead Discard Sector ACL
Pelagic shark complex	488.0	Undefined	Undefined	Undefined
Porbeagle shark	11.3	1.7	0.1	9.5
Blue shark[3]	273.0	Undefined	Undefined	Undefined
Smoothhound—Atlantic	1,430.6	1,201.7	188.4	39.1
Smoothhound—Gulf of Mexico	509.6	336.4	0.6	169.8

Note: mt dw = Metric tons dressed weight. LCS = Large coastal sharks. SCS = Small coastal sharks. [1]Allocated in ACL for recreational fishery. [2]Prohibited species are measured in individuals, not mt dw. [3]Blue shark and pelagic shark TAC are not allocated between commercial, recreational, or discards. Source: NOAA Fisheries 2008, 2013, 2015a, 2015b.

5.2.2 U.S. Landings by Species

5.2.2.1 Tuna Landings

Atlantic tunas landings through 2019 (Table 5.3-Table 5.7) are taken from the 2020 National Report of the United States to ICCAT (NOAA Fisheries 2020).

Table 5.3 U.S. Landings (mt ww) of Atlantic Bluefin Tuna by Area and Gear in 2015–2019

Area	Gear	2015	2016	2017	2018	2019
Northwest Atlantic	Longline *	70.1	82.4	70.8	91.4	77.4
	Handline	0.0	1.1	5.0	1.4	0.0
	Purse seine	38.8	0.0	0.0	0.0	0.0
	Harpoon	77.1	52.9	81.7	43.6	118.2
	Commercial rod and reel	581.4	722.1	652.8	765.7	798.6
	Recreational rod and reel	112.9	143.7	140.1	112.5	179.9
Gulf of Mexico	Longline	9.3	10.7	11.7	8.0	4.5
	Recreational rod and reel	0.0	1.7	1.7	1.6	1.9
North Central Atlantic**	Longline	8.3	12.0	32.9	4.0	9.8
Caribbean	Longline	0.0	0.2	0.0	0.0	0.4
All areas	All gears	898.8	1,026.8	996.8	1,028.3	1,190.8

mt ww = Metric tons whole weight. *Includes landings and estimated discards from scientific observer and logbook sampling programs. **Referenced as “NCA Area 94a” in the ICCAT report. Source: NOAA Fisheries 2020.

Table 5.4 **U.S. Landings (mt ww) of Atlantic Yellowfin Tuna by Area and Gear in 2015–2019**

Area	Gear	2015	2016	2017	2018	2019
Northwest Atlantic	Longline	438.9	480.4	731.4	392.7	535.5
	Rod and reel*	976.1	1,936.2	2,427.4	1,463.9	1,446.7
	Troll	25.6	16.6	35.5	31.2	4.2
	Gillnet	0.8	2.3	0.5	0.3	0.0
	Handline	64.3	31.4	32.4	17.94	47.1
	Unclassified	2.5	2.5	28.6	11.0	3.6
Gulf of Mexico	Longline	490.8	695.2	595.0	367.9	224.2
	Rod and reel*	678.7	776.2	463.8	306.3	254.8
	Troll	0.0	1.3	5.9	30.7	19.1
	Handline	1.9	5.6	5.8	3.8	3.5
	Unclassified	0.0	0.03	0.0	0.0	0.0
Caribbean	Longline	109.9	123.6	103.2	94.4	116.9
	Handline	0.6	1.3	<0.1	<0.1	0.2
	Rod and reel*	5.7	30.3	13.2	0.0	0.0
North Central Atlantic**	Longline	1.8	1.0	1.1	0.2	0.5
All areas	All gears	2,797.6	4,103.9	4,443.9	2,720.4	2,656.4

mt ww = Metric tons whole weight. *Rod and reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector. **This area is sometimes referenced as "NCA Area 94a" in the ICCAT report. Source: NOAA Fisheries 2020.

Table 5.5 **U.S. Landings (mt ww) of Atlantic Skipjack Tuna by Area and Gear in 2015–2019**

Area	Gear	2015	2016	2017	2018	2019
Northwest Atlantic	Longline	0.2	0.9	0.3	0.2	0.3
	Rod and reel*	49.9	130.1	80.9	63.1	34.6
	Gillnet	0.2	0.7	<0.1	0.1	0.2
	Trawl	1.1	0.0	<0.1	0.6	<0.1
	Handline	0.2	0.8	1.6	0.2	0.2
	Unclassified	<0.1	0.2	1.0	0.2	<0.1
Gulf of Mexico	Longline	0.0	0.2	0.3	0.2	0.1
	Rod and reel*	34.3	34.0	113.2	12.6	7.5
	Handline	0.0	0.0	0.0	<0.1	<0.1
Caribbean	Rod and reel*	7.6	11.4	1.0	0.0	0.0
	Handline	0.5	0.9	0.2	0.6	1.1
All areas	All gears	94.6	179.2	198.6	77.9	44.3

mt ww = Metric tons whole weight. *Rod and reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector. Source: NOAA Fisheries 2020.

Table 5.6 **U.S. Landings (mt ww) of Atlantic Bigeye Tuna by Area and Gear in 2015–2019**

Area	Gear	2015	2016	2017	2018	2019
Northwest and North Central Atlantic	Longline	557.7	360.2	540.4	378.8	570.3
	Gillnet	0.5	0.2	0.0	0.0	0.0
	Rod and reel*	448.5	170.5	259.7	493.9	204.9
	Troll	6.4	1.0	1.7	4.9	1.5
	Handline	51.3	9.4	4.0	25.5	13.9
	Trawl	0.1	0.1	0.0	0.9	0.0
	Unclassified	0.5	0.4	2.9	2.8	1.7
Gulf of Mexico	Longline	9.2	6.6	10.5	8.0	4.9
	Rod and reel*	<0.1	0.2	0.0	0.7	30.6
	Unclassified	0.0	0.0	0.0	2.6	0.2
Caribbean	Longline	7.5	5.6	7.7	2.4	3.3
	Rod and reel*	0.5	0.0	0.0	0.0	0.0
	Handline	0.0	0.2	0.0	0.0	0.0
Southwest Atlantic	Longline	0.0	13.8	9.4	1.2	0.0
All areas	All gears	1,082.2	568.2	836.3	920.8	831.3

mt ww = Metric tons whole weight. *Rod and reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector. Source: NOAA Fisheries 2020.

Table 5.7 **U.S. Landings (mt ww) of Atlantic Albacore Tuna by Area and Gear in 2015–2019**

Area	Gear	2015	2016	2017	2018	2019
Northwest Atlantic	Longline	83.9	59.9	94.0	44.9	113.2
	Gillnet	0.5	3.3	0.2	0.5	0.3
	Handline	2.7	0.7	0.1	0.2	0.5
	Trawl	1.7	0.5	1.7	<0.1	1.1
	Troll	0.0	<0.1	0.0	0.0	0.0
	Rod and reel*	120.5	41.4	27.5	8.9	29.5
	Unclassified	0.0	0.0	0.0	0.0	0.0
Gulf of Mexico and Caribbean	Longline	145.0	143.1	114.7	48.0	76.3
	Rod and reel*	<0.1	1.2	0.0	0.0	0.0
	Handline	0.0	0.1	0.0	0.0	0.0
All areas	All gears	354.4	250.2	238.3	102.6	221.4

mt ww = Metric tons whole weight. *Rod and reel catches and landings represent estimates of landings and dead discards when available based on statistical surveys of the U.S. recreational harvesting sector. Source: NOAA Fisheries 2020.

5.2.2.2 Swordfish Landings

Swordfish landings through 2019 (Table 5.8) are taken from the 2020 National Report of the United States to ICCAT (NOAA Fisheries 2020).

Table 5.8 U.S. Catches and Landings (mt ww) of Atlantic Swordfish by Area and Gear in 2015–201

Area	Gear	2015	2016	2017	2018	2019
Northwest Atlantic	Longline*	1,088.6	835.4	774.8	839.2	1,014.0
	Handline	70.7	71.2	59.5	127.7	202.2
	Trawl	2.8	6.0	6.8	1.0	10.6
	Harpoon	0.0	0.0	0.3	0.1	0.3
	Rod and reel**	45.1	22.5	22.6	24.4	77.9
	Unclassified	0.0	0.0	<0.1	0.1	0.6
Gulf of Mexico	Longline*	127.4	175.8	250.6	186.8	307.3
	Handline	5.5	3.5	2.7	3.9	2.8
	Rod and reel**	1.0	4.8	10.6	11.4	9.5
Caribbean	Longline*	8.8	72.4	88.4	3.2	8.4
	Rod and reel**	0.0	0.0	0.7	0.4	0.3
	Handline	0.2	0.9	0.0	0.0	0.0
North Central Atlantic***	Longline*	367.9	304.9	187.7	76.5	129.4
Southwest Atlantic	Longline*	0.0-	0.0	0.0	0.0	0.0
All areas	All gears	1,718.4	1,497.5	1,377.2	1,274.8	1,763.3

mt ww = Metric tons whole weight. *Includes landings and estimated dead discards from scientific observer and logbook sampling programs. **Rod and reel catches and landings represent estimates of landings and dead discards when available based on statistical surveys of the U.S. recreational harvesting sector. ***Referenced as “NCA Area 94a” in International Commission for the Conservation of Atlantic Tunas report. Source: NOAA Fisheries 2020.

5.2.2.3 Shark Landings

Atlantic shark landings through 2019 (Table 5.9-Table 5.17) are summarized from the NOAA Fisheries electronic dealer reporting program, known as eDealer. Shark fins (Table 5.16) are not required to be reported at the species level. However, about half of the reported 2019 shark fin weight includes species-level information for 12 shark species. Most of the species-specific reports of shark fin landings in 2019 are from smoothhound sharks (63 percent). Fins from blacktip, finetooth, great hammerhead, spinner, and bull make up the majority of the remaining species-specific landings reported.

Table 5.9 Commercial Landings (lb dw) of Large Coastal Sharks* in Atlantic Region in 2015–2019

Management Group	Large Coastal Shark	2015	2016	2017	2018	2019
Aggregated LCS	Blacktip	176,136	248,470	205,138	125,129	88,655
	Bull	49,927	31,417	23,802	16,707	14,677
	Lemon	45,448	19,205	12,005	8,910	5,096
	Nurse	0	0	0	0	C
	Silky	992	446	702	175	495
	Spinner	4,113	55,610	62,314	58,347	59,066
	Tiger	36,425	14,896	6,324	4,073	4,685
Total aggregated LCS		313,041	370,045	310,286	213,341	<175,000
Hammerhead	Great	36,892	20,454	17,646	22,881	26,410
	Scalloped	13,197	12,329	4,919	5,927	C
	Smooth	304	125	1,193	530	661
Total hammerhead		50,393	32,908	23,758	29,338	<35,000
Total LCS carcass weight		363,434	402,953	334,044	242,679	206,015

lb dw = Pounds dressed weight. LCS = Large coastal shark. C = landings not disclosed due to reasons of confidentiality. *Sandbar shark landings are presented in a separate table (Table 5.11). Source: eDealer

Table 5.10 Commercial Landings (lb dw) of Large Coastal Sharks* in the Gulf of Mexico Region in 2015–2019

Management Group	Large Coastal Shark	2015	2016	2017	2018	2019
Blacktip	Blacktip	644,058	413,414	530,037	815,763	192,962
Aggregated LCS	Bull	274,195	154,820	171,298	176,763	86,230
	Lemon	13,023	32,034	25,039	37,593	46,526
	Nurse	62	95	C	C	C
	Silky	612	111	C	C	71
	Spinner	43,185	65,578	46,870	126,249	20,105
	Tiger	18,536	38,534	51,688	44,591	67,286
	Unclassified, assigned to LCS	0	2,221	0	0	2,475
Total aggregated LCS		349,613	293,393	295,677	384,890	<420,000
Hammerhead	Great	33,439	30,474	18,136	31,425	33,010
	Scalloped	6,290	26,503	15,151	26,303	C
	Smooth	0	0	0	0	0
	Unclassified, assigned to Hammerheads	0	0	0	0	370
Total hammerhead		39,729	56,977	33,287	57,728	<40,000
Total LCS carcass weight		389,342	350,370	328,964	442,618	452,876

lb dw = Pounds dressed weight. C = landings are not disclosed due to reasons of confidentiality. *Sandbar shark landings are presented in a separate table (Table 5.11). Source: eDealer.

Table 5.11 Commercial Landings (lb dw) of Sandbar Sharks in the Shark Research Fishery in 2015–2019

Management Group	Species	2015	2016	2017	2018	2019
Sandbar—shark research fishery	Sandbar	163,433	114,871	121,074	132,688	150,010

lb dw = Pounds dressed weight. Source: eDealer.

Table 5.12 Commercial Landings (lb dw) of Small Coastal Sharks in Atlantic Region in 2015–2019

Management Group	Small Coastal Shark	2015	2016	2017	2018	2019
Blacknose	Blacknose	45,405	26,842	17,241	11,335	18,910
Non-blacknose	Bonnethead	5,885	1,688	6,077	4,240	4,134
	Finetooth	8,712	5,647	19,874	17,071	9,688
	Sharpnose, Atlantic	293,128	175,890	251,289	268,395	292,694
Total non-blacknose SCS		307,725	183,225	277,240	289,706	325,426
Total SCS carcass weight		353,130	210,067	294,481	301,041	325,426

lb dw = Pounds dressed weight. Source: eDealer.

Table 5.13 Commercial Landings (lb dw) of Small Coastal Sharks in the Gulf of Mexico Region in 2015–2019

Management Group	Small Coastal Sharks	2015	2016	2017	2018	2019
Blacknose*	Blacknose	2,096	5	0	C	C
Non-blacknose SCS	Bonnethead	968	9	588	729	C
	Finetooth	60,169	33,431	54,511	54,436	98,353
	Sharpnose, Atlantic	137,121	126,626	88,454	90,848	48,288
Total non-blacknose SCS		198,258	160,066	143,553	146,013	<150,000
Unclassified, assigned to SCS	Unclassified	0	2,719	344	C	0
Total SCS carcass weight		200,354	162,790	143,887	146,013	147,478

lb dw = Pounds dressed weight. C = landings are not disclosed due to reasons of confidentiality. *Blacknose shark are prohibited in the Gulf of Mexico, however some landings do exist likely due to misidentification problems or lack of awareness of shark fishing regulations. Source: eDealer.

Table 5.14 Commercial Landings (lb dw) of Smoothhound Sharks in Gulf of Mexico and Atlantic Regions in 2016–2019

Region	2016*	2017	2018	2019
Atlantic**	701,727	831,761	908,072	805,841
Gulf of Mexico***	0	0	C	C
Total smoothhound carcass weight	701,727	831,761	908,072	805,841

lb dw = Pounds dressed weight. C = Landings are not disclosed due to reasons of confidentiality. *Smoothhound shark quota effective March 15, 2016 (80 FR 73128; November 25, 2015); therefore, smoothound shark landings may be underrepresented in 2016 due to the change in regulations. **In the U.S. Atlantic region, smoothhound sharks are smooth dogfish. ***In the Gulf of Mexico region, smoothhound sharks are smooth dogfish, Florida smoothhound, and Gulf smoothhound. Source: eDealer.

Table 5.15 Commercial Landings (lb dw) of U.S. Atlantic Pelagic Sharks in 2015–2019

Management Group	Pelagic Shark	2015	2016	2017	2018	2019
Blue sharks	Blue	1,114	607	4,272	C	0
Porbeagle sharks	Porbeagle	0	0	C	811	C
Other pelagic sharks	Mako, shortfin	141,720	160,829	184,993	57,719	53,573
	Mako, unclassified	0	0	0	0	0
	Oceanic whitetip	0	0	0	0	0
	Thresher	72,463	78,219	61,990	63,805	51,170
Total other pelagic sharks		214,183	239,048	246,983	121,524	104,742
Unclassified, assigned to pelagic	Unclassified	0	0	0	0	0
Total pelagic carcass weight		215,297	239,655	251,375	122,335	> 104,000

lb dw = Pounds dressed weight. C = Landings are not disclosed due to reasons of confidentiality. Source: eDealer.

Table 5.16 Commercial Landings (lb dw) of Shark Fins in 2015–2019

Region	2015 †	2016 †	2017	2018	2019
Total landed fin weight	72,445	76,032	86,117	127,041	52,934

lb dw = Pounds dressed weight. † Smoothhound shark quota effective March 15, 2016 (80 FR 73128; November 24, 2015); therefore, smoothhound shark fins totals may be underrepresented for these years due to changing regulations. Source: eDealer.

Table 5.17 Commercial Landings (lb dw) Reported of Prohibited Shark Species in 2015–2019

Management Group and Region	Prohibited Sharks	2015	2016	2017	2018	2019
LCS and SCS—Gulf of Mexico	Caribbean reef*	440	294	335	C	317
	Atlantic angel*	0	0	0	C	0
Pelagic—Atlantic and Gulf of Mexico	Sevengill*	43	71	60	C	161
Unclassified, assigned to prohibited		288	260	192	59	227
Total prohibited shark weight		771	625	394	104	705

Note: Prohibited shark species with no reported landings from 2015 to 2019 are not included in the table. For a list of commercially prohibited sharks, visit www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-fishery-compliance-guides. lb dw = Pounds dressed weight. LCS = Large coastal shark. SCS = Small coastal shark. C = landings are not disclosed due to reasons of confidentiality. *Prohibited in the commercial fishery as of June 21, 2000. Source: eDealer.

5.2.3 U.S. Catch Comparison to International Catch

U.S. catch levels relative to other nations/entities can be compared for many Atlantic HMS. International- and U.S.-reported catches for all Atlantic HMS, other than sharks, are available in the 2020 Report of the Standing Committee on Research and Statistics at https://www.iccat.int/Documents/SCRS/SCRS_2020_Advice_ENG.pdf (SCRS 2020). Three species of shark—blue, shortfin mako, and porbeagle—are also assessed by SCRS, and their international catches are available in the report.

The U.S. percentage of regional and total catch of Atlantic HMS species assessed by SCRS is presented in Table 5.18. Catch is broken down to landings and dead discards, where possible. U.S. billfish catch includes recreational landings and commercial dead discards. The bluefin tuna and swordfish catch includes recreational landings, commercial landings, and dead discards.

The data from SCRS are reported by species rather than gear type. International catch and landings reported specifically from the pelagic longline and purse seine fisheries, however, are available. These landings are included in Sections 5.3.2.4 and 5.3.3.3 respectively.

Table 5.18 U.S. vs. Total International Catch (mt ww) of Atlantic Highly Migratory Species Reported to the International Commission for the Conservation of Atlantic Tunas in 2019

Species	Region	U.S. Landed (Total Int.)	U.S. Discarded Dead (Total Int.)	U.S. Total Catch (Total Int.)	U.S. % of Total Int. Catch
Swordfish	North Atlantic	1,454 (9,839)	291 (308)	1,745 (10,146)	17.2
	South Atlantic	-- (10,054)	-- (50)	-- (10,104)	--
	Total	1,454 (19,893)	291 (358)	1,745 (20,250)	8.6
Bluefin tuna	West Atlantic	1,185 (2,297)	6 (9)	1,191 (2,306)	51.6
	East Atlantic and Mediterranean	-- (28,747)	-- (13)	-- (28,760)	--
	Total	1,185 (31,044)	6 (22)	1,191 (31,066)	3.8

Species	Region	U.S. Landed (Total Int.)	U.S. Discarded Dead (Total Int.)	U.S. Total Catch (Total Int.)	U.S. % of Total Int. Catch
Bigeye tuna	Atlantic and Mediterranean total	831 (74,065)	-- (25)	831 (74,091)	1.1
Yellowfin tuna	West Atlantic	2,656 (24,910)	NA (4)	2,656 (24,914)	10.7
	East Atlantic	-- (107,221)	-- (22)	-- (107,243)	--
	Total	2,656 (132,131)	0 (26)	2,656 (132,158)	2.0
Albacore tuna	North Atlantic	221 (34,621)	0 (151)	221 (34,772)	0.6
	South Atlantic and Mediterranean	-- (18,004)	-- (39)	-- (18,043)	--
	Total	221 (52,625)	0 (190)	221 (52,815)	0.4
Skipjack tuna	West Atlantic	44 (19.272)	NA (0)	44 (19,272)	0.2
	East Atlantic and Mediterranean	-- (244,916)	-- (208)	-- (245,124)	--
	Total	44 (264,188)	-- (208)	44 (264,396)	0.0
Blue marlin	Atlantic and Mediterranean total	19 (1,111)	31 (71)	50 (1,181)	4.2
White marlin + Roundscale spearfish	Atlantic and Mediterranean total	3 (190)	4 (62)	7 (252)	2.8
Sailfish	West Atlantic	3 (1,253)	5 (6)	8 (1,258)	0.6
	East Atlantic	-- (2,001)	-- (6)	-- (2,008)	--
	Total	3 (3,254)	5 (12)	8 (3,266)	0.2
Blue shark	North Atlantic	17 (27,074)	29 (205)	46 (27,279)	0.2
	South Atlantic and Mediterranean	-- (34,497)	-- (346)	-- (34,843)	--
	Total	17 (61,571)	29 (551)	46 (62,121)	0.0
Porbeagle shark	North Atlantic	12 (12)	13 (16)	25 (28)	89.3
	South Atlantic and Mediterranean	-- (0)	-- (0)	-- (0)	--
	Total	12 (12)	13 (16)	25 (29)	86.2
Shortfin mako shark	North Atlantic	57 (1,829)	2 (34)	59 (1,863)	3.2
	South Atlantic and Mediterranean	-- (2,299)	-- (10)	-- (2,309)	--
	Total	57 (4,128)	2 (44)	59 (4,172)	1.4

Note: U.S. catch is reported outside the parentheses and included with the total international catch shown within the parentheses. Catch amounts are as reported by ICCAT member nations and totals are subject to rounding error. mt ww = Metric tons whole weight. NA = No data are indicated for the United States in the report cited. A double dash (--) indicates that the region does not include U.S. waters; therefore, no U.S. landings would exist for that region. Source: SCRS 2020.

5.3 Data by Gear

5.3.1 Background

> **More Information**
>
> - Gear: Section 10.1
> - Management: Section 10.2
> - Permits: Section 4.1
> - Bycatch: Section 6.3

Participation in a fishery requires the use of an authorized gear type in an approved fishery. The list of approved fisheries and authorized gear types are provided in 50 CFR 600.725(v). Generally, a fish may be retained only if it is taken within a listed fishery, with a gear authorized for that fishery, and following the applicable regulations. However, an individual fisherman may notify the appropriate council, or the director of the Office of Sustainable Fisheries in the case of Atlantic HMS, of their intent to use a gear or participate in a fishery not already on the list. The individual may use the gear or participate in that fishery ninety days after such notification unless regulatory action is taken to prohibit the use of the gear or participation in the fishery. A list of Atlantic HMS fisheries and the authorized gear types are presented in Table 5.19.

Table 5.19 List of Highly Migratory Species Fisheries and Authorized Gear Types*

Atlantic HMS Fishery	Authorized Gear Types
Swordfish handgear	Rod and reel, harpoon, handline, bandit gear, buoy gear, green-stick gear
Swordfish recreational	Rod and reel, handline
Pelagic longline	Longline
Shark gillnet	Gillnet
Shark bottom longline	Longline
Shark handgear	Rod and reel, handline, bandit gear
Shark recreational	Rod and reel, handline
Tuna purse seine	Purse seine
Tuna recreational	Rod and reel, handline, speargun (allowed for bigeye, albacore, yellowfin, and skipjack tunas only), green-stick (only with HMS Charter/Headboat permit)
Tuna handgear	Rod and reel, harpoon, handline, bandit gear
Tuna harpoon	Harpoon
Tuna green-stick	Green-stick
Atlantic billfish recreational	Rod and reel
Commercial Caribbean small boat	Rod and reel, handline, harpoon, bandit gear, green-stick, buoy gear

*(50 CFR 600.725(v))

5.3.2 Pelagic Longline

5.3.2.1 Background

The pelagic longline fishery for Atlantic HMS primarily targets swordfish and bigeye and yellowfin tunas in various areas and seasons. Although gear can be modified (e.g., depth of set, hook type, hook size, and bait) to target swordfish or tunas, the pelagic longline fishery is generally a multispecies fishery.

The number of hooks per set varies with line configuration and target species, as shown in Table 5.20.

More Information

- Gear: Section 10.1
- Management: Section 10.2
- Permits: Section 4.1
- Bycatch: Section 6.3.2

Table 5.20 Average Number of Hooks per Pelagic Longline Set in 2015–2019

Target Species	2015	2016	2017	2018	2019
Swordfish	729	758	797	708	739
Bigeye tuna	641	619	716	640	766
Yellowfin tuna	571	641	549	551	669
Mix of tuna species	653	702	735	629	730
Shark	298	274	295	260	NA
Dolphinfish	1,140	943	917	970	996
Other species	150	NA	643	NA	NA
Mix of species	715	758	733	716	760

Source: Unified Data Processing.

5.3.2.2 Pelagic Longline Observer Program

In 2019, NOAA Fisheries observers in the Pelagic Observer Program recorded 502 pelagic longline sets, which is an overall fishery coverage of 10 percent. The Pelagic Longline Take Reduction Plan (PLTRP) (74 FR 23349; May 19, 2009) recommended that NOAA Fisheries increase observer coverage to 12–15 percent throughout all Atlantic pelagic longline fisheries that interact with pilot whales and Risso's dolphins to ensure representative sampling of fishing effort. On December 15, 2020 (85 FR 81168), NOAA Fisheries proposed changes to the PLTRP, reflecting the most recent data and recommendations developed since 2009. The proposed rule would remove long-finned pilot whales and Risso's dolphins from the scope of the PLTRP because recent data indicate the estimated mortality and serious injury levels for these species have been below their respective insignificance thresholds in the pelagic longline fishery. It also proposes new regulatory and non-regulatory measures to further reduce mortality and injury to short-finned pilot whales. The public comment period on the proposed rule closes February 16, 2021, and NOAA Fisheries will consider public comments before finalizing measures to update the PLTRP Monitoring Strategy.

Table 5.21 details the amount of observer coverage in past years for this fleet.

Table 5.21 Observer Coverage of the U.S. Atlantic Pelagic Longline Fishery in 2015–2019

Year	Total Observed Sets	Percentage of Total Number of Sets
2015	1,144	14.0
2016	1,230	17.9
2017	897	12.2
2018	731	13.0
2019	502	10.4

Source: Garrison and Stokes 2016; unpublished Pelagic Observer Program data 2017, 2018, 2019, 2020.

5.3.2.3 Recent Catch and Landings

U.S. Atlantic pelagic longline catch, including bycatch, incidental catch, and target catch, whether kept or discarded, is largely related to vessel characteristics and gear configuration. The reported catch, in numbers of fish, is summarized in Table 5.22 for the whole pelagic longline fishery. Table 5.23 provides a summary of U.S. Atlantic pelagic longline landings as reported to ICCAT. Detailed information on bycatch for this fishery is provided in Section 6.3.2.

Table 5.22 Reported Numbers of Catch and Hooks in the U.S. Atlantic Pelagic Longline Fishery in 2015–2019

Species and Hooks	2015	2016	2017	2018	2019
Swordfish kept	29,758	26,388	24,865	25,102	27,495
Swordfish discarded	5,797	4,681	7,596	8,004	4,307
Blue marlin discarded	993	1,051	1,566	858	984
White marlin discarded	2,862	2,156	2,223	1,587	1,467
Sailfish discarded	715	855	658	810	402
Spearfish discarded	837	745	687	459	469
Bluefin tuna kept	320	411	475	465	447
Bluefin tuna discarded	210	582	229	310	347
BAYS tunas kept	54,759	57,123	68,709	37,944	50,291
BAYS tunas discarded	3,196	7,899	6,721	3,230	3,649
Pelagic sharks kept	2,219	2,190	2,564	875	566
Pelagic sharks discarded	44,680	27,471	25,155	14,656	12,733
Large coastal sharks kept	50	50	79	36	117
Large coastal sharks discarded	8,116	8,675	11,042	5,639	4,466
Dolphinfish kept	53,670	46,530	29,300	27,515	36,979
Dolphinfish discarded	1,503	1,108	816	830	681
Wahoo kept	1,583	1,769	1,479	1,275	987
Wahoo discarded	164	180	188	115	84
Sea turtle interactions	357	229	162	86	66
Number of hooks (× 1000)	5,856	5,219	5,328	4,056	3,649

BAYS = Bigeye, albacore, yellowfin, and skipjack. Source: Unified Data Processing.

Table 5.23 **Reported Landings (mt ww) in the U.S. Atlantic Pelagic Longline Fishery in 2015–2019**

Species	2015	2016	2017	2018	2019
Yellowfin tuna	1,041.4	1,300.2	1,430.7	854.9	877.1
Skipjack tuna	0.2	1.1	0.6	0.4	0.4
Bigeye tuna	574.4	386.2	568.0	389.2	578.5
Bluefin tuna*	87.7	105.3	115.4	103.4	92.1
Albacore tuna	228.9	203.0	208.7	92.9	189.5
North Atlantic swordfish*	1,592.7	1,388.5	1,301.5	1,105.7	1,459.1
South Atlantic swordfish*	0.0	0.0	0.0	0.0	0.0
Total	3,525.3	3,384.3	3,624.9	2,546.5	3,196.7

mt ww = Metric tons whole weight. *Includes landings and estimated discards from scientific observer and logbook sampling programs as reported to ICCAT. Source: NOAA Fisheries 2020.

5.3.2.4 International Issues and Catch

Tuna, Billfish, and Swordfish

The U.S. pelagic longline fleet represents a small fraction of the international pelagic longline fleet competing on the high seas for catches of tunas and swordfish. In recent years, the proportion of U.S. pelagic longline landings of Atlantic HMS has remained relatively stable in proportion to international landings for the fisheries in which the United States participates. Historically, the U.S. fleet has accounted for less than 0.5 percent of the landings of swordfish and tuna from the Atlantic Ocean south of 5° N. latitude, referred to as the South Atlantic area. The U.S. fleet also does not operate in the Mediterranean Sea. Foreign fleet landings of tuna and swordfish operating in the tropical Atlantic and Mediterranean are higher than the landings of these species by the U.S. fleet in the North Atlantic area. The retention of billfish is prohibited in the U.S. Atlantic pelagic longline fishery.

Within the area where the U.S. pelagic longline fleet operates, U.S. pelagic longline landings still represent a limited fraction of total landings. From 2014 to 2019, U.S. pelagic longline landings have averaged 4.0 percent of total Atlantic pelagic longline landings, ranging from a high of 4.3 percent in 2018 to a low of 3.8 percent in both 2016 and 2019. Table 5.24 contains aggregate pelagic longline landings of Atlantic tunas and swordfish and pelagic longline landings and discards of billfish for all countries in the Atlantic for the period of 2015–2019.

Table 5.24 **Estimated International Pelagic Longline Landings (mt ww) of Tuna, Billfish, and Swordfish for All Countries Fishing in the Atlantic in 2015–2019**

Species	Region	2015	2016	2017	2018	2019
Swordfish	North and South Atlantic	20,168	20,032	19,541	18,728	19,369
Yellowfin tuna	West Atlantic[1]	8,803	11,465	10,407	9,876	10,091
Bigeye tuna	Atlantic and Mediterranean	40,362	36,321	35,156	32,038	34,199
Bluefin tuna	West Atlantic[1]	553	562	559	664	675
Albacore tuna	North and South Atlantic	14,562	16,637	16,625	18,240	17,242
Skipjack tuna	West Atlantic[1]	464	804	291	322	412

Species	Region	2015	2016	2017	2018	2019
Blue marlin	Atlantic and Mediterranean[2]	1,264	1,281	1,446	979	1,027
White marlin	Atlantic and Mediterranean[2]	443	405	376	221	238
Sailfish	West Atlantic[3]	891	1,191	1,059	1,349	1,242
Total international[4]		87,510	88,698	85,460	82,417	84,495
Total U.S.[5]		3,525	3,384	3,630	3,528	3,236.7
U.S. as percent of total international		4.0%	3.8%	4.2%	4.3%	3.8%

mt ww = Metric tons whole weight. [1]Note that the United States has not reported participation in the East Atlantic yellowfin tuna fishery since 1983 and has not participated in the East Atlantic bluefin or the East Atlantic skipjack tuna fishery since 1982. [2]Includes U.S. and foreign discards. [3]Includes U.S. dead discards. [4]From Standing Committee on Research and Statistics, 2020. [5] Includes swordfish, blue marlin, white marlin, and sailfish longline discards. Source: U.S. ICCAT National Reports 2016–2020 (NOAA Fisheries 2016, 2017a, 2018, 2019, 2020); SCRS 2020.

Atlantic Sharks

Stock assessments and data collection for international shark fisheries have improved in recent years due to increased reporting requirements adopted by ICCAT. Since 2004, there have been shark-related recommendations and resolutions, largely related to sharks caught in association with ICCAT fisheries (e.g., ICCAT Recs. 04-10, 06-10, 07-06, 08-07, 08-08, 09-07, 10-06, 10-07, 11-08, 12-05, 13-10, 14-6, 15-6, 17-08, 18-06, 19-06, 19-07, and 19-08). Additionally, SCRS has assessed several species of sharks, including blue, shortfin mako, and porbeagle sharks. For more information on ICCAT shark actions, see previous SAFE Reports (www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-stock-assessment-and-fisheries-evaluation-reports) and the ICCAT webpage (www.iccat.int/en).

Table 5.25 provides the most recent catch totals for blue, shortfin mako, and porbeagle sharks.

Table 5.25 Estimated International Pelagic Longline Landings (mt ww) of Pelagic Sharks for All Countries in the Atlantic in 2015–2019 Compared to U.S. Catch

Species	2015	2016	2017	2018	2019
Total international[1] blue shark	61,424	68,456	66,602	66,683	60,625
Total international[1] shortfin mako	5,411	5,877	5,341	5,153	3,975
Total international[1] porbeagle	91	28	31	18	13
Total International[1] longline landings	66,926	74,361	71,974	71,854	64,613
U.S. blue shark catches[2]	82	43	42	11	29
U.S. shortfin mako catches[2]	100	108	112	42	33
U.S. porbeagle catches[2]	34	1	9	1	13
Total U.S. catches[2]	216	152	163	54	75
U.S. catches[2] as percent of total international catch	0.3%	0.2%	0.2%	0.08%	0.1%

mt ww = Metric tons whole weight. [1]International totals include landings from North Atlantic, South Atlantic, and the Mediterranean Sea regions for all countries, including the United States. [2]U.S. totals includes both landings and discards. Source: SCRS 2020.

5.3.3 Purse Seine

5.3.3.1 Background

NOAA Fisheries has not opened the Atlantic tunas purse seine fishery in recent years because there were no active vessels permitted to fish for bluefin tuna with purse seine gear. Continuation of the purse seine fishery was discussed during scoping for Amendment 13 to the 2006 Consolidated Atlantic HMS FMP and may be further considered during that rulemaking.

More Information

- Gear: Section 10.1.2
- Management: Section 10.2
- Permits: Section 4.1.1
- Bycatch: Section 6.3.3

5.3.3.2 Recent Catch and Landings

In the 1980s and early 1990s, purse seine landings of yellowfin tuna were often over several hundred metric tons, with over 4,000 mt ww of yellowfin landings in 1985. Historic purse seine U.S. bluefin tuna landings made up approximately 20 percent of the total annual U.S. bluefin tuna landings and about 25 percent of total commercial landings. Over the past 30 years, the U.S. purse seine fleet, when active, directed effort only on bluefin tuna and not on other Atlantic HMS; Table 5.26, therefore, includes only bluefin tuna.

These numbers have dropped significantly over the past 20 years. Purse seine catch, including landings and dead discards, was last recorded in 2015. The bluefin tuna baseline percentage quota share for the Purse Seine category is 18.6 percent of the U.S. quota. NOAA Fisheries redistributes 75 percent of that quota to the Reserve category, as outlined in Amendment 7, for those years when there is no purse seine catch. Purse seine fishery participants may lease their quota allocations to vessels fishing in the pelagic longline fishery through the IBQ Program.

5.3.3.3 International Issues and Catch

The U.S. purse seine fleet has historically accounted for a small percentage of the total international Atlantic tuna landings. Table 5.26 shows that since 2010, the U.S. purse seine fishery has contributed to less than 0.10 percent of the total purse seine catch reported to ICCAT.

In Recommendation 16-14, ICCAT established a minimum standard for scientific fishing vessel observer programs and adopted a minimum 5 percent observer coverage of fishing effort in the purse seine fishery, as measured in number of sets or trips.

Table 5.26 Estimated International Atlantic Tuna Catches (mt ww) for the Purse Seine Fishery in the Atlantic and Mediterranean in 2015–2019

Species	2015	2016	2017	2018	2019
Bluefin	10,034	11,361	14,520	17,130	17,224
Yellowfin	89,222	101,996	89,194	91,281	91,894
Skipjack	197,061	206,118	216,902	246,535	215,950
Bigeye	25,184	29,605	27,848	27,286	27,001
Albacore	491	88	254	72	86
Total	321,990	349,122	348,664	386,276	352,155
U.S. total	38.8	0.0	0.0	0.0	0.0
U.S. %	< 0.01	0	0	0	0

mt ww = Metric tons whole weight. Source: SCRS 2020.

5.3.4 Commercial Handgear

5.3.4.1 Background

More Information

- Gear: Section 10.1.3
- Management: Section 10.2
- Permits: Sections 4.1.1 (LAP) and 4.1.3 (Open Access)
- Bycatch: Section 6.3.4

Commercial handgears, including handline, harpoon, rod and reel, buoy gear, and bandit gear, are used to fish for Atlantic HMS on private vessels, charter vessels, and headboat vessels. Permits that authorize the use of commercial handgear include the Atlantic Tunas General category permit, Atlantic Tunas Harpoon category permit, Swordfish Handgear limited access permit, Swordfish General Commercial permit, Commercial Caribbean Small Boat permit, and HMS Charter/Headboat permit with a commercial endorsement. Fishing usually takes place 5–125 miles from shore. Those vessels using bait typically use herring, mackerel, whiting, mullet, menhaden, ballyhoo, butterfish, and squid.

Fishermen with Atlantic Tunas General and Harpoon category permits, the HMS Charter/Headboat permit, and combination swordfish/tuna permits are required to report all bluefin tuna landings and dead discards, within 24 hours of the landings or end of each trip through an online catch reporting system, a smartphone app, or a phone number. More information is available at https://hmspermits.noaa.gov/catchReports. These reports are in addition to any information submitted by federally permitted dealers.

5.3.4.2 Trip Estimates

Table 5.27 displays the estimated number of rod and reel and handline trips targeting large pelagic species like tunas, billfishes, swordfish, sharks, wahoo, dolphinfish, and amberjacks from Maine through Virginia in 2014–2019. The trips include commercial and recreational trips and are not specific to any particular species. The 2019 estimates are preliminary and subject to change. Buoy gear effort, as reported by the fishery, is presented from 2015 to 2019 in Table 5.28.

Table 5.27 Estimated Number of Rod and Reel and Handline Trips Targeting Atlantic Large Pelagic Species by State in the Northeast in 2015–2019

Vessel Type	Year	NH/ME	MA	CT/RI	NY	North NJ	South NJ/ MD/DE	VA	Total
Private	2015	4,074	12,130	3,336	7,068	3,166	11,741	2,522	44,037
	2016	4,224	10,511	3,802	6,481	3,337	11,193	2,754	42,302
	2017	5,397	12,088	2,909	9,060	3,843	10,316	2,082	45,695
	2018	4,115	9,943	3,507	8,470	3,983	14,448	1,879	46,345
	2019	3,721	10,984	2,294	7,020	2,973	17,728	2,529	47,250
Charter	2015	1,264	3.835	619	1,458	1,167	1,730	499	10,572
	2016	669	3,756	552	1,423	1,439	2,798	263	10,900
	2017	998	3,934	329	1,866	1,554	2,657	822	12,160
	2018	1,344	3,925	386	1,452	798	2,975	344	11,224
	2019	371	3,576	426	1,908	1,002	3,359	337	10,978

Source: Large Pelagics Survey.

Table 5.28 Reported Buoy Gear Effort in 2015–2019

Specifications	2015	2016	2017	2018	2019
Number of vessels	37	42	36	44	60
Number of trips	358	338	253	582	798
Average buoy gears deployed per trip	21.1	23.6	23.3	23.1	25.2
Total number of set hooks	8,267	8,588	6,282	13,572	20,450
Average number hooks per gear	1.1	1.1	1.1	1.0	1.0

Source: Unified Data Processing.

5.3.4.3 Recent Catch and Landings

The commercial handgear fisheries for all Atlantic HMS are typically most active during the summer and fall, although fishing also occurs in the South Atlantic and Gulf of Mexico during the winter months. The proportion of domestic Atlantic HMS landings that are harvested with commercial handgear varies by species, with Atlantic tunas comprising the majority of commercial landings. In 2019, Atlantic bluefin tuna commercial handgear landings accounted for approximately 77 percent of the total U.S. Atlantic bluefin tuna landings. By comparison, the shark commercial handgear fishery plays a very minor role in contributing to overall shark landings. As a result, several of the tables in this section generally do not include shark landings. For information regarding shark fishery landings, refer to Sections 5.3.5.2 and 5.3.6.3. Economic and social aspects of all the domestic handgear fisheries are described in Chapter 8.

The commercial handgear fishery for bluefin tuna targets large-medium and giant bluefin tuna, and occurs mainly in New England and to a lesser degree off the coast of southern Atlantic states, such as Virginia, North Carolina, and South Carolina. Targeting bluefin tuna in the Gulf of Mexico is prohibited. The majority of U.S. commercial handgear fishing activities for bigeye, albacore, yellowfin, and skipjack tunas takes place in the northwest Atlantic.

Figure 5.1 shows bluefin tuna commercial landings, which are predominately handgear landings, by geographic region. The South Atlantic region ends at Cape Hatteras, North Carolina, and the Mid-Atlantic region ends at eastern Long Island, New York. Commercial landings in the Mid-Atlantic region have increased notably starting in 2017. The availability of Atlantic tunas at a specific location and time is highly dependent on environmental variables that fluctuate from year to year.

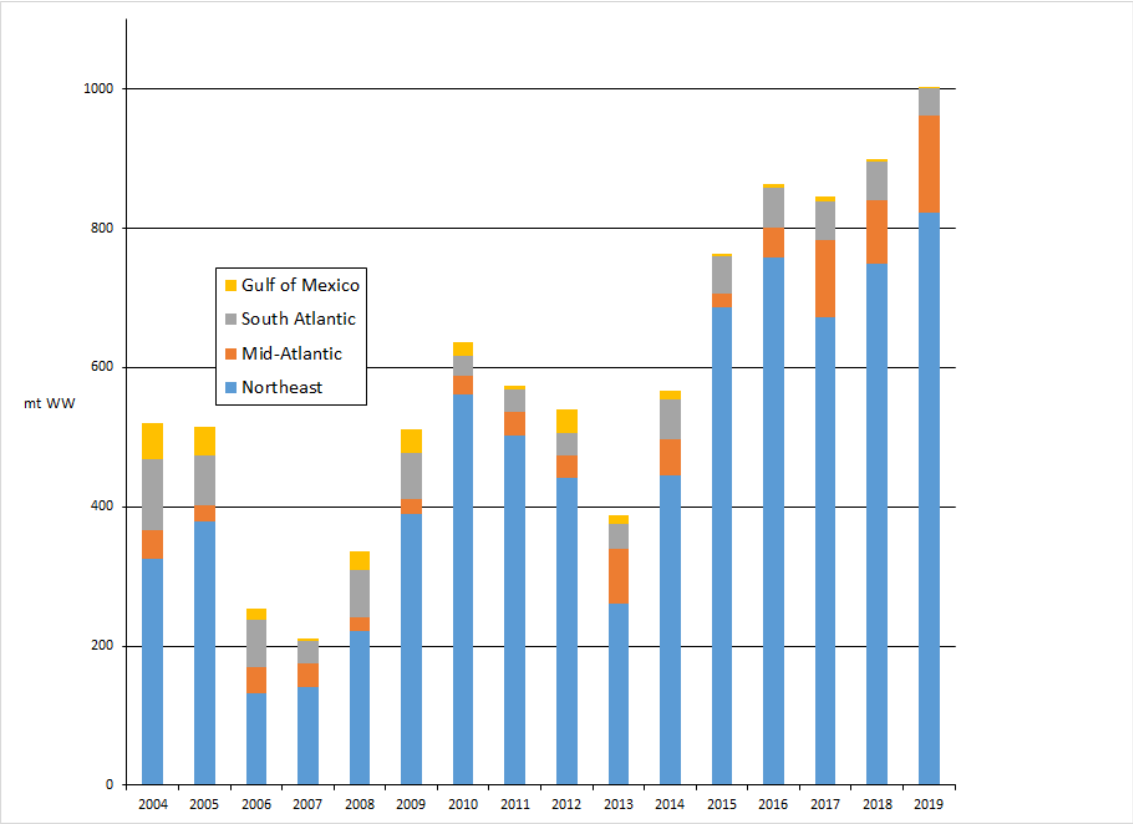

Figure 5.1 Commercial Landings (mt ww) of North Atlantic Bluefin Tuna by U.S. Geographic Region in 2004–2019
mt ww = Metric tons whole weight. Source: eBFT.

Figure 5.2 shows the U.S. Atlantic bluefin tuna landings by category since 2004. Incidental retention of bluefin is allowed by trap and pelagic longline gear, and these landings are combined in the figure. The commercial handgear landings are comprised of bluefin tuna landed by both the General and Harpoon categories. Figure 5.2 shows the large degree by which handgear landings dominate overall commercial bluefin landings.

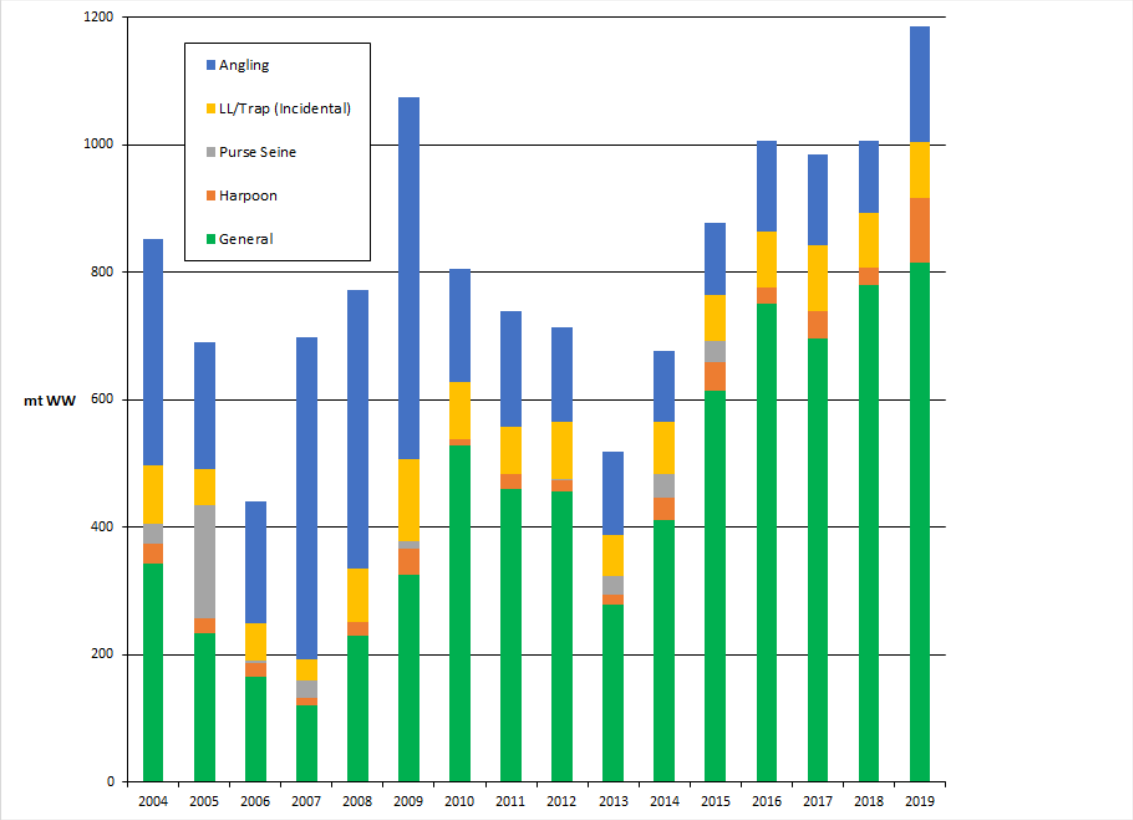

Figure 5.2 Domestic Landings of Bluefin Tuna (mt ww) by Fishing Category in 2004–2019

LL = Pelagic longline gear. mt ww = Metric tons whole weight. Source: eBFT.

Commercial handgear landings of tuna and swordfish in the United States are shown by gear in Table 5.29 and by area in Table 5.30. Commercial handgear landings for 2019 of yellowfin, skipjack, bigeye and albacore tunas (Table 5.29) were compared to total U.S. recreational and commercial landings presented in Section 5.2.2.1 (Table 5.4, Table 5.5, Table 5.6, and Table 5.7). In 2019, yellowfin tuna commercial handgear landings (74.1 mt ww) accounted for almost 3 percent of the total U.S. yellowfin landings and almost 8 percent of U.S. yellowfin commercial landings (954.9 mt ww). Commercial handgear landings of skipjack in 2019 (1.4 mt ww) also accounted for 3 percent of total U.S. landings and about 64 percent of total commercial skipjack landings (2.2 mt ww). Bigeye tuna commercial handgear landings (15.6 mt ww) accounted for almost 2 percent of total bigeye landings) and close to 3 percent of total commercial bigeye landings (595.9 mt ww). For albacore, 2019 commercial handgear landings (0.5 mt ww) accounted for less than 1 percent of total albacore landings and less than 1 percent of total commercial albacore landings (191.9 mt ww).

Buoy gear-caught large pelagic species, including swordfish, bigeye tuna, and yellowfin tuna, are presented in Table 5.31 and Table 5.32. Landings of swordfish for this gear have more than tripled over the last five years. Landings for bigeye tuna have occurred only during the last three years, and few yellowfin are landed using this gear.

Table 5.29 U.S. Atlantic Commercial Handgear Landings of Tunas and Swordfish (mt ww) by Handgear Type in 2015–2019

Species	Gear	2015	2016	2017	2018	2019
Bluefin tuna	Rod and reel	581.4	722.1	652.8	765.7	798.6
	Handline	0.0	1.1	5.0	1.4	0
	Harpoon	77.1	52.9	81.7	43.6	118.2
Total bluefin tuna		658.5	776.1	739.5	810.7	916.8
Bigeye tuna	Troll	6.4	1.0	1.3	7.5	1.7
	Handline	51.3	9.6	3.5	24.3	13.9
Total bigeye tuna		57.7	10.6	4.8	31.8	15.6
Albacore tuna	Troll	0.0	<0.1	0.0	0.0	0
	Handline	2.7	0.5	0.1	0.2	0.5
Total albacore tuna		2.7	0.5	0.1	0.2	0.5
Yellowfin tuna	Troll	25.6	17.9	34.3	62.3	23.3
	Handline	66.8	38.4	33.0	19.5	50.8
Total yellowfin tuna		92.4	56.3	67.3	81.8	74.1
Skipjack tuna	Troll	0.0	0.0	0.0	0.0	0.0
	Handline	0.7	1.2	0.6	1.3	1.4
Total skipjack tuna		0.7	1.2	0.6	1.3	1.4
Swordfish	Handline	76.4	75.7	58.2	132.4	205.0
	Harpoon	0.0	0.0	0.3	0.1	0.3
Total swordfish		76.4	75.7	58.5	132.5	205.3

mt ww = Metric tons whole weight. Source: NOAA Fisheries 2020.

Table 5.30 **U.S. Atlantic Commercial Handgear Landings of Tunas and Swordfish (mt ww) by Region in 2015–2019**

Species	Region	2015	2016	2017	2018	2019
Bluefin tuna	Northwest Atlantic	658.5	776.1	739.5	810.7	916.8
Bigeye tuna	Northwest Atlantic	51.3	10.4	4.8	29.2	24.4
	Gulf of Mexico	0.0	0.0	0.0	2.6	0.2
	Caribbean	0.0	0.2	0.0	0.0	0.0
Albacore tuna	Northwest Atlantic	2.7	0.4	0.1	0.2	0.5
	Gulf of Mexico/Caribbean	0.0	0.1	0.0	0.0	0.0
Yellowfin tuna	Northwest Atlantic	64.3	48.1	55.4	46.6	51.3
	Gulf of Mexico	1.9	6.9	11.8	35.0	22.6
	Caribbean	0.6	1.3	<0.1	<0.1	0.2
Skipjack tuna	Northwest Atlantic	0.2	0.3	0.5	0.8	0.2
	Gulf of Mexico	0.0	0.0	0	<0.1	0.1
	Caribbean	0.5	0.9	0.1	0.5	1.1
Swordfish	Northwest Atlantic	70.7	71.3	58.5	127.7	202.5
	Gulf of Mexico	5.5	3.5	2.7	4.8	2.8
	Caribbean	0.2	0.9	0.0	0.0	0.0

mt ww = Metric tons whole weight. Source: NOAA Fisheries 2020.

Table 5.31 **Reported Buoy Gear Landings by weight (lb dw) in 2015–2019**

Species	2015	2016	2017	2018	2019
Swordfish	84,340	93,360	77,243	186,577	293,651
Dolphinfish	216	733	298	265	411
Oilfish	490	121	109	1,117	432
Wahoo	45	58	26	0	172
Bigeye tuna	0	0	207	92	120
King mackerel	29	323	60	35	0
Yellowfin tuna	0	0	0	350	0
Bonito	0	0	60	14	0
Blackfin tuna	189	96	86	276	427

lb dw = Pounds dressed weight. Source: Unified Data Processing.

Table 5.32 Reported Buoy Gear Landings and Discards in Numbers of Fish in 2015–2019

Catch Status	Species	2015	2016	2017	2018	2019
Landed	Swordfish	1,561	1,558	1,297	3,231	4,707
	Dolphinfish	18	48	28	28	68
	Oilfish	12	3	2	26	9
	Bigeye tuna	0	0	1	1	1
	Blackfin tuna	16	13	9	27	44
	Wahoo	1	2	2	0	5
	Bonito	0	0	8	2	10
	King mackerel	4	43	6	4	0
	Shortfin mako*	6	11	10	0	0
	Blacktip shark*	0	0	0	0	4
Released alive	Swordfish	311	223	439	697	670
	Dolphinfish	0	0	0	1	20
	Blue marlin	0	0	0	0	1
	Hammerhead shark	23	22	27	46	134
	Thresher shark	0	0	1	0	0
	Tiger shark	0	0	2	8	4
	Sandbar shark	0	1	0	0	1
	Shortfin mako shark	1	0	1	5	6
	Blacktip shark	0	0	0	34	1
	Silky shark	18	6	3	11	60
	Oilfish	0	0	1	3	5
	Blackfin tuna	0	0	2	2	5
	Prohibited sharks	94	61	39	17	69
Released dead	Swordfish	45	13	29	50	28
	Hammerhead shark	1	0	0	6	3
	Blackfin tuna	0	0	2	0	0
	Sailfish	0	0	1	0	0
	Prohibited sharks	14	2	0	1	1

*Buoy gear is not an authorized gear for sharks. Source: Unified Data Processing.

5.3.5 Recreational Handgear

5.3.5.1 Background

More Information

- Gear: Section 10.1.3
- Management: Section 10.2
- Permits: Sections 4.1.3.5 and 4.1.3.6
- Bycatch: Section 6.3.5
- Tournaments: Section 8.5.2

Recreational fishermen target various Atlantic HMS using a variety of handgear: rod and reel, handline, and speargun. HMS Angling and HMS Charter/Headboat permit holders are required to report all non-tournament recreational swordfish and billfish landings, as well as bluefin tuna landings and dead discards, within 24 hours of the landings or end of each trip through an online catch reporting system, a smartphone app, or phone number. In Maryland and North Carolina, vessel owners are required to report their billfish, bluefin tuna, and some shark landings through the submission of catch cards at state operated landings stations. More information is available at hmspermits.noaa.gov/catchReports. These reports are in addition to any information submitted by federally permitted dealers.

Each of the following data tables contain estimates of total harvest derived from multiple data sources, some survey based (i.e., Marine Recreational Information Program (MRIP), Large Pelagics Survey, Louisiana Creel survey ("LA Creel"), Texas Parks and Wildlife Survey ("TPWD"), Southeast Regional Headboat Survey), and some census based (ATR, Automated Landings Reporting System, MD and NC Catch Cards). One should note that survey-based estimates include estimates of precision (i.e., statistical variance) that allow for the calculation of percent standard errors (PSEs) and confidence intervals, while census-based count data do not. We do not include estimates of PSEs in the following tables because it is computationally difficult to combine variance estimates across surveys using different sampling designs, and impossible to do so between surveys and census-based approaches. As a rule, surveys like the Large Pelagics Survey (LPS) generate lower estimates of variance for Atlantic HMS species because they survey a more targeted audience of offshore anglers while MRIP surveys target anglers fishing for all saltwater fish species. Within any given survey, variance estimates will also be consistently lower for species that are more commonly caught and observed (i.e., higher sample sizes) such as yellowfin tuna, Atlantic sharpnose sharks, bonnethead sharks, shortfin mako sharks, and blacktip sharks than for species that are less commonly caught and observed.

5.3.5.2 Recent Catch and Landings

The landings in this section reflect the re-estimation of recreational effort, catch, and harvest conducted in 2018 with results from the new Fishing Effort Survey (FES) and redesigned Access Point Angler Intercept Survey (APAIS) (Table 5.33-Table 5.43). FES fully replaced the historically used Coastal Household Telephone Survey in 2018, while the redesigned APAIS was fully implemented in 2014.

The new survey methods resulted in significantly higher estimates of recreational fishing effort, catch, and harvest. On average, estimates of private boat effort and catch were found to have doubled, and shore-based fishing effort and catch estimates increased sixfold. The new MRIP catch and harvest estimates will be incorporated into new stock assessments to estimate updated annual catch limits. More information on the current survey methods, reasons for the survey redesigns, how they have affected catch and effort estimates, and implications for management can be found at www.fisheries.noaa.gov/recreational-fishing-data/effort-survey-improvements#transition-process.

It is important to note that effort data for the for-hire fleet, which consists of charter boat and headboat vessels, is primarily collected through the For-Hire Survey (FHS), which was not a part of the survey redesign mentioned above. LPS, which is used to collect precise recreational estimates for tunas, swordfish, billfish, and sharks from Maine to Virginia, was also not part of the redesign. As such, the historic estimates of catch and effort from FHS and LPS have not changed at this time. NOAA Fisheries is in the process of redesigning these surveys but does not anticipate the same high-magnitude changes that were observed with FES re-estimates given that the FHS and LPS

have smaller populations of known permit holders, which has always allowed for highly targeted data collection.

Recreational Tuna Fishery

Tuna and swordfish landings for Atlantic HMS recreational rod and reel fisheries from 2015 through 2019 are presented in Table 5.33.

Table 5.33 Domestic Landings (mt ww) for the Atlantic Tunas and Swordfish Recreational Rod and Reel Fishery in 2015–2019

Species	Region	2015	2016	2017	2018	2019
Bluefin tuna*	Northwest Atlantic	112.9	143.7	140.1	112.5	179.9
	Gulf of Mexico	0	1.7	1.7	1.6	1.9
	Total	112.9	145.4	141.8	114.1	181.8
Bigeye tuna**	Northwest Atlantic	448.5	170.5	259.7	493.9	204.9
	Gulf of Mexico	<0.1	0.2	0	0.7	30.6
	Caribbean	0.5	0	0	0	0
	Total	449.0	170.7	259.7	494.6	235.5
Albacore**	Northwest Atlantic	120.5	41.4	27.5	8.9	29.5
	Gulf of Mexico and Caribbean	<0.1	1.2	0	0	0
	Total	120.6	42.6	27.5	8.9	29.5
Yellowfin tuna**	Northwest Atlantic	976.1	1,936.2	2,427.4	1,463.9	1,446.7
	Gulf of Mexico	678.7	776.2	463.8	306.3	254.8
	Caribbean	5.7	30.3	13.2	0.0	0
	Total	1,660.5	2,742.7	2,904.4	1,770.2	1,701.5
Skipjack tuna**	Northwest Atlantic	49.9	130.1	80.9	63.5	34.6
	Gulf of Mexico	34.3	34.0	113.2	12.6	7.5
	Caribbean	7.6	11.4	1.0	0	0
	Total	91.8	175.5	195.1	76.1	42.1
Swordfish	Total	46.0	45.8	33.8	36.2	87.7

mt ww = Metric tons whole weight. *Rod and reel catch and landings estimates of bluefin tuna < 73 inches curved fork length are based on statistical surveys of the U.S. recreational harvesting sector. Rod and reel catch of bluefin tuna > 73 inches CFL are commercial landings and may also include a few metric tons of recreational "trophy" bluefin (recreational bluefin ≥ 73 inches CFL). **Rod and reel catches and landings for Atlantic tunas represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector. Source: NOAA Fisheries 2016, 2017a, 2018, 2019, 2020.

Recreational Billfish Fishery

Table 5.34 provides a summary of reported billfish and swordfish landings from 2015 through 2019. Due to the rare nature of billfish encounters and the difficulty of monitoring landings outside of tournament events, reports of recreational billfish landings are sparse. However, ATR provides a preliminary source for analyzing recreational billfish tournament landings. Recreational report totals are developed from analysis of multiple datasets, including an automated landings reporting system (ALRS), LPS, Maryland and North Carolina catch cards, ATR, and MRIP. These datasets include tournament data, non-tournament data, or both.

In 2012, NOAA Fisheries established a new accounting protocol that analyzes tournament and non-tournament landings reports of billfishes using all available programs (see sources in Table 5.34). The "Total landings of marlin and roundscale spearfish" by year and "Balance remaining from 250 limit" rows reflect the U.S. landings limits established at ICCAT. Under ICCAT Recommendation 19-05, and as specified in Section 635.27(d)(1), the United States recreational marlin fishery is limited to a maximum of 250 combined Atlantic blue and white marlin landings per year. Roundscale spearfish is included in this count. Sailfish and swordfish are presented underneath the ICCAT accounting rows and do not count towards the 250 marlin limit.

The number of registered tournaments and reported tournament landings by state are shown in Table 3.35.

Table 5.34 Atlantic Highly Migratory Species Recreational Swordfish and Billfish Landings in Numbers in 2015–2019

Species	Reporting	2015	2016	2017	2018	2019
Swordfish	Tournament[1]	17	42	50	42	62
	Non-tournament[2]	315	458	518	619	1,234
Total swordfish		332	500	568	661	1,296
Sailfish	Tournament[1]	1	0	1	4	14
	Non-tournament[2]	113	114	104	94	96
Total sailfish		114	114	105	98	110
Blue marlin	Tournament[1]	40	63	45	75	51
	Non-tournament[2]	23	17	17	15	28
Total blue marlin		63	80	62	90	79
White marlin	Tournament[1]	46	46	50	51	44
	Non-tournament[2]	20	14	11	27	31
Total white marlin		66	60	61	78	75
Roundscale spearfish	Tournament[1]	10	21	6	20	33
	Non-tournament[2]	0	1	0	0	2
Total roundscale spearfish		10	22	6	20	35
Total marlin and roundscale spearfish		139	162	129	188	189
Balance remaining from 250 marlin and roundscale spearfish limit		111	88	121	62	61

Source: [1]Atlantic Tournament Registration and Reporting, Maryland and North Carolina HMS catch cards, Large Pelagics Survey, and Marine Recreational Information Program; [2]Automated Landings Reporting System, Maryland and North Carolina HMS catch cards, LPS, and MRIP.

Table 5.35 Tournaments and Numbers of Billfishes and Swordfish Kept by State/Territory in 2019

State	Tournaments	White Marlin	Blue Marlin	Sailfish	Roundscale Spearfish	Swordfish
New York	3	0	0	0	0	0
New Jersey	34	16	7	0	10	5
Maryland	28	18	5	0	18	7
Massachusetts	3	0	0	0	0	0
Alabama	4	0	3	0	0	0
Virginia	14	0	0	0	0	18
North Carolina	36	0	20	0	0	6
South Carolina	14	0	0	0	0	1
Florida	55	0	1	1	0	14
Mississippi	5	0	0	0	0	0
Louisiana	30	0	4	0	0	1
Texas	17	0	3	10	0	0
Puerto Rico	10	0	0	0	0	0

Notes: Some states have been excluded to protect tournament reporting privacy. These states include Delaware, and Georgia, as well as the U.S. Virgin Islands. Fourteen registered tournaments were held outside the United States (data not shown). Source: Atlantic Tournament Registration and Reporting.

Recreational Shark Fishery

Recreational shark landings must be reported to NOAA Fisheries when an angler is required to participate in LPS or MRIP. Vessel owners in Maryland must and in North Carolina can report shark landings on catch cards at state-operated landings stations. Maryland recreational shark landings in 2015–2019 are summarized by species in Table 5.36. North Carolina catch cards from 2015 to 2019 indicate two shortfin mako sharks were reported in 2015; two bull sharks were reported in 2016; and one spinner shark was reported in 2019. No sharks were reported in 2017 or 2018 via the North Carolina catch card program.

Table 5.36 Recreational Shark Landings Reported From the Maryland Catch Card Program in 2015–2019

Species	2015	2016	2017	2018	2019
Atlantic sharpnose	13	31	40	76	80
Blue	2	2	4	0	0
Thresher	10	8	10	6	6
Scalloped hammerhead	0	1	0	0	0
Shortfin mako	55	55	61	3	13
Spinner	0	0	0	0	0
Smoothhound	0	2	0	0	0
Tiger	0	0	1	0	0
Total	80	99	116	85	99

Source: Maryland Department of Natural Resources.

The preceding tables, which provide estimated shark recreational landings, have undergone changes from previous SAFE Reports. First, beginning in the 2019 report, recreational harvest data from the new Louisiana Recreational Creel survey have been included. The creel survey was implemented by the state of Louisiana in 2014 to replace the NOAA Fisheries MRIP data collection. Second, all MRIP data collections in Puerto Rico have been suspended since September 2017, following the impact of Hurricane Maria. As such, MRIP surveys were not conducted in 2019 as the island continued to recover.

With these updates, estimated recreational landings are provided by region for each of the three groups of shark species: large coastal sharks (Table 5.37, Table 5.38, and Table 5.39), pelagic sharks (Table 5.40), and small coastal sharks (Table 5.41 and Table 5.42). Estimated recreational landings for smoothhound (smooth dogfish) sharks are in Table 5.43. Observed and estimated recreational harvest of prohibited shark species are in Table 6.27.

Table 5.37 Estimated Recreational Harvest of Large Coastal Sharks in the U.S. Atlantic Region in 2015–2019 in Number of Fish Per Species

Species	2015	2016	2017	2018	2019
Blacktip	5,306	6,520	1,527	500	224
Bull	2	26	3,750	32	.
Hammerhead, great	1	.	.	.	1
Hammerhead, scalloped	.	.	.	.	1
Hammerhead, smooth	.	.	.	.	.
Hammerhead, unclassified	.	799	.	.	.
Lemon	119	1,207	764	.	4
Nurse	318	21	2	5	13
Spinner	396	761	623	153	66
Tiger	1,481	2,061	.	1	.
Requiem shark, unclassified	594	732	625	7,544	83,129
Total	8,217	12,127	7,291	8,235	83,438

Note: A period indicates that species were not reported. Source: Southeast Region Headboat Survey and Marine Recreational Information Program (Fishing Effort Survey/Access Point Angler Intercept Survey calibrated).

Table 5.38 Estimated Recreational Harvest of Large Coastal Sharks in the Gulf of Mexico Region in 2015–2019 in Number of Fish Per Species

Species	2015	2016	2017	2018	2019
Blacktip	23,751	26,107	21,635	17,777	5,725
Bull	767	532	3,373	5,945	1,993
Hammerhead, great	49	2	.	.	.
Hammerhead, scalloped	28	22	58	30	3
Hammerhead, smooth	.	.	.	.	.
Hammerhead, unclassified	.	.	.	.	.
Lemon	15	1,581	.	47	.
Nurse	1	1	2,282	1	.
Spinner	4,829	1,730	4,804	6,054	3,300

Species	2015	2016	2017	2018	2019
Tiger	2	1	3	1	2
Requiem shark, unclassified	9,831	15,431	13,504	1,136	12,703
Total	39,320	45,407	45,868	30,991	23,726

Note: A period indicates that species were not reported. Source: Texas Parks & Wildlife Department; Marine Recreational Information Program (Fishing Effort Survey/Access Point Angler Intercept Survey calibrated); Southeast Region Headboat Survey; Louisiana Recreational Creel.

Table 5.39 Estimated Recreational Harvest of Large Coastal Sharks in Puerto Rico in 2015–2019 in Numbers of Fish Per Species

Species	2015	2016	2017[1]	2018[1]	2019
Nurse	.	201	.	.	.
Total	.	201	.	.	.

Note: A period indicates that species were not reported. [1]Marine Recreational Information Program data collection in Puerto Rico was suspended in September 2017 and was not resumed for the 2018 or 2019 season as the island continued to recover following Hurricane Maria. Source: MRIP (Fishing Effort Survey/Access Point Angler Intercept Survey calibrated); Southeast Region Headboat Survey.

Table 5.40 Domestic Landings (mt ww) of Pelagic Sharks in the Recreational Rod and Reel Fishery in the U.S. Atlantic, Gulf of Mexico, and U.S. Caribbean in 2015–2019

Species	2015	2016	2017	2018	2019
Blue shark	32.0	30.8	21.9	15.2	16.7
Mako, shortfin	489.6	167.5	192.4	125.1	25.2
Oceanic whitetip	2.0	.	.	.	.
Porbeagle	7.6	4.3	7.7	2.8	11.8
Thresher	89.0	74.3	92.0	96.6	108.8
Total	620.2	276.9	314.0	239.7	162.5

mt ww = Metric tons whole weight. Sources: Large Pelagic Survey; Marine Recreational Information Program (Fishing Effort Survey/Access Point Angler Intercept Survey calibrated); Southeast Region Headboat Survey; Louisiana Recreational Creel; Texas Parks & Wildlife Department. A period indicates that species were not reported.

Table 5.41 Estimated Recreational Harvest of Small Coastal Sharks in the U.S. Atlantic Region in 2015–2019 in Number of Fish Per Species

Species	2015	2016	2017	2018	2019
Blacknose	3,782	225	13	13	83
Bonnethead	10,346	37,832	18,239	37,168	31,086
Finetooth	5,221	.	1,219	.	176
Atlantic sharpnose	41,172	155,023	38,784	24,468	40,144
Total	60,522	193,080	58,255	61,649	71,489

Source: Marine Recreational Information Program (Fishing Effort Survey/Access Point Angler Intercept Survey calibrated); Southeast Headboat Survey. A period indicates that species were not reported.

Table 5.42 **Estimated Recreational Harvest of Small Coastal Sharks in the Gulf of Mexico Region in 2015–2019 in Number of Fish Per Species**

Species	2015	2016	2017	2018	2019
Blacknose	1,256	40	2,484	17,371	406
Bonnethead	18,006	18,236	20,649	118,148	20,338
Finetooth	203	351	2,565	3,884	103
Atlantic sharpnose	39,761	74,379	71,904	51,176	25,452
Total	59,226	93,008	97,601	190,579	46,299

Source: Texas Parks & Wildlife Department; Marine Recreational Information Program (Fishing Effort Survey/Access Point Angler Intercept Survey calibrated); Southeast Region Headboat Survey; Louisiana Recreational Creel.

Table 5.43 **Estimated Recreational Harvest of Smoothhound Sharks* in the Gulf of Mexico and U.S. Atlantic Regions in 2015–2019 in Number of Fish Per Species**

Region	2015	2016	2017	2018	2019
Atlantic	88,316	145,689	58,446	40,736	56,375
Gulf of Mexico	3	3	.	.	.
Total	88,319	145,692	58,446	40,736	56,375

*Atlantic stock includes smooth dogfish. Gulf of Mexico stock includes smooth dogfish, Florida smoothhound, and Gulf smoothhound. A period indicates that species were not reported. Source: Texas Parks & Wildlife Department; Marine Recreational Information Program (Fishing Effort Survey/Access Point Angler Intercept Survey calibrated); Southeast Region Headboat Survey; Louisiana Recreational Creel.

5.3.6 Bottom Longline

5.3.6.1 Background

Bottom longline is the primary commercial gear deployed for targeting large and small coastal sharks throughout the Atlantic Ocean. The bottom longline fishery includes the shark research fishery. Section 6.3.6.1 under the bycatch reduction measures for bottom longline, provides a description of the shark research fishery.

> **More Information**
>
> - Gear: Section 10.1.4
> - Management: Section 10.2 (See Amendment 6 and Amendment 5b)
> - Permits: Section 4.1.1
> - Bycatch: Section 6.3.6

Current commercial regulations include limited access vessel permits requirements, commercial quotas, vessel retention limits, a prohibition on landing 20 species of sharks (one of these species can be landed in the shark research fishery), numerous closed areas, gear restrictions, landing restrictions (including requiring all sharks be landed with fins naturally attached), fishing regions, vessel monitoring system (VMS) requirements, dealer permits, and vessel and dealer reporting requirements.

5.3.6.2 Trips and Fishing Effort

The reported bottom longline effort for fishermen targeting sharks by region from 2015 through 2019 is provided in Table 5.44. A targeted shark trip is defined as a trip where 75 percent of the landings by weight were sharks. Greater numbers of vessels target sharks in the Atlantic region than the Gulf of Mexico. The number of trips and

average sets per trip remain fairly similar between the two regions. Since 2017, the total number of set hooks in the Gulf of Mexico continue to exceed those reported in the Atlantic region.

Table 5.44 Reported Bottom Longline Effort Targeting Sharks in 2015–2019

Specifications	Region	2015	2016	2017	2018	2019
Number of vessels	Gulf of Mexico	18	16	13	13	6
	Atlantic	14	13	18	14	12
Number of trips	Gulf of Mexico	528	261	322	340	119
	Atlantic	331	282	325	212	118
Average sets per trip	Gulf of Mexico	1.1	1.2	1.2	1.3	1.8
	Atlantic	1.8	1.4	1.4	1.5	1.8
Total number of set hooks	Gulf of Mexico	140,356	89,723	112,295	121,992	83,335
	Atlantic	170,232	104,665	109,851	85,307	34,322
Average number of hooks per set	Gulf of Mexico	236.1	272.3	292.1	275.9	403.3
	Atlantic	294.9	269.6	260.0	276.1	204.4
Total soak time (hours)	Gulf of Mexico	2,920	1,416	2,140	2,058	1,039
	Atlantic	2,295	2,041	3,054	1,410	866
Average mainline length (miles)	Gulf of Mexico	2.1	2.6	2.9	3.0	6.6
	Atlantic	3.8	3.6	3.6	3.7	3.2

Source: Unified Data Processing.

5.3.6.3 Recent Catch and Landings

This section provides information on non-prohibited shark landings and species composition and discards as reported in the Southeast Fisheries Science Center Bottom Longline Observer Program. For information on prohibited sharks, see Section 6.4.

Since 2002, shark bottom longline vessels have been required to take an observer, if selected. Participants in the shark research fishery are required to take an observer on all shark research fishery trips. Outside the research fishery, and depending on the time of year, vessels that target sharks, possess a current valid Shark Directed permit, and reported fishing with longline gear in the previous year were randomly selected for observer coverage. The target observer coverage level is 5–10 percent (Mathers et al. 2020a, unpublished).

In 2019, the Bottom Longline Observer Program placed observers on seven vessels—five of the vessels were selected within the shark research fishery and two selected in the non-research shark bottom longline fishery. A total of 134 bottom longline sets (defined as setting gear, soaking gear for some duration of time, and retrieving gear) and 74 trips (defined as from the time a vessel leaves the port until the vessel returns to port and lands catch, including multiple hauls therein) were observed between January and December 2019 on the seven vessels. Gear characteristics of trips varied by area (Gulf of Mexico or the U.S. Atlantic Ocean) and target species (non-sandbar large coastal sharks or sandbar shark) (Mathers et al. 2020a, unpublished).

In the non-research shark fishery, the program observed trips in the southern Atlantic and the Gulf of Mexico region targeting coastal shark species. These trips caught mostly Atlantic sharpnose sharks, followed by blacktip, nurse, and blacknose sharks (Table 5.45). There were 34 bottom longline sets on 14 observed trips targeting large

coastal sharks. These sets used a bottom longline that was between 0.3 and 9.9 km (0.1– 6.0 miles) long with 12–540 hooks attached. The 16.0 circle hook and 20.0 circle hook were the most common hook used (41.2 percent). The average soak duration was 2.8 hours.

Fishermen in the 2019 shark research fishery targeted sandbar sharks in the Gulf of Mexico and southern Atlantic regions. There were 100 sets on 60 trips, all of which were observed, that caught mostly sandbar sharks, with blacktip, tiger, and nurse sharks being the next most-caught species (Table 5.46). Trips in the shark research fishery used a bottom longline gear that was an average length of 5.0 km (3.1 miles) with 125–300 hooks attached. The average soak duration was 6.1 hours. Fishermen targeting sandbar sharks with bottom longline gear most commonly used the 20.0 circle hook (64.0 percent of the time) (Mathers et al. 2020a, unpublished).

Table 5.45 Non-prohibited Shark Species Caught on Observed Bottom Longline Trips in the Non-Shark Research Fishery Targeting Sharks in the South Atlantic and Gulf of Mexico in 2019

Species	Total Caught	Kept (%)	Discarded Dead (%)	Discarded Alive (%)	Disposition Unknown (%)
Atlantic sharpnose shark	264	97.0	1.9	0.8	0.4
Blacktip shark	148	91.2	7.4	0.7	0.7
Nurse shark	83	4.8	0.0	95.2	0.0
Blacknose shark	71	29.6	33.8	36.6	0.0
Tiger shark	67	50.8	3.0	46.3	0.0
Sandbar shark	62	0.0	0.0	100.0	0.0
Bull shark	34	100.0	0.0	0.0	0.0
Great hammerhead shark	28	85.7	7.1	3.6	3.6
Lemon shark	25	96.0	0.0	4.0	0.0
Scalloped hammerhead shark	8	75.0	12.5	12.5	0.0
Spinner shark	7	100.0	0.0	0.0	0.0
Finetooth shark	5	100.0	0.0	0.0	0.0
Sharks, unclassified	111	75.7	18.9	5.4	0.0
Total	913				

Source: Mathers et al. 2020a, unpublished.

Table 5.46 Non-prohibited Shark Species Caught on Observed Bottom Longline Trips in the Shark Research Fishery in the Gulf of Mexico and Southern Atlantic in 2019

Species	Total Caught	Kept (%)	Discarded Dead (%)	Discarded Alive (%)	Disposition Unknown (%)
Sandbar shark	3,377	98.4	0.3	0.0	1.0
Blacktip shark	563	96.8	1.8	0.9	0.5
Tiger shark	312	27.9	1.9	69.6	0.6
Nurse	174	2.9	0.0	97.1	0.0
Atlantic sharpnose shark	150	57.3	41.3	0.7	0.7

Species	Total Caught	Kept (%)	Discarded Dead (%)	Discarded Alive (%)	Disposition Unknown (%)
Bull shark	111	91.9	0.0	1.8	6.3
Great hammerhead shark	73	76.7	4.1	19.2	0.0
Blacknose shark	71	15.5	53.5	31.0	0.0
Scalloped hammerhead shark	62	62.9	4.8	27.4	4.8
Lemon shark	52	92.3	0.0	3.9	3.9
Spinner shark	20	90.0	5.0	5.0	0.0
Hammerhead shark	2	100.0	0.0	0.0	0.0
Silky shark	2	0.0	0.0	100.0	0.0
Thresher shark	1	100.0	0.0	0.0	0.0
Bonnethead shark	1	0.0	100.0	0.0	0.0
Sharks, unclassified	1	0.0	100.0	0.0	0.0
Total	5,105				

Source: Mathers et al. 2020a, unpublished.

5.3.7 Gillnet

5.3.7.1 Background

Gillnet gear is the primary gear for vessels landing small coastal sharks and smooth dogfish, although such vessels can also catch other shark species. Vessels participating in the shark gillnet fishery typically possess permits for other council or state managed fisheries in addition to their federal permit. Many of the commercial regulations for the Atlantic shark fishery are the same for both the bottom longline and gillnet fishery, including seasons, quotas, species complexes, permit requirements, authorized/prohibited species, and retention limits.

The data presented in this section focus on gillnet fisheries in the Southeast and Gulf of Mexico regions landing small coastal sharks or finfish, as well as gillnet fisheries in the Northeast region landing smooth dogfish sharks.

5.3.7.2 Trips and Fishing Effort

Southeast Atlantic and Gulf of Mexico Gillnet Fishery

The majority of the vessels and trips catching and landing sharks, other than smooth dogfish, with gillnet gears occurs in the southern portion of the Atlantic region. In addition to small coastal sharks, these Southeast trips catch and retain king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), and bluefish (*Pomatomus saltatrix*). Most of the landings from the Gulf of Mexico region cannot be aggregated at sufficient levels to release given confidentiality requirements under the Magnuson-Stevens Act (Table 5.47).

Table 5.47 Gillnet Gear Effort in the U.S. South Atlantic and Gulf of Mexico Regions Targeting Sharks in 2015–2019

Specifications	Region	2015	2016	2017	2018	2019
Number of vessels	Gulf of Mexico	C	0	3	C	C
	Atlantic	19	21	20	27	19
Number of trips	Gulf of Mexico	C	0	15	C	C
	Atlantic	161	206	131	203	264
Average sets per trip	Gulf of Mexico	C	N/A	1.7	C	C
	Atlantic	2.1	1.8	1.4	1.5	2
Total soak time (hours)	Gulf of Mexico	C	N/A	128.0	C	C
	Atlantic	539.8	852.5	499.1	562.5	698.8
Average gillnet length (yards)	Gulf of Mexico	C	N/A	696.7	C	C
	Atlantic	726.7	1,155.1	1,046.7	1,169.4	827.6
Average mesh size (inches stretched)	Gulf of Mexico	C	N/A	8.5	C	C
	Atlantic	5.2	5.2	4.7	4.6	6.3

C = Due to confidentiality requirements under the Magnuson-Stevens Act, some of the data are not presented. N/A = No data reported.
Source: Unified Data Processing.

Northeast and Mid-Atlantic Gillnet Fishery

The majority of the vessels and trips fishing with gillnet gear in the northeast and mid-Atlantic regions catch and land smooth dogfish. Interactions in this fishery are recorded by observers with the Northeast Fisheries Observer Program (NEFOP). The smooth dogfish gillnet fishery is a mixed fishery with a large portion of trips catching and retaining a variety of additional species dominated by winter skate, bluefish, and spiny dogfish.

In 2019, the NEFOP observed 13 vessels making 191 sets on 48 trips targeting smooth dogfish. Smooth dogfish was recorded caught on a total of 179 sets. Summary information on those 48 trips is presented in Table 5.48.

More Information

- Gear: Section 10.1.5
- Management: Section 10.2 (See Amendment 6 and Amendment 5b)
- Permits: Section 4.1.1
- Bycatch: Section 6.3.7

Table 5.48 Gillnet Gear Effort in the U.S. Northeast and Mid-Atlantic Regions Targeting Smooth Dogfish in 2018-2019

Specifications	2018	2019
Number of trips	45	48
Number of sets	176	191

Source: Northeast Fisheries Observer Program.

5.3.7.3 Recent Catch and Landings

Table 5.49 displays the total catch, landings, and discards of smooth dogfish sharks in NEFOP observed trips in 2018 and 2019.

Table 5.49 Catch and Landings of Smooth Dogfish using Gillnet Gear in the U.S. Northeast and Mid-Atlantic Regions in 2018-2019

Specifications	2018	2019
Total caught (lb dw)	105,942	83,426
Kept (%)	99.4%	98.7%
Discarded (%)	0.6%	1.3%

lb dw = Pounds dressed weight. Source: Northeast Fisheries Observer Program.

5.3.8 Green-Stick

5.3.8.1 Background

Green-stick gear may be used to harvest bigeye, albacore, yellowfin, skipjack, and bluefin tunas aboard vessels with Atlantic Tunas General category, Atlantic HMS Charter/Headboat, and Atlantic Tunas Longline category permits.

5.3.8.2 Recent Catch and Landings

Table 5.50 presents green-stick landings data from state trip ticket programs.

More Information

- Gear: Section 10.1.6
- Management: Section 10.2 (See Amendment 8)
- Permits: Section 4.1
- Bycatch: Section 6.3.8

Table 5.50 Select Landings with Green-Stick Gear (lb ww) in 2015–2019

Species	Region	2015	2016	2017	2018	2019
Yellowfin tuna	Atlantic	44,673	47,223	92,629	82,040	14,486
	Gulf of Mexico	-	C	6,177	66,258	40,942
Bigeye tuna	Atlantic	11,399	2,341	4,500	12,975	6,330
	Gulf of Mexico	-	C	-	C	C

Note: Additional landings of other Atlantic HMS have occurred but cannot be displayed due to confidentiality requirements. lb ww = Pounds whole weight. Sources: 2015: eDealer, 2016-2019: ACCSP, GulfFIN. C = Due to confidentiality requirements under the Magnuson-Stevens Act, some of the data are not presented. A dash indicates that species were not reported.

5.4 Landings of Non-Target Atlantic HMS in Other Fisheries

5.4.1 Bottom Longline Fisheries

The NEFOP may observe Atlantic HMS catch on bottom longline trips that target other finfish species. In 2019, five vessels primarily targeting golden tilefish were observed interacting with Atlantic HMS on seven trips and 18 sets. Tiger sharks were most frequently encountered, representing 49 percent of the highly migratory species reported. Atlantic HMS species caught and kept in this fishery in 2019 are displayed in Table 5.51. Data on HMS species caught and discarded in this fishery can be found in Section 6.5.3, Table 6.31.

Table 5.51 **Atlantic HMS Species* Caught and Kept on Observed Bottom Longline Trips Targeting Golden Tilefish and other Finfish in the North Atlantic in 2019**

Species	Total Caught	Kept (%)
Tiger shark	18	5.6
Shortfin mako shark	3	100.0
Yellowfin tuna	2	100.0
Blacktip shark	1	100.0
Total	24	

* Prohibited shark species landings and interactions are compiled and presented in Section 6.4, Bycatch in the Prohibited Shark Complex. Source: Northeast Fisheries Observer Program.

5.4.2 Gillnet Fisheries

5.4.2.1 Northeast and Mid-Atlantic Gillnet Fishery

Gillnet gear is the predominant gear type used in the smooth dogfish shark fishery in the Northeast and Mid-Atlantic regions. Observations in this fishery are reported through the NEFOP. The gillnet fishery in these regions is a mixed fishery with a large portion of trips catching and retaining a variety of species, dominated by bluefish, croaker, and spiny dogfish.

Two types of gillnet gear, sink and drift, were observed in trips targeting mixed species, other than smooth dogfish or other sharks (J. Mello, personal communication). Interactions with highly migratory species were observed on all trips. A total of 354 trips totaling 756 sets on 110 vessels were observed in 2019. Shark species dominated the catch, including porbeagle, unidentified sharks, Atlantic sharpnose, and sandbar sharks. A list of shark species caught and kept by gillnet fishermen targeting mixed teleosts is presented in Table 5.52. Data on shark species caught and discarded in this fishery can be found in Section 6.5.4, Table 6.32.

Table 5.52 **Shark Species* Caught and Kept on Observed Trips across All Gillnet Gear Types Targeting Mixed Teleosts in 2019**

Common Name	Total Number Caught	Kept (%)
Porbeagle shark	556	1.3
Atlantic sharpnose shark	297	80.1
Sandbar shark	150	2.0
Spinner shark	90	75.6
Thresher shark	86	75.6
Scalloped hammerhead shark	44	52.3
Blacktip shark	35	60.0
Smooth dogfish	10	60.0
Bonnethead shark	8	62.5
Smooth hammerhead shark	5	20.0
Finetooth shark	2	100.0
Great hammerhead shark	1	100.0
Unidentified sharks	305	26.6
Total	1,589	

* Bycatch information of prohibited shark species across all Atlantic HMS fisheries is presented in Section 6.4. Source: Northeast Fisheries Observer Program.

Drift gillnet gear was used in 234 sets on 83 trips by 32 vessels, The catch from drift gillnets not targeting sharks or smooth dogfish was dominated by Atlantic sharpnose, unidentified sharks, and spinner sharks. Sink gillnet gear not targeting sharks or smooth dogfish was used in 522 sets on 274 trips by 88 vessels. The catch with sink gillnet gear on these trips was dominated by porbeagle sharks, sandbar sharks, and unidentified sharks.

5.4.2.2 Southeast Atlantic and Gulf of Mexico Gillnet Fishery

The Southeast Gillnet Observer Program covers anchored, strike, and drift gillnet fishing regardless of target species. In 2019, the Southeast program observed 95 sets comprised of various southeast gillnet fisheries. None of the gillnet trips observed targeted sharks. In the drift gillnet fishery, two gillnet vessels were observed making five drift gillnet sets on three trips, and in the strike gillnet fishery, one gillnet vessel was observed making one strike gillnet set on a single trip. Due to data confidentiality requirements under the Magnuson-Stevens Act, the details of the drift and strike gillnet trips cannot be further described. In the sink gillnet fishery, eight vessels were observed making 89 sink net sets on 21 trips in 2019. Observed sink gillnet trips exclusively targeted Spanish mackerel.

Table 5.53 outlines shark species composition for sharks caught and kept during observed sink gillnet trips with observers onboard in 2019 (Mathers et al. 2020b, unpublished). Data on shark species caught and discarded in this fishery can be found in Section 6.5.4, Table 6.33. Observations on drift and strike gillnet trips are not presented due to vessel confidentiality.

Table 5.53 Shark Species Caught and Kept on Observed Southeast Sink Gillnet Trips Targeting Spanish Mackerel in 2019

Species	Total Caught	Kept (%)
Atlantic sharpnose shark	407	9.8
Bonnethead shark	67	62.7
Blacktip shark	44	22.7
Spinner shark	24	87.5
Blacknose shark	15	73.3
Finetooth shark	5	100.0
Total	562	

Source: Mathers et al. 2020b, unpublished.

5.4.3 Other Fisheries

The Northeast Fisheries Observer Program surveys anchored (sink) and drift gillnet fishing trips, regardless of target species. In 2019, 803 sets on 377 trips were observed on 114 vessels with gillnet fishing gear. Of these, smooth dogfish was the target species for nine vessels on 20 trips and 35 sets.

Table 5.54 of this section outlines shark species composition information for sharks other than smooth dogfish caught and kept during Northeast Fisheries Observer Program-observed trips targeting smooth dogfish across all gear types. Data on shark species caught and discarded in this fishery can be found in Section 6.5.5, Table 6.34.

Table 5.54 Non-Target Shark Species* Caught and Kept on Observed Smooth Dogfish-Targeted Trips Across All Gear Types in 2019

Species	Total Caught (lb)	Kept (%)
Thresher shark	1,125	81.3
Atlantic sharpnose shark	335	100.0
Blacktip shark	215	100.0
Spinner shark	45	66.7
Total	1,720	

* Prohibited shark species landings and interactions are compiled and presented in Section 6.4, Bycatch in the Prohibited Shark Complex. Source: Northeast Fisheries Observer Program.

5.5 Chapter 5 References

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6 Bycatch, Incidental Catch, and Protected Species

6.1 Background

"Bycatch" in fisheries is a term that generally refers to discarded fish or interactions between fishing operations and protected species. Under the Magnuson-Stevens Act, bycatch is specifically defined as fish that are harvested in a fishery, but that are not sold or kept for personal use, and includes both economic and regulatory discards. Economic discards are fish that are discarded because they are of an undesirable species, size, sex, or quality, or for other economic reasons. Regulatory discards are fish that are caught but discarded because regulations do not allow fishermen to retain the fish; for example, fishermen may be required to discard fish under a certain size or of a specific species for conservation reasons. The National Bycatch Reduction Strategy was completed in 2016 and defines bycatch as discarded catch of marine species and unobserved mortality due to a direct encounter with fishing vessels and gear. More information about the strategy may be found at www.fisheries.noaa.gov/national/bycatch/national-bycatch-reduction-strategy.

- Some relevant examples of fish caught in Atlantic HMS fisheries as bycatch or incidental catch are:
- Marlin, undersized swordfish, and undersized bluefin tuna by commercial fishing gear.
- Undersized swordfish and tunas in recreational hook and line fisheries.
- Species for which there is little or no market, such as blue sharks.
- Species caught and released in excess of a bag limit.
- Prohibited species, such as longbill spearfish and those in the prohibited shark complex.

National Standard 9 of the Magnuson-Stevens Act requires that fishery management measures minimize bycatch and bycatch mortality to the extent practicable. Very few legal fishing gears are perfectly selective for the target species of each fishing operation; thus, expecting to eliminate bycatch of all non-target species in Atlantic HMS fisheries would be impracticable. Methods employed to reduce bycatch in the Atlantic HMS fisheries are listed in Table 6.1. Final Amendment 5b and Amendment 11 to the 2006 Consolidated Atlantic HMS FMP expanded the use of several of these methods in Atlantic HMS fisheries.

Table 6.1 Bycatch Reduction Methods in the Atlantic Highly Migratory Species Fisheries

Commercial Fisheries	Recreational Fisheries
• Gear modifications (including hook and bait types) • Corrodible (non-stainless steel) circle hooks • Weak hooks • Time/area closures • Performance standards • Education/outreach • Use of de-hooking devices (mortality reduction only) • Prohibiting retention of certain fish • Handling and release requirements (e.g., in the pelagic longline fishery, sharks that are not retained must have less than 3 ft. of trailing gear attached to the hook when released) • Fleet communication and relocation protocols (e.g., vessels must move 1 mile and inform other vessels that dusky sharks are in the area after a dusky shark interaction)	• Corrodible (non-stainless steel) circle hooks (mortality reduction only) • Catch-and-release programs • Prohibiting retention of certain fish • Education/outreach • Use of de-hooking devices (mortality reduction only)

6.2 Laws and Determinations Related to Bycatch in Atlantic HMS Fisheries

The major legal requirements pertaining to bycatch are in four acts:

- Magnuson-Stevens Act.
- Marine Mammal Protection Act (MMPA).
- Endangered Species Act (ESA).
- Migratory Bird Treaty Act.

This section reviews the laws related to bycatch and the ways in which NOAA Fisheries is abiding by these laws, including requirements for standardized bycatch reporting methodology. Laws related to endangered and protected species, and measures to address protected species concerns, are available on the NOAA Fisheries Office of Protected Resources website (www.fisheries.noaa.gov/about/office-protected-resources) and discussed in the 2011 SAFE Report (NOAA Fisheries 2011).

6.2.1 Magnuson-Stevens Act

Under the Magnuson-Stevens Act, "bycatch" has a very specific meaning: "Fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch and release fishery management program" (16 U.S.C. 1802(2)). Fish are defined as finfish, mollusks, crustaceans, and all other forms of marine animal and plant

life other than marine mammals and birds (1802(12)). Birds and marine mammals are therefore not considered bycatch under the Magnuson-Stevens Act.

6.2.1.1 Standardized Bycatch Reporting Methodology

Section 303(a)(11) of the Magnuson-Stevens Act requires all fishery management plans to "establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery" (16 U.S.C. 1853(11)). The requirements pertaining to the collection, reporting, and recording of bycatch data are established in the 2006 Consolidated Atlantic HMS FMP, its amendments, and the implementing regulations.

While the 2006 Consolidated Atlantic HMS FMP and subsequent amendments have established the standardized bycatch reporting methodologies (SBRM) for most Atlantic HMS fisheries, NOAA Fisheries summarizes and reviews these SBRMs annually in its SAFE Report, specifying the required procedures that constitute the standardized reporting methodology for each Atlantic HMS fishery. Assessment of bycatch, while not a part of the standardized reporting methodology, must be considered to evaluate the amount and type of bycatch occurring in the fishery. This facilitates the development of conservation and management measures that, to the extent practicable, minimize bycatch and bycatch mortality as required by National Standard 9 of the Magnuson-Stevens Act (16 U.S.C. 1851(a)(9)).

On January 19, 2017, NOAA Fisheries published final guidance on the requirements and implementation of standardized bycatch reporting methodologies in all fisheries managed under the Magnuson-Stevens Act (82 FR 6317). Regulations implemented through that rule require that standardized reporting methodologies meet specific purposes (50 C.F.R. 600.1610)), may be different for different fisheries, and must address specified factors to ensure the SBRM satisfies Magnuson-Stevens Act requirements. These factors include: information about characteristics of bycatch in the fishery, feasibility, data uncertainty, and data use (600.1610(a)(2)). Under the regulations, "standardized reporting methodology" means an established, consistent procedure or procedures used to collect, record, and report bycatch data in a fishery, which may vary from one fishery to another (50 C.F.R 600.1605).

The SBRM final rule also requires that all FMPs must ensure consistency with the requirements related to establishing and reviewing SBRMs by February 21, 2022. (600.1610(b)). Thereafter, a review of SBRM should be conducted at least once every five years to verify continued compliance with the Magnuson-Stevens Act and SBRM regulations. For Atlantic HMS fisheries, NOAA Fisheries is undertaking this review through Amendment 12 to the 2006 Consolidated Atlantic HMS FMP. On August 25, 2020, NOAA Fisheries released Draft Amendment 12 (85 FR 52329), which, among other things, reviewed and would make updates to Atlantic HMS fishery SBRM. Amendment 12 would, if finalized as drafted, address the revised NS1 guidelines provisions on addressing SBRM-related requirements for Atlantic HMS fisheries, consistent with the 2017 SBRM rulemaking. For a description of gear-specific SBRM for Atlantic HMS fisheries, see Section 2.3 of Draft Amendment 12 at: https://www.fisheries.noaa.gov/action/amendment-12-2006-consolidated-hms-fishery-management-plan-msa-guidelines-and-national. When Amendment 12 is finalized, subsequent SAFE reports would reflect the updated SBRM descriptions by gear in this section.

NOAA Fisheries scientists and managers continue to consult as necessary on reporting methodology design considerations for the collection of bycatch assessment data. These considerations include changes in monitoring and reporting technology and methods for improving the quality of target and non-target catch estimates while considering cost, technical, and operational feasibilities. Post-release mortality of Atlantic HMS is considered in stock assessments to the extent that the data allow. Fishing mortality estimates from these sources of information, as incorporated in stock assessments, are critical to understanding the overall status and outlook of a stock, as well as helping to understand the available options for conservation and management measures for the stock and potential implications for the ecosystem in which it lives.

6.2.2 Marine Mammal Protection Act

The MMPA as amended is one of the principal federal statutes guiding marine mammal species protection and conservation policy. In 1994 amendments, Section 118 established the goal that the incidental mortality or serious injury of marine mammals occurring during the course of commercial fishing operations be reduced to insignificant levels, approaching a zero mortality rate goal and zero serious injury rate goal within seven years of enactment. In addition, the amendments established a three-part strategy to govern interactions between marine mammals and commercial fishing operations. These include the preparation of marine mammal stock assessment reports, a registration and marine mammal mortality monitoring program for certain commercial fisheries, and the preparation and implementation of take reduction plans. NOAA Fisheries uses Take Reduction Teams (TRTs) to develop recommendations for measures to be included in take reduction plans and to monitor the implementation of those plans until NOAA Fisheries has determined that the goals have been met. Team members include representatives of relevant fisheries, conservation groups, the academic community, fishery management organizations, and involved federal and state agencies.

NOAA Fisheries relies on both fishery-dependent and fishery-independent data to produce stock assessments for marine mammals in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. Draft stock assessment reports are typically published in January, and final reports are typically published in the fall. Stock assessment reports are available at www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments.

Under MMPA requirements, NOAA Fisheries produces an annual list of fisheries that identifies species with which Atlantic HMS fisheries interact and classifies domestic commercial fisheries by gear type relative to their rates of incidental mortality or serious injury to marine mammals. The final MMPA list of fisheries for 2020 became effective May 18, 2020 (85 FR 21079; April 16, 2020).

Additional information and references to current and historical lists of fisheries can be found at https://www.fisheries.noaa.gov/action/mmpa-list-fisheries-2020.

Table 6.2 outlines the marine mammal species that occur off the Atlantic and Gulf coasts that are or could be of concern with respect to potential interactions with Atlantic HMS fisheries.

Table 6.2 Atlantic and Gulf Coast Marine Mammal Species Potentially of Concern in Atlantic Highly Migratory Species Fisheries Interactions in 2020

Common Name	Scientific Name
Atlantic spotted dolphin	Stenella frontalis
Beaked whales, mesoplodon	*Mesoplodon spp.*
Bottlenose dolphin	*Tursiops truncatus*
Bryde's Whale	*Balaenoptera edeni*
Common dolphin	*Delphinis delphis*
Cuvier's beaked whale	*Ziphius cavirostris*
Dwarf sperm whale	*Kogia sima*
Harbor porpoise	*Phocoena phocoena*
Humpback whale	*Megaptera novaeangliae*
False killer whale	*Pseudorca crassidens*
Killer Whale	*Orcinus orca*
Long-finned pilot whale	*Globicephela melas*

Common Name	Scientific Name
Minke whale	*Balaenoptera acutorostrata*
North Atlantic right whale	*Eubalaena glacialis*
Pantropical spotted dolphin	*Stenella attenuate*
Pygmy sperm whale	*Kogia breviceps*
Risso's dolphin	*Grampus griseus*
Rough-toothed dolphin	*Steno bredanensis*
Short-finned pilot whale	*Globicephela macrorhynchus*
Sperm whale	*Physeter macrocephalus*

Source: NOAA Fisheries 2020a List of Fisheries.

Three classifications exist in the list of fisheries:

- Category I fisheries are those with frequent serious injury or mortality to marine mammals.
- Category II fisheries are those with occasional serious injury or mortality.
- Category III fisheries are those with a remote likelihood of serious injury or mortality to marine mammals.

Table 6.3 Marine Mammal Protection Act Classification of Commercial Atlantic HMS Fisheries

Category	Commercial Fishery
Category I	Atlantic Ocean, Caribbean, and Gulf of Mexico pelagic longline fishery
Category II	Southeastern Atlantic shark gillnet fishery
Category III	Atlantic tuna purse seine
	Gulf of Maine and Mid-Atlantic tuna, shark, and swordfish hook-and-line/harpoon
	Southeastern Mid-Atlantic and Gulf of Mexico shark bottom longline
	Mid-Atlantic, southeastern Atlantic, and Gulf of Mexico pelagic hook-and-line/harpoon fisheries
	Commercial passenger fishing vessel (charter/headboat) fisheries

Recreational vessels are not categorized since they are not considered commercial fishing vessels.

Owners of vessels or gear engaging in a Category I or II fishery are required under MMPA to register with NOAA Fisheries and accommodate an observer aboard their vessels if requested. Vessel owners or operators or fishermen in Category I, II, and III fisheries must report all incidental mortalities and serious injuries of marine mammals during the course of commercial fishing operations to NOAA Fisheries' Office of Protected Resources on the Mortality/Injury Reporting Form.

There are currently no regulations requiring recreational fishermen to report marine mammal interactions; however, voluntary reporting of injured, entangled, or stranded marine mammals to (877) 942-5343 is encouraged. Incidental take of marine mammals by recreational fishermen is illegal.

Numbers of marine mammal interactions, observed and estimated, are summarized by Atlantic HMS fishery in Section 6.3. NOAA Fisheries continues to monitor observed interactions with marine mammals on a quarterly basis and reviews data for appropriate action, as necessary.

6.2.2.1 Pelagic Longline Take Reduction Team and Plan

Under Section 118 of MMPA, the Pelagic Longline Take Reduction Team is charged with developing recommendations to reduce bycatch of pilot whales in the Atlantic pelagic longline fishery to a level approaching a zero mortality rate within five years of implementation. NOAA Fisheries considered these recommendations and developed a take reduction plan (74 FR 23349; May 19, 2009) that became effective June 18, 2009. A suite of management strategies were implemented to reduce mortality and serious injury of pilot whales and Risso's dolphins in the Atlantic pelagic longline fishery. These include:

- The Cape Hatteras Special Research Area (CHSRA), with specific observer and research participation requirements for fishermen operating in that area.
- A 20 nautical mile (nmi) upper limit established on the mainline length for all pelagic longline sets within the Mid-Atlantic Bight.
- Informational placards on the handling and release of marine mammals to be displayed both in the wheelhouse and on the working deck of all active pelagic longline vessels in the Atlantic fishery.

The following non-regulatory measures were also included in the take reduction plan:

- Increased observer coverage in the Mid-Atlantic Bight to 12–15 percent to ensure representative sampling of pilot whales and Risso's dolphins.
- Encouraged vessel operators to maintain daily communication with other local vessel operators regarding protected species interactions throughout the pelagic longline fishery with the goal of identifying and exchanging information relevant to avoiding protected species bycatch.
- Recommended that NOAA Fisheries update the guidelines for handling and releasing marine mammals and work with industry to develop new technologies, equipment, and methods for safer and more effective handling and release of marine mammals (completed and available here: https://www.fisheries.noaa.gov/webdam/download/107105351).
- Recommended that NOAA Fisheries pursue the research and data collection goals in the take reduction plan regarding pilot whales and Risso's dolphins.

NOAA Fisheries reconvened the Team in 2015 and 2016 to develop additional take reduction recommendations and meet the MMPA goal. On December 15, 2020 (85 FR 81168), NOAA Fisheries published a proposed rule to amend the regulations for the PLTRP under the Marine Mammal Protection Act based on consensus recommendations by the PLTRT, which is a multi-stakeholder group comprised of representatives from the fishing industry, academia, and non-governmental organizations. The purpose of the proposed rule is to reduce mortalities and serious injuries of short-finned pilot whales incidental to Atlantic portion of the Atlantic pelagic longline fishery. Regulatory measures in the proposed rule would: (1) remove the CHSRA and its special observer and research participation requirements; (2) modify the mainline length requirements for the Exclusive Economic Zone (EEZ) portion of the Mid-Atlantic Bight to limit total length of active gear in the water and reduce soak times associated with pelagic longline sets that have multiple mainlines; and (3) implement terminal gear (hook and gangion) requirements in order to make the hooks the weakest part of the terminal gear (so that the hooks straighten before the gangion breaks) in the EEZ portion of the Northeast Coastal, Mid-Atlantic Bight, South Atlantic Bight, and Florida East Coast statistical areas. NOAA Fisheries will consider public comments before finalizing the rule.

More information on the take reduction team can be found at https://www.fisheries.noaa.gov/national/marine-mammal-protection/pelagic-longline-take-reduction-plan and in the 2011 SAFE Report (NOAA Fisheries 2011).

6.2.2.2 Atlantic Large Whale Take Reduction Team and Plan

The Atlantic Large Whale Take Reduction Team was established in 1996 to help develop plans that mitigate the risks to marine mammals posed by fishing gear. The resulting Atlantic Large Whale Take Reduction Plan includes regulatory and non-regulatory measures intended to reduce serious injuries and deaths of large whales due to incidental entanglement in fishing gear. The reduction plan continues to evolve as more information becomes available on causes of whale entanglement and how fishing practices might be modified to reduce these risks. Major changes to the plan were implemented in a final rule that published on October 5, 2007 (72 FR 57104) and June 27, 2014 (79 FR 36586).

Regulations implementing the Plan can be found at 50 CFR 229.32 and include the following measures that affect Atlantic HMS fisheries, specifically gillnet fisheries, including closed and restricted areas:

- A closed area for all gillnet fisheries from November 15 to April 15 from 29° 00'N to 32° 00'N from shore eastward to 80° 00'W and off South Carolina, within 35 nmi of the coast (Southeast U.S. Restricted Area North).
- A restricted area from December 1 to March 31 from 27° 51'N to 29° 00'N from shore eastward to 80° 00'W (Southeast U.S. Restricted Area South).
- Additional seasonal boundaries for Exclusive Economic Zone waters east of 80° 00'W from 26° 46.50'N to 32° 00'N (Other Southeast Gillnet Waters).
- A monitoring area specific to the Atlantic shark gillnet fishery effective December 1–March 31 that extends from the area along the coast from 27° 51'N south to 26° 46.50'N eastward to 80° 00'W (Southeast U.S. Monitoring Area).
- Buoy line and gillnet panel marking requirements in these four areas.

Specific compliance requirements for fishing in these areas vary and are summarized in the Guide to the Atlantic Large Whale Take Reduction Plan, available at www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp.

Pursuant to Atlantic Large Whale Take Reduction Plan requirements, Amendment 9 to the 2006 Consolidated Atlantic HMS FMP requires federal Directed Shark permit holders with gillnet gear on board to use a vessel monitoring system only in the Southeast U.S. Monitoring Area. The Amendment 9 measures became effective on March 15, 2016.

The Atlantic Large Whale Take Reduction Team last met in April 2019 in Providence, Rhode Island. The Team provided near-consensus recommendations to NOAA Fisheries to broadly require weakened rope and reduced buoy lines in the lobster and Jonah crab fisheries within the Northeast Trap/Pot Management Area to achieve at least a 60 percent reduction in mortalities and serious injuries of North Atlantic right whales in those fisheries. The ALWTRT proposed modifications focused on the Northeast Jonah crab and lobster trap/pot fisheries, which deploy about 93 percent of the buoy lines fished in areas where right whales occur. In 2021, the ALWTRT will be asked to recommend risk reduction measures for other Atlantic trap/pot and gillnet fisheries, which could include shark gillnet fisheries. More information on the take reduction team and plan is at www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan.

6.2.2.3 Harbor Porpoise Take Reduction Plan

The goal of the Harbor Porpoise Take Reduction Plan, implemented in 1998, is to reduce interactions between harbor porpoises and commercial gillnet gear capable of catching multispecies in both New England and Mid-Atlantic areas.

The Harbor Porpoise Take Reduction Team last met December 12, 2018, via webinar to review 2017 abundance and bycatch estimates for the harbor porpoise. Compliance with closed areas, gear modifications, and use of pingers was also examined. The agenda and presentations can be accessed from the Harbor Porpoise Take Reduction Plan website at www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/harbor-porpoise-take-reduction-plan.

6.2.2.4 Bottlenose Dolphin Take Reduction Plan

The goal of the Bottlenose Dolphin Take Reduction Plan is to reduce deaths and serious injuries of Atlantic coastal bottlenose dolphins incidental to commercial fishing. NOAA Fisheries published a final rule on April 26, 2006, to implement the Bottlenose Dolphin Take Reduction Plan (71 FR 24775). Included in the final rule are:

- Effort reduction measures.
- Gear proximity requirements.
- Gear or gear deployment modifications.
- Outreach and education measures to reduce dolphin bycatch below the stock's potential biological removal level.

The final rule also includes time/area closures and size restrictions on large mesh gillnet fisheries in portions of the Mid-Atlantic Exclusive Economic Zone to reduce incidental takes of endangered and threatened sea turtles, as well as to reduce dolphin bycatch. These restrictions were continued through the final rule on January 20, 2009 (73 FR 77531). Permanent night fishing restrictions on medium mesh gillnets operating in North Carolina coastal state waters from November 1 through April 30 became effective August 30, 2012 (77 FR 45268; July 31, 2012). In 2014, an Environmental Assessment (EA) was completed, which conducted an environmental analysis on the Bottlenose Dolphin Conservation Measures. This resulted in a rulemaking that revised the Bottlenose Dolphin Take Reduction Plan. The final rule amended MMPA and ESA implementing regulations to reduce bottlenose dolphin serious injuries and mortalities from Virginia pound nets, and revised Virginia pound net-related definitions, gear prohibitions, and non-regulatory measures. NOAA Fisheries published a final rule on February 9, 2015 (80 FR 6925).

NOAA Fisheries has reconvened the Team, with the most recent meeting occurring in December 2017 in St. Petersburg, Florida. Maps, amendments, assessments, and meeting information are available at www.fisheries.noaa.gov/national/marine-mammal-protection/bottlenose-dolphin-take-reduction-plan.

6.2.3 Endangered Species Act

The ESA as amended (16 U.S.C. 1531 et seq.) provides for the conservation and recovery of endangered and threatened species of fish, wildlife, and plants. The listing of a species is based on the status of the species throughout its range, or in a specific portion of its range in some instances. Threatened species are those likely to become endangered in the foreseeable future if no action is taken to stop the decline of the species, whereas endangered species are those in danger of becoming extinct throughout all or a significant portion of their range (16 U.S.C. 1532(20)). Species can be listed as endangered without first being listed as threatened. The Secretary of Commerce, acting through NOAA Fisheries, is authorized to list marine and anadromous fish species, marine mammals (except for walruses and sea otters), marine reptiles, and marine plants. In total, NOAA Fisheries has jurisdiction over 165 threatened and endangered marine species (https://www.fisheries.noaa.gov/species-directory/threatened-endangered). The Secretary of the Interior, acting through the U.S. Fish and Wildlife Service, is authorized to list walruses and sea otters, seabirds, terrestrial plants and wildlife, and freshwater fish and plant

species.

In addition to listing species under the ESA, NOAA Fisheries or the U.S. Fish and Wildlife Service generally must designate critical habitat for listed species concurrently with the listing decision to the "maximum extent prudent and determinable" (16 U.S.C. 1533(a)(3)). The ESA defines critical habitat as those specific areas that are occupied by the species at the time it is listed that are essential to the conservation of a listed species and that may be in need of special consideration, as well as those specific areas that are not occupied by the species that are essential to their conservation. Federal agencies are prohibited from undertaking actions that are likely to destroy or adversely modify designated critical habitat.

6.2.3.1 Biological Opinion for the Atlantic HMS Pelagic Longline Fishery

NOAA Fisheries has taken numerous steps to reduce sea turtle and other endangered species bycatch and bycatch mortality in the Atlantic HMS pelagic longline fishery over the years. The details of these efforts are described in past SAFE reports and are not repeated here.

On May 15, 2020, NOAA Fisheries released the latest Biological Opinion (BiOp) conducted under Section 7 of the ESA. This BiOp analyzed the best available data, the status of the species, environmental baseline, effects of the proposed action, and cumulative effects. The BiOp concluded that the Atlantic HMS pelagic longline fishery was not likely to jeopardize the continued existence of sperm whales, the Northwest Atlantic Distinct population segment (DPS) of loggerhead, Kemp's ridley, the North and South Atlantic DPSs of green, leatherback, hawksbill, or olive ridley sea turtles, giant manta ray, the Central and Southwest Atlantic DPS of scalloped hammerhead shark, and oceanic whitetip shark. Since no critical habitat will be adversely affected, the action is not likely to destroy or adversely modify designated critical habitat.

The BiOp also determined that the following Reasonable and Prudent Measures (RPMs) were necessary and appropriate to minimize the impacts of future takes on sea turtles and other ESA-listed fish and to monitor levels of incidental take. The Atlantic HMS Management Division shall ensure that fishermen in the Atlantic HMS PLL fishery receive relevant outreach materials and provide such materials describing how captured ESA-listed sea turtles and fish should be handled and how gear should be removed from ESA-listed sea turtles, fish, and marine mammals to minimize adverse effects from incidental take and reduce mortality. The Atlantic HMS Management Division shall provide such training using materials provided by the SERO PRD Division to fishermen. The Atlantic HMS Management Division must also ensure that any takes of ESA-listed species are monitored and reported, coordinating with the SEFSC as necessary and appropriate. Such reports should allow the agency to: (1) detect any adverse effects resulting from the proposed action; (2) assess the actual level of incidental take in comparison with the anticipated incidental take documented in this Opinion; (3) assess (for sea turtles) the hooking location and gear remaining on every sea turtle released to allow for post-release mortality estimations; and (4) detect when the level of anticipated take (lethal and non-lethal) is exceeded.

To be exempt from the take prohibitions established by Section 9 of the ESA, the BiOp requires compliance with specified terms and conditions, which implement the RPMs described above. The terms and conditions specify the types of outreach materials that must be provided to PLL fishermen, levels of observer coverage, quarterly reporting of the total take and total mortalities (dead-on-retrieval and post-release mortality) of ESA-listed species in the Atlantic HMS pelagic longline fishery, and an annual report detailing interactions between ESA-listed species and the Atlantic HMS pelagic longline fishery.

The 2020 Atlantic HMS PLL BiOp may be found at: https://www.fisheries.noaa.gov/resource/document/biological-opinion-pelagic-longline-fishery-atlantic-highly-migratory-species.

Table 6.4 Status of Listed Species that may be Affected in Atlantic Highly Migratory Species Pelagic Longline Fisheries

Species	Status
Blue whale *(Balaenoptera musculus)*	Endangered
Gulf of Mexico Bryde's Whale (*Balaenoptera edeni*)	Endangered
Fin whale *(Balaenoptera physalus)*	Endangered
North Atlantic right whale *(Eubalaena glacialis)*	Endangered
Sei whale *(Balaenoptera borealis*	Endangered
Sperm whale *(Physeter macrocephalus)*	Endangered
Green turtle *(Chelonia mydas)*	Threatened*
Hawksbill sea turtle *(Eretmochelys imbricata)*	Endangered
Kemp's ridley sea turtle *(Lepidochelys kempii)*	Endangered
Leatherback sea turtle *(Dermochelys coriacea)*	Endangered
Loggerhead sea turtle *(Caretta caretta)*	Threatened
Giant manta ray (*Manta birostris*)	Threatened
Olive ridley sea turtle *(Lepidochelys olivacea)*	Threatened
Gulf of Maine Atlantic salmon (*Salmo salar*)	Threatened
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)	Endangered/Threatened**
Gulf sturgeon (*Acipenser oxyrinchus desotoi*)	Threatened
Smalltooth sawfish *(Pristis pectinata)*	Endangered
Oceanic whitetip shark (*Carcharhinus longimanus*)	Threatened
Scalloped hammerhead shark (*Sphyrna lewini*)	Threatened***

*Green sea turtles in the Florida breeding population were changed from endangered to threatened on April 6, 2016 (81 FR 20057). Green sea turtles have two DPSs: North Atlantic and South Atlantic. **Atlantic sturgeon have five distinct population segments. The population in the Gulf of Maine is considered threatened. The other DPSs—New York Bight, Chesapeake Bay, Carolina, and South Atlantic—are all considered endangered. ***Scalloped hammerhead sharks have two DPSs. The populations in the Central and Southwest Atlantic are considered threatened. The other populations in the Northwest Atlantic and Gulf of Mexico DPSs are not considered threatened.

6.2.3.2 Biological Opinion for Atlantic HMS Non-Pelagic Longline Fisheries

As with the Atlantic HMS pelagic longline fishery, NOAA Fisheries has taken many actions over the years to reduce sea turtle and other endangered species bycatch and bycatch mortality in Atlantic HMS non-pelagic longline fisheries. Details on the most recent BiOp for Atlantic HMS Non-Pelagic Longline Fisheries are below. Details on the previous BiOp for Atlantic HMS non-Pelagic Longline Fisheries are described in previous SAFE reports and other documents and are not repeated here.

On May 15, 2020, NOAA Fisheries released a BiOp for all Atlantic HMS fisheries except pelagic longline, which stated that these fisheries (including handgear fisheries) are not likely to jeopardize the continued existence of sea turtles, sawfish, Atlantic sturgeon, scalloped hammerhead shark (Caribbean and Central Atlantic DPS), oceanic whitetip shark, and giant manta ray. NOAA Fisheries is implementing the RPMs and Terms and Conditions of the 2020 BiOp for Atlantic HMS fisheries except pelagic longline. This action is not anticipated to affect the above-referenced ESA-listed species in any way not previously analyzed for existing regulations, including the provision

for exempted fishing activities, and there is no new information that would alter this conclusion. Any of the covered ESA-listed species taken with handgear would be considered against the Incidental Take Statement (ITS) in the 2020 BiOp for the Atlantic HMS fisheries except pelagic longline, as long as the operations are consistent with the RPMs in that BiOp, namely: any protected resources caught while engaging in research activities must be safely handled, resuscitated, and released; and all protected resource interactions must be reported to NOAA Fisheries.

The BiOp on the operation of the Atlantic HMS fisheries other than PLL can be found here: https://www.fisheries.noaa.gov/resource/document/biological-opinion-operation-atlantic-highly-migratory-species-fisheries.

Table 6.5 Status of Listed Species that may be Affected in Atlantic Highly Migratory Species Non-Pelagic Longline Fisheries

Species	Status
Blue whale *(Balaenoptera musculus)*	Endangered
Bryde's Whale (*Balaenoptera edeni*)	Endangered
Fin whale *(Balaenoptera physalus)*	Endangered
North Atlantic right whale *(Eubalaena glacialis)*	Endangered
Sei whale *(Balaenoptera borealis*	Endangered
Sperm whale *(Physeter macrocephalus)*	Endangered
Green turtle *(Chelonia mydas)*	Threatened*
Hawksbill sea turtle *(Eretmochelys imbricata)*	Endangered
Kemp's ridley sea turtle *(Lepidochelys kempii)*	Endangered
Leatherback sea turtle *(Dermochelys coriacea)*	Endangered
Loggerhead sea turtle *(Caretta caretta)*	Threatened
Giant manta ray (*Manta birostris*)	Threatened
Gulf of Maine Atlantic salmon (*Salmo salar*)	Endangered
Nassau grouper *(Epinephelus striatus)*	Threatened
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)	Endangered/Threatened**
Gulf sturgeon (*Acipenser oxyrinchus desotoi*)	Threatened
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Smalltooth sawfish *(Pristis pectinata)*	Endangered
Oceanic whitetip shark (*Carcharhinus longimanus*)	Threatened
Scalloped hammerhead shark (*Sphyrna lewini*)	Threatened***

*Green sea turtles in the Florida breeding population were changed from endangered to threatened on April 6, 2016 (81 FR 20057). **Atlantic sturgeon have five distinct population segments. The population in the Gulf of Maine is considered threatened. The other DPSs—New York Bight, Chesapeake Bay, Carolina, and South Atlantic—are all considered endangered. ***Scalloped hammerhead sharks have two DPSs. The populations in the Central and Southwest Atlantic are considered threatened. The other populations in the Northwest Atlantic and Gulf of Mexico DPSs are not considered threatened.

6.2.4 Migratory Bird Treaty Act and Seabird Interactions With Fisheries

Gannets, gulls, greater shearwaters, and storm petrels are occasionally hooked in the Atlantic pelagic longline fishery. These species and other seabirds are protected under the Migratory Bird Treaty Act, and some are listed as

endangered or threatened under the ESA. The majority of longline interactions with seabirds occur as the gear is being set. The birds eat the bait and become hooked on the line. The line then sinks, and the birds are subsequently drowned.

The National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries was released in February 2001. It calls for detailed assessments of longline fisheries and, if a problem is found to exist within a longline fishery, for measures to reduce seabird bycatch within two years. Because interactions appear to be relatively low in Atlantic HMS fisheries, the adoption of immediate measures is unlikely. The plan can be downloaded from NOAA Fisheries at www.fisheries.noaa.gov/resource/document/national-plan-action-reduction-seabird-incidental-catch-longline-fisheries.

In 2014, NOAA Fisheries released the Implementation of the United States National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries report: www.st.nmfs.noaa.gov/Assets/nationalseabirdprogram/longline_fisheries.pdf. It highlighted advancements made by the United States toward the objectives of the 2001 U.S. National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries. Since 2001, the United States has improved research, outreach and education, and domestic management of incidental seabird catch, resulting in a significant decrease in seabird incidental catch in its domestic fisheries.

The Seabirds on the Western North Atlantic and Interactions with Fisheries project, as described in the 2014 report, was carried out by SEFSC. This project aimed to improve the identification of incidental seabird catch on the Western North Atlantic U.S. pelagic longline fishery where, beginning in 2004, all birds observed caught were identified at least to genus and most to species. The project also worked to improve the estimation of incidental catch of the pelagic longline fleet based on observer reports of seabird interactions and allowed for preparation of the U.S. National Report on Seabird Bycatch of the Western North Atlantic U.S. Pelagic Longline Fishery for ICCAT.

6.3 Bycatch Reduction Measures and Data by Atlantic HMS Fishery

6.3.1 Background

The reduction of bycatch and bycatch mortality is an important component of National Standard 9 of the Magnuson-Stevens Act. The NOAA Fisheries Atlantic HMS bycatch reduction program includes an evaluation of current data collection programs, implementation of bycatch reduction measures such as gear modifications and time/area closures, and continued support of data collection and research relating to bycatch. Further details on bycatch and bycatch reduction measures can be found in Section 3.5 of the 1999 Atlantic Tunas, Swordfish and Sharks FMP (NOAA Fisheries 1999), Regulatory Amendment 1 to the 1999 FMP (NOAA Fisheries 2000), Regulatory Adjustment 2 to the 1999 FMP (NOAA Fisheries 2002), Amendment 1 to the 1999 FMP (NOAA Fisheries 2003), and the 2006 Consolidated Atlantic HMS FMP (NOAA Fisheries 2006).

On August 25, 2020, NOAA Fisheries released Draft Amendment 12, which, among other things, reviewed and would make updates to standardized bycatch reporting methodology (SBRM), for Atlantic HMS fisheries. Amendment 12 would, if finalized as drafted, address the revised NS1 guidelines provisions on addressing SBRM-related requirements for Atlantic HMS fisheries, consistent with the 2017 SBRM rulemaking.

A summary of bycatch species, data collection methods, and management measures by fishery/gear type is found in Table 6.6.

Table 6.6 Summary of Bycatch Species, Marine Mammal Protection Act Category, Endangered Species Act Requirements, Data Collections, and Management Measures for Atlantic Highly Migratory Species Fisheries

Fishery/Gear Type	Bycatch Species	MMPA Category	ESA Requirements	Bycatch Data Collection	Management Measures (Year Implemented)
Pelagic longline	Bluefin tuna; billfish; undersize target species; marine mammals; sea turtles; seabirds; non-target finfish; prohibited SHK; species; LCS species after closure	Category I	Jeopardy findings in 2000, 2004 & 2020; RPA implemented 2001–2004 & 2020; ITS, terms and conditions, RPMs	Permit requirement (1985); logbook requirement (SWO, 1985; SHK, 1993); observer requirement (1992); EFPs (2001–present); VMS reporting (2015); EM reporting	BFT target catch requirements (1981); quotas (SWO—1985; SHK—1993); prohibit possession of billfish (1988); minimum size (1995); gear marking (1999); line clippers, dipnets (2000); MAB closure (1999); limited access (1999); limit length of mainline (1996–1997 only); move 1 nmi after interaction (1999); voluntary vessel operator workshops (1999); GOM closure (2000); FL, Charleston Bump, NED closures (2001); gangion length, corrodible hooks, de-hooking devices, handling & release guidelines (2001); NED experiment (2001–2003); VMS (2003); circle hooks and bait requirements (2004); mandatory safe handling & release workshops (2006); sea turtle control device (2008); closed area research (2008–2010); marine mammal handling and release placard, 20 nm mainline restriction in MAB, , increased observer coverage in PLL fishery (2009), weak hook requirement in GOM (2011, modified in 2020); IBQ, GRAs, EM, VMS reporting (2015); sharks released not retained by dehooker or cutting gangion < 3 ft from hook, shark identification course for vessel owners and operators, move 1 nmi after dusky shark interaction and notify other vessels (2017); convert Northeastern United States Closed Area and Spring Gulf of Mexico Gear Restricted Area into monitoring areas (2020)
Shark bottom longline	Prohibited shark species; target species after closure; sea turtles; smalltooth sawfish; non-target finfish	Category III	ITS, terms and conditions, RPMs	Permit requirement (1993); logbook requirement (1993); observer coverage (1994)	Quotas (1993); trip limit (1994); gear marking (1999); handling & release guidelines (2001); line clippers, dipnets, corrodible hooks, de-hooking devices, move 1 nmi after interaction (2004); South Atlantic closure, VMS (2005); shark identification workshops for dealers (2007); sea turtle control device (2008); shark research fishery (2008); shark identification course for vessel owners and operators, move 1 nmi after dusky shark interaction and notify other vessels (2017); circle hooks (2018)
Northeast sink and Mid-Atlantic shark gillnet (smoothhound)	Marine mammals	Category I			Sink gillnet soak time limits and net check requirements for drift gillnets (2016)

Fishery/Gear Type	Bycatch Species	MMPA Category	ESA Requirements	Bycatch Data Collection	Management Measures (Year Implemented)
Northeast, Southeast U.S. Atlantic, and Gulf of Mexico shark gillnet	Prohibited shark species; sea turtles; marine mammals; non-target finfish; smalltooth sawfish	Category II	ITS, terms and conditions, RPMs	Permit requirement (1993); logbook requirement (1993); observer coverage (1994)	Quotas (1993); trip limit (1994); gear marking (1999); deployment restrictions (1999); 30-day closure for leatherbacks (2001); handling & release guidelines (2001); net checks (2002); whale sighting (2002); VMS (2004; revised 2016); closure for right whale mortality (2006); shark identification workshops for dealers (2007); sink gillnet soak time limits and net check requirements for drift gillnets (2016); shark identification course for vessel owners and operators, move 1 nmi after dusky shark interaction and notify other vessels (2017)
Bluefin tuna purse seine	Undersize target species; non-target finfish	Category III	ITS, terms and conditions	Permit requirement (1982); observer requirement (1996, 2001 only); EFPs (2002-03); VMS reporting (2015)	Quotas (1975); limited access, individual vessel quotas (1982); minimum size (1982); VMS requirements and reporting (2015)
Bluefin tuna and swordfish harpoon	Undersize target species	Category III	ITS, terms and conditions	Permit requirement (BFT, 1982; SWO, 1987); SWO logbook requirement (1987); online catch reporting (2015)	Quotas (BFT,1982; SW0,1985); minimum size (BFT, 1982; SWO, 1985); online catch reporting (2015)
Handgear—commercial	Undersize target species; non-target finfish	Category II	ITS, terms and conditions	Permit requirement (BFT, 1982; SWO, 1987; SHK, 1993); logbook requirement (SWO, 1985; SHK, 1993); online catch reporting (2015)	Regulations vary by species (including quotas, minimum sizes, retention limits, landing form); online catch reporting (2015)
Handgear—for-hire	Undersize target species; non-target finfish	Category III	ITS, terms and conditions	LPS (1992); MRFSS (1981); online catch reporting (2015)	Regulations vary by species (including minimum sizes, retention limits, landing form); BFT quotas, online catch reporting (2015); circle hooks when fishing for sharks south of Chatham, MA, online shark identification and management measure video and quiz to obtain shark endorsement (2018)

LCS = Large coastal shark. ITS = Incidental Take Statement. RPM = Reasonable and prudent measures. RPA = Reasonable and prudent alternative. SWO = Swordfish. SHK = Shark. BFT = Bluefin tuna. EFP = Exempted fishing permit. VMS = Vessel monitoring system. EM = Electronic monitoring. nmi = Nautical mile. MAB = Mid-Atlantic Bight. GOM = Gulf of Mexico. NED = Northeast Distant Waters. PLL = Pelagic longline. IBQ = Individual bluefin quota. GRA = Gear restricted area. MRFSS = Marine Recreational Fishing Statistics Survey (now the Marine Recreational Information Program).

Domestic fishery landings and bycatch data are collected from many sources. They are taken from the U.S. Annual Report to ICCAT (which includes mortality estimates), directly from NOAA Fisheries program databases for commercial landings, observer programs, the electronic dealer reporting program, and from recreational landings. See Section 10.3 for details on data collection methods. Permits data are assembled from the NOAA Fisheries regional permits offices, the Atlantic HMS Permit Shop, Atlantic HMS exempted fishing permits, Atlantic HMS display permits, Atlantic HMS scientific research permits, the International Fisheries Trade Permit, and tournament registrations.

Bycatch reduction measures and fishery interactions data are presented by gear below. In addition to the gear-specific measures, Atlantic HMS regulations state that all fish must be released in a manner that increases their chances of survival. Research has shown that removing fish from the water significantly increases the likelihood of post-release mortality due to injuries associated with the stress of being hooked or caught in a net that are not immediately apparent. Because of these stress injuries, post-release mortality may not be anticipated by the fisherman who releases the fish, even in a rapid and safe manner. Ongoing research uses data on release techniques and from pop-up satellite tags to examine in situ mortality rates of Atlantic HMS. Information on bycatch mortality of these fish will continue to be collected and, in the future, may be used to estimate bycatch mortality in stock assessments.

6.3.2 Pelagic Longline

6.3.2.1 Reduction Measures

Pelagic longlines have been classified as a Category I fishery under the MMPA.

Pelagic longline vessels must comply with gear and deployment restrictions to minimize bycatch and bycatch mortality. Requirements that apply to vessels in the pelagic longline fishery include the following:

- Any finfish species that cannot be landed due to fishery regulations are required to be released, regardless of whether the catch is dead or alive.
- Gangions must be at least 10 percent longer than the length of floatlines if the two lengths combined are less than 100 meters, allowing hooked sea turtles enough length to breathe at the surface.
- Vessels may possess only corrodible (i.e., non-stainless) 18/0 or larger circle hooks with an offset not to exceed 10 degrees when fishing in the Northeast Distant Waters. Vessels fishing outside this area are required to use corrodible 18/0 or larger circle hooks with an offset not to exceed 10 degrees or 16/0 non-offset corrodible circle hooks. All pelagic longline vessels must use only whole finfish or squid bait, decreasing the chance of an animal swallowing the hook.
- Vessels fishing in the Gulf of Mexico may not use live bait. Vessels fishing in the Gulf of Mexico between the months of January 1 and June 30 each year may possess or deploy only circle hooks that are constructed of round wire stock with a diameter no larger than 3.65 millimeters to increase the self-release and survival rate of spawning bluefin tuna that come into contact with the gear.
- Vessel owners and operators must carry NOAA Fisheries-approved dehooking devices onboard and must store and post careful handling and release protocols and guidelines in the wheelhouse to minimize injury to protected species when interactions occur.
- Vessel owners and operators must immediately release dusky sharks and protected species that become entangled or hooked and retrieve gear immediately. For dusky sharks, marine mammals, turtles, and smalltooth sawfish, the vessel must move at least 1 nmi from that location before fishing is resumed to avoid interacting with the species again.

All owners and operators of vessels fishing with pelagic longline gear must also attend a Safe Handling, Release, and Identification Workshop every three years. The curriculum of the required Safe Handling, Release, and Identification Workshop is compliant with the Right Whale Ship Strike Reduction Rule and the Pelagic Longline Take Reduction Plan, the Atlantic Large Whale Take Reduction Plan, the Harbor Porpoise Take Reduction Plan, and the Bottlenose Dolphin Take Reduction Plan. See Section 6.2.2 for details on those plans.

Pelagic Longline Bycatch Reduction Measures: Sharks

Management measures for sharks caught in association with ICCAT fisheries using pelagic longline gear have been domestically implemented to comply with ICCAT recommendations. Consistent with ICCAT Recommendations 09-07, 10-07, 10-08, and 11-08, the United States has prohibited the retention of bigeye thresher sharks since 1999; prohibited retaining, transshipping, landing, storing, or selling oceanic whitetip sharks or hammerhead sharks caught in association with ICCAT fisheries since 2011; and prohibited retaining on board, transshipping, or landing silky sharks caught in association with ICCAT fisheries since 2012.

Consistent with ICCAT Recommendation 15-06, the United States in 2016 began requiring pelagic longline vessels to release unharmed, to the extent practicable, porbeagle sharks that are alive at the time of haulback if tunas, swordfish, or billfish are onboard vessels (81 FR 57803; September 23, 2016). Additionally, in 2018, the United States began requiring pelagic longline vessels to release any shortfin mako that are alive at haulback, consistent with ICCAT Recommendation 17-08. Shortfin mako requirements were addressed through Amendment 11 to the 2006 Consolidated Atlantic HMS FMP, which was intended to reduce fishing mortality and establish a foundation for rebuilding the stock. Amendment 11 increased the shortfin mako minimum size and required circle hooks for the recreational Atlantic HMS fishery, and only allowed commercial retention of shortfin mako dead at haulback in certain fisheries. Additionally, NOAA Fisheries began using the electronic monitoring system to verify that only those shortfin mako sharks that were dead at haulback are retained.

NOAA Fisheries has prohibited the retention of dusky sharks since 2000. Based upon the results of a 2016 stock assessment update indicating that the Atlantic dusky shark stock remained overfished and was experiencing overfishing, NOAA Fisheries implemented additional management measures to reduce fishing mortality on the stock and rebuild the dusky shark population (82 FR 16478; April 4, 2017). In the pelagic longline fishery, these included the adoption of shark release protocols, dusky shark identification and safe handling training and outreach, and fleet communication protocols.

Pelagic Longline Reduction Measures: Individual Bluefin Quota Program

The IBQ Program implemented by Amendment 7 to the 2006 Consolidated Atlantic HMS FMP enhanced accountability for bluefin tuna at the individual vessel level and is supported by several reporting and monitoring requirements specifically for pelagic longline vessels. IBQ allocations are distributed annually to permitted vessels with IBQ shares on January 1 of each year. A shareholder's share percentage is multiplied by the total pounds of Atlantic Tunas Longline category quota available to derive the amount of allocation in pounds. If an IBQ shareholder's Atlantic Tunas Longline category permit is not associated with a vessel, the relevant annual allocations of IBQ are not released to the shareholder's IBQ account until the permit is associated with a vessel.

Throughout the year, NOAA Fisheries may transfer bluefin quota from the Reserve category to the Longline category, as well as other categories. These inseason transfers are based on consideration of regulatory determination criteria relating to the current circumstances in the fishery and the goals and objectives of the 2006 Consolidated Atlantic HMS FMP, as amended. The regulations and processes pertaining to inseason transfers from the Reserve category to other categories are distinct from those regulations and processes that determine annual IBQ distributions to shareholders. NOAA Fisheries transferred quota from the Reserve category into the Longline category inseason during 2015 through 2018 in order to achieve specific objectives, including:

- Reducing quota debt.
- Encouraging full accounting of bluefin catch by vessels who may be in debt.
- Fostering conditions in which permit holders become more willing to lease IBQ shares to other vessel owners.
- Reducing uncertainty in the fishery as a whole.

During 2019 and 2020, NOAA Fisheries did not transfer quota from the Reserve category to the Longline category based on various fishery conditions such as trends in the IBQ allocation leasing market (e.g., weighted average lease price, amount of IBQ allocation leased, number of lessees), and the amount of bluefin catch relative to the total Longline category quota. NOAA Fisheries may distribute bluefin quota inseason either to all IBQ share recipients or to only active vessels in the fishery, regardless of whether the vessels are IBQ share recipients. This option provides flexibility with respect to which vessels receive IBQ inseason transfers and allows NOAA Fisheries to achieve the objectives of the IBQ Program, such as accounting for bluefin during longline operations and optimizing fishing opportunity for target species. Active vessels, in this context, are those with any fishing activity using pelagic longline gear over the course of the previous and current year. Fishing activity is quantified using logbook, vessel monitoring system, and electronic monitoring data. Table 6.7 includes data on the annual, inseason, and combined distributions of IBQ by shareholder tier.

Table 6.7 Individual Bluefin Quota Allocations (mt) to the Pelagic Longline Category by Share Tier (lb) in 2015–2020

Year	Quota Distribution	Date	IBQ (mt)	High Tier (~1.2%)	Medium Tier (~0.6%)	Low Tier (~0.37%)
2015	Annual allocation	January 1, 2015	137.3	3,616	1,808	1,124
	Transfer from reserve category	July 28, 2015	34.0	551	551	551
	ICCAT baseline quota increase	August 28, 2015	11.0	292	146	90
2015 total			182.3	4,459	2,505	1,765
2016	Annual allocation	January 1, 2016	148.3	3,913	1,956	1,206
	Transfer from reserve category	January 4, 2016	34.0	551	551	551
2016 total			182.3	4,464	2,507	1,757
2017	Annual allocation	January 1, 2017	148.3	3,913	1,956	1,206
	Transfer from reserve category*	March 2, 2017	45.0	1,102	1,102	1,102
2017 total			193.3	5,015	3,058	2,308
2018	Annual allocation	January 1, 2018	148.3	3,913	1,956	1,206

Year	Quota Distribution	Date	IBQ (mt)	High Tier (~1.2%)	Medium Tier (~0.6%)	Low Tier (~0.37%)
	Transfer from reserve category*	April 13, 2018	44.5	1,102	1,102	1,102
	ICCAT baseline quota increase	October 5, 2018	15.3	404	202	124
2018 total			208.1	5,419	3,260	2,432
2019	Annual allocation	January 1, 2019	163.6	4,317	2,157	1,330
2019 total			163.6	4,317	2,157	1,330
2020	Annual allocation	January 1, 2020	163.6	4,317	2,157	1,330
2020 total			163.6	4,317	2,157	1,330

mt = Metric tons. *Transfer from Reserve category to vessels with recent fishing activity only.

Pelagic Longline Reduction Measures: Area Closures and Gear Restrictions

Since 2000, NOAA Fisheries has implemented a number of time/area closures and gear restrictions in the Atlantic Ocean and Gulf of Mexico to reduce discards and bycatch of a number of species (e.g., juvenile swordfish, bluefin tuna, billfish, sharks, and sea turtles) in the pelagic longline fishery (Figure 6.1). Time/area closures and gear restrictions have been part of a successful strategy to reduce bycatch in the Atlantic HMS pelagic longline fishery in the past, although NOAA Fisheries has been considering the ongoing need for such measures in light of improved data collection, current regulations, current fishery trends, and the age of some closures.

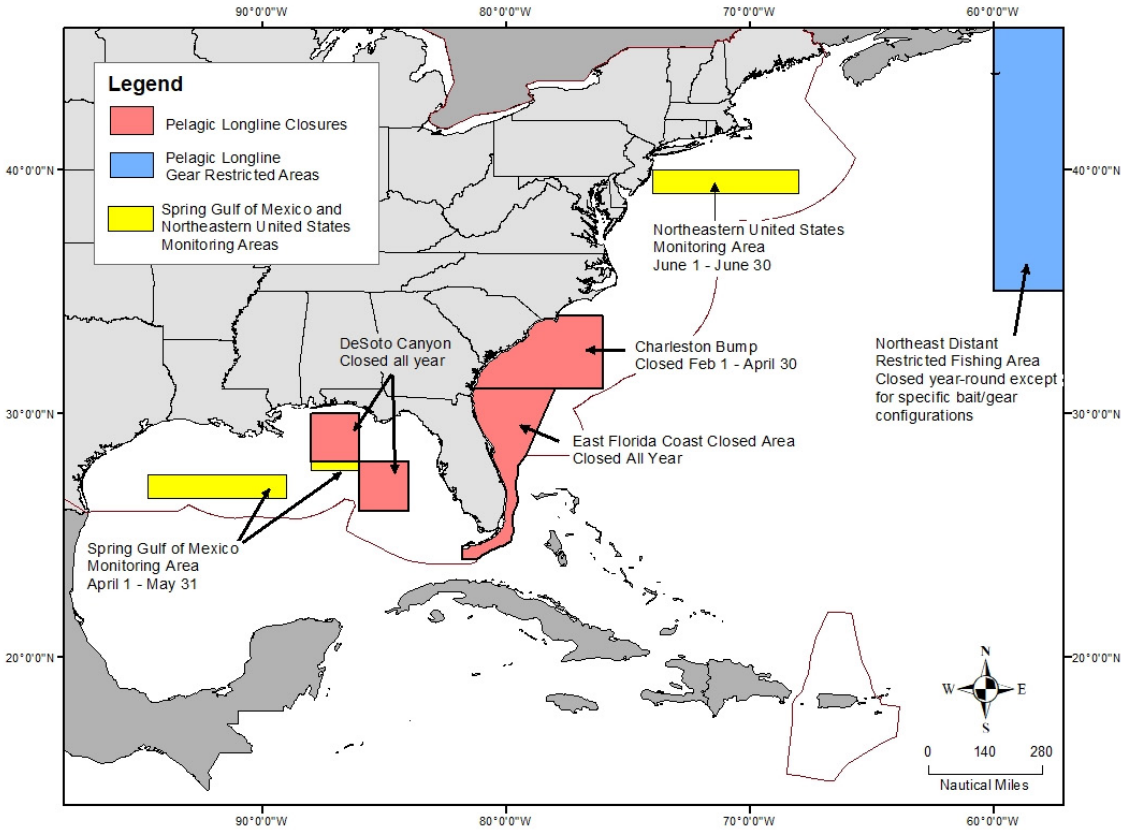

Figure 6.1 Areas Closed/Restricted To Pelagic Longline Fishing by U.S. Flagged Vessels

In 2020 (85 FR 18812; April 12, 2020) NOAA Fisheries eliminated the Cape Hatteras Gear Restricted Area and converted the Northeastern United States PLL Monitoring Area and the Spring Gulf of Mexico GRA into monitoring areas that allow fishing with pelagic longline gear provided specific threshold amounts of bluefin catch are not exceeded. NOAA Fisheries will collect and review relevant data during the conditional three-year evaluation period to determine whether future closure of these geographic areas to pelagic longline gear is necessary. These monitoring areas were previously closed to pelagic longline gear during April and May (Spring Gulf of Mexico Gear Restricted Area) and June (Northeastern United States Close Area).

Pelagic Longline Reduction Measures: Weak Hook Requirement in the Gulf of Mexico

A weak hook is a circle hook that meets NOAA Fisheries' current size and offset restrictions for the Gulf of Mexico pelagic longline fishery but is constructed of round wire stock that is thinner gauge than the circle hooks currently used and is no larger than 3.65 millimeters in diameter. These hooks may allow incidentally hooked bluefin tuna to escape capture because the hooks are more likely to straighten when a large fish is hooked. The intent of this requirement was to reduce the bycatch of bluefin tuna, allow the long-term beneficial socioeconomic benefits of normal operation of directed fisheries in the Gulf of Mexico with minimal short-term negative socio-economic impacts, and have both short- and long-term beneficial impacts on the stock status of Atlantic bluefin tuna. Weak hooks were initially implemented as a year-round requirement in the Gulf of Mexico (April 5, 2011; 76 CFR 18653) but the measure was modified in 2020. As a result of the Pelagic Longline Bluefin Tuna Area-Based and Weak Hook management measures rule adopted in 2020, vessels now are only required to use weak hooks in the Gulf of Mexico between January 1 and June 30 each year (85 FR 18812; April 2, 2020), the time period during which the majority of the catch of bluefin tuna occurs.

6.3.2.2 Bycatch Data

Reporting methods used for the pelagic longline fishery are described in Section 6.2.1.1. These data, which include information on the disposition of bycatch, are used in part to estimate post-release mortality of sea turtles and marine mammals based on guidelines for each (Angliss and DeMaster 1998, Ryder et al. 2006). Protected species interactions are reported in this section. See Table 6.15 for marine mammal interactions and starting at Table 6.16 for sea turtle interactions in the pelagic longline fishery. Landings, including discards, for this fishery are reported in Section 5.3.2.

Pelagic Longline Bycatch Data: Sharks

The number of releases and the status of ICCAT-prohibited species from pelagic longline vessels in 2019 is presented in Table 6.8.

Table 6.8 International Commission for the Conservation of Atlantic Tunas-Designated Prohibited Shark Interactions and Dispositions in the Pelagic Longline Fishery in 2019

Species	Kept	Released Dead	Released Alive	Released Unknown	Lost at Surface
Bigeye thresher	0	12	18	0	1
Silky	1	69	121	0	0
Great hammerhead	0	0	2	0	0
Oceanic whitetip	0	7	35	0	0
Smooth hammerhead	0	3	15	0	1
Scalloped hammerhead	0	5	17	0	0
Unidentified hammerhead	0	33	45	1	0
Porbeagle*	0	2	0	0	0

*Vessels can keep porbeagle assuming they are dead at haulback. Source: Pelagic Observer Program.

Pelagic Longline Bycatch Data: Individual Bluefin Quota Program

The data indicate that, in general, compliance with the Amendment 7 regulations with regard to the IBQ Program is high. For example, one of the reporting requirements is for dealers and vessel operators to report bluefin tuna landings and dead discards in the online IBQ system at the point of sale. The amount of landings of bluefin tuna, as indicated by data entered into the IBQ online system, was very similar the amount derived from the preexisting mandatory bluefin tuna dealer reports, which was required for all commercially landed bluefin tuna regardless of gear type or geographic area. Another comparison is vessel reported VMS data and the dealer data (for bluefin retained and landed). Although in previous years there was a close correspondence between the two types of reported data, in 2019 the number of bluefin retained, as reported in the vessel monitoring system was notably less than the number of bluefin landed, as reported on bluefin tuna dealer reports (Figure 6.2). The two data sources did show a similar seasonal pattern. Bluefin tuna dealer reports are maintained in the commercial bluefin tuna landings database, also referred to as the electronic bluefin tuna dealer landings database, and known as eBFT.

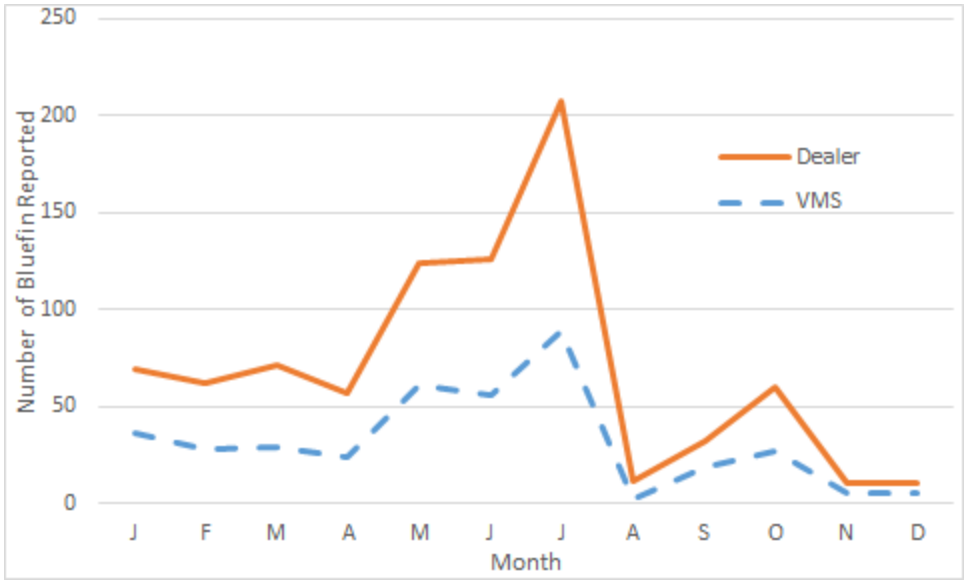

Figure 6.2 Comparisons between the Reported Numbers of Incidentally Caught Bluefin Tuna Retained and Landed in the Pelagic Longline Fishery in 2019

Source: Vessel monitoring system; eBFT.

Table 6.9 summarizes various IBQ Program metrics regarding allocation, catch, fishing effort, IBQ leasing, and reporting and monitoring. Table 6.10 provides data on the number of sets and vessels audited during three-month audit periods. The number of pelagic longline sets and vessels audited is variable due to the sample design. The sample design is referred to as "two-stage stratified random sampling," with an underlying objective to maximize the opportunity of sampling trips/sets with bluefin interactions. The sample design targets specific geographic regions and seasons based on historical data. It also samples each vessel annually and samples among vessels in proportion to their annual fishing effort.

Table 6.9 Bluefin Catch and Other Individual Bluefin Quota Program Metrics in 2016–2019

Metric	2016	2017	2018	2019
Permits eligible for IBQ shares	136	136	136	136
Number vessels fished with pelagic longline gear	85	89	76	67
Number vessels landing bluefin tuna	55	58	50	44
Weight bluefin landed (lb ww)	196,142	229,396	193,969	190,194
Weight bluefin landed (mt ww)	89.0	104.1	88.0	86.3
Weight landed in Gulf of Mexico (mt ww)	3.5	5.7	3.3	2.1
Weight landed in Atlantic (mt ww)	85.5	98.1	81.0	84.2
Number of bluefin landed	447	501	467	445
Number of bluefin landed in Gulf of Mexico	13	21	12	7
Number of bluefin landed in Atlantic	424	480	455	438
Quota caught (mt, ww) in Northeast Distant Waters* (max. 25 mt quota)	17.3	25	4.0	9.6

Metric	2016	2017	2018	2019
Total bluefin dead discards (mt ww)	22.6	11.4	14.6	8.05
Discarded in Gulf of Mexico (mt ww)	7.1	6.5	3.6	2.5
Discarded in Atlantic (mt, ww)	14.8	3.7	11.0	5.3
Discarded in Northeast Distant Waters* (mt ww)	0.7	1.2	0	0.25
Number of trips with pelagic longline gear	1,025	1,078	924	870
Number of pelagic longline sets	6,885	7,305	5,666	4,803
Number of hooks (x 1,000)	5,217	5,327	4,056	3,649
Number of IBQ leases	81	85	83	76
Number of participants leasing	63	52	55	56
Average amount leased per transaction (lb)	1,743	1,789	2,050	2,378
Total amount leased (lb)	141,183	152,050	170,160	180,756
Average price per pound (weighted average)	$ 2.52	$ 1.67	$ 2.02	$ 1.40
Number of trips based on VMS prelanding declarations	990	793	936	910
Number sets based on VMS bluefin reports	5,921	6,507	5,479	3,748
Number vessels with installed EM systems	113	112	112	110
Number hard drives received	975	1,020	925	856
Number vessels submitting hard drives	85	86	77	69

lb ww = Pounds whole weight. mt ww = Metric tons whole weight. VMS = Vessel monitoring system. EM = Electronic monitoring. *A map with the location of the Northeast Distant Waters is found in Figure 6.4. Source: Pelagic Observer Program (dead discard data); Unified Data Processing (landings, effort, dead discard data); IBQ Program (IBQ leasing data); VMS and EM data (via Saltwater, Inc., NOAA Fisheries contractor for installation and maintenance of systems and ERT Corp., NOAA Fisheries contractor for review and storage of data).

Table 6.10 Numbers of Pelagic Longline Sets and Vessels Audited During Three-Month Audit Periods within the Bluefin Tuna Electronic Monitoring Program in 2015–2020

Audit Period	Period Coverage	Sets Audited	Vessels Audited
1	Jun–Aug 2015	126	43
2	Sept–Nov 2015	70	25
3	Dec 2015–Feb 2016	155	48
4	Mar–May 2016	160	44
5	Jun–Aug 2016	85	28
6	Sep–Nov 2016	77	24
7*	Dec 2016	35	12
8	Jan–Mar 2017	179	48
9	Apr–Jun 2017	181	55
10	July–Sept 2017	52	17

Audit Period	Period Coverage	Sets Audited	Vessels Audited
11	Oct–Dec 2017	158	49
12	Jan–Mar 2018	102	29
13	Apr–Jun 2018	152	42
14	Jul–Sept 2018	51	17
15	Oct–Dec 2018	167	48
16	Jan–Mar 2019	91	27
17	Apr-Jun 2019	58	23
18	Jul-Sept 2019	24	10
19	Oct-Dec 2019	85	27
20	Jan-Mar 2020	91	26

*December 2016 was limited to a one-month audit period in order to transition alignment with calendar years. Source: Electronic monitoring program.

Pelagic Longline Bycatch Data: Area Closures and Gear Restrictions

The combined effects of the individual area closures and gear restrictions to the pelagic longline fishery were examined and presented for this report by comparing the reported catch and discards from 2005–2019 to the averages for 1997–1999 throughout the U.S. Atlantic fishery. Previous analyses on this topic attempted to examine the effectiveness of the time/area closures only by comparing the 2001–2003 reported catch and discards to the chosen base period (of 1997–1999) and are included here for reference. The percent changes in the reported numbers of fish caught and discarded are compared to the predicted changes from the analyses in Regulatory Amendment 1 to the 1999 FMP (NOAA Fisheries 2000). Summaries of these examinations are presented by species and area in Table 6.11, Table 6.12, and Table 6.13.

Overall effort, expressed as the number of hooks fished, declined by 29.4 percent during 2005–2019 from 1997–1999 (Table 6.11). Declines were noted for the numbers of kept and discarded fish of almost all species examined, including swordfish, tunas, pelagic sharks, billfish, and sea turtles (Table 6.11 and Table 6.12). The only positive changes from the base period were observed in the numbers of bluefin tuna and dolphinfish kept and in spearfish and large coastal shark discards. The number of dolphinfish discarded show similar levels between the two time periods. The reported number of bluefin tuna kept increased by 64.5 percent for 2005–2019 compared to 1997–1999 (Table 6.11). The total number of reported discards (live and dead) of bluefin tuna decreased by 18.2 percent between the same time periods, which contrasts with the predicted 10.7 percent increase from the analyses in Regulatory Amendment 1. The number of bluefin tuna kept and discarded since 2015 was influenced by the regulatory measures implemented through Amendment 7. The number of dolphinfish kept increased by 5.6 percent (Table 6.12). Reported billfish (blue marlin, white marlin, and sailfish) discards decreased by 33–59 percent from 1997–1999 to 2005–2018 (Table 6.12). The reported discards of spearfish increased by 65.8 percent, although the absolute number of discards were lower than the other billfish species. The reported number of turtle interactions decreased by 68.7 percent from 1997–1999 to 2005–2018.

The reported declines in swordfish kept and discarded; bluefin tuna discards; bigeye, albacore, yellowfin, and skipjack tunas kept (Table 6.11); and large coastal sharks kept (Table 6.12) decreased more than the predicted values developed for Regulatory Amendment 1. Reported kept fish and discards of pelagic sharks and billfish (with the exception of spearfish, for which no predicted change was developed in Regulatory Amendment 1), as well as turtle interactions, also declined more than the predicted values. The number of large coastal sharks increased by

14.6 percent from 1997–1999 to 2005–2018. The numbers of large coastal shark discards and dolphinfish kept were higher than the predicted values.

The reported distribution of effort by area over the same time periods was also examined for changes in fishing behavior (Table 6.13). Overall, total reported effort decreased by 28.4 percent from 1997–1999 to 2005–2018. Increases in the number of hooks set were noted in three areas. The Sargasso Sea exhibited increases in reported effort more than seven-fold from the period of 1997 to 1999; however, this effort represents only 2.7 percent of the overall effort reported in the fishery. Also note that effort in the Sargasso Sea has decreased each year since 2014 until 2018, where a slight increase is reported. Effort increased in South Atlantic Bight by 10.5 percent and in the Florida East Coast area by 6.6 percent. Reported effort declined by 32–92 percent in all other areas. At 91.6 percent, the largest decline was reported in the North Central Atlantic. Other large declines of 76.4 percent in the Caribbean and 64.2 percent in Tuna North and Tuna South areas combined were reported. However, these three areas represent less than 4.5 percent of total reported effort. The Gulf of Mexico, representing 28.6 percent of the total reported effort, declined 37.8 percent compared to the 1997–1999 period. The Mid-Atlantic Bight, representing 28.2 percent of the total reported effort, decreased only 2.5 percent from the 1997–1999 baseline levels.

Concern over the status of bluefin tuna and the effects of the pelagic longline fishery on bluefin tuna led to a re-examination of a previous analysis that compared the reported catch and discards of select species or species groups from the Mid-Atlantic Bight and Northeast Coastal areas to that reported from the rest of the fishing areas (Table 6.14). While an increase was observed in 2016, discards remain low through 2018. The reported number of bluefin kept in these areas increased in 2016 to 245, dropped slightly, and then increased to 261 fish in 2018 (Table 6.14). The reported number of bluefin kept from areas other than the Mid-Atlantic Bight/Northeast Coastal areas (Table 6.15) initially decreased from 275 in 2014 to 166 in 2016, peaked at 292 in 2017, and decreased to 204 in 2018. The number of bluefin discarded in other fishing areas are generally lower than those in the Mid-Atlantic Bight/Northeast Coastal areas, increasing from the lowest value of 64 in 2015 to 134 in 2016 and then decreasing to 87 in 2018. Changes in fishermen behavior when retaining bluefin tuna may have been influenced by the management measures implemented under Amendment 7. Reporting accuracy may also have improved with the implementation of electronic monitoring under Amendment 7.

Table 6.11 Number of Swordfish, Bluefin Tuna, Yellowfin Tuna, Bigeye Tuna, and Total Bigeye, Albacore, Yellowfin, and Skipjack Tunas Reported Landed or Discarded in the U.S. Atlantic Pelagic Longline Fishery (2015–2019) and Percent Changes Since 1997–1999

Year	Number Hooks Set (x1000)	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Total BAYS Kept	Total BAYS Discards
1997–1999	8,533.1	69,131	21,519	238	877	72,342	2,489	21,308	1,133	101,477	4,224
(A) 2001–2003	7,364.1	50,838	13,240	212	607	55,166	1,827	13,524	395	76,116	3,069
2015	5,855.9	27,730	5,382	320	210	28,346	1,412	16,236	519	54,734	3,117
2016	5,217.6	24,456	4,427	411	582	36,807	3,658	11,835	1,064	56,978	7,898
2017	5,532.6	24,403	7,514	494	229	43,030	2,839	15,907	757	68,329	6,558
2018	4,055.7	25,102	8,004	465	309	23,578	1,569	10,566	767	37,831	3,230
2019	3,649.3	27,495	4,307	447	347	27,757	2,270	14,158	575	50,291	3,649
(B) 2005–2019	6,027.65	37,026	7,485	392	718	40,561	1,536	13,168	510	61,863	3,434
% dif (A)	-13.7	-26.5	-38.5	-10.9	-30.8	-23.7	-26.6	-36.5	-65.1	-25.0	-27.3
% dif (B)	-29.4	-46.4	-65.2	64.5	-18.2	-43.9	-38.3	-38.2	-55.0	-39.0-3-18.78.7	-18.6
Pred 1		-24.6	-41.5		-1.0					-5.2	
Pred 2		-13.0	-31.4		10.7					10.0	

Note: (A) and (B) are average values for the years indicated. Predicted values are from Amendment 1, where Pred 1 = without redistribution of effort and Pred 2 = With redistribution of effort. BAYS = Bigeye, albacore, yellowfin, and skipjack tunas. Source: Unified Data Processing.

Table 6.12 Number of Pelagic Sharks, Large Coastal Sharks, Dolphinfish, and Wahoo Reported Landed or Discarded and Number of Billfish and Sea Turtles Reported Caught and Discarded in the U.S. Atlantic Pelagic Longline Fishery (2015–2019) and Percent Changes Since 1997–1999

Year	Pelagic Shark Kept	Pelagic Shark Discards	LCS Kept	LCS Discards	Dolphinfish Kept	Dolphinfish Discards	Wahoo Kept	Wahoo Discards	Blue Marlin Discards	White Marlin Discards	Sailfish Discards	Spearfish Discards	Sea Turtle Interactions
1997–99	3,898	52,093	8,860	6,308	39,711	608	5,172	175	1,621	1,973	1,342	213	596
(A) 2001–2003	3,237	23,017	5,306	4,581	29,361	322	3,776	74	815	1,045	341	139	429
2015	2,208	45,082	50	8,293	53,551	1,503	1,568	164	990	2,896	715	837	160
2016	2,172	27,900	50	8,656	46,947	1,108	1,774	180	1,050	2,153	855	745	228
2017	2,542	25,567	92	12,005	30,527	816	1,471	188	1,568	2,235	718	686	172
2018	875	14,649	36	7,988	27,392	830	1,275	115	854	1,586	810	459	86
2019	566	12,733	142	6,463	36,979	681	987	84	984	1,467	402	469	66
(B) 2005–2019	2,816	33,343	518	6,598	41,252	611	2,293	109	817	1,347	557	373	183
% diff (A)	-17.0	-55.8	-40.1	-27.4	-26.1	-47.0	-27.0	-57.7	-49.7	-47.0	-74.6	-34.7	-28.0
% diff (B)	-27.8	-36.0	-94.2	4.6	3.9	0.5	-55.7	-38.0	-49.6	-31.7	-58.5	75.0	-69.3
Pred 1	-9.5	-2.0	-32.1	-42.5	-29.3				-12.0	-6.4	-29.6		-1.9
Pred 2	4.1	8.4	-18.5	-33.3	-17.8				6.5	10.8	-14.0		7.1

Note: (A) and (B) are average values for the years indicated. Predicted values are from Amendment 1, where Pred 1 = Without redistribution of effort and Pred 2 = With redistribution of effort. Source: Unified Data Processing.

Table 6.13 Reported Distribution of Hooks Set by Area in 2015–2019 and Percent Change since 1997–1999

Year	CAR	GOM	FEC	SAB	MAB	NEC	NED	SAR	NCA	TUN+TUS	Total
1997–1999	328,110	3,346,298	722,580	813,111	1,267,409	901,593	511,431	14,312	191,478	436,826	8,533,148
(A) 2001–2003	175,195	3,682,536	488,838	569,965	944,929	624,497	452,430	76,130	222,070	127,497	7,364,086
2015	30,435	1,465,502	926,512	1,055,480	1,224,135	547,949	225,011	277,506	13,250	144,648	5,925,628
2016	158,319	1,618,290	626,984	958,027	985,870	378,990	210,031	116,920	17,650	161,116	5,264,597
2017	294,901	1,554,480	538,406	1,009,646	1,417,364	216,293	236,253	97,925	3,788	136,553	5,532,609
2018	57,299	1,176,127	348,737	930,082	1,143,221	54,107	112,521	106,906	3,040	123,635	4,055,675
2019	148,192	717,073	405,932	860,929	953,054	345,701	82,686	47,484	3,075	85,150	3,649,276
(B) 2005–2019	98,223	2,147,228	718,803	884,759	1,204,582	456,690	277,843	156,859	15,175	146,500	6,108,706
% diff (A)	-46.6	10.0	-32.3	-29.9	-25.4	-30.7	-11.5	431.9	16.0	-70.8	-13.7
% diff (B)	-70.1	-35.8	-0.5	8.8	-5.0	-49.3	-45.7	996.0	-92.1	-66.52	-28.4

Note: (A) and (B) are average values for the years indicated. CAR = Caribbean. GOM = Gulf of Mexico. FEC = Florida East Coast. SAB = South Atlantic Bight. MAB = Mid-Atlantic Bight. NEC = Northeast Coastal. NED = Northeast Distant Waters. SAR = Sargasso Sea. NCA = North Central Atlantic. TUN+TUS = Tuna North and Tuna South areas.
Source: Unified Data Processing.

Table 6.14 Number of Bluefin Tuna, Swordfish, Pelagic and Large Coastal Sharks, Billfish, and Sea Turtles Reported Kept and Discarded in the Mid-Atlantic Bight and Northeast Coastal Areas Combined in 2015–2019

Year	Hooks Set (x1000)	Bluefin Kept	Bluefin Discards	Swordfish Kept	Swordfish Discards	Pelagic Shark Kept	Pelagic Shark Discards	LCS Kept	LCS Discards	Billfish Discards	Sea Turtle Interactions
2015	1,772.1	75	146	6,893	2,309	1,772	17,521	8	3,585	1,928	159
2016	1,364.9	245	449	4,761	1,494	1,812	14,897	19	3,796	1,023	98
2017	1,633.7	179	128	5,468	3,363	2,139	10,687	57	7,017	1,406	76
2018	1,197.3	162	222	4,644	2,375	675	7,893	18	3,379	702	18
2019	1,298.8	252	305	6,277	753	458	6,240	108	3,281	861	23

Source: Unified Data Processing.

Table 6.15 Number of Bluefin Tuna, Swordfish, Pelagic and Large Coastal Sharks, Billfish, and Sea Turtles Reported Kept and Discarded in All Areas Other than the Mid-Atlantic Bight and Northeast Coastal in 2015–2019

Year	Hooks Set (x1000)	Bluefin Kept	Bluefin Discards	Swordfish Kept	Swordfish Discards	Pelagic Shark Kept	Pelagic Shark Discards	LCS Kept	LCS Discards	Billfish Discards	Sea Turtle Interactions
2015	4,153.5	246	64	21,390	3,231	413	27,259	42	4,712	3,510	101
2016	3,899.7	166	133	19,804	2,938	376	12,586	31	4,868	3,780	131
2017	3,899.0	315	107	18,935	4,151	499	15,640	32	5,008	3,804	96
2018	2,858.3	203	87	20,458	5,629	200	6,756	18	4,617	3,007	68
2019	2,350.5	195	42	21,218	3,554	108	6,493	32	3,214	2,461	43

Source: Unified Data Processing.

Pelagic Longline Bycatch Data: Weak Hook Requirement in the Gulf of Mexico

To evaluate the impacts of the weak hook requirement discussed in Section 6.3.1, reported landings of major target species and marlin interactions from the Gulf of Mexico were examined for initial trends (Table 6.16). Reported landings prior to the implementation of the requirement (2007–2010) are compared here with reported landings post-implementation (2015–2019). Annual reported landings of swordfish and yellowfin tuna immediately following implementation of the weak hook requirement appeared to be on the rise (not shown). In 2019, the number of hooks fished, landings for these five target species, and discards of white marlin in the Gulf of Mexico are shown at their lowest levels for 2015–2019. Swordfish and blue marlin discards, at 1,116 and 70 fish, respectively, both dropped since 2018, with swordfish discards at their second lowest levels and blue marlin discards at their lowest. In 2019, 16 bluefin tuna were discarded. A rise of 62 fish was observed in 2018 relative to the 2017 level of 29 fish, however the 2019 discards remain the lowest than the highest level of 84 fish, reported in 2016.

In order to remove interannual differences, the mean reported landings for each period were calculated and compared. The mean reported landings of bigeye and albacore tuna were greater following implementation of the weak hook requirement. The mean reported landings of swordfish, bluefin, yellowfin, and bigeye tuna were lower in the years following implementation of the weak hook requirement. Discards of swordfish and bluefin tuna were lower after implementation, while marlin discards were slightly higher.

Table 6.16 shows the landings and dead discards of major target species and marlin interactions in the Gulf of Mexico pelagic longline fishery for 2015–2019.

Nominal catches per unit effort (CPUEs) of Atlantic HMS were examined before and after implementation of weak hook management measures (Figure 6.3). Dolphin and wahoo, while not managed by the Atlantic HMS Management Division, are frequently caught alongside Atlantic HMS and are included. Numbers of kept and/or discarded (dead and alive discards) fish are expressed per 1,000 hooks reported. These numbers vary between the four graphs. CPUEs of yellowfin (kept), albacore tuna (kept), billfishes (discarded), and many sharks (discarded) are higher since weak hook implementation (2012–2019). CPUEs of swordfish (kept and discarded), bluefin tuna (kept and discarded), and hammerhead sharks (discarded) are lower following weak hook implementation. CPUEs of bigeye tuna and mako sharks are nearly unchanged before and after implementation. CPUE of bluefin tuna kept is 50 percent lower following weak hook implementation, and the CPUE of bluefin tuna discards is 51 percent lower since implementation. Blue marlin discard CPUE is 54 percent greater after the weak hook requirement went into effect, and white marlin CPUE is 101 percent greater after the weak hook requirement.

On April 02, 2020, NOAA Fisheries published a final rule to adjust regulatory measures that manage Atlantic bluefin tuna incidental catch in the pelagic longline fishery (85 FR 18812). This rule specifically addressed the weak hook requirement in the Gulf of Mexico and several closed or restricted areas. Gulf of Mexico gear requirements were adjusted to shorten the duration of required weak hook use from year-round to seasonal (January-June).

Table 6.16 Reported Number of Hooks Fished, Landings, Means, and Catch per Unit Effort of Major Target Species and Marlin Interactions From the Gulf of Mexico in 2015–2019

Year	Hooks (x1000)	Swordfish	Bluefin	Yellowfin	Bigeye	Albacore	Swordfish Discards	Bluefin Discards	Blue Marlin Discards	White Marlin Discards
2015	1,480.7	2,395	17	9,903	190	470	1,036	31	229	335
2016	1,605.7	2,960	14	15,548	138	843	1,370	84	276	501
2017	1,554.5	4,268	23	13,585	309	595	1,805	29	390	414
2018	1,176.1	2,911	17	6,664	150	183	1,727	62	227	260
2019	717.1	2,314	6	4,060	98	199	1,116	16	70	78
2007–10 mean	2,349.9	6,491.8	97.5	16,955.0	275.0	377.3	2,906.3	193.0	277.0	285.5
2015-19 mean	1,315.8	2,969.6	15.4	9,952.0	177.0	458.0	1,410.8	44.4	238.4	317.6
2007–10 CPUE		2.7625	0.0415	7.2151	0.117	0.1605	1.2367	0.0821	0.1179	0.1202
2015-19 CPUE*		2.2569	0.0117	7.5634	0.1345	0.3481	1.0722	0.0337	0.1812	0.2414

CPUE = Catch per Unit Effort. Note: 2007-2010 represents four years prior to weak hook implementation, where weak hooks were implemented in 2011, with the most recent five years of data. *Illustrated in Figure 6.3. Source: Unified Data Processing.

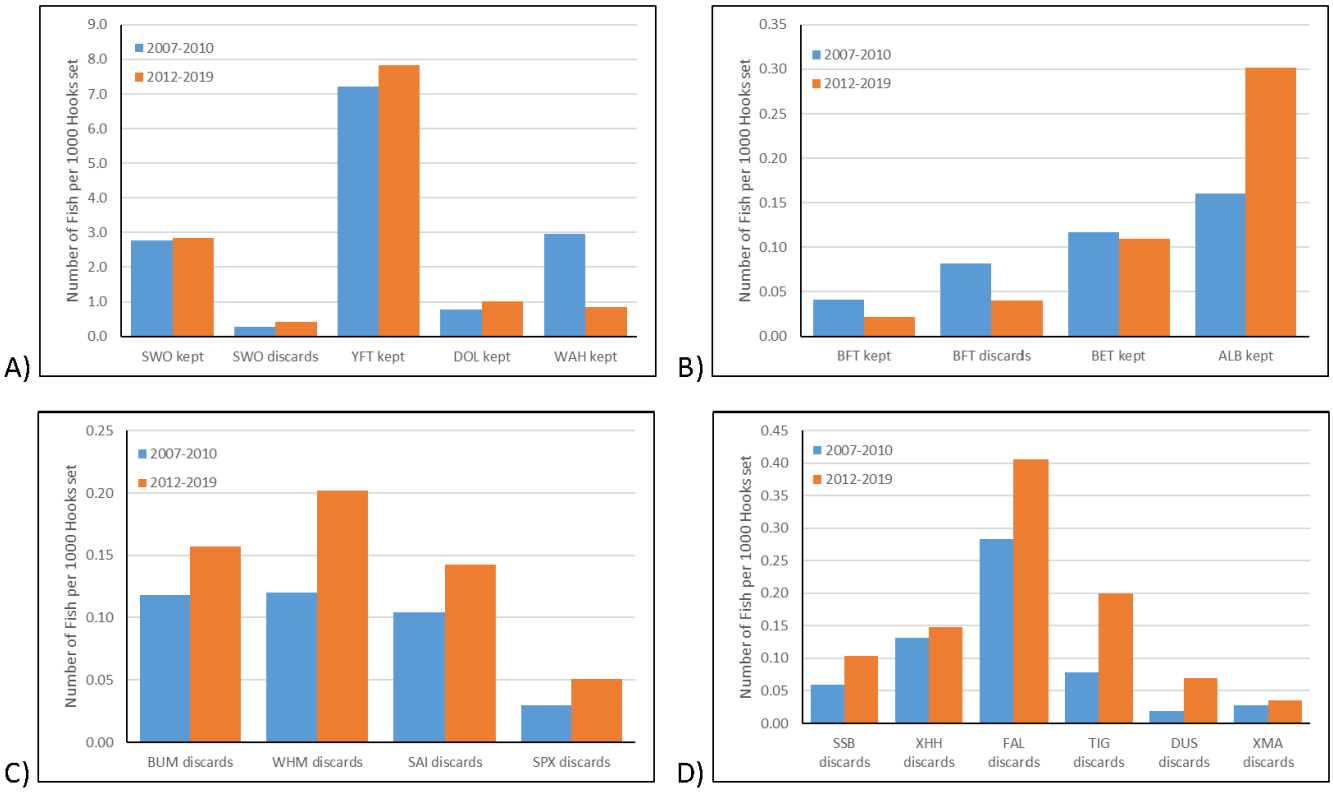

Figure 6.3 Catch Per Unit Effort Comparisons of Highly Migratory Species Prior to and Following 2011 Weak Hook Management Implementation in 2007–10 vs 2012–19

Notes: Number of fish kept and discarded (alive and dead) are presented per 1,000 hooks. Blue indicates numbers reported prior to implementation of weak hook management measures (2011); orange indicates numbers reported after implementation (2012–2019). A.) Kept and discarded swordfish (SWO), kept yellowfin tuna (YFT), kept dolphin, and kept wahoo (WAH); B) Kept and discarded bluefin tuna (BFT), kept bigeye tuna (BET), and kept albacore (ALB); C) Discarded billfish, including blue marlin (BUM), white marlin (WHM), sailfish (SAI), and spearfish (SPX); D) Shark discards, including sandbar, hammerhead, silky, tiger, dusky and mako sharks. The number of reported hooks presented on the y-axis vary between graphs. Source: Unified Data Processing.

Pelagic Longline Bycatch Data: Marine Mammals

NOAA Fisheries monitors observed interactions with protected marine mammals on a quarterly basis and reviews data for action, as necessary. Many of the marine mammals hooked by U.S. pelagic longline fishermen are released alive, although some animals suffer serious injuries and may die after being released. The observed and estimated marine mammal interactions for 2012–2018 are summarized in Table 6.17.

Marine mammals are caught primarily during the third and fourth quarters in the Mid-Atlantic Bight. These geographic areas are illustrated in Figure 6.4. In 2019, one pantropical spotted dolphin interaction was observed (Garrison, unpublished data).

Table 6.17 Marine Mammal Interactions in the Atlantic Pelagic Longline Fishery in 2015–2019

Year	Species	Total Obs.	Total Est.	Mortality Obs.	Mortality Est.	Serious Injury* Obs.	Serious Injury* Est.	Alive* Obs.	Alive* Est.
2015	Beaked whale	1.0	4.0	-	-	1.0	4.0	-	-
	Bottlenose dolphin	1.0	4.7	-	-	-	-	1.0	4.7
	Common dolphin	2.0	14.4	-	-	1.0	9.0	1.0	5.4
	Risso's dolphin	2.0	8.4	-	-	2.0	8.4	-	-
	Short-finned pilot whale	38.0	233.5	-	-	32.0	202.9	6.0	30.7
	Sperm whale	1.0	1.3	-	-	1.0	1.3	-	-
	Unidentified dolphin	2.0	8.5	-	-	-	-	2.0	8.5
	Unidentified marine mammal	2.0	10.5	-	-	1.0	5.8	1.0	4.7
2016	Long-finned pilot whale**	0.3	1.3	-	-	0.2	1.1	0.1	0.2
	Risso's dolphin	4.0	22.0	1	5.6	1.5	10.5	1.5	5.9
	Short-finned pilot whale**	22.7	130.8	-	5.1	19.3	111.1	3.4	14.6
	Unidentified dolphin	2.0	9.3	-	-	1.0	1.2	1.0	8.1
	Unidentified marine mammal	2.0	4.1	-	-	0.5	0.8	1.5	3.3
	Unidentified whale	1.0	9.2	-	-	0.5	4.7	0.5	4.5

Year	Species	Total Obs.	Total Est.	Mortality Obs.	Mortality Est.	Serious Injury* Obs.	Serious Injury* Est.	Alive* Obs.	Alive* Est.
2017	Common dolphin	1.0	4.9	-	-	1.0	4.9	-	-
	Long-finned pilot whale**	1.3	15.6	-	-	0.3	3.3	1.0	12.3
	Risso's dolphin	1.0	7.7	-	-	-	-	1.0	7.7
	Short-finned pilot whale**	29.7	340.3	-	-	14.0	132.9	15.7	207.4
	Unidentified dolphin	1.0	5.3	-	-	-	-	1.0	5.3
	Unidentified marine mammal	2.0	11.7	-	-	-	-	2.0	11.7
2018	Bottlenose dolphin	2.0	23.6	-	-	1.5	6.2	0.5	17.4
	Common dolphin	1.0	2.8	-	-	0.5	1.4	0.5	1.4
	Long-finned pilot whale**	0.1	0.4	-	-	0.1	0.4	-	-
	Short-finned pilot whale**	10.0	153.0	-	-	6.7	102.2	3.3	51.8
	Unidentified marine mammal	3.0	40.9	-	-	3.0	40.9	-	-
2019	Long-finned pilot whale**	0.1	0.4	-	-	0.1	0.4	-	-
	Pantropical spotted dolphin	1.0	12.9	-	-	1.0	12.9	-	-

Note: A dash indicates there were no observations for the species. Obs. = Observed. Est. = Estimated. *Cases where serious injury cannot be determined from available data are partitioned based upon observed serious injury rates from past interactions. This results in proportional assignment of observed animals to the serious injury and alive categories. **Pilot whales are not identified to species at sea by observers. Observed interactions are partitioned between the two species based upon location, water depth, and sea surface temperature at the time of the interaction. Source: Garrison and Stokes 2016, 2017, 2019; Garrison 2019, unpublished data, 2020.

Pelagic Longline Bycatch Data: Sea Turtles

NOAA Fisheries monitors observed interactions with sea turtles on a quarterly basis and reviews data for action, as necessary. Sea turtle interactions have also historically been analyzed in three-year periods in accordance with a BiOp released in June 2004 (NOAA Fisheries 2004a). A new BiOp was released in May 2020 (NOAA Fisheries 2020b) which indicates that NOAA Fisheries must continue to monitor sea turtle interactions on a quarterly and annual basis. Additionally, the 2020 BiOp specifies that sea turtle interactions must also be analyzed in in three-year rolling (not static) time periods. Sea turtle takes are summarized by large geographic areas and are illustrated in Figure 6.4.

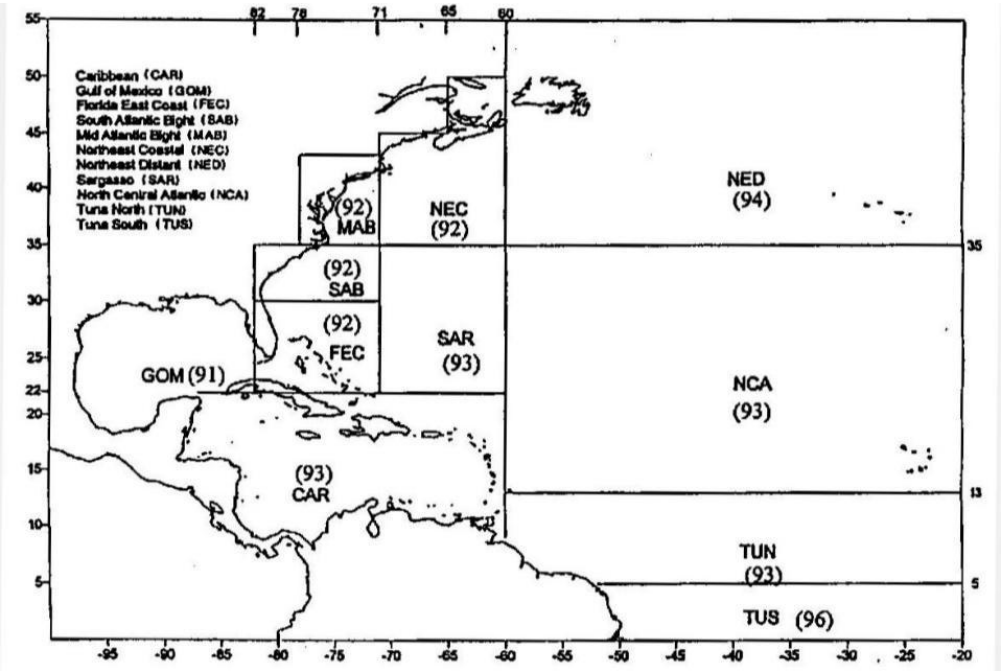

Figure 6.4 Geographic Areas Used in Summaries of Pelagic Logbook Data

CAR = Caribbean. GOM = Gulf of Mexico. FEC = Florida East Coast. SAB = South Atlantic Bight. MAB = Mid-Atlantic Bight. NEC = Northeast Coastal. NED = Northeast Distant Waters. SAR = Sargasso Sea. NCA = North Central Atlantic. TUN = Tuna North. TUS = Tuna South. Source: Cramer and Adams 2000.

The estimated sea turtle takes for regular fishing and experimental fishing effort for 2015–2019 are summarized for loggerhead sea turtles and leatherback sea turtles in Table 6.18 and Table 6.19, respectively. Sea turtle bycatch in the U.S. Atlantic pelagic longline fishery has decreased significantly in the last five years (Table 6.18, Table 6.19, and Table 6.20). In 2019, the majority of loggerhead sea turtle interactions occurred along the Florida East Coast and in the South Atlantic Bight (Table 6.18). Interactions with leatherback sea turtles were highest for 2019 in the Mid-Atlantic Bight, South Atlantic Bight, and Gulf of Mexico (Table 6.19). The total interactions for the 2016–2018 Incidental Take Statement, the most recent and complete three-year period, were below the level established in the 2004 BiOp for both loggerheads and leatherbacks (see Table 6.20). Reported leatherback and loggerhead sea turtle interactions remained low in 2019.

Table 6.18 **Estimated Number of Loggerhead Sea Turtle Interactions in the U.S. Atlantic Pelagic Longline Fishery by Statistical Area in 2015–2019**

Area	2015	2016	2017	2018	2019
Caribbean	1	6	4	0	5
Gulf of Mexico	1	4	18	10	0
Florida East Coast	90	49	0	9	33
South Atlantic Bight	18	63	41	17	14
Mid-Atlantic Bight	70	9	4	0	9
Northeast Coastal	52	17	1	6	0
Northeast Distant Waters	7	6	4	6	6
Sargasso Sea	4	0	1	13	0
North Central Atlantic	0	0	0	0	0
Tuna North	0	0	5	0	1
Tuna South	0	0	0	0	0
Total	243	154	78	61	67
Experimental fishery (2012–2014)	-	-	-	-	-
Total	243	154	78	61	67

Source: Garrison and Stokes 2017, 2019, 2020; Garrison unpublished data, 2019, 2020.

Table 6.19 **Estimated Number of Leatherback Sea Turtle Interactions in the U.S. Atlantic Pelagic Longline Fishery by Statistical Area in 2015–2019**

Area	2015	2016	2017	2018	2019
Caribbean	0	0	0	0	0
Gulf of Mexico	99	80	57	20	20
Florida East Coast	30	31	0	5	0
South Atlantic Bight	8	21	67	16	22
Mid-Atlantic Bight	61	63	127	34	30
Northeast Coastal	60	56	8	5	0
Northeast Distant Waters	24	84	27	23	15
Sargasso Sea	12	0	5	13	0
North Central Atlantic	0	0	0	0	0
Tuna North	5	4	1	3	3
Tuna South	0	0	0	0	0
Total	299	339	292	119	90
Experimental fishery (2012–2014)	-	-	-	-	-
Total	299	339	292	119	90

Source: Garrison and Stokes 2017, 2019, 2020; Garrison unpublished data, 2019, 2020.

Table 6.20 **Estimated Sea Turtle Interactions and Sea Turtle Incidental Take Levels in the U.S. Atlantic Pelagic Longline Fishery by Species in 2016–2019**

Year	Leatherback	Loggerhead	Other/Unidentified Sea Turtles
2016	340	155	13
2017	293	78	26
2018	120	61	4
2019	90	67	8

Data for 2018 and 2019 are preliminary estimates. Source: Garrison and Stokes 2019, 2020; Garrison, unpublished data, 2019, 2020.

Total interactions of sea turtles over specified three-year periods cannot exceed Incidental Take Statement Levels established for leatherback, loggerhead and "Other/unidentified" sea turtles. The three-year ITS Level for leatherback sea turtles is 1,764 interactions. The ITS Level for loggerhead sea turtles is 1,905 interactions. The ITS Level for "Other/unidentified" sea turtles is 105. The last complete three-year period was from 2016–2018. Total interactions for this period were well below the ITS Levels at 753 leatherback sea turtles, 294 loggerhead sea turtles, and 43 other/unidentified sea turtles. Interactions in 2019 will be combined with those in 2020 and 2021 for the next three-year ITS Level statement period.

Pelagic Longline Bycatch Data: Seabirds

Observer data indicate that seabird bycatch is low in the U.S. Atlantic pelagic longline fishery. A cumulative total of reported seabird interactions with the U.S. Atlantic pelagic longline fishery from 1992 to 2019 is presented in Table 6.21.

Seabird species bycatch observed between 2012 and 2019 are listed in Table 6.22 by year, quarter, and the geographic area where they were encountered. In 2018, there were 76 U.S. pelagic longline vessels actively fishing in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea that reported setting approximately 4 million hooks. No interactions with seabirds were observed in 2018.

Table 6.21 **Seabird Bycatch in the U.S. Atlantic Pelagic Longline Fishery in 2015–2019**

Species	Released Dead	Released Alive	Released Total	% Released Dead
Greater shearwater	2	0	2	100
Unidentified shearwater	4	0	4	100
Herring gull	5	1	6	83
Unidentified gull	14	8	22	64
Northern gannet	1	0	1	100
Brown pelican	0	1	1	0
Northern fulmar	1	0	1	100
Total	14	8	22	64

Source: Pelagic Observer Program.

Table 6.22 Observed Seabird Bycatch in the U.S. Atlantic Pelagic Longline Fishery in 2015–2019

Year	Quarter	Area	Type of Bird	Number Observed	Status
2015	2	TUN	Unidentified shearwater	1	Dead
2015	4	MAB	Greater shearwater	1	Dead
2016	1	GOM	Greater shearwater	1	Dead
2016	1	GOM	Herring gull	1	Dead
2016	1	GOM	Northern gannet	1	Alive
2016	1	MAB	Northern gannets	3	Alive
2016	1	SAB	Northern gannet	1	Alive
2016	1	SAB	Unidentified gull	1	Alive
2016	1	GOM	Brown pelican	1	Alive
2016	4	NEC	Herring gull	3	Dead
2017	1	MAB	Herring gull	1	Dead
2017	1	MAB	Unidentified seabird	1	Dead
2017	1	SAB	Northern gannet	1	Live
2017	1	MAB	Herring gull	1	Live
2017	4	MAB	Northern fulmar	1	Dead
2017	4	MAB	Shearwater	2	Dead
2018*	-	-	-	0	-
2019	2	GOM	Northern gannet	1	Dead
2019	2	MAB	Shearwater	1	Dead

NED = Northeast Distant Waters. GOM = Gulf of Mexico. MAB = Mid-Atlantic Bight. TUN = Tuna North. SAB = South Atlantic Bight. NEC = Northeast Coastal. *No seabird interactions occurred in 2018. Source: Pelagic Observer Program.

Incidental seabird catches recorded by observers in the U.S. Atlantic longline fisheries were analyzed from 1992–2017 (Bi et al. 2020) from three geographic zones—the south Atlantic Bight, the Mid-Atlantic Bight, and the Northeast Coastal area (see Figure 6.4 for reference). Of the 6,469 longline sets observed, 99 percent of the sets did not have any recorded interactions. Of the 77 sets with interactions, 149 seabirds were caught, with gulls (*Larus* sp.) captured the most frequently, followed by shearwaters (*Procellariidae* spp., especially great shearwaters, *Ardenna gravis*) and northern gannets (*Morus bassanus*). Obvious spatial and temporal patterns were noted in the seabird bycatch rates, with 99 percent of the seabirds caught in summer through winter, 62 percent of seabirds caught in the mid-Atlantic Bight, and a peak in catch occurred in 1997.

6.3.3 Purse Seine

6.3.3.1 Bycatch Data

Reporting methods used for the purse seine fishery are described in Section 6.2.1.1. Landings for this fishery are reported in Section 5.3.3. There are no recorded instances of non-tuna finfish, other than minimal numbers of blue/basking sharks, caught in tuna purse seines. Anecdotal evidence indicates that if fish are discarded, they are easily released out of the net with minimal bycatch mortality.

6.3.4 Commercial Handgear

6.3.4.1 Bycatch Data

Reporting methods used for the commercial handgear fishery are described in Section 6.2.1.1. Landings, including dead discards, in this fishery are reported in Section 5.3.4.

Because of the deliberate nature of harpoon gear, bycatch for vessels targeting bluefin tuna or swordfish is expected to be low to non-existent, other than undersized fish. Bycatch mortality in those fisheries for non-directed species would, therefore, be near zero. However, for those directed species that may be undersized, mortality would be high.

6.3.5 Recreational Handgear

6.3.5.1 Reduction Measures

NOAA Fisheries developed a Code of Angling Ethics as part of implementing Executive Order 12962—Recreational Fisheries. NOAA Fisheries implemented a national plan to support, develop, and implement programs that were designed to enhance public awareness and understanding of marine conservation issues relevant to the wellbeing of fishery resources in the context of marine recreational fishing. This angling code is consistent with the requirement of National Standard 9 to minimize bycatch and bycatch mortality. These guidelines are discretionary, not mandatory, and are intended to inform the angling public of NOAA Fisheries' views regarding what constitutes ethical angling behavior. Part of the ethical angling code covers catch-and-release fishing and is directed toward minimizing bycatch mortality. For a detailed description of the Code of Angling Ethics, refer to Section 3.9.8.3 of the 2006 Consolidated Atlantic HMS FMP (NOAA Fisheries 2006).

NOAA Fisheries has initiated an outreach program to address bycatch and educate anglers on the benefits of circle hooks. In January 2011, NOAA Fisheries created a brochure that provides guidelines on how to increase the survival of large pelagic species caught with hook-and-line. This brochure was updated in 2017 and is available at www.fisheries.noaa.gov/resource/educational-materials/careful-catch-and-release-brochure. NOAA Fisheries distributes educational outreach materials on the careful catch and release of Atlantic HMS to recreational fishing tournaments, where a large audience of recreational fishermen can be reached.

Also in 2017, NOAA Fisheries finalized Amendment 5b to the 2006 Consolidated Atlantic HMS FMP to end overfishing on and rebuild dusky shark stocks. Several measures were included to educate anglers and reduce post-release mortality of dusky sharks caught as bycatch by recreational fishermen. Since dusky sharks are a prohibited species, recreational fishermen are not permitted to target or retain them. A video and quiz on the safe handling and release of prohibited Atlantic sharks is available for anyone to view and take on the Atlantic HMS permits website (hmspermits.noaa.gov). HMS Angling and HMS Charter/Headboat permit holders must add a shark endorsement to recreational permits in order to fish for, retain, possess, or land sharks. Applicants must complete a brief online shark identification and fishing regulations training course and quiz prior to purchasing or renewing an applicable Atlantic HMS permit.

As of January 1, 2018, anglers fishing recreationally for sharks on a vessel with an HMS Angling or HMS Charter/Headboat permit have been required to use non-offset, non-stainless steel circle hooks when fishing south of 41° 43'N latitude (near Chatham, Massachusetts, which is the northern extent of the dusky shark's U.S. Atlantic range), except when fishing with flies or artificial lures. On March 2, 2018, NOAA Fisheries implemented an emergency interim final rule to adopt internationally recommended management measures for shortfin mako to address overfishing of the stock (83 FR 8950). Among other things, this interim rule encouraged anglers to continue catch-and-release practices for shortfin mako.

On March 3, 2019, NOAA Fisheries implemented Amendment 11 to the 2006 Atlantic HMS FMP to adopt longer-term management measures for shortfin mako (84 FR 5358). Amendment 11 maintained the 83-inch fork length minimum size for female shortfin makos and established a smaller 71-inch (180 cm) fork length minimum size

for male shortfin mako sharks, which mature at a smaller size. This action was taken to reduce the proportion of female shortfin mako sharks in the recreational harvest (they accounted for nearly three-quarters of harvested sharks under the emergency measures) and allow fishermen to focus their harvest on smaller male sharks, which are less vital to the rebuilding of the stock.

Amendment 11 also extended the requirement to use circle hooks when fishing recreationally for sharks to all federal waters of the Atlantic.

6.3.5.2 Bycatch Data

Reporting methods used for the recreational handgear fishery are described in Section 6.2.1.1. Landings for this fishery are reported in Section 5.3.5.

Bycatch in the recreational rod and reel fishery is difficult to quantify because many fishermen may value the experience of fishing over the catch of a targeted species, thus making it difficult to distinguish between target species and bycatch species. However, the actual numbers of fish discarded for many species are low. Post-release mortality estimation of billfishes has been examined in a review by Graves and Horodysky (2015).

Most evidence suggests that circle hooks reduce at-vessel and post-release mortality rates for many Atlantic HMS compared to J-hooks without reducing the catch of target species, although this varies by species, gear configuration, bait, and other factors. By design, circle hooks tend to hook sharks in the jaw more frequently than in the throat or gut (a practice known as deep-hooking), thereby reducing injury and associated mortality compared to J-hooks (Godin et al. 2012, Campana et al. 2009, Keller et al. 2020). In a meta-analysis of 42 empirical studies, Reinhardt et al. (2017) compared the effects of hook type on catch rate and at-vessel mortality of 43 and 31 species, respectively. Catch rates were statistically significantly higher for a number of sharks, tunas, and sailfish. This study also found statistically significant evidence that at-vessel mortality of fish caught on J-hooks was higher for a number of billfish, swordfish, tunas, and sharks. Another meta-analysis conducted by Keller et al. (2020) for the ICCAT SCRS evaluated 28 papers on the effects of hook type on the catchability, at-haulback mortality, post-release mortality, and hooking locations of shortfin mako sharks caught in pelagic longline fisheries. While the findings of the examined studies varied on catchability and at-haulback mortality, the examined studies unequivocally found that circle hooks were more likely to result in mouth-hooking, and less likely to result in gut or foul hooking (Carruthers et al. 2009, Epperly et al. 2012). Similarly, Willey et al. (2016) examined the frequencies of jaw, throat, gut, and foul hooking of sharks using recreational fishing gear with non-offset circle and J-hooks. Across all species, they found that sharks caught recreationally with circle hooks were deep hooked in 3 percent of the interactions, while sharks caught on J-hooks were deep hooked in 6 percent of the interactions. This equates to a 50 percent reduction in the frequency of deep-hooking with the use of circle hooks (N=624). Campana et al. (2009) observed that 96 percent of the deep hooked blue sharks were severely injured or dead, while 97 percent of sharks that were hooked superficially in the mouth or jaw were released healthy and with no apparent trauma. Therefore, assuming that deep hooking in sharks results in comparable post-release mortality rates (96-percent), converting recreational shark fisheries from J-hooks to circle hooks should reduce the mortality rate of hooked sharks by 63 percent ((17.5%-6.0%/17.5%)*96% = 63%).

Bycatch in the recreational bigeye, albacore, yellowfin, and skipjack tunas spearfishing fishery is expected to be virtually, if not totally, non-existent; therefore, bycatch mortality would be near zero.

The number of kept and released fish reported or observed through the LPS dockside intercepts for 2014–2018, including prohibited sandbar and dusky sharks, are presented in Table 6.23 and Table 6.24.

Table 6.23 **Highly Migratory Species Retained by the Rod and Reel Fishery as Reported in the Large Pelagics Survey* Between May and October in 2015–2019**

Species	2015	2016	2017	2018	2019
White marlin	13	10	7	16	22
Blue marlin	4	6	1	2	4
Sailfish	.	1	1	.	0
Swordfish	43	27	14	10	120
Giant bluefin tuna	119	132	194	252	199
Large medium bluefin tuna	29	63	56	20	47
Small medium bluefin tuna	33	28	33	21	26
Large school bluefin tuna	40	128	73	16	108
School bluefin tuna	141	147	224	272	215
Young school bluefin tuna	.	.	3	.	0
Bigeye tuna	240	99	28	469	185
Yellowfin tuna	1,942	2,968	2,358	2,328	3,663
Skipjack tuna	125	181	147	150	115
Albacore tuna	310	127	135	20	103
Thresher shark	68	43	55	55	70
Shortfin mako shark	152	129	146	26	24
Sandbar shark2	1	.	.	.	0
Dusky shark1	.	.	.	.	0
Tiger shark	3	.	.	1	1
Porbeagle	3	5	6	5	9
Blacktip shark	.	.	.	.	.
Atlantic sharpnose shark	13	2	5	6	2
Blue shark	25	39	17	17	14
Hammerhead shark	.	.	.	.	.
Smooth hammerhead shark	.	.	.	.	.
Scalloped hammerhead shark	.	.	.	.	.
Unidentified hammerhead shark	.	.	1	.	0
Wahoo	135	102	78	32	194
Dolphinfish	9,814	6,222	5,080	9,155	9,556
King mackerel	.	8	5	14	48
Atlantic bonito	46	41	106	158	320
Little tunny	108	262	298	229	311
Amberjack	46	18	8	46	3

Species	2015	2016	2017	2018	2019
Spanish mackerel	165	20	8	3	43

*Covers the geographic region between Virginia and Maine. [1]Prohibited in the recreational fishery as of July 1, 1999. [2]Prohibited as of July 2008. Source: Large Pelagics Survey.

Table 6.24 **Highly Migratory Species Released Alive and Dead by the Rod and Reel Fishery as Reported in the Large Pelagics Survey* Between May and October of 2015–2019**

Species	2015	2016	2017	2018	2019
White marlin	1,528	1,705	735	1,557	1,342
Blue marlin	170	113	66	134	206
Sailfish	25	145	19	7	8
Swordfish	14	7	8	2	18
Giant bluefin tuna	.	.	21	13	38
Large medium bluefin tuna	3	2	4	4	18
Small medium bluefin tuna	51	30	29	30	27
Large school bluefin tuna	14	71	48	.	39
School bluefin tuna	277	70	273	158	182
Young school bluefin tuna	29	90	36	12	67
Bigeye tuna	14	12	4	161	16
Yellowfin tuna	920	2,061	558	354	1,306
Skipjack tuna	217	278	109	275	136
Albacore tuna	11	30	54	11	10
Thresher shark	42	20	49	47	47
Shortfin mako shark	385	128	145	269	198
Sandbar shark2	50	90	71	58	25
Dusky shark1	102	49	88	57	40
Tiger shark	18	10	13	10	7
Porbeagle	42	29	96	57	74
Blacktip shark	13	.	4	.	9
Atlantic sharpnose shark	36	26	21	4	21
Blue shark	2,164	1,462	1,316	1,487	1,200
Hammerhead shark	7	4	1	3	6
Smooth hammerhead shark	2	3	1	1	2
Scalloped hammerhead shark	2	0	4	2	10
Unidentified hammerhead shark	28	33	30	21	22

Species	2015	2016	2017	2018	2019
Wahoo	2	.	.	1	12
Dolphinfish	508	314	215	729	554
King mackerel	.	.	.	6	5
Atlantic bonito	55	88	31	227	161
Little tunny	339	875	1,359	1,532	823
Amberjack	10	62	.	18	1
Spanish mackerel	2	.	2	.	9

*Covers the geographic region between Virginia and Maine. [1]Prohibited in the recreational fishery as of July 1, 1999. [2]Prohibited as of July 2008. Source: Large Pelagics Survey.

6.3.6 Bottom Longline

6.3.6.1 Reduction Measures

Vessel owners and operators of vessels with a commercial shark limited access permit must attend a Safe Handling, Release, and Identification Workshop every three years and must carry NOAA Fisheries-approved dehooking devices onboard and use them in the event of a protected species interaction. They must also store and post careful handling and release protocols and guidelines in the wheelhouse to minimize injury to protected species when interactions occur.

Any dusky shark, sea turtle, marine mammal, and smalltooth sawfish that becomes entangled or hooked must be immediately released, and the gear must be immediately retrieved. The vessel must move at least 1 nmi from that location before fishing is resumed to avoid interacting with those species again. Marine mammal entanglements must be reported to NOAA Fisheries under the Marine Mammal Authorization Program. Time and area closures are implemented in this fishery to reduce bycatch, and these measures require the proper stowage of gear if the vessel is within a closed area.

To prevent long-term injury of bycatch that cannot be released safely if the hook is removed, bottom longline gear must include only corrodible hooks. On January 1, 2018, circle hook requirements by all Atlantic HMS Directed Shark permit holders using bottom longline gear became effective.

The bottom longline fishery also includes the shark research fishery, in which vessels are required to take an observer on all trips, and the limited access fishery, in which vessels are randomly selected for observer coverage and may be required to use a vessel monitoring system.

There were five participants in the 2019 shark research fishery. NOAA Fisheries changed the regulations for participating vessels in 2015 by modifying the regional dusky shark bycatch caps for this limited fishery and allowing observers to retain and land up to three whole sharks per trip. The resulting shark research fishery regions for 2019 are shown in Figure 6.5. Per Amendment 11, bottom longline fishermen are allowed to land shortfin mako sharks as long as the shark is dead at haulback.

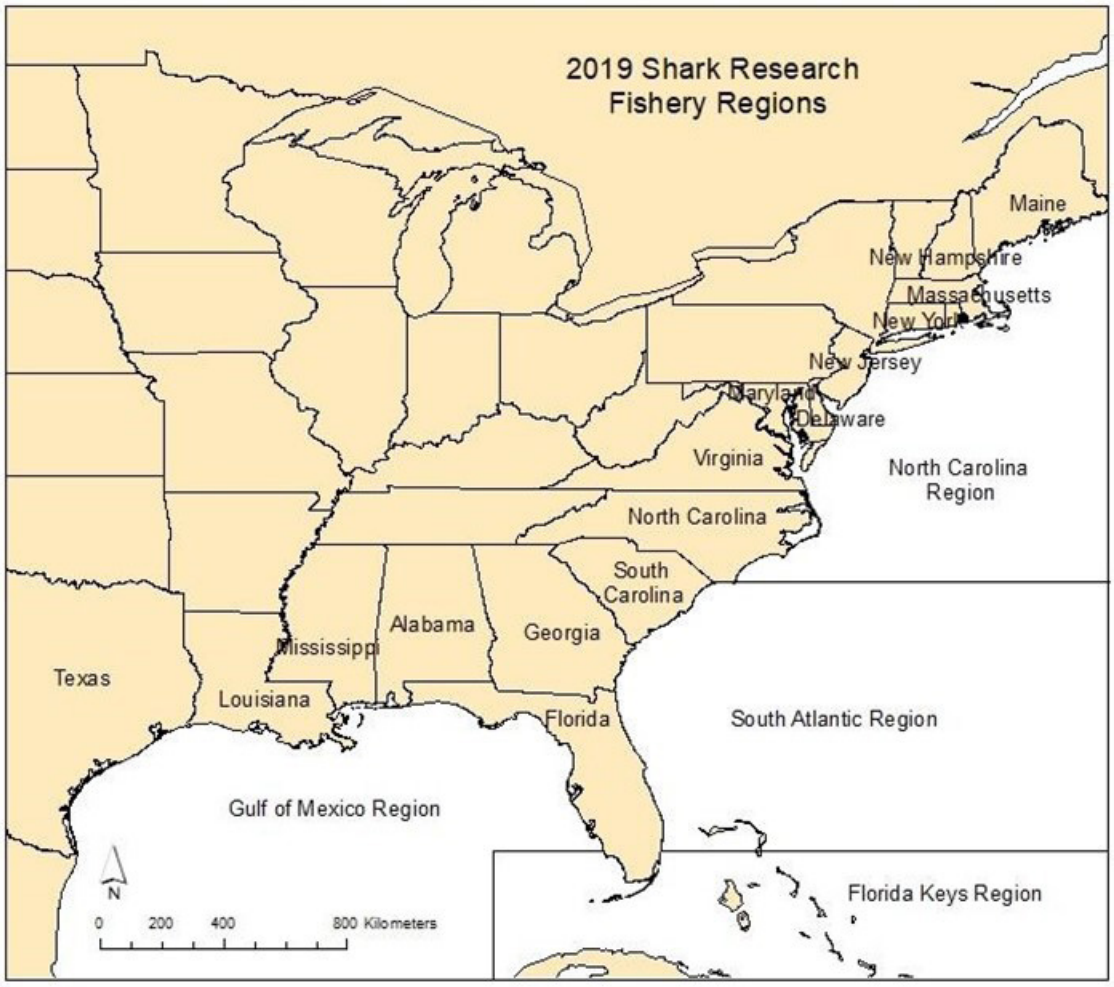

Figure 6.5 Dusky Shark Bycatch Cap Regions for the Shark Research Fishery

6.3.6.2 Bycatch Data

Reporting methods used for the bottom longline fishery are described in Section 6.2.1.1. Landings, including dead discards, for this fishery are reported in Section 5.3.6. Bycatch of prohibited sharks is summarized in Section 6.4.

The shark bottom longline fishery has relatively low observed bycatch rates. Historically, finfish bycatch has averaged approximately 5 percent of the total observed catch in the bottom longline fishery. Observed protected species bycatch (e.g., sea turtles) has typically been much lower, less than 0.01 percent of the total observed catch.

No protected species interactions occurred on bottom longline trips covered by the Northeast Fisheries Observer Program.

Table 6.25 provides information on those observed interactions with protected resources for bottom longline vessels targeting sharks in the Gulf of Mexico and Atlantic regions. The observed data were combined for the Gulf of Mexico and southern Atlantic to protect confidentiality of vessels consistent with the requirements of the Magnuson-Stevens Act. In 2019, two loggerhead sea turtles were observed in the shark research fishery and all were released alive. No protected resources interactions were observed in the Gulf of Mexico and South Atlantic regions outside of the shark research fishery. Take levels for sea turtles, smalltooth sawfish, and Atlantic sturgeon have not exceeded levels authorized in the 2012 BiOp (NOAA Fisheries 2012) over any three-year period. On May 15, 2020, the Atlantic HMS non-pelagic longline BiOp was released. For more information on the most recent BiOp, see Section 6.2.3.2. Bycatch of seabirds in the shark bottom longline fishery has been virtually non-existent. No

expanded estimates of seabird bycatch or catch rates for the bottom longline fishery have been made due to the rarity of seabird interactions.

Table 6.25 Protected Species Interactions Observed on Bottom Longline Trips Targeting Sharks in the Gulf of Mexico and Atlantic Ocean in 2015–2019

Year	Sea Turtles	Seabirds	Marine Mammals	Smalltooth Sawfish	Total
2015	4 (4A, 0D)	-	-	2 (A)	6
2016	9 (7A, 2D)	3 (U)	-	1 (A)	13
2017	3 (1A, 2D)	-	-	-	3
2018	5 (4A, 1D)	-	-	-	5
2019	2 (2A, 0D)	-	-	-	2
Total					

Note: Letters in parentheses indicate whether the animal was released (A) alive, (D) dead, or (U) unknown. Source: Mathers et al. 2020a, unpublished.

6.3.7 Gillnet

6.3.7.1 Reduction Measures

Vessel owners and operators that fish with pelagic or bottom longline or gillnet gear must attend a Safe Handling, Release, and Identification Workshop every three years. The workshop curriculum is compliant with the Right Whale Ship Strike Reduction Rule and the Pelagic Longline Take Reduction Plan, the Atlantic Large Whale Take Reduction Plan, the Harbor Porpoise Take Reduction Plan, and the Bottlenose Dolphin Take Reduction Plan. See Section 6.2.2 for details on those plans. Vessel owners and operators that hold only a smoothhound shark permit are not required to attend the workshops.

Fishermen using gillnet gear must limit soak times to 24 hours when using sink gillnet gear and conduct a net check at least every two hours when using drift gillnet gear to look for and remove any sea turtles, marine mammals, or smalltooth sawfish. If a marine mammal is taken, the vessel operator must immediately cease fishing operations and contact NOAA Fisheries consistent with the Marine Mammal Authorization Program. Smalltooth sawfish must not be removed from the water while being removed from the net. Dusky sharks must be released immediately, and vessels must move 1 nmi after a dusky shark interaction and notify other vessels. Per Amendment 11, gillnet fishermen are allowed to land shortfin mako sharks as long as the shark is dead at haulback.

6.3.7.2 Bycatch Data

Reporting methods used for the gillnet fishery are described in Section 6.2.1.1. Landings, including dead discards, for this fishery are reported in Section 5.3.7 Bycatch of prohibited sharks is summarized in Section 6.4.

Southeastern Atlantic and Gulf of Mexico Gillnet Fishery

No interactions with protected species have been observed between 2015 and 2016 in the southeastern Atlantic and Gulf of Mexico gillnet fisheries targeting mixed sharks. Effort of gillnet trips has shifted from targeting mixed sharks to targeting finfish (Mathers et al. 2020b, unpublished). Since no gillnet trips targeting sharks occurred between 2017 and 2019, no protected species interactions in this fishery have been observed.

One seabird was observed caught in gillnet gear in 2018 on a trip targeting king mackerel (Mathers et al. 2020b). No interactions with sea turtles, marine mammals, smalltooth sawfish, or Atlantic sturgeon were observed with gillnet gear in any of the gillnet fisheries.

The last observed sawfish interaction occurred in 2003 in these gillnet fisheries, and the sawfish was released with no visible injuries. There have been no interactions observed with Atlantic sturgeon to date with gillnet gear. Given that the rate of observer coverage in these gillnet fisheries is consistent with the Atlantic Large Whale Take Reduction Plan, NOAA Fisheries believes that smalltooth sawfish and Atlantic sturgeon interactions in the southeastern Atlantic and Gulf of Mexico gillnet fishery are rare.

Northeast and Mid-Atlantic Gillnet Fishery

Observed interactions with protected species for the 2019 Northeast and mid-Atlantic smooth dogfish gillnet fishery are presented in Table 6.26. One seal and 51 Atlantic sturgeon were observed caught in gillnet gear in 2019 on a trip targeting smooth dogfish (J. Mello, personal communication). No interactions with sea turtles or smalltooth sawfish were observed with gillnet gear.

Table 6.26 Observed Protected Species Interactions in the Northeast and Mid-Atlantic Gillnet Fishery Targeting Smoothhounds in 2019

Protected Species	Number of Interactions
Sea turtles	0
Seabirds	0
Marine mammals	1
Smalltooth sawfish	0
Atlantic sturgeon	51
Total	52

6.3.8 Green-Stick

6.3.8.1 Bycatch Data

Reporting methods used for the green-stick fishery are described in Section 6.2.1.1. Landings for this fishery are reported in Section 5.3.8.

NOAA Fisheries and the Louisiana Department of Wildlife and Fisheries investigated the catch and bycatch of green-stick gear in 2012–2015 in the northern Gulf of Mexico through a study funded by the NOAA Bycatch Reduction Engineering Program. The final report from that study is available upon request from the NOAA Fisheries Atlantic HMS Management Division.

6.4 Bycatch in the Prohibited Shark Complex

The annual catch limit for prohibited sharks is zero, as clarified in Amendment 5b (NOAA 2017). Fisheries for those stocks are closed, although a small amount of bycatch does occur in other fisheries. NOAA Fisheries monitors that bycatch and ensures that the annual catch limit of zero remains appropriate. This section includes the annual analysis specified by Amendment 5b to monitor the recreational estimates and observed bycatch of prohibited sharks.

These updated annual data (Table 6.27) include prohibited sharks that were observed or reported as discarded dead or landed (most likely due to misidentification issues or a lack of awareness of shark fishing regulations) in both recreational and commercial fisheries. Data were compiled from SEFSC observer programs, including bottom longline, gillnet, and pelagic observer programs, the Northeast Fisheries Observer Program, the Atlantic HMS exempted fishing permit program, and recreational data, including the LPS and MRIP. The recreational data from

LPS and MRIP include estimated landings, whereas observer program data include observed dead discards. More information about the data used can be found in Chapter 1 of Amendment 5b (NOAA Fisheries 2017), available at www.fisheries.noaa.gov/action/amendment-5b-2006-consolidated-hms-fishery-management-plan-atlantic-shark-management. Prohibited species cannot be retained unless authorized with a specific permit, such as an exempted fishing permit. Given this, a very limited amount of data may be collected on prohibited sharks, and the data availability may be influenced by research or public display permits. As a result, the actual observed number of each species can change dramatically between years. This variability in catches can be observed in Table 6.27. Compared to 2018, catch increases were observed in 2019 for bigeye thresher, longfin mako, and night sharks and catch decreases were observed in Atlantic angel, basking, Caribbean reef, dusky, sand tiger, and white sharks. To account for these highly variable interannual observed catches, NOAA Fisheries uses three-year rolling averages to smooth the interannual variability, as is commonly done in time series with high variance. Table 6.28 presents the three-year rolling averages from 2015 through 2019 and identifies whether observed bycatch mortality in the most recent three-year average for each species has increased, decreased, or not changed since the previous three-year average. If there are significant increases in the observed three-year moving average mortality for a particular species or fishery, then NOAA Fisheries may consider additional management actions to address that mortality and ensure that bycatch remains small. For species with long-term mean observations of less than 10 individuals per year, NOAA Fisheries considers an order of magnitude (10x) to represent a significant increase. For species with long-term mean observations of 10 or greater, NOAA Fisheries considers an increase of more than two standard deviations from the mean to represent a significant increase.

Table 6.27 Observed and Estimated Shark Mortality (Dead Discards and Kept in Numbers of Sharks) in the Prohibited Shark Complex in 2015–2019

Species	2015	2016	2017	2018	2019
Atlantic angel	52	113	98	31	29
Basking	13	8	4	8	3
Bigeye sand tiger	0	0	0	0	0
Bigeye sixgill	0	0	0	0	0
Bigeye thresher	39	28	21	13	24
Bignose	1	1	0	0	0
Caribbean reef	0	0	0	1	0
Caribbean sharpnose	0	0	0	0	0
Dusky	141	29	22	121	19
Galapagos	0	0	0	0	0
Longfin mako	8	15	14	4	14
Narrowtooth	0	0	0	0	0
Night	14	8	31	74	83
Sand tiger	16	26	9	48	20
Sevengill	1	0	0	0	0
Sixgill	0	0	1	0	0
Whale	0	0	0	0	0
White	5	0	10	5	3
Total	290	228	210	305	195

Source: Southeast Gillnet Observer Program; Pelagic Observer Program; Northeast Fisheries Observer Program; Large Pelagics

Survey; Marine Recreational Information Program; Bottom Longline Observer Program; the exempted fishery permit program.

Table 6.28 **Three-Year Rolling Average Observed and Estimated Shark Mortality (Dead Discards and Kept in Numbers of Sharks) in the Prohibited Shark Complex in 2015–2019 and the Directional Change Between the Two Most Recent Three-Year Averages**

Species	2015–2017	2016–2018	2017–2019	Increase (+)/Decrease (-)/No Change (0)
Atlantic angel	88	81	53	-
Basking	8	7	5	-
Bigeye sand tiger	0	0	0	0
Bigeye sixgill	0	0	0	0
Bigeye thresher	29	21	19	-
Bignose	1	0	0	0
Caribbean reef	0	0	0	0
Caribbean Sharpnose	0	0	0	0
Dusky	64	57	54	-
Galapagos	0	0	0	0
Longfin mako	12	11	11	0
Narrowtooth	0	0	0	0
Night	18	38	63	+
Sand tiger	17	28	26	-
Sevengill	0	0	0	0
Sixgill	0	0	0	0
Whale	0	0	0	0
White	5	5	6	+
Total	290	228	210	305

*Denotes significant change. Source: Southeast Gillnet Observer Program; Pelagic Observer Program; Northeast Fisheries Observer Program; Large Pelagics Survey; Marine Recreational Information Program; Bottom Longline Observer Program; the exempted fishery permit program.

These data are the best available for monitoring bycatch of prohibited sharks; however, they only provide initial insights into potential trends in the overall fishing mortality rates of these species. They are not direct indicators of fishing mortality on their own but may signal species or fisheries that require closer evaluation. If significant increases in observed/estimated mortalities are noted in a particular species or fishery, these data would then be evaluated in more detail in conjunction with other related information, including observer coverage rates, fishing effort and CPUE trends, logbook and other available data, and fishery-independent indicators of relative abundance. For example, a significant increase in observed mortality could indicate increased fishing mortality, or it could simply reflect an increase in observer coverage rates, an increase in fishing effort, or an increase in the abundance of a rebuilding stock.

At this time, there are increases for night and white sharks in numbers of observed and estimated shark mortality. However, the increase in white sharks is not greater than an order of magnitude of the long-term mean; nor is the

increase in night sharks greater than two standard deviations of the long-term mean. Thus, based on the available data, no significant increases in prohibited shark bycatch are apparent at this time.

6.5 Atlantic HMS Bycatch in Other Fisheries

The following section summarizes the bycatch of Atlantic HMS in any federal or state-managed fishery that captures them. NOAA Fisheries continues to solicit bycatch data on Atlantic HMS from all state, interjurisdictional, and federal data collection programs.

6.5.1 Squid, Mackerel, and Butterfish Trawl Fisheries

Atlantic HMS fishermen who maintain an *Illex* squid trawl moratorium permit may land swordfish and smoothhound incidentally if they hold an Incidental HMS Squid Trawl permit. The trawl permit allows squid trawl fishermen to land up to 15 swordfish per trip and smoothhound sharks up to 25 percent by weight of the total catch onboard or offloaded from a trawl vessel. A total of 264 trips totaling 481 bottom otter trawl sets targeting mixed species on 129 vessels were observed in 2019 in the Northeast and Mid-Atlantic regions. The predominant shark species caught using bottom otter trawl included porbeagle, sandbar, and unclassified sharks (Table 6.29).

Swordfish and tuna landings by U.S. squid trawl fishermen using mid-water gear are reported to ICCAT. In 2019, 2 mt whole weight of yellowfin tuna, skipjack tuna, albacore tuna, bigeye tuna, and swordfish incidental to the squid, mackerel, and butterfish trawl fishery (Table 6.30) were reported. Bycatch of these species from other trawl fisheries may be included as a portion of the overall reported trawl landings. Swordfish landings remain low relative to the directed fishery landings.

Table 6.29 Total Bottom Otter Trawl Shark Catches from Non-Smooth Dogfish Targeted Sets by Species, and Species Disposition in Order of Decreasing Abundance for All Observed Trips, 2019

Species Caught	Common Name	Total Number Caught	Percent Kept	Percent Discarded Alive	Percent Discarded Dead	Percent Unknown Disposition
Lamna nasus	Porbeagle Shark	191	2.1	60.2	34.6	3.1
Carcharhinus plumbeus	Sandbar Shark	184	0.0	65.2	12.0	22.8
Carcharhinus	Sharks (Unclassified)	68	0.0	61.8	29.4	8.8
Alopias vulpinus	Thresher Shark	45	4.4	62.2	17.8	15.6
Galeocerdo cuvier	Tiger Shark	24	0.0	70.8	25.0	4.2
Sphyrna	Hammerhead UNK	21	0.0	90.5	4.8	4.8
Sphyrna lewini	Scalloped Hammerhead Shark	18	0.0	55.6	44.4	0.0
Prionace glauca	Blue Shark	7	0.0	71.4	28.6	0.0
Carcharhinus brevipinna	Spinner	5	0.0	80.0	20.0	0.0
	Pelagic Unk	2	50.0	0.0	50.0	0.0
Somniosus microcephalus	Greenland Shark	2	0.0	0.0	50.0	50.0
Carcharhinus falciformis	Silky Shark	1	0.0	100.0	0.0	0.0
Isurus oxyrinchus	Shortfin Mako Shark	1	0.0	100.0	0.0	0.0
Hexanchus griseus	Bluntnose Sixgill	1	0.0	0.0	0.0	100.0
Prohibited Sharks*		156				
Total		726				

* Landings, discards, and bycatch information of prohibited shark species across all Atlantic HMS fisheries is presented in Section 6.4.

Source: Northeast Fisheries Observer Program.

Table 6.30 Atlantic Highly Migratory Species Landed (mt ww) Incidental to Trawl Fisheries in 2015–2019

Species	2015	2016	2017	2018	2019
Yellowfin tuna	0.0	0.0	0.5	0.0	0.0
Skipjack tuna	1.1	0.0	0.1	<0.1	<0.1
Bigeye tuna	0.1	0.1	0.0	0.9	0.0
Albacore tuna	1.7	0.5	1.7	<0.1	1.1
Swordfish	2.8	6.0	6.8	1.0	10.6
Total	5.7	6.6	9.1	2.0	11.8

mt ww = Metric tons whole weight. Source: NOAA Fisheries 2020a.

6.5.2 Shrimp Trawl Fishery

For a summary of shark bycatch in the shrimp trawl fishery, see the 2011 SAFE Report. More recent estimates of blacknose shark bycatch in the shrimp fisheries can be found in the most recent blacknose stock assessment, SEDAR 21 (Cortés and Baremore 2011). Estimates of Atlantic sharpnose and bonnethead shark bycatch in the shrimp fisheries can be found in the most recent stock assessment reports for each (SEDAR 34a and SEDAR 34b).

6.5.3 Non HMS Bottom Longline Fisheries

The Northeast Fisheries Observer Program may observe highly migratory species on bottom longline trips which target other finfish species. In 2019, five vessels primarily targeting golden tilefish were observed interacting with highly migratory species on seven trips and 18 sets. Tiger sharks were most frequently encountered, representing 49 percent of the highly migratory species reported. Shark species caught and discarded in this fishery in 2019 are displayed in Table 6.31. Data on shark species caught and kept in this fishery can be found in Section 5.4.1, Table 5.51.

Table 6.31 Shark Species* Caught and Discarded on Observed Bottom Longline Trips Targeting Golden Tilefish and other Finfish in the North Atlantic in 2019

Species	Total Caught	Discarded Dead (%)	Discarded Alive (%)	Disposition Unknown (%)
Tiger shark	18	5.6	88.9	0.0
Porbeagle shark	1	100.0	0.0	0.0
Sandbar shark	1	100.0	0.0	0.0
Unidentified sharks	11	27.3	18.2	54.5
Total	31			

* Prohibited shark species landings and interactions are compiled and presented in Section 6.4, Bycatch in the Prohibited Shark Complex. Source: Northeast Fisheries Observer Program.

6.5.4 Gillnet Fisheries

6.5.4.1 Northeast and Mid-Atlantic Gillnet Fishery

Gillnet gear is the predominant gear type used in the smooth dogfish shark fishery in the Northeast and Mid-Atlantic regions. Observations in this fishery are reported through the Northeast Fisheries Observer Program. The gillnet fishery in these regions is a mixed fishery with a large portion of trips catching and retaining a variety of species, dominated by bluefish, croaker, and spiny dogfish.

Two types of gillnet gear, sink and drift, were observed in trips targeting mixed species other than smooth dogfish or other sharks (J. Mello, personal communication). Interactions with highly migratory species were observed on all trips. A total of 354 trips totaling 756 sets on 110 vessels were observed in 2019. Shark species dominated the catch, including porbeagle, unidentified sharks, Atlantic sharpnose, and sandbar sharks. A list of shark species caught and discarded by gillnet fishermen targeting mixed teleosts are presented in Table 6.32. Data on shark species caught and kept in this fishery can be found in Section 5.4.2, Table 5.52.

Drift gillnet gear was used in 234 sets on 83 trips by 32 vessels. The catch from drift gillnets not targeting sharks or smooth dogfish was dominated by Atlantic sharpnose, unidentified sharks, and spinner sharks. Sink gillnet gear not targeting sharks or smooth dogfish was used in 522 sets on 274 trips by 88 vessels. The catch with sink gillnet gear on these trips was dominated by porbeagle sharks, sandbar sharks, and unidentified sharks.

Table 6.32 **Shark Species* Caught and Discarded on Observed Trips across All Gillnet Gear Types Targeting Mixed Teleosts (Excluding Sharks and Smooth Dogfish) in 2019**

Common Name	Total Number Caught	Discarded Alive (%)	Discarded Dead (%)	Unknown Discard Status (%)
Porbeagle shark	556	4.9	91.5	2.3
Atlantic sharpnose shark	297	15.5	4.4	0.0
Sandbar shark	150	44.7	52.6	0.7
Spinner shark	90	21.1	3.3	0.0
Thresher shark	86	7.0	17.4	0.0
Scalloped hammerhead shark	44	34.1	11.4	2.3
Blacktip shark	35	22.9	14.2	2.9
Tiger shark	14	50.0	50.0	0.0
Smooth dogfish	10	0.0	0.0	40.0
Bonnethead shark	8	37.5	0.0	0.0
Blue shark	8	12.5	87.5	0.0
Blacknose shark	5	100.0	0.0	0.0
Smooth hammerhead shark	5	60.0	20.0	0.0
Unknown hammerhead species	4	75.0	0.0	25.0
Silky shark	1	100.0	0.0	0.0
Shortfin mako shark	1	0.0	100.0	0.0
Unidentified sharks	305	47.9	21.3	4.3
Total	1,619			

* Bycatch information of prohibited shark species across all Atlantic HMS fisheries is presented in Section 6.4. Source: Northeast Fisheries Observer Program.

6.5.4.2 Southeast Atlantic and Gulf of Mexico Gillnet Fishery

The Southeast Gillnet Observer Program covers anchored, strike, and drift gillnet fishing regardless of target species. In 2019, the Southeast program observed 95 sets comprised of various southeast gillnet fisheries. None of the gillnet trips observed targeted sharks. In the drift gillnet fishery, two gillnet vessels were observed making five drift gillnet sets on three trips, and in the strike gillnet fishery, one gillnet vessel was observed making one strike gillnet set on a single trip. Due to data confidentiality requirements under the Magnuson-Stevens Act, the details of the drift and strike gillnet trips cannot be further described. In the sink gillnet fishery, eight vessels were observed making 89 sink net sets on 21 trips in 2019. Observed sink gillnet trips exclusively targeted Spanish mackerel.

Table 6.33 outlines shark species composition for sharks caught and discarded during observed sink gillnet trips with observers onboard in 2019 (Mathers et al. 2020b, unpublished). Data on shark species caught and kept in this fishery can be found in Section 5.4.2, Table 5.54. Observations on drift and strike gillnet trips are not presented due to vessel confidentiality.

Table 6.33 Shark Species Caught and Discarded on Observed Southeast Sink Gillnet Trips Targeting Spanish Mackerel in 2019

Species	Total Caught	Discarded Alive (%)	Discarded Dead (%)
Atlantic sharpnose shark	407	59.0	31.2
Bonnethead shark	67	22.4	14.9
Blacktip shark	44	61.4	15.9
Spinner shark	24	12.5	0.0
Blacknose shark	15	26.7	0.0
Scalloped hammerhead shark	6	100.0	0.0
Total	563		

Source: Mathers et al. 2020b, unpublished.

6.5.5 Other Fisheries

The Northeast Fisheries Observer Program surveys anchored (sink) and drift gillnet fishing trips, regardless of target species. In 2019, 803 sets on 377 trips were observed on 114 vessels with gillnet fishing gear. Of these, smooth dogfish was the target species for nine vessels on 20 trips and 35 sets.

Table 6.34 of this section outlines shark species composition information for sharks other than smooth dogfish caught and discarded during Northeast Fisheries Observer Program-observed trips targeting smooth dogfish across all gear types. Data on shark species caught and kept in this fishery can be found in Section 5.4.3, Table 5.54.

Table 6.34 Non-Target Shark Species* Caught and Discarded on Observed Smooth Dogfish-Targeted Trips Across All Gear Types in 2019

Species	Total Caught (lb)	Discarded (%)
Thresher shark	1,125	18.8
Scalloped hammerhead shark	200	100.0
Tiger shark	100	100.0
Sandbar shark	81	100.0
Spinner shark	45	33.3
Unidentified sharks	40	100.0
Smooth hammerhead shark	3	100.0
Total	1,594	

* Prohibited shark species landings and interactions are compiled and presented in Section 6.4, Bycatch in the Prohibited Shark Complex. Source: Northeast Fisheries Observer Program.

6.6 Chapter 6 References

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7 Safety Data

7.1 Background

National Standard 10 of the Magnuson-Stevens Act requires that conservation and management measures taken under the act promote the safety of human life at sea to the extent practicable. Safety considerations that should be considered include the operating environment, gear and vessel loading requirements, limited season and area fisheries, and mitigation measures. NOAA Fisheries considers these and other factors when evaluating or developing management measures

The National Standard 10 guidelines are the primary source of guidance for the consideration of safety issues in fishery regulations. A NOAA Fisheries technical memorandum, Guidance on Fishing Vessel Risk Assessments and Accounting for Safety at Sea in Fishery Management Design (Lambert et al. 2015), promotes the evaluation and consideration of safety issues within fisheries management. Two specific tools that can be used by fishery managers to evaluate safety within fisheries, determine if proposed management measures create a safety concern, and develop solutions for reducing risk and improving safety are described: a safety checklist and a risk assessment methodology. Additionally, USCG maintains websites for each of its regions (www.uscg.mil/Units/Organization) that communicate regulatory and safety information and region-specific statistics. They also maintain a blog, the Coast Guard Maritime Commons (mariners.coastguard.blog), which reports on safety alerts, news bulletins, and regulatory information helpful for commercial and recreational fleets.

7.2 Commercial Fisheries Safety Statistics

Commercial fishing is one of the most dangerous occupations in the United States (Lambert et al. 2015). The Bureau of Labor Statistics data indicate that there were 44 fatalities in the fishing industry in 2019 (https://www.bls.gov/news.release/pdf/cfoi.pdf). This is equivalent to a work-related fatality rate of 145 deaths per 100,000 full-time equivalent workers. The all-worker rate is 3.5 fatalities per 100,000 full-time equivalent workers.

Work-related mortality in the U.S. fishing industry was analyzed in a study published by Lucas and Case (2018) across a 15-year time period (2000–2014) and across smaller time intervals (e.g., 2010–2014) to examine recent and longer term trends. Between 2000–2014, there were approximately 693 commercial fishing fatalities (~46/year) across U.S. fishing regions (Lucas and Case 2018, Table III). Of these 693 fatalities, 164 and 225 commercial fishing deaths occurred in Gulf of Mexico and Atlantic East Coast fisheries during that time period, respectively. The majority of fatalities were due to vessel disasters (e.g., sinking, capsizing, fires, groundings) and falls overboard (e.g., as a result of losing balance, tripping or slipping, becoming entangled in gear). During the most recent time period analyzed (2010–2014), Lucas and Case (2018) noted that victims were on average 44 years of age, predominantly male (98 percent), and most often deckhands (50 percent). Fishery-specific commercial fishing fatality frequencies and rates per 100,000 for some fleets was provided in this study (see Table IV), however these data were not provided for Atlantic HMS fisheries.

In a separate study, Case et al. (2018) evaluated data concerning fatal falls overboard for incidents reported between 2000 and 2016. A total of 204 commercial fishermen died from falls overboard, representing approximately 27 percent of all work-related deaths analyzed for this industry. Many (59.3 percent) of these falls overboard were not witnessed. Consistent with Lucas and Case (2018), most victims were male, many were experienced deckhands (median 16 years of experience), and none were wearing a PFD at the time of death. In cases where information was available, many of these falls overboard occurred while fishermen were working with gear (setting, hauling, or handling gear on deck). Information specific to Atlantic HMS fisheries was not provided in this paper, however conclusions are discussed in the broad context of U.S. fisheries.

NIOSH/CDC published in 2017 two summary documents that characterize Gulf of Mexico (https://www.cdc.gov/

niosh/docs/2017-174/pdf/2017-174.pdf?id=10.26616/NIOSHPUB2017174,%20respectively.) and Atlantic region (https://www.cdc.gov/niosh/docs/2017-173/pdf/2017-173.pdf?id=10.26616/NIOSHPUB2017173) fatal fishing events. No information specific to Atlantic HMS fisheries was provided for the Atlantic region in these publications. However, two of the incidents discussed in the Gulf of Mexico document occurred in the shark fishery. Information on other Atlantic HMS fisheries operating in the Gulf of Mexico was not provided.

The Commercial Fishing Safety Research and Design Program of the National Institute for Occupational Safety and Health recommends prioritizing the use of personal floatation devices when on deck. Gear entanglements are still a concern and recommended prevention strategies include the use of line bins and rope lockers. Man-overboard alarms and reboarding ladders are encouraged to help in the event of a fall overboard, particularly when fishermen are working alone.

The USCG published a report ("Flag State Control in the United States: 2019 Domestic Annual Report") to summarize statistics and information regarding inspections and enforcement of regulations on U.S. flagged vessels. In 2019, USCG marine inspectors conducted 21,471 inspections on U.S. flagged vessels and identified 31,738 deficiencies. On average, inspectors identified 1.48 deficiencies per inspection in 2019. A total of 1,142 and 3,500 fishing vessels (inclusive of vessels used for catching, processing, and support/tender) respectively participated in initial and renewal dockside examinations. Approximately 3,805 Commercial Fishing Vessel Safety decals were issued. During these exams approximately 10,178 deficiencies were noted. The 10 most prevalent deficiencies noted were for certificates/documentation, radio communications, life jackets/PFDs, immersion suits, piloting/steering (i.e., having charts and publications), firefighting (portable extinguishers), alarms/indicators, drills/instructions, collision/grounding avoidance (i.e., navigation lights/day shapes), and lifebuoys.

These exams are an important component of addressing safety at sea in commercial fisheries. Minor failures may not necessarily compromise the vessel, and can often be resolved at sea or in port without loss of life or property. However, these failures are often not resolved, and can lead to disaster or loss of life. Research by Case and Lucas (2020) suggests that vessels that experience less serious casualties (e.g., loss of propulsion, fire, or flooding) are often more at risk for a future disaster. Specifically, Case and Lucas found through investigation of several models that predictors of disaster events included having one or more casualties within 10 years, vessel size, hull type, and having expired safety decals. Vessel size and hull type was theorized to have more to do with exposure to high-risk situations, such that larger vessels with steel hulls tend to fish for longer periods of time further offshore (and often year-round) in comparison to smaller fiberglass-hulled vessels that may fish seasonally and/or closer to shore.

7.3 New Information on Commercial Fisheries Safety Practices

The Coast Guard Authorization Act of 2010, which elevated maritime safety with that of other U.S. Coast Guard responsibilities, and the U.S. Coast Guard and Maritime Transportation Act of 2012 included:

- Several safety regulations implemented between 2013 and 2016 (www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/MSIB/2014/018_14_12-1-2014.pdf).
- Dockside safety examinations increase safety of persons aboard vessels and are required to be fully compliant with existing fishing vessel safety regulations (46 CFR 41–47, Subchapter E, Load Lines). These safety examinations are also required if a commercial vessel must carry a NOAA Fisheries observer. In order to assist fishing vessel owners/operators with preparing their fishing vessel prior to examination by the Coast Guard, a customized checklist of items specifically tailored to fishing vessels can be created through the "Commercial Fishing Vessel Checklist Generator" at http://www.fishsafewest.info/DocksideExams.asp.
- Implementation and issuance of the first awards in 2019 under the Commercial Fishing Occupational Safety Research Cooperative Agreement and Training Project Grant Program. This research and training program was created to provide funding to advance fishing safety research and provide targeted, regionally appropriate training for the nation's commercial fishermen. Information on the program and awards can be found at https://www.cdc.gov/niosh/updates/upd-09-09-19.html.

In 2016, NOAA Fisheries published a final rule that removed vessel upgrade restrictions for Swordfish Directed and Atlantic Tunas Longline category permits (81 FR 84501; November 23, 2016). The action, which went into effect December 26, 2016, allowed fishermen to buy, sell, or transfer these permits without concerns of exceeding the maximum upgrade limit. It also allowed vessel owners to transfer permits to newer vessels. The removal of upgrade restrictions for these vessels provided an avenue for vessel owners to address safety issues that exist with older vessels through the transfer of their permits to newer vessels and to facilitate improvements while onboard without restrictions. In 2018, NOAA Fisheries finalized a tech memo to provide guidance on factors that can either positively or negatively influence fishing safety: https://www.fisheries.noaa.gov/resource/document/guidance-fishing-vessel-risk-assessments-and-accounting-safety-sea-fishery.

On January 5, 2018, NOAA Fisheries published a final rule (82 FR 57543) prohibiting the sale of any catch of Atlantic HMS by HMS Charter/Headboat permitted vessels unless they obtain a "commercial sale" endorsement as part of the permit. Interested permit holders can obtain the commercial sale endorsement for no additional cost when renewing or obtaining their HMS Charter/Headboat permit. Those individuals that hold an HMS Charter/Headboat permit with a "commercial sale" endorsement may be categorized as commercial vessels for the purposes of USCG commercial fishing vessel safety requirements. Those vessels holding an HMS Charter/Headboat permit without a "commercial sale" endorsement would not be categorized as commercial fishing vessels and would not be subject to the USCG commercial fishing vessel safety requirements. More information can be found here: https://www.fisheries.noaa.gov/bulletin/atlantic-highly-migratory-species-charter-headboat-permit-commercial-sale-endorsement.

In 2019, the Coast Guard released a Work Instruction to provide guidance on applying statutory and regulatory requirements to the commercial fishing industry, the Coast Guard, and third parties. The Work Instruction clarifies and consolidates existing Commercial Fishing Vessel Safety Program requirements related to dockside safety examinations and third-party organizations that conduct them. Additional information is available at www.fishsafewest.info/PDFs/3rdParty_WI.pdf.

In 2020, NOAA Fisheries adopted certain Safety at Sea initiatives in response to public health concerns to protect public health and to ensure the safety of fishermen, observers, and others. In response to the pandemic, NOAA Fisheries published an emergency action (effective from March 24, 2020, through September 23, 2020) that permitted the waiver of observer coverage requirements if travel conditions or social control guidance preclude observer placement, or if qualified observers are unavailable for placement due to health, safety, or training issues related to COVID-19 (85 FR 17285; March 27, 2020). In June 2020, NOAA Fisheries issued an emergency action to provide the authority, on a case-by-case basis, to waive observer coverage, some training, and other program requirements while meeting conservation needs and providing ongoing supplies of fish to markets (https://www.fisheries.noaa.gov/leadership-message/noaa-fisheries-continues-evaluate-observer-situation). National-level criteria for vessels to be waived (released) from observer or at-sea monitoring coverage were implemented in July 2020 based on the availability of observers and whether safety protocols imposed by a state on commercial fishing crew or by the vessel or vessel company on crew could be met (https://www.fisheries.noaa.gov/leadership-message/noaa-fisheries-identifies-national-level-observer-waiver-criteria-will-begin). NOAA Fisheries extended the March emergency action to waive observer requirements due to the ongoing COVID-19 pandemic, continued national and local declarations of emergency, and followed guidance from the Centers for Disease Control and Prevention (85 FR 59199; September 21, 2020).

On August 31, 2020, the USCG Office of Commercial Vessel Compliance published Work Instruction CVC-WI-025(1), "Risk Based Fishing Vessel Exam Program," which is intended to facilitate more frequent safety examinations of firefighting, lifesaving, and other safety systems on vessels that have a higher probability of being in a marine casualty.

7.4 Recreational Fisheries Safety Data

Safety at sea is not just an issue for commercial fisheries. Recreational boating statistics are published annually

by the U.S. Coast Guard Office of Auxiliary and Boating Safety (https://www.uscgboating.org/library/accident-statistics/Recreational-Boating-Statistics-2019.pdf).

The following summarizes recreational boating statistics, inclusive of recreational fishing activities for 2019 (USCG 2020):

- There were 11,878,542 recreational vessels registered by states.
- The Coast Guard reported 4,168 accidents involving 613 deaths, approximately 55 million dollars in damages, and 2,559 injuries as a result of recreational boating accidents.
- The fatality rate for 2019 was 5.2 deaths per 100,000 registered recreational vessels. This rate represents a 1.9 percent decrease from the 2018 fatality rate of 5.3 deaths per 100,000 registered recreational vessels.
- Where cause was known, most fatalities (79 percent) were associated with drowning. Approximately 86 percent of drowning victims were not wearing a life jacket at the time of fatality.
- Alcohol use was a leading known contributing factor in fatal boating accidents. Where the primary cause is known, it was listed as the principal factor in 23 percent of deaths.
- Accidents were attributed to several factors, the top five of which included operator inattention, improper lookout, operator inexperience, excessive speed, and alcohol use.
- From a summary of accident reports, approximately 680 vessels were engaged in fishing activities at the time of accidents, which resulted in 198 deaths and 261 injuries.

Regulations for recreational boaters, including recreational fishermen, are summarized at www.uscgboating.org/regulations. Recreational fishermen are also subject to safety regulations published by other federal agencies and from state and local agencies or entities.

7.5 Observer Safety Data for Atlantic HMS Fisheries

Fishery observers play a critical role in the sustainable management of our nation's fisheries. Fishing vessels participating in fisheries managed by the Atlantic HMS Management Division are subject to carrying fishery observers to collect data critical to evaluate the harvest and status of fish stocks. Observer programs administered by the Southeast and Northeast Fisheries Science Centers place observers on vessels participating in the shark bottom longline, pelagic longline, and gillnet fisheries, all of which target species managed under the 2006 Consolidated Atlantic HMS Fishery Management Plan.

Common safety issues identified for observers working aboard commercial fishing vessels are similar to those faced by commercial fishermen. These dangers include but are not limited to: the risk of falling overboard; entanglement with fishing gear, trips, slips, and falls; motion sickness; infection; and illness.

Due to the relatively dangerous nature of working aboard commercial fishing vessels, and the propensity of minor safety events to become complicated by the lack of ready access to emergency services while offshore, safety training is required during training of fishery observers and at-sea monitors. Additionally, any vessels selected for observer coverage must have a current U.S. Coast Guard dockside examination. A pre-trip vessel safety check performed by the observer is also required to be completed prior to departure. These precautions help ensure that in the event of an emergency, the opportunity to deescalate, avoid, or minimize damages due to equipment failure is maximized.

Information on safety incidents is collected during a trip and in post-trip debriefings by regional observer programs. While the safety record of fisheries observers has been generally good, the NOAA Office of Science and Technology conducted a review of Observer Program safety policies and practices was completed in 2018 (https://www.fisheries.noaa.gov/resource/document/observer-safety-program-review-report). The review summarized

156 incidents reported by the Pelagic Observer Program from 2011 through the first quarter of 2017. An additional 27 incidents have been reported by the Pelagic Observer Program for 2018 and 2019. The top three most frequent reported incidents were:

- 58 injuries reported.
- 53 illness reported.
- 49 sea sickness reported.

Biting bugs (bed bugs, ants, and other unidentified arthropods) and infection were also reported less frequently.

There were also 26 maritime casualties reported by observers while deployed:

- 8 fire incidents (3 leading to a loss of propulsion).
- 3 flooding incidents (1 leading to a sinking).
- 8 man overboard incidents.
- 10 loss of propulsion that required tow to port incidents.

While no quantitative measures were available for the Southeast Gillnet and Shark Bottom Longline Observer Programs at the time of the Observer Safety Program Review was published, it was noted that there have not been any events that triggered the Emergency Notification Plan in recent history.

An overview of the National Observer Program with more detailed information on region-specific operations can be found at https://www.fisheries.noaa.gov/topic/fishery-observers.

A regional observer program has also been established by ICCAT to collect data pertaining to transshipment of tuna and other species caught in the ICCAT Convention area. Under this program, foreign flagged vessels have carried observers of U.S. citizenship. Data available until 2018 indicate that there had been no health or safety problems encountered in the ICCAT Transshipment Regional Observer Program. ICCAT Recommendation 19-10 implemented further safety provisions for the program, including requiring an independent two-way satellite communication device be provided to observers, that vessels develop Emergency Action Plans, and that observers be allowed access to inspect safety equipment to ensure the vessel is appropriately outfitted for the entirety of each voyage.

7.6 Chapter 7 References

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8 Economics of Atlantic HMS Fisheries

8.1 Background

The development of conservation and management measures for Atlantic HMS fisheries is facilitated when there is an economic baseline against which the action or fishery may be evaluated. In this chapter, NOAA Fisheries used the past five years of data to facilitate the analysis of trends.

It should be noted that all dollar figures in this chapter are reported in current dollars. If analysis of real dollar trends controlled for inflation is desired, price indexes for 2015–2019 are provided in Table 8.1. To determine the real price in base year dollars, divide the base year price index by the current year price index and then multiply the result by the price that is being adjusted for inflation.

Table 8.1 Inflation Price Indexes in 2015–2019

Year	CPI-U	GDP Deflator	PPI Unprocessed Finfish
2015	237.0	104.6	610.2
2016	240.0	105.7	690.4
2017	245.1	107.7	674.9
2018	251.1	110.3	653.9
2019	255.7	112.3	673.4

Notes: CPI-U is the standard Consumer Price Index for All Urban Consumers (1982–1984=100) and the Producer Price Index (PPI) for unprocessed finfish (1982=100). The Gross Domestic Product (GDP) Implicit Price Deflator index is 2012=100. Source: U.S. Department of Labor Bureau of Labor Statistics (CPI-U and PPI); U.S. Department of Commerce Bureau of Economic Analysis (GDP).

8.2 Commercial Fisheries

In 2018, U.S. fishermen landed a total of 9.4 billion pounds of all fish species, valued at $5.6 billion at U.S. ports (Fisheries of the United States, 2018; NOAA Fisheries 2020). That represents a 5.3 percent decrease in landings from the 9.9 billion pounds landed in 2017. It is also a 2.8 percent increase in the value of the landings in 2018 compared to the year before.

The total value of commercial Atlantic HMS landings in 2019 was $34.6 million. Revenues of Atlantic HMS fisheries are further discussed in Section 8.2.2.

8.2.1 Ex-Vessel Prices

Ex-vessel prices are a measure of the monetary worth of commercial landings. The ex-vessel price depends on a number of factors, including the quality of the fish (e.g., freshness, fat content, method of storage), the weight of the fish, the supply of fish, and consumer demand. The average ex-vessel prices per pound dressed weight for 2015–2019 by species and area are summarized in Table 8.2.

Table 8.2 **Average Ex-Vessel Price Per Pound for Atlantic Highly Migratory Species by Area in 2015–2019**

Species	Area	2015 ($)	2016 ($)	2017 ($)	2018 ($)	2019 ($)
Bluefin tuna	Gulf of Mexico	5.75	5.88	5.20	5.71	4.58
	South Atlantic	7.27	6.79	6.15	6.80	5.76
	Mid-Atlantic	7.20	5.98	6.21	6.31	5.94
	North Atlantic	6.37	7.23	6.52	7.05	5.61
Albacore tuna	Gulf of Mexico	0.75	0.70	1.05	1.01	1.00
	South Atlantic	1.70	1.80	1.93	2.23	2.32
	Mid-Atlantic	1.34	1.38	1.35	1.98	1.31
	North Atlantic	1.34	1.93	1.49	1.96	1.73
Bigeye tuna	Gulf of Mexico	5.76	6.06	5.52	5.70	6.73
	South Atlantic	5.00	5.01	5.21	5.77	5.44
	Mid-Atlantic	5.88	5.64	5.47	6.22	6.27
	North Atlantic	4.79	5.45	4.53	4.77	4.68
Yellowfin tuna	Gulf of Mexico	4.27	3.49	3.76	4.36	4.38
	South Atlantic	3.46	3.18	3.34	3.83	3.73
	Mid-Atlantic	4.07	4.24	4.26	4.34	4.21
	North Atlantic	3.18	3.57	3.48	3.34	3.21
Skipjack tuna	Gulf of Mexico	-	-	0.71	1.24	0.90
	South Atlantic	0.68	0.88	0.87	0.90	0.83
	Mid-Atlantic	0.72	0.76	1.11	0.79	1.25
	North Atlantic	-	-	1.44	1.50	0.93
Swordfish	Gulf of Mexico	2.67	3.03	3.09	3.08	3.01
	South Atlantic	4.30	4.75	4.57	4.18	4.41
	Mid-Atlantic	3.86	4.31	3.96	3.93	4.12
	North Atlantic	3.25	4.67	4.37	4.21	4.07
Large coastal sharks	Gulf of Mexico	0.49	0.60	0.53	0.62	0.73
	South Atlantic	0.78	0.73	0.86	0.89	0.87
	Mid-Atlantic	0.74	0.70	0.95	0.71	0.94
	North Atlantic	-	-	-	-	-
Pelagic sharks	Gulf of Mexico	1.00	1.84	1.47	0.73	1.38
	South Atlantic	1.57	1.62	1.62	1.50	1.47
	Mid-Atlantic	1.19	1.31	1.18	1.33	1.19
	North Atlantic	1.68	1.93	2.03	1.64	1.44

Species	Area	2015 ($)	2016 ($)	2017 ($)	2018 ($)	2019 ($)
Small coastal sharks	Gulf of Mexico	0.35	0.38	0.41	0.54	0.59
	South Atlantic	0.76	0.73	0.98	1.02	1.02
	Mid-Atlantic	0.81	0.89	0.93	0.77	0.97
	North Atlantic	-	-	-	-	-
Smoothhound	Gulf of Mexico	-	-	-	0.65	1.08
	South Atlantic	0.71	0.84	0.94	0.93	1.13
	Mid-Atlantic	0.67	0.77	0.73	0.77	0.82
	North Atlantic	0.35	0.47	0.37	0.42	0.38
Shark fins	Gulf of Mexico	9.92	11.47	11.37	11.18	11.10
	South Atlantic	10.26	8.50	7.88	7.94	8.11
	Mid-Atlantic	1.95	2.36	2.44	2.18	1.87
	North Atlantic	0.80	-	-	1.50	2.25

Notes: Gulf of Mexico is Texas, Louisiana, Mississippi, Alabama, and west coast of Florida. South Atlantic is east coast of Florida, Georgia, South Carolina, and North Carolina. Mid-Atlantic is Virginia, Maryland, Delaware, New Jersey, New York, and Connecticut. North Atlantic is Rhode Island, Massachusetts, New Hampshire, and Maine. Source: eDealer; dealer weigh out slips from the Southeast Fisheries Science Center and Northeast Fisheries Science Center; eBFT.

The average 2019 ex-vessel prices for bluefin tuna have decreased 19.5 percent since 2018. The ex-vessel prices for bluefin tuna can be influenced by many factors, including market supply and the Japanese yen/U.S. dollar (¥/$) exchange rate. Figure 8.1 shows the average ¥/$ exchange rate, plotted with average ex-vessel bluefin tuna prices, from 2015 to 2019.

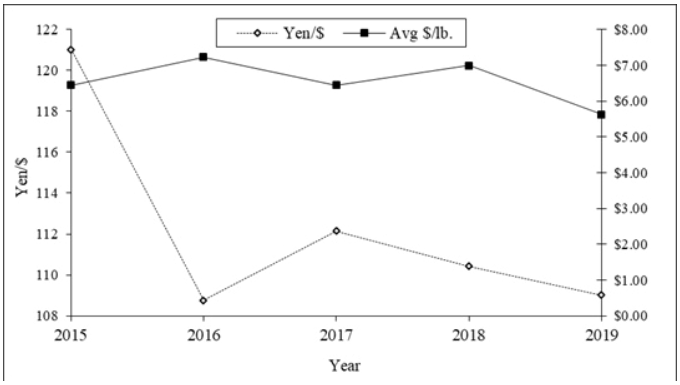

Figure 8.1 Average Annual Yen/$ Exchange Rate and Average U.S. Bluefin Tuna Ex-Vessel $/lb (dw) for All Gears in 2015–2019

dw = dressed weight. Source: Federal Reserve Bank (research.stlouisfed.org); NOAA Fisheries.

8.2.2 Revenues

Landings weight and price for most Atlantic HMS are collected from reports through NOAA Fisheries' electronic dealer reporting program, eDealer. For Atlantic bluefin tuna, landings weight and revenue are collected through the

electronic bluefin tuna dealer landings reporting system, known as eBFT. Table 8.3 summarizes the average annual revenues of Atlantic HMS fisheries based on average ex-vessel prices. These values indicate that the estimated total annual revenue of Atlantic HMS fisheries has increased to $34.6 million for 2019 from $33.3 million in 2018. Total revenue changes over the same time period for individual fisheries:

- Atlantic tuna: Increase of $0.1 million (Table 8.4).
- Atlantic swordfish: Decrease of $0.7 million (Table 8.5).
- Atlantic sharks: Increase of $1.9 million (Table 8.6).

Table 8.3 Estimates of the Total Ex-Vessel Annual Revenues of Atlantic Highly Migratory Species Fisheries in 2015–2019

Species	2015 ($)	2016 ($)	2017 ($)	2018 ($)	2019 ($)
Total tuna	23,262,035	24,654,371	26,531,264	22,751,128	$22,882,640
Total swordfish	10,175,662	10,351,695	9,012,183	7,540,277	$9,435,022
Total sharks	3,029,186	2,524,991	2,791,306	2,980,245	$2,280,126
Total Atlantic HMS	35,896,078	37,531,057	38,334,753	33,271,650	$34,597,788

Source: eDealer for bigeye, albacore, yellowfin, and skipjack tunas, swordfish, and sharks; eBFT for bluefin tuna.

Table 8.4 Estimates of the Total Ex-Vessel Annual Revenues of Atlantic Tunas in 2015–2019

Species	Values	2015	2016	2017	2018	2019
Bluefin	Ex-vessel*	$6.45	$7.23	$6.45	$6.99	$5.63
	Weight**	1,347,920	1,522,634	1,490,321	1,587,794	1,742,863
	Fishery revenue	$8,716,613	$11,008,644	$9,581,816	$11,010,617	$9,787,551
Albacore	Ex-vessel*	$1.46	$1.56	$1.63	$1.98	$1.76
	Weight**	409,210	373,792	364,723	164,483	334,002
	Fishery revenue	$593,911	$563,784	$652,948	$335,570	$571,281
Bigeye	Ex-vessel*	$5.35	$5.26	$5.33	$5.94	$5.79
	Weight**	1,129,017	711,488	991,718	735,581	1,026,960
	Fishery revenue	$5,454,461	$3,454,060	$5,371,772	$4,348,519	$5,934,807
Skipjack	Ex-vessel*	$0.72	$0.88	$0.92	$0.90	$1.04
	Weight**	3,421	6,213	6,216	3,816	3,340
	Fishery revenue	$2,269	$5,597	$6,633	$3,473	$3,031
Yellowfin	Ex-vessel*	$3.71	$3.53	$3.70	$4.03	$3.93
	Weight**	1,965,050	2,351,936	2,637,684	1,543,898	1,579,646
	Fishery revenue	$8,494,781	$9,622,286	$10,918,095	$7,052,949	$6,585,970
Total tunas	Fishery revenue	$23,262,035	$24,654,371	$26,531,264	$22,751,128	$22,882,640
Total highly migratory species	Fishery revenue	$35,896,078	$37,531,057	$38,334,753	$33,271,650	$34,597,788

*Dollars per pound dressed weight. **Pounds dressed weight. Source: eDealer for bigeye, albacore, yellowfin, and skipjack tunas; eBFT for bluefin tuna.

Table 8.5 Estimates of the Total Ex-Vessel Annual Revenues of Atlantic Swordfish in 2015–2019

Value	2015	2016	2017	2018	2019
Ex-vessel ($/lb dw)	$4.07	$4.54	$4.32	$4.10	4.32
Weight (lb dw)	2,576,537	2,448,044	2,019,857	1,750,631	2,239,596
Total fishery revenue	$10,175,662	$10,351,695	$9,012,183	$7,540,277	$9,435,022
Total highly migratory species fishery revenue	$35,896,078	$37,531,057	$38,334,753	$33,271,650	$34,597,788

Source: eDealer.

Table 8.6 Estimates of the Total Ex-Vessel Annual Revenues of Atlantic Sharks in 2015–2019

Shark Group	Value	2015	2016	2017	2018	2019
Large coastal sharks	Ex-vessel*	$0.66	$0.68	$0.72	$0.74	$0.82
	Weight**	1,593,989	1,276,747	1,311,408	1,634,872	796,415
	Fishery revenue	$885,305	$720,802	$746,642	$878,279	$506,112
Pelagic sharks	Ex-vessel*	$1.40	$1.54	$1.51	$1.42	$1.35
	Weight**	215,298	239,850	251,153	129,885	97,595
	Fishery revenue	$323,129	$387,688	$386,446	$160,772	$130,664
Small coastal sharks	Ex-vessel*	$0.57	$0.56	$0.74	$0.87	$0.94
	Weight**	553,419	370,118	437,094	432,483	456,167
	Fishery revenue	$410,305	$253,406	$364,181	$375,877	$422,633
Smoothhound	Ex-vessel*	$0.65	$0.75	$0.70	$0.74	$0.78
	Weight**	915,723	702,400	832,631	907,277	794,998
	Fishery revenue	$570,805	$502,717	$567,076	$678,309	$607,971
Shark fins	Ex-vessel*	$8.46	$8.36	$7.97	$8.71	$7.60
	Weight**	105,189	76,048	85,877	97,813	63,056
	Fishery revenue	$839,642	$660,378	$726,961	$887,008	$612,746
Total sharks	Fishery revenue	$3,029,186	$2,524,991	$2,791,306	$2,980,245	$2,280,126
Total highly migratory species	Fishery revenue	$35,896,078	$37,531,057	$38,334,753	$33,271,650	$34,597,788

*Dollars per pound dressed weight. **Pounds dressed weight. Source: eDealer.

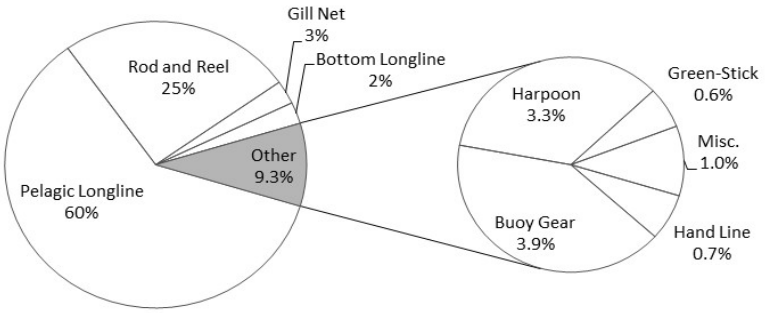

Figure 8.2 Percent of 2019 Total Ex-Vessel Revenues of Atlantic Highly Migratory Species Fisheries by Gear

Source: eDealer; eBFT.

Figure 8.2 displays the percent composition of the $34.6 million ex-vessel annual revenues landed in 2019 by fishing gear category. Based on dealer reports, approximately 60 percent of 2019 total revenues in the fishery were landed by pelagic longline gear. In addition, 25 percent of landings by value were from vessels using commercial rod and reel gear, 2 percent were from bottom longline gear, 3 percent were from gillnet, and 9 percent were from other gear categories. These other gear categories include harpoon, buoy gear, green-stick, hand line, and other miscellaneous gears.

8.2.3 Operating Costs

NOAA Fisheries collects operating cost information from commercial permit holders via logbook reporting. Each year, 20 percent of active Atlantic HMS commercial permit holders are selected to report economic information along with their Atlantic HMS Logbook or Southeast Coastal Fisheries Logbook submissions (see Section 10.3.1 for information on data collections). In addition, NOAA Fisheries also receives voluntary submissions of the trip expense and payment section of the logbook form from non-selected vessels. A majority of the operating cost information collected from these logbooks are from pelagic longline and bottom longline gears. As operating costs from other gear are limited, only pelagic longline and bottom longline gears are discussed below.

It should be noted that operating costs for the Atlantic HMS commercial fleet vary considerably from vessel to vessel. The factors that impact operating costs include unit input costs, vessel size, fishing gear, target species, and geographic location.

8.2.3.1 Pelagic Longline Vessels

Primary expenses associated with operating an Atlantic HMS permitted pelagic longline commercial vessel include labor, fuel, bait, ice, groceries, and other gear, as well as light sticks for swordfish trips. Unit costs are collected on some of the primary variable inputs associated with trips from vessel logbook data. The unit costs for fuel, bait, and light sticks are reported in Table 8.7.

Fuel costs per gallon remained unchanged from 2018 to 2019, and the cost per pound for bait also remained unchanged. The unit cost per light stick also remained unchanged from 2018 to 2019.

Table 8.7 Pelagic Longline Vessel Median Unit Costs for Fuel, Bait, and Light Sticks in 2015–2019

Input Unit Costs	2015	2016	2017	2018	2019
Fuel ($ per gallon)	2.20	1.81	2.10	2.50	2.50
Bait ($ per pound)	1.15	1.25	1.50	1.65	1.65
Light sticks ($ per stick)	0.30	0.35	0.35	0.35	0.35

Source: United Data Processing.

The median input costs per trip for the major variable inputs associated with Atlantic HMS trips taken by pelagic longline vessels are provided in Table 8.8. Fuel costs are one of the largest variable expenses. Total median pelagic longline vessel fuel costs per trip decreased 18.2 percent from 2018 to 2019.

Table 8.8 Median Input Costs (Dollars) for Pelagic Longline Vessel Trips in 2015–2019

Input Costs	2015	2016	2017	2018	2019
Fuel	1,920	1,850	2,169	2,445	2,000
Bait	2,250	2,244	2,000	2,077	2,000
Light sticks	720	700	740	840	646
Ice costs	750	900	1,080	1,183	900
Grocery expenses	900	900	900	900	900
Other trip costs	603	800	880	1,000	1,000

Source: United Data Processing.

Labor costs are also an important component of operating costs for Atlantic HMS pelagic longline vessels. Table 8.9 lists the number of crew on a typical pelagic longline trip. The median number of three crew members has been consistent from 2015 to 2019. Most crew and captains are paid based on a lay system. According to Atlantic HMS Logbook reports, owners are typically paid 50 percent of revenues. Captains receive a 25 percent share, and crew in 2019 received 25 percent on average. These shares are typically paid out after costs are netted from gross revenues. Median total shared costs per trip on pelagic longline vessels over the last five year ranged from a low of $6,033 in 2016 to a high of $6,889 in 2018.

Table 8.9 Median Labor Inputs for Pelagic Longline Vessel Trips in 2015–2019

Labor	2015	2016	2017	2018	2019
Number of crew	3	3	3	3	3
Days at sea	10	10	12	11	9
Owner share (%)	50	50	50	50	50
Captain share (%)	25	25	25	25	25
Crew share (%)	25	25	25	25	25
Total shared costs ($)	6,426	6,033	6,425	6,889	6,368

Source: United Data Processing.

In 2019, median reported total trip sales were $17,263. In 2018, median reported total trip sales were $20,193. In 2017, median reported total trip sales were $19,638. After adjusting for operating costs, median net earnings per trip were $11,214 in 2017. Median net earnings per trip decreased to $9,858 in 2018. Median net earnings per trip decreased to $9,544 in 2019.

8.2.3.2 Bottom Longline Vessels

The primary expenses associated with operating an Atlantic HMS-permitted bottom longline commercial vessel include labor, fuel, bait, ice, groceries, and other miscellaneous expenses. These expenses are reported in the Southeast Coastal Fisheries Logbook for vessels that have been selected for reporting economic information. Bottom longline trips primarily target shark species and are of short duration. Table 8.10 provides the median reported trip input costs from 2015 to 2019.

Table 8.10 Median Input Costs for Bottom Longline Vessel Trips in 2015–2019

Input Costs	2015	2016	2017	2018	2019
Fuel ($)	156	120	124	156	144
Bait ($)	50	61	60	50	100
Ice costs ($)	36	50	36	20	24
Grocery expenses ($)	40	40	20	20	10
Misc. trip costs ($)	54	20	20	0	20
Number of crew	2	2	2	2	3
Days at sea	1	1	1	1	1

Source: United Data Processing.

In 2019, median reported total trip sales were $2000 for vessels using bottom longline gear. In 2018, median reported total trip sales were $976 for vessels using bottom longline gear. In 2017, median reported total trip sales were $1,110. After adjusting for operating costs, median net earnings per bottom longline trip were $801 in 2017. Median net earnings per trip decreased to $609 in 2018. Median net earnings per trip increased to $1,192 in 2019.

8.3 Fish Processing and Wholesale Sectors

Consumers spent an estimated $11.6 billion on domestically processed fishery products from domestic and imported products. This includes $10.7 billion on edible fishery products, including fresh, frozen, canned, and cured, and $889.3 million on industrial fishery products. Tuna are in the top five species processed at 384 million pounds valued at $836 million (NOAA Fisheries 2020).

NOAA Fisheries does not currently have specific information regarding the costs and revenues for Atlantic HMS dealers. In general, dealer costs include purchasing fish, paying employees, processing fish, managing reporting obligations, rent or mortgage, and supplies to process the fish. Some dealers may provide loans to the vessel owner or money for vessel repairs, fuel, ice, bait, etc. In general, dealer expenditures and revenues are not as variable or unpredictable as those of a vessel owner. However, dealer costs may fluctuate depending upon supply of fish, labor costs, and equipment repair.

Although NOAA Fisheries does not have specifics regarding Atlantic HMS dealers, there is some information on the number of processors and wholesalers employees in the United States provided in Fisheries of the United States (NOAA Fisheries 2020). Table 8.11 provides a summary of available information.

Table 8.11 **Processors and Wholesalers: Plants and Employment in 2019**

Region	State	Processor[1] Plants	Processor[1] Employment	Wholesale[2] Plants	Wholesale[2] Employment	Total Plants	Total Employment
New England	ME	33	742	185	1,360	218	2,102
	NH	7	*	12	98	19	98
	MA	45	2,457	163	2,406	208	4,863
	RI	8	212	30	*	38	*
	CT	4	80	21	*	25	80
Total New England		97	3,491	411	3,864	508	7,143
Mid-Atlantic	NY	22	388	276	2,185	298	2,573
	NJ	18	496	82	1,074	100	1,570
	PA	4	84	29	703	33	787
	DE	4	*	8	24	12	24
	DC	-	-	3	*	3	*
	MD	19	321	44	809	63	1,130
	VA	36	1,329	64	522	100	1,851
Total Mid-Atlantic		103	2,618	506	5,317	609	7,935
South Atlantic	NC	26	680	69	796	47	1,476
	SC	4	17	23	169	27	186
	GA	7	717	31	801	38	1,518
	FL	42	1,579	321	2,706	363	4,285
Total South Atlantic		79	2,993	444	4,472	523	7,465
Gulf of Mexico	AL	34	1,451	13	255	47	1,706
	MS	23	2,432	22	123	45	2,555
	LA	61	1,592	106	758	167	2,350
	TX	48	1,542	153	1,414	201	2,956
Total Gulf of Mexico		166	7,017	294	2,550	460	9,567
Total inland states/ other areas**		63	1,590	301	3,675	364	5,265

[1]Based on North American Industry Classification System 3117 as reported to the Bureau of Labor Statistics. [2]Based on North American Industry Classification System 42446 as reported to the Bureau of Labor Statistics. *Included with the category "Inland States/Other Areas." **Includes Puerto Rico and U.S. Virgin Islands. Source: NOAA Fisheries 2020.

8.4 International Trade

Several regional fishery management organizations, including ICCAT, use consignment documents to collect international trade data, which is then used to estimate landings in international Atlantic HMS fisheries and identify compliance problems with regional organizations' management measures. The United States collects general trade data through the U.S. Customs and Border Protection's International Trade Data System, in collaboration with the

U.S. Bureau of the Census (Census Bureau). NOAA Fisheries provides searchable Census Bureau trade data for marine fish products for the public at www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade.

Data on the amount and value of imports and exports are categorized under the Harmonized Tariff Schedule (HTS), which is the primary resource for determining tariff classifications of goods imported to the United States. Many Atlantic HMS have distinct HTS codes, and some species are further subdivided by the disposition of the product (e.g., fresh or frozen, fillets, and steaks). Some species are combined into groups (e.g., sharks), which can limit the value of these data for fisheries management, when species-specific information is required. Data may be further limited if the ocean area of origin for each product is not distinguished for species found globally. For example, the HTS code is the same for bigeye tuna from the Atlantic, Pacific, and Indian oceans.

This section describes general U.S. trade monitoring programs for Atlantic HMS products and the relevant Atlantic HMS trade monitoring programs of regional fishery management organizations. Statistics describing U.S. trade activity for Atlantic HMS products between 2009 and 2019 are also provided.

8.4.1 The Use of Trade Data for Management Purposes

Trade data have been used in a number of ways to support the international management of Atlantic HMS. When appropriate, the Standing Committee on Research and Statistics uses ICCAT trade data from consignment document programs such as the electronic Bluefin Tuna Catch Document, Swordfish Statistical Document, or frozen Bigeye Tuna Statistical Document, as an indication of landings trends. These data can augment estimates of the fishing mortality of these species, which improves scientific stock assessments. Trade data can also assist in assessing compliance with ICCAT recommendations and identifying those countries whose fishing practices diminish the effectiveness of ICCAT conservation and management measures.

8.4.2 Atlantic HMS Trade Documentation Programs

NOAA Fisheries implemented the Atlantic HMS International Trade Program (ITP) in 2005 (69 FR 67268; November 17, 2004) to identify importers and exporters of bluefin tuna, swordfish, and frozen bigeye tuna products that require trade monitoring or "consignment" documentation. Under this program, traders in these species and shark fins were required to obtain the International Trade Permit. On August 3, 2016 (81 FR 51126), NOAA Fisheries replaced the 2005 program with the International Fisheries Trade Permit and expanded its scope to include dolphin-safe tuna imports covered by the Tuna Tracking and Verification Program (www.fisheries.noaa.gov/dolphin-safe) and the trade of Patagonia/Antarctic toothfish, also known as Chilean sea bass (www.fisheries.noaa.gov/national/international-affairs/importing-and-exporting-antarctic-marine-living-resources-and). This rulemaking also implemented mandatory electronic reporting of import and export documentation per the Safety and Accountability For Every Port Act, also known as the SAFE Port Act of 2006. On April 1, 2016 (81 FR 18796), NOAA Fisheries implemented the electronic version of the ICCAT Bluefin Tuna Catch Documentation program for Atlantic bluefin tuna, known as eBCD. On December 9, 2016 (81 FR 88975), NOAA Fisheries implemented the Seafood Import Monitoring Program, which added shark and tuna importers to the list of traders required to obtain the International Fisheries Trade Permit and report trade data to NOAA Fisheries via the International Trade Data System (effective January 1, 2018).

ICCAT trade monitoring programs are described in greater detail in the 2011 SAFE Report. Further information on NOAA Fisheries' International Fisheries Trade Permit and associated reporting requirements are available through www.fisheries.noaa.gov/permit/international-fisheries-trade-permit.

8.4.3 Convention on International Trade in Endangered Species of Wild Fauna and Flora

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement that regulates the global trade in plants and wildlife to ensure that international trade does not threaten their survival. International trade in Appendix II species (Table 8.12) is regulated in part through CITES export permits issued by the exporting country. Species listed on Appendix II are vulnerable to overexploitation but not at

risk of extinction. To import an Appendix II species or specimen, a proper export permit must be included with the import. That permit may only be issued if the CITES authorities of the exporting country make a determination that the export will not be detrimental to the survival of the species, the specimen was legally acquired in accordance with national wildlife protection laws, and any live specimen will be shipped in a manner that will minimize injury, damage, or cruel treatment. Specimens of Appendix II species harvested on the high seas must be accompanied by an introduction from the sea certificate or an export permit, depending on where the specimen is landed. Specimens landed in the United States must be landed in a U.S. Fish and Wildlife-designated port. The re-export of any specimen of a species included in Appendix II requires a re-export certificate. In addition to Appendix II, CITES also has Appendix I, which includes species prohibited in international commercial trade, and Appendix III, which includes species for which a country has requested help with monitoring trade. The three appendices of CITES can be found at cites.org.

Any dealer who intends to import, export, or re-export Atlantic HMS listed on CITES Appendix II, or any fisherman who lands these species from the high seas, must have the appropriate permits from the U.S. Fish and Wildlife Service. More information is available at www.fws.gov/international/permits/by-species/sharks-and-rays.html.

Table 8.12 Atlantic HMS Managed Species Listed on CITES Appendix II

Atlantic HMS Species on Appendix II	Conference of Parties (CoP)	Meeting Year
Basking shark	CoP13	2004
Whale shark	CoP13	2004
White shark	CoP13	2004
Hammerhead shark, great	CoP16	2013
Hammerhead shark, scalloped	CoP16	2013
Hammerhead shark, smooth	CoP16	2013
Oceanic whitetip shark	CoP16	2013
Porbeagle shark	CoP16	2013
Silky shark	CoP17	2016
Thresher shark	CoP17	2016
Longfin mako shark	CoP18	2019
Shortfin mako shark	CoP18	2019

CITES = The Convention on International Trade in Endangered Species of Wild Fauna and Flora.

8.4.4 U.S. Exports of Atlantic HMS

Exports may include merchandise of both domestic and foreign origin. The Census Bureau defines exports of domestic merchandise to include commodities that are grown, produced, or manufactured in the United States (e.g., fish caught by U.S. fishermen). For statistical purposes, domestic exports also include commodities of foreign origin that have been altered in the United States from the form in which they were imported or that have been enhanced in value by further manufacture in the United States. The value of an export is defined as the value at the port of export based on a transaction price, including inland freight, insurance, and other charges incurred in placing the merchandise alongside the carrier. It excludes the cost of loading the merchandise, freight, insurance, and other charges or transportation costs beyond the port of export.

The value of Atlantic HMS exports is nationally dominated by tuna products. In 2019, fresh and frozen tuna products accounted for 11,402 mt dw of the 1.2 million mt dw of principal fresh and frozen seafood products exported from the United States (NOAA Fisheries 2020). The value of these Atlantic HMS tuna products accounted

for $49.3 million out of a national total of $4.9 billion. U.S. trade data collected for most Atlantic HMS combine products from both the Atlantic and Pacific Ocean, which are not identified by area of catch. Atlantic-specific trade trends for those species cannot be accurately determined. For swordfish, bluefin tuna, and frozen bigeye tuna, data from international trade-tracking consignment document programs can be used to differentiate area of catch, and determine the amount of product originating from the Atlantic.

8.4.4.1 Atlantic and Pacific Bluefin Tuna Exports

Table 8.13 gives bluefin tuna export data for exports from the United States since 2009 and includes NOAA Fisheries dealer data, ICCAT eBCD consignment document program data, and U.S. Census Bureau data. The Census Bureau usually reports a greater amount of bluefin tuna exported when compared to the amount reported by NOAA Fisheries. Additional quality control measures taken by NOAA Fisheries ensure data for other species (e.g., southern bluefin tuna) or other transaction types (e.g., re-exports) are removed from the NOAA Fisheries bluefin tuna export data. The effectiveness of the eBCD program, implemented in 2016, is demonstrated through increased timely data access and improved summary data accuracy. Bluefin tuna re-export data are listed separately in Section 8.4.5. In Table 8.13 and depicted in Figure 8.3, U.S. exports of Atlantic bluefin tuna ranged from a low of 139 mt in 2013 to a high of 375.1 mt in 2016. From 2016–2019, exports remained about 300 mt while landings increased dramatically. Exports of Pacific bluefin decreased dramatically in 2018–2019 compared to the previous four years. Most U.S. bluefin tuna exports are destined for the sushi markets in Japan. In Figure 8.3, U.S. domestic landings of Atlantic bluefin tuna that are exported are compared to those that are consumed in the United States from 2009 to 2019. For the first half of the time series shown in Figure 8.3, domestic consumption of U.S. landings remained fairly constant (i.e., between 100 and 200 mt); however, domestic landings consumption increased to approximately 400 mt per year after 2014, and to nearly 700 mt in 2019.

Table 8.13 U.S. Exports of Atlantic and Pacific Bluefin Tuna in 2009–2019

Year	Atlantic BFT Commercial Landings[1] (mt dw)	Atlantic BFT Exports[2] (mt dw)	Pacific BFT Exports[2] (mt dw)	Total U.S. Exports[2] (mt dw)	Total U.S. Exports[3] (mt)	Value of U.S. Exports[3] ($ MM)
2009	408.5	236.2	0.0	236.2	300	4.05
2010	509.5	334.2	0.0	334.2	346	4.90
2011	453.6	329.5	0.8	330.5	293	4.03
2012	451.8	334.5	0.0	334.5	511	4.91
2013	283.0	139.0	0.0	139.0	296	2.92
2014	454.2	195.3	160.8	356.1	381	3.36
2015	763.8	265.4	150.4	415.8	527	5.52
2016	863.1	375.1	287.7	662.8	624	5.95
2017	676.4	284.2	212.8	497.0	473	5.65
2018	719.2	314.0	3.5	317.5	461	5.17
2019	1009.0	315.2	47.3	362.5	537	5.71

Note: Most Pacific exports were in whole weight form, although some exports were in product form as dressed or gilled/gutted fish. Atlantic exports were almost entirely dressed, but also included whole and other product forms. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. dw = Dressed weight. Source: [1]Atlantic HMS Management Division; [2]eBCD; [3]U.S. Census Bureau.

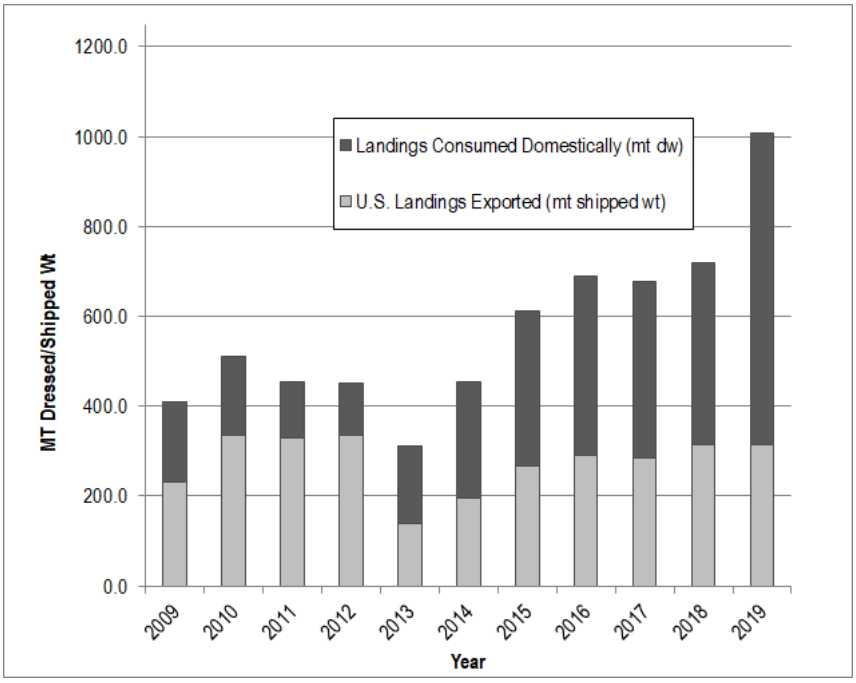

Figure 8.3 Annual U.S. Domestic Landings of Atlantic Bluefin Tuna Divided into U.S. Export and U.S. Domestic Consumption in 2009–2019

mt = Metric tons. dw = Dressed weight. Source: eBCD; U.S. Census Bureau.

Figure 8.4 demonstrates exports as a percentage of the commercial U.S. bluefin tuna harvest from 1996 to 2019. Exports were greatest at 89 percent in 1996, and were stable at just over 40 percent from 2013 through 2018. In 2019, exports decreased to 30 percent of a relatively large harvest (1,009 mt).

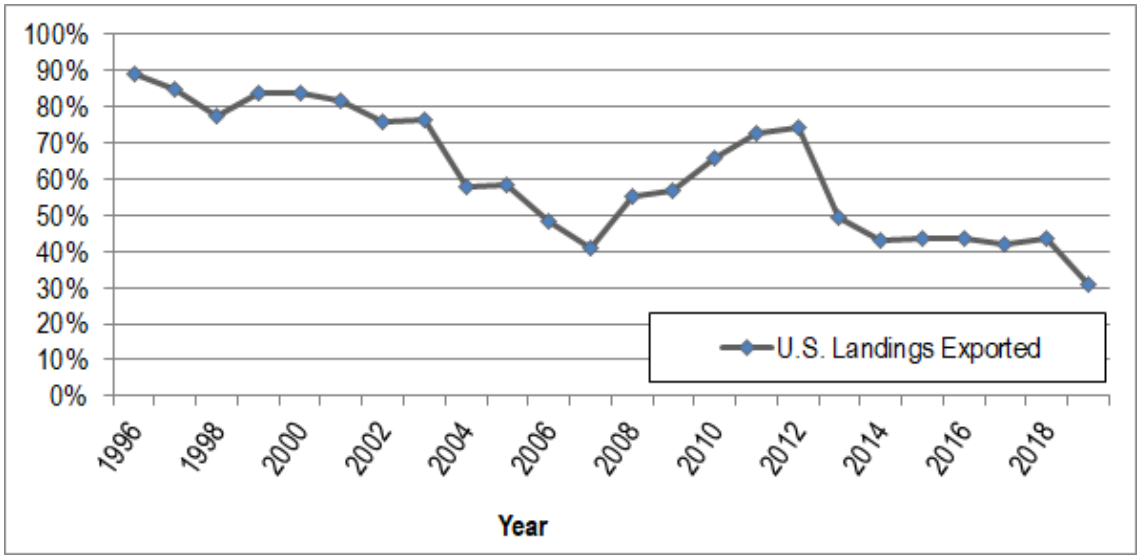

Figure 8.4 Annual Percentage by Weight of Commercially Landed U.S. Atlantic Bluefin Tuna Exported in 1996–2019

Source: eBCD; U.S. Census Bureau.

8.4.4.2 Other Tuna Exports

Export data for bigeye, albacore, yellowfin, and skipjack tunas gathered by the U.S. Census Bureau combines data from all ocean areas of origin. The value of annual albacore exports exceeded the value for any other tuna export since the beginning of the time series and has remained over $22 million and over 5,400 mt per year between 2009 and 2019 (Table 8.14). Atlantic albacore tuna landings ranged between 103 mt in 2018 and 599 mt in 2013, while total U.S. exports of albacore ranged between 5,425 mt in 2019 and 15,251 mt in 2013. This indicates that most albacore exports are Pacific in origin. Recently, lowest levels in total U.S. exports have been observed between 2019 and 2017 at 5,425 mt and 6,154 mt, respectively, where each of these years accounted for less than half of the highest quantity recorded in 2013 at 15,251 mt.

Table 8.14 U.S. Atlantic Landings and Total U.S. Exports of Albacore Tuna From All Ocean Areas in 2009–2019

Year	Atlantic Landings[1] (mt dw)	Fresh Exports[2] (mt)	Fresh Value[2] ($ MM)	Frozen Exports[2] (mt)	Frozen Value[2] ($ MM)	Total Exports[2] (mt)	Total Value[2] ($ MM)
2009	189	417	1.02	9,903	22.58	9,510	23.60
2010	315	1,269	3.25	8,528	23.31	9,798	26.56
2011	422	531	1.47	9,807	23.73	10,338	25.20
2012	418	1,256	4.46	9,787	26.51	11,043	30.97
2013	599	1,481	4.88	13,770	34.73	15,251	39.62
2014	459	2,970	8.56	8,905	27.52	11,875	36.09
2015	354	1,733	5.18	7,121	21.41	8,855	26.59
2016	250	983	2.83	13,749	37.61	14,732	40.44
2017	238	205	0.58	5,949	29.77	6,154	30.36
2018	103	568	1.70	6,231	27.11	6,800	28.80
2019	221	540	1.57	4,886	20.78	5,425	22.35

Note: Landings include recreational catch and dead discard data from statistical surveys that were re-calibrated for 2014 and beyond. Exports may be in whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. ww = Whole weight. Source: [1]NOAA Fisheries 2020; [2]U.S. Census Bureau.

U.S. Atlantic landings and exports of yellowfin tuna from all ocean areas are shown in Table 8.15. Annual yellowfin tuna exports were unusually high in 2017 and 2018, reflecting a large increase in the export of frozen product. Total yellowfin tuna exports for 2012–2015 were consistent at about 850 mt per year, but decreased by almost half in 2016 before significantly increasing in 2017 and 2018 to levels over 1,400 mt.

Table 8.16 shows variability in the amount and value of exported fresh and frozen skipjack tuna over the time series without any perceptible pattern. Atlantic landings have ranged between 44 mt in 2019 and 199 mt in 2017. Total value peaked at $3.4 million in 2013, while total exports peaked at 737 mt in 2009. Total exports and value have decreased gradually over the last three years.

Table 8.15 U.S. Atlantic Landings and Total U.S. Exports of Yellowfin Tuna From All Ocean Areas in 2009–2019

Year	Atlantic Landings[1] (mt dw)	Fresh Exports[2] (mt)	Fresh Value[2] ($ MM)	Frozen Exports[2] (mt)	Frozen Value[2] ($ MM)	Total Exports[2] (mt)	Total Value[2] ($ MM)
2009	2,802	221	2.51	274	0.66	495	3.17
2010	2,482	211	2.31	70	0.33	281	2.64
2011	3,010	278	3.03	56	0.23	334	3.26
2012	4,100	311	3.35	535	1.91	846	5.26
2013	2,332	224	2.55	624	1.88	848	4.43
2014	3,197	332	2.46	554	1.33	886	3.78
2015	2,798	213	1.02	634	1.87	847	2.89
2016	4,104	82	0.84	401	1.44	483	2.29
2017	4,444	84	0.90	1,730	4.65	1,814	5.54
2018	2,700	40	0.53	1,434	3.35	1,474	3.88
2019	2,656	55	0.54	845	2.25	900	2.80

Note: Landings include recreational catch and dead discard data from statistical surveys that were re-calibrated for 2014 and beyond. Exports may be in whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. ww = Whole weight. Source: [1]NOAA Fisheries 2020; [2]U.S. Census Bureau.

Table 8.16 U.S. Atlantic Landings and Total U.S. Exports of Skipjack Tuna in 2009–2019

Year	Atlantic Landings[1] (mt dw)	Fresh Exports[2] (mt)	Fresh Value[2] ($ MM)	Frozen Exports[2] (mt)	Frozen Value[2] ($ MM)	Total Exports[2] (mt)	Total Value[2] ($ MM)
2009	119	206	0.54	530	0.71	737	1.25
2010	54	194	0.57	126	0.17	319	0.73
2011	87	162	0.47	14	0.05	176	0.52
2012	112	46	0.17	293	1.17	334	1.34
2013	118	10	0.04	575	3.40	585	3.43
2014	184	152	0.23	77	0.52	228	0.75
2015	97	23	0.09	116	0.18	139	0.27
2016	179	47	0.12	26	0.13	73	0.25
2017	199	31	0.08	148	0.38	180	0.46
2018	78	56	0.13	610	1.11	667	1.24
2019	44	33	0.12	60	0.09	93	0.22

Note: Landings include recreational catch and dead discard data from statistical surveys that were re-calibrated for 2014 and beyond. Exports may be in whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. ww = Whole weight. Source: 1NOAA Fisheries 2020; 2U.S. Census Bureau.

Bigeye tuna exports and Atlantic landings are given in Table 8.17. Atlantic landings ranged from a low of 515 mt

in 2009 to a high of 1,082 in 2015. Unlike most other products discussed, Atlantic landings for bigeye tuna exceed total U.S. exports annually. Bigeye tuna exports include more fresh than frozen product, except in 2008, 2012, and 2018, when exports of frozen product were greater. The total amount and value of exports peaked in 2012 at 679 mt and $3.52 million. They then dropped substantially, reaching the lowest levels for the time series in 2015 at 39 mt and $ 0.36 million. The total amount and value of exports increased in 2017 and have declined steadily since then.

Table 8.17 U.S. Atlantic Landings and Total U.S. Exports of Bigeye Tuna in 2009–2019

Year	Atlantic Landings[1] (mt dw)	Fresh Exports[2] (mt)	Fresh Value[2] ($ MM)	Frozen Exports[2] (mt)	Frozen Value[2] ($ MM)	Total Exports[2] (mt)	Total Value[2] ($ MM)
2009	515	121	1.53	78	0.19	199	1.72
2010	571	141	1.96	37	0.11	179	2.07
2011	719	199	2.13	44	0.13	243	2.26
2012	867	293	2.38	386	1.14	679	3.52
2013	880	147	1.36	25	0.13	172	1.49
2014	896	66	0.66	8	0.85	73	0.74
2015	1,082	26	0.27	13	0.10	39	0.36
2016	568	37	0.45	6	0.10	43	0.54
2017	836	316	1.85	15	0.12	331	1.98
2018	921	50	0.40	113	0.51	164	0.91
2019	831	61	0.46	2	0.03	64	0.49

Note: Landings include recreational catch and dead discard data from statistical surveys that were re-calibrated for 2014 and beyond. Exports may be in whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. ww = Whole weight. Source: 1NOAA Fisheries 2020; 2U.S. Census Bureau.

8.4.4.3 Shark Exports

Export data for sharks gathered by the U.S. Census Bureau include trade data for sharks from any ocean area of origin. Shark exports are not categorized to the species level, with the exception of spiny dogfish, and are not identified by a specific product code other than fresh meat, frozen meat, and, beginning in 1998, shark fins. The specific HTS code assigned to shark fins in 1998 distinguished the high relative value of the product compared to shark meat. There is no tracking of shark products besides meat and fins. As a result, NOAA Fisheries cannot track trade in shark leather, oil, cartilage, or other shark products.

Table 8.18 indicates the amount and value of shark exports, excluding smoothhound sharks, by the United States from 2009 to 2019. The amount and value of shark exports were greatest in 2016, and have decreased steadily since then. Exports of dried shark fins were highest (56 mt) in 2009 but are much lower since then, ranging between 6 mt and 19 mt for 2011–2019. In 2017, HTS codes were implemented identifying other shark fin products as "frozen" and "fresh," improving tracking of the product. The value of fins in these categories are much lower per unit than dried shark fins (Table 8.19).

Table 8.18 Amount and Value of U.S. Shark Products Exported in 2009–2019

Year	Fin Export* (mt)	Fin Value* ($ MM)	Fresh Export† (mt)	Fresh Value† ($ MM)	Frozen Export† (mt)	Frozen Value† ($ MM)	Total Exports (mt)	Total Value ($ MM)
2009	56	2.82	254	0.72	320	1.33	630	4.87
2010	36	2.89	222	0.67	244	0.52	502	4.08
2011	15	1.51	333	0.89	59	0.22	407	2.62
2012	11	0.99	436	1.08	1,054	4.52	1,501	6.58
2013	12	0.79	196	0.57	1,043	5.21	1,250	6.57
2014	19	0.98	218	0.57	828	5.31	1,064	6.86
2015	18	1.02	273	0.66	930	4.92	1,221	6.60
2016	12	0.85	285	0.61	1,499	7.38	1,794	8.83
2017**	11	0.62	474	0.89	730	2.05	1,305	3.79
2018	10	1.08	462	0.89	206	0.69	678	2.53
2019	6	0.37	320	0.71	23	0.08	348	1.15

Note: Exports may be in whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. *Prior to 2017, shark fin exports may include fresh, frozen, and dried products. **New Harmonized Tariff Schedule codes for shark fins were implemented in 2017, allowing for tracking of fresh and frozen shark fins. †Fresh and frozen shark product not provided to species. Source: U.S. Census Bureau.

Table 8.19 Amount and Value of Total U.S. Shark Fin Products Exported in 2017–2019

Year	Dried Exports (mt)	Dried Value ($ MM)	Fresh Exports (mt)	Fresh Value ($ MM)	Frozen Exports (mt)	Frozen Value ($ MM)	Total Exports (mt)	Total Value ($ MM)
2017	11	0.62	2	0.01	88	0.22	101	0.85
2018	10	0.95	4	0.03	12	0.10	26	1.08
2019	6	0.37	0	0	32	0.26	38	0.62

Note: U.S. shark fin products include dried, fresh, and frozen shark fins. New Harmonized Tariff Schedule codes for fresh and frozen products were implemented in 2017. $ MM = Millions of dollars. mt = Metric tons. Source: U.S. Census Bureau.

8.4.4.4 Swordfish Exports

Swordfish HTS categories were modified in 2012, allowing for data about exported quantities of "fresh" swordfish meat to be collected (Table 8.20). The low cost and year-round availability of swordfish imports into the United States are believed to have reduced the marketability of U.S. domestic swordfish. A modest export market for U.S. swordfish product exists, but total exports have been decreasing with minor fluctuations. In 2009, the U.S. exported 231 mt of swordfish, while the 2019 total was 107 mt.

Table 8.20 Amount and Value of U.S. Swordfish Product Exported in 2009–2019

Year	Fresh Fillet Export (mt)	Fresh Fillet Value ($ MM)	Frozen Fillet Export (mt)	Frozen Fillet Value ($ MM)	Fresh Fish Export (mt)	Fresh Fish Value ($ MM)	Frozen Fish Export (mt)	Frozen Fish Value ($ MM)	Fresh Meat Export* (mt)	Fresh Meat Value* ($ MM)	Frozen Meat Export (mt)	Frozen Meat Value ($ MM)	Total Exports (mt)	Total Value ($ MM)
2009	43	0.38	19	0.23	133	0.81	12	0.04	-	-	24	0.13	231	1.59
2010	98	0.71	16	0.15	134	0.78	1	0.01	-	-	3	0.02	252	1.67
2011	32	0.26	31	0.28	134	0.80	72	0.45	-	-	1	0.01	269	1.80
2012	0	0.01	4	0.05	141	0.82	11	0.09	7	0.09	5	0.03	168	1.09
2013	0	0	18	0.09	160	0.87	13	0.13	2	0.04	2	0.02	196	1.15
2014	1	0.01	14	0.14	115	0.63	22	0.06	3	0.04	1	0.01	156	0.90
2015	1	0.01	24	0.23	94	0.56	20	0.12	1	0.01	9	0.04	148	0.97
2016	1	0.01	5	0.04	87	0.46	38	0.31	6	0.07	3	0.02	140	0.91
2017	1	0.01	9	0.08	64	0.36	9	0.03	3	0.06	0	0	102	0.54
2018	1	0.03	25	0.15	101	0.54	9	0.06	4	0.06	26	0.07	166	0.91
2019	2	0.04	1	0.01	97	0.51	0	0.00	4	0.06	3	0.04	107	0.65

*Harmonized Tariff Schedule codes were not available for fresh swordfish meat prior to 2012. $ MM = Millions of dollars. mt = Metric tons. Source: U.S. Census Bureau.

8.4.4.5 Re-Exports of Atlantic HMS

For purposes of Atlantic HMS international trade tracking, the term "re-export" refers to a product that has been "entered for consumption" into the United States and then exported to another country, with or without further processing in the United States (from 50 CFR Part 300, Subpart M, International Trade Documentation and Tracking Programs for Atlantic HMS). Re-export activity of most Atlantic HMS is normally a small fraction of export activity and well below relative reference points of 1,000 mt and/or $1 million annually. Exceptions include re-exports of yellowfin tuna (fresh or frozen) and shark fins which may exceed 1,000 mt and frequently exceed the value reference point of $1 million over the last 10 years. Annual re-export figures in excess of either of these relative reference points, other than for bluefin tuna, are given in Table 8.21. Re-exports of bluefin tuna, alongside bluefin tuna imports, are shown in Section 8.4.5.

Table 8.21 Re-Exports of Highly Migratory Species (Excluding Bluefin Tuna) in Excess of 1,000 mt* and/or $1 Million (U.S.) in 2009–2019

Year	Product	Amount (mt)	Value ($ MM)
2009	Yellowfin tuna, fresh	162	2.18
2010	Yellowfin tuna, fresh	130	1.88
2010	Yellowfin tuna, frozen	340	1.12
2011	Yellowfin tuna, fresh	117	1.85
2011	Swordfish fillet, frozen	302	2.70
2011	Shark fins, dried	23	1.42
2012	Yellowfin tuna, fresh	123	2.26
2012	Yellowfin tuna, frozen	515	1.63
2012	Shark fins**	41	1.86
2012	Shark, unspecified, frozen	405	1.46
2013	Yellowfin tuna, fresh	102	1.80
2014	Yellowfin tuna, fresh	65	1.17
2015	None	-	-
2016	None	-	-
2017	None	-	-
2018	Yellowfin tuna, frozen	412	1.49
2019	None	-	-

$ MM = Millions of dollars. * Atlantic HMS re-exports weights have not exceeded 1,000 mt during this time period. **In 2012, the product classification "shark fin, dried" in the Harmonized Tariff Schedule was renamed "shark fins." Source: U.S. Census Bureau.

8.4.5 U.S. Imports of Atlantic HMS

All import shipments must be reported to and cleared by Customs and Border Protection. General imports are reported when a commodity enters the country, and consumption imports consist of entries into the United States for immediate consumption combined with withdrawals from Customs and Border Protection-bonded warehouses. Consumption import data reflect the actual entry of commodities originating outside the United States into U.S. channels of consumption. As discussed previously, Customs and Border Protection data for certain products are provided to NOAA Fisheries for use in implementing trade tracking programs. Census Bureau import data are used by NOAA Fisheries as well.

8.4.5.1 Atlantic and Pacific Bluefin Tuna Imports

Atlantic and Pacific bluefin tuna import amounts are recorded by Customs and Border Protection and by the Atlantic HMS Management Division through the Atlantic HMS ITP, which includes data from ICCAT bluefin catch documents. These programs differ in data collection methods and data quality review. A comparison of total bluefin import data between the two programs in 2009–2019 is shown in Table 8.22.

In the early part of the time series, import amounts between the two programs differed, at times to a large degree; however, since the implementation of ICCAT's eBCD program in 2016, import amounts are more similar. As shown in the Atlantic HMS ITP bluefin catch documentation data, imports have increased annually since 2012. A contributing factor to this increased import market is the rise in popularity in the United States of sashimi using Atlantic and Pacific bluefin tuna. Re-exports of bluefin tuna in 2013 were particularly high, with 2018 being the third highest re-export year in the time series. The value of bluefin tuna in 2018 is the highest in the time series.

U.S. consumption of Atlantic bluefin tuna is calculated by first combining the total landings and imports and then subtracting the total amount of exports and re-exports. U.S. consumption has increased over the last six years to an all-time high for the time series in 2018 (Figure 8.5). Consumption of domestic landings was consistent until 2014, ranging between about 100 and 200 mt per year. Since then, domestic landings consumption has climbed closer to 400 mt, where it has remained since 2016. Consumption of imported bluefin tuna has been more variable but has increased substantially each year since 2013. Figure 8.6 also shows U.S. domestic landings and imports of Atlantic bluefin tuna alongside exports and re-exports since 2008. Annually, the United States has imported more bluefin tuna than it has exported. This trade gap has increased noticeably since 2015.

Table 8.22 U.S. Imports and Re-Exports of Atlantic and Pacific Bluefin Tuna from Two Data Collection Programs in 2009–2019

Year	Imports (mt)—Atlantic HMS ITP*	Imports (mt)—CBP Data	Value ($ MM)—CBP Data	Re-Exports (mt)—Atlantic HMS ITP*
2009	407.7	476.8	10.29	33.6
2010	512.3	682.5	15.75	61.5
2011	442.5	555.4	14.01	35.1
2012	400.2	770.4	14.74	25.9
2013	569.0	1,177.5	20.52	71.3
2014	670.4	1,087.2	20.75	40.7
2015	861.0	1,243.9	21.46	32.7
2016	1,338.0	1,303.5	25.65	39.8
2017	1,777.2	1,760.5	33.20	38.1
2018	2,232.1	2,235.6	47.69	50.1
2019	1,859.7	2,542.8	56.34	71.5

CBP = U.S. Customs and Border Protection

Note: Most imports of bluefin tuna were in dressed form, while some were round and gilled/gutted fish or fillets or belly meat. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. *Atlantic catch documentation data after 2015 collected by the International Commission for the Conservation of Atlantic Tunas eBCD program. Source: Highly Migratory Species International Trade Program (bluefin catch documentation through 2015 and eBCD after 2015); U.S. Customs and Border Protection.

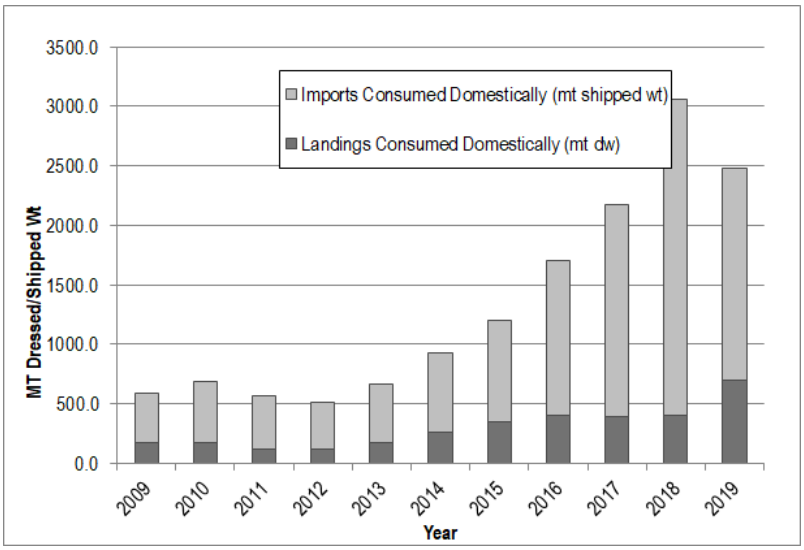

Figure 8.5 U.S. Annual Consumption of Atlantic and Pacific Bluefin Tuna by Imports and U.S. Landings in 2009–2019

Note: Annual U.S. imports, re-exports, exports, and landings are also depicted. Consumption is defined as landings combined with imports minus all exports and re-exports. mt = Metric tons. wt = Weight. dw= Dressed weight.

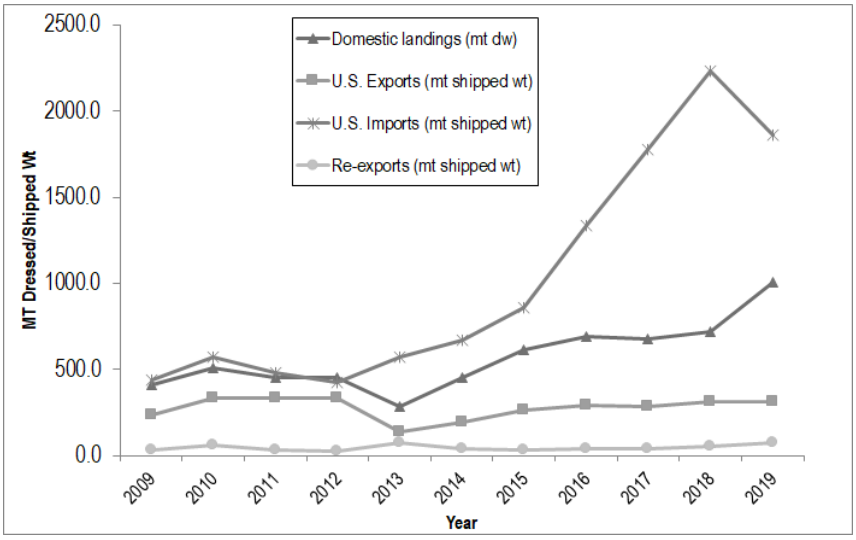

Figure 8.6 U.S. Domestic Landings of Atlantic Bluefin Tuna, and Exports, Imports and Re-Exports of Atlantic and Pacific Bluefin Tuna in 2009–2019

mt = Metric tons. wt = Weight. dw= Dressed weight.

8.4.5.2 Other Tuna Imports

Customs and Border Protection collects species-specific import information for bigeye, albacore, yellowfin, and skipjack tunas grouped to include all ocean areas. Table 8.23 shows the total amount of bigeye tuna imports between 2009 and 2019. Total annual imports are reported between 4,000 mt and 5,000 mt since 2010 for all but two years in the time series where they fell to about 3,500 mt (2011, 2018).

Table 8.23 U.S. Imports of Bigeye Tuna From All Ocean Areas Combined in 2009–2019

Year	Fresh Imports (mt)	Fresh Value ($ MM)	Frozen Imports (mt)	Frozen Value ($ MM)	Total Imports (mt)	Total Value ($ MM)
2009	5,459	41.72	1,125	2.36	6,584	44.08
2010	4,025	32.39	316	0.73	4,340	33.12
2011	3,011	26.72	487	1.01	3,498	27.73
2012	3,723	33.43	580	1.22	4,304	34.65
2013	4,023	35.51	498	1.02	4,521	36.52
2014	4,126	35.61	338	0.68	4,465	36.30
2015	5,023	45.17	6	0.02	5,029	45.20
2016	4,217	36.91	36	0.09	4,253	37.00
2017	3,876	34.01	193	0.44	4,070	34.44
2018	3,198	31.24	236	0.52	3,435	31.77
2019	3,287	31.90	1,687	3.64	4,974	35.54

Note: Imports may be whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. Source: U.S. Census Bureau.

Annual yellowfin tuna imports into the United States for all ocean areas combined are in Table 8.24. Yellowfin tuna products are imported in the greatest quantity of all the Atlantic HMS-managed tuna in both fresh and frozen products, with a majority of the products imported fresh. The highest annual levels of total yellowfin imports was in 2018 at just over 20,000 mt. Total imports had generally been increasing since 2015, but dropped in 2019.

Table 8.24 U.S. Imports of Yellowfin Tuna From All Ocean Areas Combined in 2009–2019

Year	Fresh Imports (mt)	Fresh Value ($ MM)	Frozen Imports (mt)	Frozen Value ($ MM)	Total Imports (mt)	Total Value ($ MM)
2009	14,199	112.34	2,868	24.73	17,067	137.07
2010	15,985	128.69	2,077	16.91	18,062	145.60
2011	15,635	141.83	2,398	17.56	18,033	159.39
2012	15,829	152.66	2,076	25.84	17,905	178.52
2013	16,031	156.58	2,602	24.69	18,633	181.27
2014	16,160	155.73	2,029	13.94	18,183	169.62
2015	15,532	146.76	2,657	18.62	18,189	165.38
2016	16,550	150.96	3,207	24.91	19,757	175.87
2017	16,278	150.94	3,385	31.44	19,663	182.38
2018	16,602	168.08	3,525	33.44	20,127	201.52
2019	16,208	161.45	3,487	35.70	19,695	197.15

Note: Imports may be whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. Source: U.S. Census Bureau.

The amount of fresh and frozen albacore products imported from all ocean areas (Table 8.25) was greatest in 2011 (4,462 mt) and lowest in 2019 (1,334 mt) without any perceptible pattern from year to year. The greatest total value of albacore imports was in 2017 ($11.25 million). Imports for both fresh and frozen products fell by more than 50 percent in 2018 compared to the previous year, but values did not. Products in airtight containers like cans and foil pouches are not included in these data.

Skipjack tuna imports into the United States are comprised mainly of frozen product (Table 8.26). The total amount of skipjack imports has generally been decreasing during the time series. A notable exception from this trend occurred in 2012, when 890 mt of skipjack tunas were imported. Products in airtight containers like cans and foil pouches are not included in these data.

Table 8.25 U.S. Imports of Albacore Tuna From All Ocean Areas Combined in 2009–2019

Year	Fresh Imports (mt)	Fresh Value ($ MM)	Frozen Imports (mt)	Frozen Value ($ MM)	Total Imports (mt)	Total Value ($ MM)
2009	718	3.07	1,493	3.46	2,211	6.53
2010	519	2.19	1,860	5.17	2,380	7.36
2011	669	3.05	3,794	7.17	4,462	10.22
2012	748	3.53	1,178	2.61	1,926	6.14
2013	858	3.57	2,199	4.27	3,057	7.84
2014	844	3.49	1,362	3.14	2,205	6.63
2015	962	4.25	1,373	3.04	2,335	7.29
2016	1,014	5.07	2,240	4.26	3,254	9.33
2017	1,072	5.06	2,369	6.19	3,441	11.25
2018	886	4.12	685	6.26	1,571	10.38
2019	640	3.43	694	4.71	1,334	8.14

Note: Imports may be whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. Source: U.S. Census Bureau.

Table 8.26 U.S. Imports of Skipjack Tuna from All Ocean Areas Combined in 2009–2019

Year	Fresh Imports (mt)	Fresh Value ($ MM)	Frozen Imports (mt)	Frozen Value ($ MM)	Total Imports (mt)	Total Value ($ MM)
2009	20	0.04	498	0.63	519	0.67
2010	36	0.09	542	0.79	578	0.87
2011	2	0.05	594	0.92	595	0.96
2012	23	0.05	866	1.16	890	1.21
2013	38	0.11	272	0.51	310	0.62
2014	70	0.13	395	0.62	467	0.75
2015	4	0.03	230	0.36	233	0.39
2016	0	0	251	0.37	251	0.37

Year	Fresh Imports (mt)	Fresh Value ($ MM)	Frozen Imports (mt)	Frozen Value ($ MM)	Total Imports (mt)	Total Value ($ MM)
2017	0	0	129	0.24	129	0.24
2018	1	0.01	100	0.19	101	0.19
2019	0	0	11	0.03	11	0.03

Note: Imports may be whole weight or product weight. Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. Source: U.S. Census Bureau.

8.4.5.3 Swordfish Imports

Table 8.27 provides annual amounts and values of swordfish products from all ocean areas combined that were imported into the United States from 2009 to 2019. Overall, annual totals for products and value are increasing over the time series, with the total import amount and value ranging from a low of 7,272 mt in 2009 to a high of 11,684 mt in 2018. Imports fell slightly in 2019, and 2016 to 2018 showed a trend of decreasing product value coupled with increasing product amount.

Table 8.27 Imported Swordfish Products (mt dw*) in 2009–2019

Year	Fresh Fillet	Fresh Steak	Fresh Meat	Fresh Other	Frozen Fillet	Frozen Steak	Frozen Meat[1]	Frozen Meat[2]	Frozen Other	Total Imports (mt)	Total Value ($ MM)
2009	53	10	0	5,312	1,632	112	96	23	33	7,272	55.85
2010	125	2	0	5,228	2,077	153	277	45	31	7,939	68.33
2011	74	1	0	5,060	2,116	139	1,384	471	12	9,258	68.64
2012	13	2	66	5,478	2,013	604	825	43	15	8,993	77.01
2013	31	2	62	6,011	1,394	457	182	4	12	8,093	71.38
2014	31	0	24	7,137	1,575	512	153	<1	32	9,442	82.00
2015	2	162	15	7,751	1,833	578	454	38	56	10,890	87.85
2016	3	20	2	7,780	1,905	266	379	2	10	10,367	87.36
2017	9	4	1	7,100	2,831	325	862	2	18	11,150	85.79
2018	4	3	2	7,863	2,386	264	1,129	14	18	11,684	85.53
2019	24	1	1	7,316	2,139	229	709	17	20	10,456	80.03

Note: Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. dw = Dressed weight. *Imports may be whole weight or product weight. [1]Frozen meat > 6.8 kg. [2]Frozen meat ≤ 6.8 kg. Source: U.S. Census Bureau.

Table 8.28 summarizes swordfish import data collected by the NOAA Fisheries Swordfish Statistical Document Program for the 2019 calendar year. According to these data, most swordfish imports were Pacific Ocean product from Central and South America. Most North Atlantic imports came from Canada, and South Atlantic product came from Brazil. Customs and Border Protection data located at the bottom of the table reflect a larger amount of imports than reported by the import monitoring program and may be used by NOAA Fisheries staff to follow up with importers, collect statistical documents that have not been submitted, and enforce dealer reporting requirements. Customs and Border Protection data may include product that is improperly labelled as swordfish.

Table 8.28 U.S. Imports (mt dw) of Swordfish by Flag of Harvesting Vessel and Ocean of Origin in 2019

Harvesting Vessel Flag	Atlantic	North Atlantic	South Atlantic	Pacific	Western Pacific	Indian	Not Provided	Total
Australia	0	0	0	0.28	138.12	0	0	138.40
Belize	0	0	7.21	0	0	0	0	7.21
Brazil	0	8.42	1,264.10	0	0	0	0	1,272.52
Canada	0	253.75	0	0	0	0	0	253.75
Chile	0	0	0	153.69	0	0	0	153.69
China	0	0	0	33.11	0	29.43	0	62.54
Chinese Taipei	13.73	0	16.39	91.27	0	242.56	0	363.95
Costa Rica	0	0	0	763.66	1.38	0	0	765.03
Ecuador	0	0	0	3,153.40	0.27	0	16.90	3,170.56
Egypt	0	0	0	0.20	0	0	0	0.20
El Salvador	0	0	0	0.43	0	0	0	0.43
Fiji Islands	0	0	0	9.94	9.41	0	0	19.35
France	0	0	0	0	0	6.37	0	6.37
French Polynesia	0	0	0	33.53	0	0	0	33.53
India	0	0	0	0	0	0.30	0	0.30
Indonesia	0	0	0	21.07	0	142.09	0	163.17
Malaysia	0	0	0	0	0	7.17	0	7.17
Maldives	0	0	0	0	0	66.09	0	66.09
Marshall Islands	0	0	0	0.55	0	0	0	0.55
Mauritus	0	0	0	0	0	2.90	0	2.90
Mexico	0	0	0	228.38	0	0	0	228.38
Mozambique	0	0	0	0	0	113.29	0	113.29
New Zealand	0	0	0	0	108.08	0	0	108.08
Nicaragua	0	0	0	37.75	0	0	0	37.75
Panama	0	0	0	0.45	0	0	0	0.45

Harvesting Vessel Flag	Atlantic	North Atlantic	South Atlantic	Pacific	Western Pacific	Indian	Not Provided	Total
Saint Vincent and the Grenadines	0	0.06	0	0	0	0	0	0.06
Samoa	0	0	0	0.75	0	0	0	0.75
Senegal	0	59.22	0	0	0	0	0	59.22
Seychelles	0	0	0	0	0	107.23	0	107.23
South Africa	0	0	250.55	2.78	0	57.03	0	310.37
Spain	0	0	0	2.08	0	0.60	0	2.68
Sri Lanka	0	0	0	0	0	83.84	0	83.84
Trinidad & Tobago	0	2.90	0.38	0	0	0	0	3.28
Vanuatu	0	0	0	51.77	0	0	0	51.77
Vietnam	0	0	0	159.79	0	0	0	159.79
Total Imports Reported by Statistical Documents								7,754.63
Total imports reported by U.S. Customs and Border Protection								10,456.42
Total imports not reported by statistical documents								2,701.79

mt dw = Metric tons dressed weight. Source: NOAA Fisheries Swordfish Statistical Document Program.

8.4.5.4 Shark Imports

NOAA Fisheries does not require shark importers to collect and submit information regarding the ocean area of catch. Shark imports are not categorized by species and lack specific product information on imported shark meat, such as the proportion of fillets and steaks. Table 8.29 summarizes Census Bureau data on shark imports for 2009 through 2019. Imports of fresh and frozen shark were lowest in 2018 at 34 mt. Imports of dried shark fins have been variable between a range of 0 mt in 2019 and 63 mt in 2013. In 2017, fresh and frozen shark fins were given new HTS codes (Table 8.30). Total shark fin imports for all categories have declined since 2017. As of July 2, 2008, shark fin importers, exporters, and re-exporters must obtain a permit under NOAA Fisheries Atlantic HMS ITP regulations (73 FR 31380; June 2, 2008). Permitting of shark fin traders assists in enforcement and monitoring the trade of this valuable commodity.

Table 8.29 U.S. Imports of Shark Products† From All Ocean Areas Combined in 2009–2019

Year	Dried Fins (mt)	Fins Value ($ MM)	Fresh Shark* (mt)	Fresh Value* ($ MM)	Frozen Shark* (mt)	Frozen Value* ($ MM)	Total Imports (mt)	Total Value ($MM)
2009	21	0.97	180	0.37	125	1.50	326	2.83
2010	34	1.18	114	0.33	34	1.16	182	2.66
2011	58	1.79	72	0.22	32	1.20	162	3.21
2012**	43	0.77	88	0.30	9	0.07	141	1.14
2013	63	0.74	153	0.46	3	0.05	219	1.25
2014	35	0.45	105	0.35	8	0.20	146	0.99
2015	24	0.29	88	0.32	21	0.26	133	0.87
2016	56	0.69	67	0.23	108	0.60	231	1.52
2017***	35	0.54	65	0.26	30	0.20	238	1.30
2018	3	0.01	30	0.14	0	0	34	0.30
2019	0	0.00	56	0.24	1	0.01	56	0.24

Note: Data are preliminary and subject to change. $ MM = Millions of dollars. mt = Metric tons. †Imports may be whole weight or product weight. *Shark product not reported to species. **In 2012, the product classification "shark fin, dried" in the Harmonized Tariff Schedule was renamed "shark fins." ***New HTS codes for shark fins were implemented in 2017, allowing for tracking of fresh and frozen shark fins. See total shark fin exports in Table 8.19. Source: U.S. Census Bureau.

Table 8.30 U.S. Imports of Total Shark Fin Products in 2017–2019

Year	Dried Fins (mt)	Dried Value ($ MM)	Fresh Fins (mt)	Fresh Value ($ MM)	Frozen Fins (mt)	Frozen Value ($ MM)	Total Fins (mt)	Total Value ($ MM)
2017	35	0.54	44	0.15	65	0.14	143	0.83
2018	2	0.15	3	0.01	0	0.00	4	0.15
2019	0	0.00	1	0.00	0	0.00	1	0.00

Note: The Harmonized Tariff Schedule code for shark fins was sub-divided into fresh, frozen, and dried in 2017. $ MM = Millions of dollars. mt = Metric tons. Source: U.S. Census Bureau.

8.5 Recreational Fisheries

Atlantic HMS recreational fishing provides significant positive economic impacts to coastal communities that are derived from individual angler expenditures, recreational charters, tournaments, and the shoreside businesses that support those activities.

8.5.1 Recreational Angling

A report summarizing the results of the 2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation was released in September 2017. This report, which is the 13th regarding a series of surveys that has been conducted about every five years since 1955, provides relevant information, such as the number of anglers, expenditures by type of fishing activity, number of participants and days of participation by animal sought, and demographic characteristics of participants. The survey estimated that 8.3 million Americans participated in saltwater recreational fishing in 2016 and spent over 75 million days fishing in saltwater. This was down from 8.9 million participants and 99 million days of recreational saltwater fishing in 2011. The final national report and the data CD-ROM are available from the U.S. Fish and Wildlife Service (USFWS 2011). More information on the 2016 national survey is available at wsfrprograms.fws.gov/subpages/nationalsurvey/2016_Survey.html.

In 2014, NOAA Fisheries conducted a partial update of the National Marine Recreational Fishing Expenditure Survey that collected data on marine angler expenditures for fishing equipment and durable goods related to recreational fishing (e.g., boats, vehicles, tackle, electronics, and second homes). This survey covered Atlantic HMS anglers from Maine to Texas. Atlantic HMS anglers in the Northeast, from Maine to Virginia, were found to spend $12,913 on average for durable goods and services related to marine recreational fishing. Of that, $5,284 could be attributed to Atlantic HMS angling, based on their ratio of Atlantic HMS trips to total marine angling trips. The largest expenditures items for marine angler durable goods among HMS anglers in this Northeast region were for new boats ($3,305), used boats ($2,835), boat maintenance ($1,532), and boat storage ($1,486). Atlantic HMS anglers in the Northeast were estimated to have spent a total of $61 million on durable goods for Atlantic HMS angling, which in turn was estimated to generate $73 million in economic output and support 697 regional jobs in 2014 (Lovell et al. 2016).

Atlantic HMS anglers from North Carolina to Texas were found to spend $29,532 on average for durable goods and services related to marine recreational fishing. Of that, $15,296 could be attributed to Atlantic HMS angling, based on their ratio of HMS trips to total marine angling trips. The largest expenditures items for marine angler durable goods among Atlantic HMS anglers in this Southeast region were for new boats ($8,954), used boats ($6,579), boat maintenance ($3,028), boat storage ($1,813), and rods and reels ($1,608). Atlantic HMS anglers were estimated to have spent a total of $108 million on durable goods for Atlantic HMS angling. These expenditures in turn were estimated to generate $152 million in economic output and support 1,331 regional jobs in 2014 (Lovell et al. 2016). An updated durable goods expenditures survey of HMS Angling permit holders from Maine to Texas was conducted in the fall of 2019, and a final report will be issued in 2020.

In 2015, researchers with the Virginia Institute of Marine Sciences funded by NOAA Fisheries conducted a survey of HMS Angling permit holders from Maine to North Carolina to estimate the economic value of recreational bluefin tuna fishing (Goldsmith et al. 2018). Survey participants were presented with examples of hypothetical fishing trips that varied by the size of bluefin tuna caught, bag limit regulations, and trip costs. They found the overall average willingness-to-pay for a bluefin trip to be $1,285 per angler trip. Increasing the bag limit by one school-sized bluefin tuna increased the willingness-to-pay by approximately $160, while increasing the bag limit by a large school/small medium or large medium/giant bluefin tuna increased the willingness-to-pay by approximately $289–360 per angler trip. Overall, the 2015 bluefin tuna private boat fishery was estimated to have a value of $14 million in addition to the angling expenditures of $8.7 million.

In 2016, NOAA Fisheries conducted another update to the National Marine Recreational Fishing Expenditure Survey to collect national level data on trip expenditures related to marine recreational fishing and estimate the associated economic impact (NOAA Fisheries 2018). Nationally, marine anglers were estimated to have spent $4.3

billion on trip related expenses (e.g., fuel, ice, and bait) and $26.6 billion on fishing equipment and durable goods (e.g., fishing rods, tackle, and boats). Using regional input-output models, these expenditures were estimated to have generated $67.9 billion in total economic impacts and supported 472,000 jobs in the United States in 2016.

This survey also included a separate survey of HMS Angling permit holders from Maine to Texas (Hutt and Silva 2019). Estimated non-tournament trip-related expenditures and the resulting economic impacts for Atlantic HMS recreational fishing trips are presented in Table 8.31. For the Atlantic HMS Angler Expenditure Survey, randomly selected HMS Angling permit holders were surveyed every two months and asked to provide data on the most recent non-tournament related fishing trip in which they targeted Atlantic HMS. Anglers were asked to identify the primary Atlantic HMS they targeted and their expenditures related to the trip. Of the 1,806 Atlantic HMS anglers who returned a survey, 63 percent indicated their primary target on their most recent private boat trip was either bluefin, yellowfin, bigeye, or albacore tuna, or they simply indicated they had fished for tuna in general without identifying a specific species. Of the rest of those surveyed, 14 percent reported trips targeting billfish (i.e., blue marlin, white marlin, or sailfish), 12 percent reported trips targeting shark (i.e., shortfin mako, thresher shark, or blacktip shark), 6 percent reported trips targeting swordfish, and 5.6 percent reported trips that did not target Atlantic HMS or failed to indicate what species they targeted. Average trip expenditures ranged from $623/trip for shark trips to $1,015/trip for billfish trips. Boat fuel was the largest trip-related expenditure for all Atlantic HMS trips and made up about 56 percent of average trip costs overall. Total trip-related expenditures for 2016 were calculated by expanding average trip-related expenditures with estimates of total directed boat trips per region from the LPS and MRIP survey. Total expenditures were then divided among the appropriate economic sectors and entered into an input-output model to estimate total economic output and employment supported by the expenditures within coastal states from Maine to Texas. Overall, $46.7 million of Atlantic HMS angling trip-related expenditures generated approximately $103 million in economic output, $30.5 million in household income, and $54.8 million in value-added impacts. The expenditures also supported 577 full-time jobs from Maine to Texas in 2016.

Table 8.31 **Highly Migratory Species Recreational Angler Expenditure Survey Results of Estimated Non-Tournament Expenditures and Economic Contributions, Regionally, and Nationally in 2016**

Region	Average Trip Expenditures	Total Atlantic HMS Trips[1]	Total Expenditures	Jobs	Total Sales Output[2]
New England	$502	10,132	$5,172,293	37	$4,867,047
Mid-Atlantic	$678	15,753	$10,676,438	75	$10,891,525
South Atlantic	$680	30,149	$20,498,004	187	$21,427,876
Gulf of Mexico	$821	12,254	$10,055,265	105	$16,979,295
Total United States	$682	68,468	$46,675,320	577	$103,372,357

[1]Atlantic HMS-directed non-tournament angling trips were estimated in New England and the Mid-Atlantic using data from the Large Pelagics Survey, in the South Atlantic using the Marine Recreational Information Program, and in the Gulf of Mexico using data from MRIP, the Louisiana Recreational Creel survey, and the Texas Parks and Wildlife Division. [2]Total sales output represents all business sales within the regional economy supported by Atlantic HMS trip-related expenditures, either through direct expenditures by Atlantic HMS anglers, indirect expenditures by supported business, or household expenditures by individuals whose employment and income is supported by the above expenditures. Source: LPS; MRIP; LA Creel; Texas Parks and Wildlife Division.

8.5.2 Atlantic HMS Tournaments

In 2019, NOAA Fisheries released the results of the Atlantic HMS Tournament Economic Study, which provides expenditure data on a unique group of saltwater angling trips that are largely under-represented in national surveys (Hutt and Silva 2019). This study was conducted in 2016 in two parts. The first part involved a survey of

registered Atlantic HMS tournaments on their costs and earnings associated with the operation of a tournament. The second part involved a survey of Atlantic HMS tournament participants, referred to as "teams" below, on their expenditures associated with participating in an Atlantic HMS tournament. To meet the study criteria, all tournaments selected had to be:

- Registered with the Atlantic HMS Management Division.
- Held within the United States or its Caribbean territories.
- Ten days or less in duration.

Letters were sent to 218 Atlantic HMS tournaments requesting their participation in the operator survey. Completed operator surveys were returned by 73 of the selected tournaments.

Results from the operator survey showed that reporting tournaments averaged 2.8 days in length, 39 participating vessels, and 194 participating anglers. The number of participating vessels varied considerably ranging from 4 to 308. Reporting tournaments were most likely to target blue and white marlin (61 percent), sailfish (54 percent), and yellowfin tuna (52 percent). Tournament operations reported average net revenues of $175,000 against average expenses of $148,000 plus $11,357 in charitable donations. The result was average net revenues over $16,000. Extrapolated values to all 218 qualifying tournaments resulted in estimates of $38.4 million in total revenue, $32.4 million in operating expenses and prizes, $2.5 million in charitable donations, and $3.5 million in net revenue. After excluding monetary prizes paid out ($22 million), an economic impact analysis was conducted on the remaining $20 million in tournament operation expenditures, which supported an estimated $44 million in total economic output, $15.1 million in household income, and 295 full- or part-time jobs in 2016. Monetary prizes were excluded from economic contribution analysis as they were considered a redistribution of income from multiple participants entering the tournament to a single individual or team. As such, they would not be considered to represent a new economic impact.

Of the 218 registered tournaments, 94 tournaments were randomly selected to assist NOAA Fisheries to recruit tournament participants to complete the participant survey. Ultimately, 99 participant responses were received from 27 tournaments, representing 29 percent of tournaments selected for participant reporting. Results from the participant survey showed that teams participating in Atlantic HMS tournaments spent over $85.6 million across 218 registered Atlantic HMS tournaments, with an average of $13,361 per team and average total expenditures of $392,661 per tournament. Fifty-six percent of the total expenditures, or $48 million, covered registration and optional entry fees, which were also accounted for in tournament operator revenues. Excluding tournament registration and optional entry fees, teams spent $5,860 per tournament and $37.5 million across all tournaments. Other top expenditure items for participating teams included boat fuel ($2,079), lodging ($998), restaurants and groceries ($993 combined), and bait ($367). Tournament-related Atlantic HMS fishing trips generated $37.5 million in expenditures, minus registration fees. Those expenditures in turn generated economic contributions of $84.7 million in total output, $46 million in value-added impacts, $30.5 million in income, and 532 jobs. Results from the Atlantic HMS Tournament Economic Study are summarized in Table 8.32.

Table 8.32 Atlantic Highly Migratory Species Tournament Economic Study Results for 2016

Measurement	Tournament Events	Participating Teams
Number of events/teams	218	6,407
Average prize payout	$100,991	-
Average registration fees	-	$7,501
Average other expenditures	$92,525	$5,860
Total expenditures, minus prizes and fees	$20,171,466	$35,544,910

Measurement	Tournament Events	Participating Teams
Jobs	295	532
Total sales output	$43,970,942	$84,671,666

Notes: Selected, registered tournaments excluded those held in the Bahamas or lasting longer than 10 days. Economic contributions are estimated based on expenditures, excluding tournament registration fees for participants and prize money awards by tournament operators. Source: Hutt and Silva 2019.

8.5.3 Atlantic HMS Charter and Party Boat Operations

At the end of 2004 and 2012, NOAA Fisheries collected market information regarding advertised charter boat rates. The analysis of these data focused on advertised rates for full-day charters. Full-day charters vary in length from 6 to 14 hours, with a typical trip being 10 hours. The average price for a full-day boat charter was $1,053 in 2004 and $1,200 in 2012. Sutton et al. (1999) surveyed charter boats throughout Alabama, Mississippi, Louisiana, and Texas in 1998 and found the average charter boat base fee to be $762 for a full-day trip. Holland et al. (1999) conducted a similar study on charter boats in Florida, Georgia, South Carolina, and North Carolina and found the average fee for full-day trips to be $554, $562, $661, and $701, respectively. Comparing these two studies conducted in the late 1990s to the average advertised daily Atlantic HMS charter boat rate in 2004 and 2012, it is apparent that there has been a significant increase in charter boat rates.

In 2013, NOAA Fisheries executed a logbook study to collect cost and earnings data on charter boat and headboat trips targeting Atlantic HMS throughout Maine to Texas (Hutt and Silva 2015). The Atlantic HMS Cost and Earning Survey commenced in July 2013 and ended in November 2013. Data from the survey indicate that 47 percent of HMS Charter/Headboat permit holders who responded to the survey did not plan to take for-hire trips to target Atlantic HMS from July to November of 2013.

The study revealed that the HMS most commonly targeted by charter boats included yellowfin tuna (45 percent), sailfish (37 percent), marlin (32 percent), and coastal sharks (32 percent). The reported percentages add to greater than 100 percent as most Atlantic HMS for-hire trips targeted multiple species. This was especially apparent for trips targeting tuna or billfish species as the majority of these trips reported targeting at least two other species. The exception was HMS trips targeting coastal sharks with only 5 percent or fewer of charter boats reporting targeting other species.

Of the 19 headboat trips that reported targeting coastal sharks, none reported targeting any other species. The Atlantic HMS most commonly targeted by headboats were bigeye tuna (45 percent), yellowfin tuna (37 percent), swordfish (34 percent), and coastal sharks (33 percent). In the North Atlantic region, the two Atlantic HMS most commonly targeted on both charter boat and headboat trips were yellowfin tuna (57 and 100 percent, respectively) and bigeye tuna (48 and 100 percent, respectively). The third most commonly targeted Atlantic HMS in the North Atlantic on charter boat trips were bluefin tuna (35 percent), which was not targeted on any reported headboat trips. Atlantic HMS charters in the South Atlantic were most likely to report targeting sailfish (56 percent), yellowfin tuna (44 percent), and marlins (40 percent). In the Gulf of Mexico, Atlantic HMS charter boats and headboats were most likely to report targeting coastal sharks (64 and 48 percent, respectively), yellowfin tuna (35 and 53 percent respectively), and marlins (23 and 30 percent, respectively).

In the Northeast, the average net return per Atlantic HMS charter boat trip was $969 (Table 8.33). Inflows from charter fees averaged $2,450 per trip. Northeast charter boat trips averaged $1,229 in material costs, with their greatest material expenditures being for fuel ($966) and bait ($129). In the Southeast, the average net return per Atlantic HMS charter boat trip was $534. Inflows from charter fees averaged $1,223 per trip.

Southeast charter boat trips averaged $496 in material costs, with their greatest material expenditures being for fuel ($376) and bait ($46). The lower costs and revenues reported for this region were likely due to the fact that

only one overnight trip was reported in the Southeast for the survey. In the Gulf of Mexico, the average net return per Atlantic HMS charter boat trip was $1,028. Inflows from charter fees averaged $2,111 per trip. Gulf of Mexico charter boat trips averaged $858 in material costs, with their greatest material expenditures being for fuel ($631) and bait ($70).

Table 8.33 Average Expenditures and Revenues for Highly Migratory Species Charter Boat Trips by Region in 2013

Type	Expenditures	Northeast Region	Southeast Region	Gulf of Mexico
Outflow	Material costs ($)	1,228.62	495.66	857.56
	Fuel costs ($)	966.79	376.32	631.03
	Fuel price ($)	3.96	3.74	3.64
	Gallons used (gal)	244.14	100.62	173.36
	Bait costs ($)	129.05	45.76	69.99
	Tackle costs($)	61.01	37.74	58.22
	Ice costs ($)	56.28	13.52	42.95
	Other costs ($)	15.49	22.32	55.37
Payouts	Captain ($)	109.16	101.56	111.34
	Crew ($)	144.11	97.42	114.13
Inflow	Total fare ($)	2,450.40	1,223.02	2,111.44
	Daily fare ($)	1,791.67	1,201.55	1,422.19
Net return	Net return ($)	968.51	528.38	1,028.41

Note: The Northeast region, with 95 responses, includes states from Maine to Virginia. The Southeast region, with 297 responses, includes states from North Carolina to the east coast of Florida. The Gulf of Mexico, with 86 responses, includes states from the west coast of Florida to Texas. Source: Hutt and Silva 2015.

In the Northeast, LPS estimated there were 4,936 charter trips from July to November in 2013 that targeted Atlantic HMS (Table 8.34). Extrapolating the average gross revenue per Atlantic HMS trip in the Northeast resulted in an estimate of $12.1 million in gross revenue from July to November of 2013. Of that gross revenue, $7.3 million went toward covering trip expenditures (e.g., fuel, bait, ice, and crew), and $4.8 million went to owner net return and other annual operation costs. An input-output analysis in the economic impact assessment software IMPLAN (Minnesota IMPLAN 2010) estimated that these expenditures generated $31.9 million in total economic output, $8.0 million in labor income, and 460 full- and part-time jobs (Table 8.35).

In the Southeast, MRIP estimated that there were 3,008 charter trips from July to November of 2013 that targeted Atlantic HMS (Table 8.34). Extrapolating the average gross revenue per Atlantic HMS trip in the Southeast resulted in an estimate of $3.7 million in gross revenue from July to November of 2013. Of that gross revenue, $2.1 million went toward covering trip expenditures (e.g., fuel, bait, ice, and crew), and $1.6 million went to owner net return and other annual operation costs. Analysis in IMPLAN estimated that these expenditures generated $10.6 million in total economic output, $2.9 million in labor income, and 243 full- and part-time jobs (Table 8.35).

In the Gulf of Mexico, excluding Texas, MRIP estimated that there were 1,505 charter trips from July to November of 2013 that targeted Atlantic HMS (Table 8.34). Extrapolating the average gross revenue per Atlantic HMS trip in the Gulf of Mexico resulted in an estimate of $3.2 million in gross revenue from July to November of 2013. Of that gross revenue, $1.6 million went toward covering trip expenditures (e.g., fuel, bait, ice, and crew), and $1.5 million went to owner net return and other annual operation costs. Analysis in IMPLAN estimated that these expenditures generated $8.8 million in total economic output, $2.2 million in labor income, and 428 full- and part-time jobs (Table 8.35).

Table 8.34 Total Costs and Earnings for Highly Migratory Species Charter Boats by Region in July–November 2013

Type	Expenditure	Northeast	Southeast	Gulf of Mexico[2]
Total Atlantic HMS charter trips[1]		4,936	3,008	1,505
Inflow (gross revenue)		$12,095,174	$3,678,938	$3,176,799
Outflow (expenses)	Fuel	$4,772,097	$1,131,996	$949,426
	Bait	$636,991	$137,996	$105,305
	Tackle	$301,145	$113,525	$87,596
	Ice	$277,798	$40,669	$64,621
	Other	$76,459	$67,140	$83,308
	Hired captain	$538,814	$305,500	$167,518
	Crew/mates	$711,327	293,047	$171,716
Owner net return plus fixed costs		$4,780,544	$1,589,411	$1,547,309

[1]Charter boat trips that indicated Atlantic HMS were their primary or secondary target species. Excludes head boat trips.[2]The estimate of Atlantic HMS for-hire trips in the Gulf of Mexico does not include trips originating from Texas, as the state does not participate in the Marine Recreational Information Program survey. Source: Hutt and Silva 2015.

This study estimated 1,131 jobs were generated as a result of Atlantic HMS charter vessel operations during the study period (Table 8.35). This number is a conservative estimate and does not include jobs created by additional travel expenditures generated by the Atlantic HMS anglers that charter Atlantic HMS for-hire vessels. Furthermore, most Atlantic HMS for-hire vessels also take out trips targeting other species, and these trips were not included in this study's analysis and are not reflected in the estimated employment figures.

Table 8.35 Estimated Total Expenditures and Economic Impacts Generated by Atlantic Highly Migratory Species Charter Boat Trip Operations by Region in July–November 2013

Region	Total Expenditures (x$1,000)	Employment	Labor Income (x$1,000)	Total Output (x$1,000)
Northeast	$12,095	460	$8,011	$31,929
Southeast	$3,679	243	$2,848	$10,587
Gulf of Mexico	$3,177	428	$2,226	$8,847
Total	$18,951	1,131	$13,085	$51,363

Source: Hutt and Silva 2015.

8.6 Economic Impact of Regulations on Small Entities

The Regulatory Flexibility Act (5 U.S.C. 601) requires that federal agencies take into account how their regulations affect "small entities," including small businesses, small governmental jurisdictions, and small organizations. To assess the continuing effect of an agency rule on small entities, the Regulatory Flexibility Act contains a provision in

Section 610 that requires federal agencies to review existing regulations on a periodic basis that had or will have a significant economic impact on a substantial number of small entities.

Final rules are reviewed to determine whether they should be continued without change, amended, or rescinded consistent with the stated objectives of applicable statutes. Section 610 requires NOAA Fisheries to consider the following factors when reviewing rules to minimize any significant economic impact of the rule on a substantial number of small entities:

1. The continued need for the rule.

2. The nature of complaints or comments received concerning the rule from the public.

3. The complexity of the rule.

4. The extent to which the rule overlaps, duplicates, or conflicts with other federal rules, and, to the extent feasible, with state and local government rules.

5. The length of time since the rule has been evaluated or the degree to which technology, economic conditions, or other factors have changed in the area affected by the rule.

NOAA Fisheries published a plan for this required periodic review of regulations in the Federal Register in 2020 (85 FR 60079; September 24, 2020). This plan required review of rules issued between January 1, 2011, and December 31, 2013. The 2011 regulations were reviewed in the 2018 SAFE Report. Table 8.36 reviews the Atlantic HMS regulations issued between 2012 and 2013 using the criteria established in Section 610 of the Regulatory Flexibility Act.

Table 8.36 Regulatory Flexibility Act Section 610 Review of Atlantic Highly Migratory Species Regulations in 2012 and 2013

Name of Action, Date, and FR Cite	Atlantic Highly Migratory Species: Electronic Dealer Reporting Requirements. RIN 0648-BA75 (77 FR 47303; August 8, 2012)
Current Status of Rule (Expired, Rescinded, Superseded, Amended, or Continuing)	Continuing
Description of Management Measures and Complexity	This final rule required that Federal Atlantic swordfish, shark, and tuna dealers report receipt of Atlantic sharks, swordfish, and BAYS tunas to NOAA Fisheries through an electronic reporting system on a weekly basis. Atlantic HMS dealers would not be required to report bluefin tuna through this electronic reporting system, as a separate reporting system was in place for this species. This final rule changed the current definition of who was considered an Atlantic HMS dealer and required Atlantic HMS dealers to submit dealer reports to NOAA Fisheries in a timely manner in order to be able to purchase commercially-harvested Atlantic sharks, swordfish, and BAYS tunas. Any delinquent reports would need to be submitted by the dealer and received by NOAA Fisheries before a dealer could purchase commercially-harvested Atlantic sharks, swordfish, and BAYS tunas from a fishing vessel. These measures were necessary to ensure timely and accurate reporting, which was critical for quota monitoring and management of these species. This action was conducted by NOAA Fisheries under the authority of the MSA. This rule is not considered to be complex since it simplified dealer reporting and clarified the definition of an Atlantic HMS dealer.

Name of Action, Date, and FR Cite	Atlantic Highly Migratory Species: Electronic Dealer Reporting Requirements. RIN 0648-BA75 (77 FR 47303; August 8, 2012)
Economic Impacts of Management Measures and Nature of Public Comments	This action simplifies dealer reporting on dealers and changed the current definition of who is considered an Atlantic HMS dealer in order to simplify the regulations and maintain consistency with respect to who is considered a first receiver across species. In addition, this rule only allowed Atlantic HMS dealers to purchase commercially-harvested Atlantic swordfish, sharks, and BAYS tunas if the dealer has submitted timely reports to NOAA Fisheries. Under the final action, the cost associated with this rule would be the additional reporting burden on dealers by requiring weekly reporting frequency for Atlantic swordfish, sharks, and BAYS tunas dealers. The amount of time it would take dealers to report through the electronic system is estimated to be the same amount of time Atlantic HMS dealers previously took to report in a paper format (i.e., 15 minutes per report). However, dealers would be reporting twice as frequently as they do under the previous regulations (i.e., they will be required to report weekly instead of twice a month). Thus, for Atlantic swordfish, sharks, and BAYS tunas, dealers would spend one hour per month (15 minutes per report each week × 4 weeks/month) or 12 hours per year reporting to NOAA Fisheries. Based on the number of Atlantic swordfish, shark, and tuna dealer permits (that deal with BAYS tunas) in 2011 (or 916 total permits), this would result in an estimated total annual burden of 10,992 hours. Negative reports would require less of a reporting burden as negative reports are estimated to only take 5 minutes to complete and submit to NOAA Fisheries. NOAA Fisheries assumes that this increase in the proposed reporting frequency should balance the need for timely data in quota limited fisheries while minimizing reporting burdens on Atlantic HMS dealers. NOAA Fisheries has not received any additional comments on this rule since the publication of the final rule.
Overlap with other State or Federal Rules	This final rule does not duplicate or conflict with any other Federal rules. NOAA Fisheries strives to ensure consistency among the regulations with Fishery Management Councils and other relevant agencies.
Changes in Technology, Economic Conditions, or Other Factors since Last Evaluation	NOAA Fisheries continues to use electronic reporting for Atlantic HMS dealers. The technological costs have decreased since 2011 and now there are more device options (tablets and mobile) and software platforms available for dealers to use for reporting. This action applied to all 916 Federal Atlantic HMS dealer permit holders (in 2011), of which 183 had Atlantic shark, 350 had Atlantic swordfish, and 383 had Atlantic tunas (bigeye, albacore, yellowfin, and skipjack) dealer permits. In 2020, there are now a total of 693 Federal Atlantic HMS dealer permit holders, of which 92 have Atlantic shark, 200 have Atlantic swordfish, and 401 have Atlantic tunas dealer permits. Recently, the estimated annual reporting burden for landing through the eDealer system is 3,133 hours, plus another 10,792 hours for negative reports
Recommendation to Continue, Rescind, or Amend and Rationale	NOAA Fisheries recommends continuing this action. It continues our dealer data collection programs to manage fishery quotas under the Magnuson-Stevens Act and the 2006 Consolidated Atlantic HMS FMP.

Name of Action, Date, and FR Cite	Atlantic Highly Migratory Species: Silky Shark Management Measures. RIN 0648-BB96 (77 FR 60632; October 4, 2012)
Current Status of Rule (Expired, Rescinded, Superseded, Amended, or Continuing)	Continuing
Description of Management Measures and Complexity	NOAA Fisheries implemented the ICCAT Recommendation 11-08, which prohibits retaining, transshipping, or landing of silky sharks (Carcharhinus falciformis) caught in association with ICCAT fisheries. In order to facilitate domestic compliance and enforcement, NOAA Fisheries also prohibited the storing, selling, and purchasing of the species. This rule primarily affected the commercial Atlantic HMS pelagic longline fishery for tuna and tuna-like species in the Atlantic Ocean, including the Caribbean Sea and Gulf of Mexico. This rule did not affect commercial fishermen fishing for sharks with bottom longline, gillnet, or handgear, and it does not further affect recreational fishermen because harvesting silky sharks was already prohibited in the recreational fishery. This action implemented the ICCAT recommendation, consistent with the ATCA, and furthers domestic management objectives under the MSA. This rule is not considered to be complex since it is simply a prohibition of silky shark fishing caught in association with ICCAT fisheries in order to implement an ICCAT recommendation.
Economic Impacts of Management Measures and Nature of Public Comments	Under this final rule, pelagic longline vessel owners and operators are not allowed to retain, transship, land, sell, or store silky sharks, consistent with ICCAT Recommendation 11-08 and other domestic regulations. This action facilitated domestic compliance and enforcement. On average, each vessel was expected to lose approximately $485 annually in gross revenues, which is minor (<1 percent) compared to each vessel's overall revenue from swordfish and tunas ($190,986 total revenues). This rule was determined to be unlikely to change fishing practices or effort. NOAA Fisheries has not received any additional comments on this rule since the publication of the final rule.
Overlap with other State or Federal Rules	This final rule does not duplicate, overlap, or conflict with any other Federal rules.
Changes in Technology, Economic Conditions, or Other Factors since Last Evaluation	There have been no substantial changes in the technology associated with the pelagic longline fleet since this rule was implemented. The status of the silky shark population has not changed since 2012 and the ICCAT Recommendation 11-08 is still active.
Recommendation to Continue, Rescind, or Amend and Rationale	NOAA Fisheries recommends continuing this action. This rule is continuing as currently amended to meet the objectives of the Magnuson-Stevens Act and the 2006 Consolidated Atlantic HMS FMP and continue the implementation of ICCAT Recommendation 11-08.

Name of Action, Date, and FR Cite	Highly Migratory Species: Atlantic Shark Management Measures; Amendment 5a. RIN 0648-BB29 (78 FR 40318; July 3, 2013)
Current Status of Rule (Expired, Rescinded, Superseded, Amended, or Continuing)	Amended
Description of Management Measures and Complexity	The final rule implemented the Final Amendment 5a to the 2006 Consolidated Atlantic HMS FMP. In developing Amendment 5a to the 2006 Consolidated Atlantic HMS FMP, NOAA Fisheries examined a full range of management alternatives to maintain rebuilding of sandbar sharks; end overfishing and rebuild scalloped hammerhead and Atlantic blacknose sharks; and establish a TAC and commercial quota and recreational measures for Gulf of Mexico blacknose and blacktip sharks, consistent with the MSA, and other applicable laws. This final rule implemented the final conservation and management measures in Amendment 5a to the 2006 Consolidated Atlantic HMS FMP for sandbar, scalloped hammerhead, blacknose, and Gulf of Mexico blacktip sharks. This final rule also announced the revised 2013 annual regional quotas for aggregated large coastal sharks (LCS), hammerhead, Gulf of Mexico blacktip, blacknose, and non-blacknose small coastal sharks (SCS). These changes could have affected all commercial and recreational fishermen who fish for sharks in the Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea. Given the number of provisions in this rule and the creation of new species quota categories and regional splitting of quotas, NOAA Fisheries considers this to be a moderately complex rule.
Economic Impacts of Management Measures and Nature of Public Comments	Under the final rule, NOAA Fisheries established an Atlantic and a Gulf of Mexico hammerhead shark quota. When comparing average landings of hammerhead sharks from 2008-2011 to the proposed quotas, revenue in the Gulf of Mexico region would be increased by $2,005 and increase in the Atlantic region by $1,719. However, because hammerhead sharks were counted against the regional non-sandbar LCS quotas, which were much higher than the preferred regional hammerhead shark quotas, the opportunities to land hammerhead sharks was estimated to be reduced in years of higher than average landings. Therefore, it was estimated there would be minimal impact on the annual revenues of individual vessels actively involved in the fishery most years, but minor adverse impacts in years of higher than average landings. The establishment of new separate quotas for hammerhead sharks and Gulf of Mexico blacktip sharks, necessitated the removal of these species from the non-sandbar LCS management group (which was then renamed “aggregated LCS” in both the Atlantic and Gulf of Mexico regions). The aggregated LCS quota from this rule was then based on average annual landings of the remaining species; therefore, those species composing the aggregated LCS management group were not expected to experience a change in fishing pressure and landings would be capped at recent levels. For these reasons, economic impacts to small entities resulting from this portion of the rule were expected to be neutral. This rule set the commercial quota for blacktip shark to recent average landings and was also expected to result in neutral economic impact to small entities. (Continued on next page)

Name of Action, Date, and FR Cite	Highly Migratory Species: Atlantic Shark Management Measures; Amendment 5a. RIN 0648-BB29 (78 FR 40318; July 3, 2013)
Economic Impacts of Management Measures and Nature of Public Comments (Continued)	Under this rule, NOAA Fisheries also separated blacknose shark quotas into the Atlantic and Gulf of Mexico regions as suggested in the SEDAR 21 stock assessment. This was expected to decrease the blacknose shark landings in each region. Average annual gross revenue for blacknose shark landings for the Atlantic region was expected to increase from $54,113 from before the rule to $54,854 after this rule was implemented. NOAA Fisheries anticipated that these direct and incidental shark permit holders would experience minor adverse economic impacts as blacknose sharks are not the target shark species for SCS fishermen. Average annual gross revenues for the blacknose shark landings for the Gulf of Mexico region was expected to decrease from $5,645 under no action to $5,641 under this rule. NOAA Fisheries anticipated that these directed and incidental shark permit holders would experience neutral economic impacts since the new Gulf of Mexico blacknose shark quota is consistent with previous landings. In the short-term, lost revenues would be moderate for the 20 directed shark permit and 1 incidental shark permit holders that landed blacknose sharks in the Atlantic region, and the 5 directed shark and the 2 incidental shark permit holders that land blacknose sharks in the Gulf of Mexico. The rule also established regional quotas for non-blacknose SCS based on the landings since Amendment 3 was implemented in 2010. In the Atlantic region, an average of approximately 35 vessels with directed shark permits had non-blacknose shark landings, while approximately 9 vessels with incidental shark permits had non-blacknose SCS landings prior to the implementation of this rule. In the Gulf of Mexico region, an average of approximately 5 vessels with directed shark permits had non-blacknose shark landings, while approximately 2 vessels with incidental shark permits had non-blacknose SCS landings since Amendment 3 was implemented in 2010. NOAA Fisheries estimated there would be neutral economic impacts to directed and incidental shark permit holders as the average annual gross revenues from non-blacknose SCS landings would be the same as the status quo in the short- and long-term. Fishermen would be expected to operate in the same manner as the status quo in the short-term. However, this rule could have minor negative economic impacts on fishermen if fishing effort increases for non-blacknose SCS. The fishery had never filled the entire quota established for the fishery in 2010, but that could change with a smaller regional quota and if fishermen are displaced from other fisheries. (Continued on next page)

Name of Action, Date, and FR Cite	Highly Migratory Species: Atlantic Shark Management Measures; Amendment 5a. RIN 0648-BB29 (78 FR 40318; July 3, 2013)
Economic Impacts of Management Measures and Nature of Public Comments (Continued)	The quota linkages could have short- and long-term moderate adverse economic impacts. Quota linkages are explicitly designed to concurrently close multiple shark management groups, regardless of whether all the linked quotas are filled. This provides protection against incidental capture for species for which the quota has been reached, but it could also preclude fishermen from harvesting the entirety of each of the linked quotas. Under this rule, both the Atlantic hammerhead shark and Atlantic aggregated LCS management groups would close when landings of either reaches or is expected to reach 80 percent of the quota, and in the Gulf of Mexico region, the hammerhead shark and Gulf of Mexico aggregated LCS management groups would close when landings of either one reaches or is expected to reach 80 percent of its quota. If the entire aggregated LCS quota has not been harvested, the fishery would not realize the full level of revenues possible under the established quota. However, given that the hammerhead shark quotas for the Atlantic and Gulf of Mexico regions are larger than average landings of hammerhead sharks in each region by a little more than 2,000 lb and that the Atlantic and Gulf of Mexico aggregated LCS quotas are not changing from average landings, NOAA Fisheries did not expect either quota to reach or be projected to reach 80 percent significantly faster than the other quota in either region as a result of this alternative suite. Additionally, the Gulf of Mexico blacktip shark quota would not be linked to the hammerhead shark and aggregated LCS quotas. This will allow Gulf of Mexico fishermen to continue to fish for blacktip sharks following the closures of the hammerhead and LCS quotas. NOAA Fisheries would also have the ability to transfer hammerhead shark quota between regions to allow for the greatest opportunity to harvest the aggregated LCS quotas while not exceeding the combined regional quotas for hammerhead sharks, which may help to further minimize the likelihood of adverse economic impacts. The blacknose shark and non-blacknose SCS economic impacts would be the same as the LCS since there would be similar scenarios with the quota linkage by species and region. In addition, NOAA Fisheries would allow inseason quota transfers between non-blacknose SCS regions. This would have minor beneficial economic impacts for the fishery as the non-blacknose SCS quota would not be the limiting factor. Consequently, the quota linkages were expected to have moderate adverse economic impacts in some years with high landings, but are expected to have neutral impacts most years. This rule also increased the recreational size limit for hammerhead shark species to 78 inches fork length, and provided additional outreach to recreational anglers regarding identification of all sharks, including prohibited shark species. Implementation of these management measures would result in minor alterations to the way tournaments and charter vessels operate, and minimal reductions in opportunity and demand for recreational shark fishing, which could create some minor adverse economic impacts in the short-term. However, these measures would help the hammerhead stocks rebuild, reduce accidental harvest of prohibited species, and possibly increase recreational fishing opportunities in the future. NOAA Fisheries has not received any additional comments on this rule since the publication of the final rule.
Overlap with other State or Federal Rules	This final rule does not duplicate, overlap, or conflict with any other Federal rules
Changes in Technology, Economic Conditions, or Other Factors since Last Evaluation	There have been no substantial technological changes to the fishery since this rule was implemented. There have been several regulatory changes that have modified the shark fishery since Amendment 5a based on the development and implementation of Amendment 6, Amendment 9, and Amendment 11.
Recommendation to Continue, Rescind, or Amend and Rationale	This rule has been amended. The rule and its amendments are continuing to meet the objectives of the Magnuson-Stevens Act and the 2006 Consolidated Atlantic HMS FMP and NOAA Fisheries therefore recommends that it continue.

Name of Action, Date, and FR Cite	Highly Migratory Species: 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan; Amendment 8. RIN 0648-BC31 (78 FR 52011; August 21, 2013)
Current Status of Rule (Expired, Rescinded, Superseded, Amended, or Continuing)	Amended
Description of Management Measures and Complexity	This final rule implemented Amendment 8 to the 2006 Consolidated Atlantic HMS FMP. Amendment 8 to the 2006 Consolidated Atlantic HMS FMP provided additional opportunities for U.S. fishermen to harvest swordfish using selective gears that are low in bycatch, given their rebuilt status and increased availability. This final rule created new and modified commercial fishing vessel permits that allow permit holders to retain and sell a limited number of swordfish caught on rod and reel, handline, harpoon, green-stick, or bandit gear. Specific management measures under this final action included the establishment of a new open access commercial swordfish permit, modification of HMS Charter/Headboat permit regulations to allow for the commercial retention of swordfish on non-for-hire trips, regional swordfish retention limits for the new and modified permits, gear authorizations, and reporting requirements. This action was conducted by NOAA Fisheries under the authority of the MSA. NOAA Fisheries does not consider this rule to be complex since it mainly just provided additional gear types and permits for the harvesting of swordfish.
Economic Impacts of Management Measures and Nature of Public Comments	This rule established a new open-access commercial swordfish permit and modified existing open access Atlantic HMS permits to allow for the commercial retention of swordfish using handgears. NOAA Fisheries anticipated positive economic impacts for some U.S. fishermen under this rule. It allowed small-scale U.S. fishermen to use handgear (rod and reel, handline, harpoon, bandit gear, and green-stick) to fish for and commercially sell a limited amount of swordfish (zero to six fish per vessel per trip) to permitted swordfish dealers. This rule was expected to reduce economic barriers to the commercial swordfish fishery, provide more opportunities to fish commercially for swordfish, and potentially provide economic benefits to some fishermen. For example, if a new entrant landed 10 swordfish per year under this rule, they could realize an increase in annual gross revenues of approximately $4,330. One trip landing six swordfish could yield $2,598 in gross revenues. The rule also allowed HMS Charter/Headboat permit holders to fish under open access commercial swordfish regulations, using only rod and reel and handlines, when not on a for-hire trip with paying passengers. This management measure was expected to streamline permit issuance because CHB vessels would not need to obtain another permit. This rule also created a separate open access commercial swordfish permit to allow landings using handgear. However, it would increase the costs associated with obtaining the permit for persons that have already been issued an Atlantic Tunas General or Harpoon category permit. This alternative would not streamline permit issuance for persons that want to commercially fish for both tunas and swordfish, because they would need to obtain two different permits to conduct these activities. This management measure was expected to increase access to the commercial swordfish fishery and have positive socio-economic impacts for fishermen who are currently unable to obtain a swordfish limited access permit. This rule also established swordfish management regions and a zero-to-six swordfish retention limit range within each region for the new and modified permits and codified specific regional limits within that range with authority to adjust the regional limits in-season based on pre-established criteria. If a regional retention limit is set at zero, NOAA Fisheries expects no change in socio-economic impacts. If a regional limit is set at any level above zero, this management measure could provide economic benefits to some commercial handgear fishermen if they were previously inactive and obtain the new and modified permits and begin fishing. (Continued on next page)

Name of Action, Date, and FR Cite	Highly Migratory Species: 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan; Amendment 8. RIN 0648-BC31 (78 FR 52011; August 21, 2013)
Economic Impacts of Management Measures and Nature of Public Comments (Continued)	This rule also established larger regions with the addition of a separate Florida Swordfish Management Area (the Northwest Atlantic, Gulf of Mexico, Caribbean, and a Florida Swordfish Management Area as defined below). Under this management provision, swordfish management measures can still be tailored geographically to the biological factors affecting a particular region; however, the regions would be larger (with the possible exception of the separate Florida Swordfish Management Area). In this action, NOAA Fisheries established an initial default retention limit of zero swordfish per vessel per trip for the Florida Swordfish Management Area due to concerns about the rapid growth of a commercial fishery in an important swordfish habitat area that is in close proximity to many fishermen. Under a regional retention limit set at zero for the Florida Swordfish Management Area, no change in socio-economic impacts is anticipated. In other regions, vessels making 10 trips per year and retaining the maximum allowable limit on each trip would derive annual gross revenue from swordfish ranging from $4,329.60 under a one-fish limit, $8,659.20 under a two-fish limit, and $12,988.80 under a three-fish limit. To estimate the number of entities affected by a special Florida Swordfish Management Area, NOAA Fisheries first determined the number of Atlantic tunas General category permits issued. In 2011, there were 4,084 Atlantic tunas General category permits issued. This number was used as a proxy to estimate the total number of new Swordfish General Commercial permits that could be issued fishery-wide. In 2011, 44 percent of all Directed and Incidental swordfish limited access permits were issued in Florida. Additionally, in 2011, 63 percent of all swordfish Handgear limited access permits were issued in Florida. Taking the average of these two numbers provided an estimate of 53.5 percent, which NOAA Fisheries used to estimate the percent of new swordfish permits that could be issued in Florida. Using an estimated rate of 53.5 percent of 4,084 potential new permits provides an estimate of 2,185 potential new commercial swordfish handgear permits that could be issued in Florida. Assuming that two-thirds of these permits are issued to vessels on the east coast of Florida, as is the case currently, then potentially 1,455 new open-access swordfish permits could be issued on the east coast of Florida. After implementation in 2014, NOAA Fisheries actually issued 651 Swordfish General Commercial permits, and in 2019 NOAA Fisheries issued 667 of these permits. The rule also established a Florida Swordfish Management Area extending shoreward from near Rockledge, FL, and Cocoa Beach, FL, to the outer boundary of the EEZ through the northwestern boundary of Monroe County, FL, in the Gulf of Mexico. This area in combination with a zero-fish retention limit, balances the need to prevent the rapid growth of a commercial fishery in a biologically unique area with the objective of providing additional opportunities to harvest swordfish. This alternative management measure implements a zero-fish retention limit in a smaller area, and a three-fish retention limit in the area north of Cocoa Beach, FL, that was previously proposed to be subject to a one-fish retention limit. Thus, in the smaller, modified Florida Swordfish Management Area with an initial default retention limit of zero, no change in economic impacts were anticipated. In the larger Northwest Atlantic region, annual gross revenue derived from swordfish was estimated to be approximately $12,988.80 under a three-fish limit for a vessel making ten trips per year and retaining the maximum allowable limit on each trip.
Overlap with other State or Federal Rules	This final rule does not duplicate, overlap, or conflict with any other Federal rules.
Changes in Technology, Economic Conditions, or Other Factors since Last Evaluation	There have been no substantial technological changes in the swordfish commercial fleet since this rule was implemented. Economic conditions in the domestic swordfish market have improved in the most recent years.
Recommendation to Continue, Rescind, or Amend and Rationale	This rule has been amended. The rule and its amendments are continuing to meet the objectives of the Magnuson-Stevens Act and the 2006 Consolidated Atlantic HMS FMP and NOAA Fisheries therefore recommends that it continue.

Name of Action, Date, and FR Cite	Atlantic Highly Migratory Species: Vessel Monitoring Systems. RIN 0648-BD24 (78 FR 68757; November 15, 2013)
Current Status of Rule (Expired, Rescinded, Superseded, Amended, or Continuing)	Continuing
Description of Management Measures and Complexity	NOAA Fisheries modified the reporting requirements for vessels required to use VMS units in Atlantic HMS fisheries. This final rule required vessel owners or operators, who have been issued Atlantic HMS permits and were required to use VMS, to provide hourly position reports 24 hours a day, 7 days a week (24/7) via VMS. The final rule also allowed the vessel owners or operators of such vessels to declare out of the HMS fishery when not fishing for or retaining Atlantic HMS for a period of time encompassing two or more trips. This final action continued to provide NOAA Office of Law Enforcement needed information on the target fishery and gear possessed in order to facilitate enforcement of closed areas and other Atlantic HMS regulations, while reducing the reporting burden on vessel owners and operators. This action brought Atlantic HMS fisheries regulations in line with VMS regulations in other fisheries. This rule affected all owners and/or operators of permitted vessels that fish for Atlantic HMS and are required to use VMS. This action was conducted by NOAA Fisheries under the authority of the MSA. NOAA Fisheries does not consider this rule to modify the Atlantic HMS VMS reporting requirements to be complex since it only changes the frequency of reporting and brings this regulation in line with the VMS regulations in other fisheries.
Economic Impacts of Management Measures and Nature of Public Comments	This final rule required that Atlantic HMS vessels provide hourly position reports 24/7, during those periods of the year in which they are required to use VMS, unless extenuating circumstances warrant powering the VMS unit down. NOAA Fisheries estimated the costs of 24/7 hourly position reports for all vessels by calculating the average monthly costs from the five main providers of VMS units and services. The monthly cost of these plans ranges from $35 to $50 per month (average cost $44 per month) and include 24/7 hourly position reports and data costs associated with electronic messaging. It is likely that this pricing model has been adopted because most fisheries using VMS already require 24/7 reporting. Annual costs of compliance for both alternatives for vessel owners were estimated to be $528, $308, and $220 per vessel for pelagic longline, bottom longline, and shark gillnet vessels, respectively. NOAA Fisheries did not anticipate these costs to be different from previous monthly VMS costs for most Atlantic HMS vessel owners since most VMS providers use plans that include 24/7 hourly position reports and data (for making hail-in/hail-outs and other declarations). For purposes of estimation, NOAA Fisheries assumed continuous reporting over the course of the year, or that portion of the year in which Atlantic HMS-permitted vessels are required to use VMS. Additionally, maintenance costs for VMS units were estimated at $500 per vessel per year, but changing to 24/7 reporting is not expected to affect these costs. Changing to 24/7 position reporting would, however, eliminate the need for vessel operators to hail-out at least two hours before leaving port, thus giving them greater flexibility in scheduling trips. (Continued on next page)

Name of Action, Date, and FR Cite	Atlantic Highly Migratory Species: Vessel Monitoring Systems. RIN 0648-BD24 (78 FR 68757; November 15, 2013)
Economic Impacts of Management Measures and Nature of Public Comments (Continued)	The final rule also allowed vessels not fishing for or retaining Atlantic HMS for two or more trips to advise NOAA Fisheries as such by declaring out of the Atlantic HMS fishery. Vessels that declare out of the fishery would be exempted from hailing-in/hailing-out each trip, but would still be required to follow all other Atlantic HMS regulations including continuing to provide 24/7 position reports on their VMS units. NOAA Fisheries expected few, if any, vessel owners or operators using pelagic longline to declare out of the Atlantic HMS fishery as most of these vessels target Atlantic HMS almost exclusively. Therefore, to assess the effect of this rule on reporting burden, NOAA Fisheries estimated the total number of Atlantic HMS fishing trips that bottom longline vessels from Virginia to South Carolina and shark gillnet vessels could take annually and thus be required to make daily hail-in/hail-outs. The estimates vary by gear type possessed onboard. NOAA Fisheries assumed that approximately 50 bottom longline vessels could be fishing (day trips) in the vicinity (between 33°00' N. latitude and 36°30' N. latitude) of the Mid Atlantic bottom longline closed area where VMS is required during the entire 212 day-closure (January 1-July 31), resulting in 212 trips per year. Shark gillnet vessels can target LCS, SCS, and Council-managed species, but have targeted sharks less in recent years. The gillnet fishery primarily targets SCS and blacktip sharks (included in the aggregate LCS management group in the Atlantic region and as its own management group in the Gulf of Mexico region). Season length for the different shark management groups varies annually based on quota availability, catch rates, and other considerations. Many shark gillnet vessels have been issued permits that allow them to participate in other fisheries using gillnet gear; therefore, to estimate burden, NOAA Fisheries assumed that affected vessels could be engaged in fishing activities and subject to VMS requirements from November 15 through April 15 for the duration of this time period every year (152 days). NOAA Fisheries also assumed that gillnet and bottom longline vessels would land once every 24 hours to offload catch and procure supplies. Based on public comments received prior to this rulemaking, NOAA Fisheries expected that many gillnet and bottom longline vessel owners and operators would make long-term declarations out of the fishery if given the option, which would require them to make only one declaration report. However, if Atlantic HMS are caught during a trip and the vessel operator wishes to land them, they must hail out to declare back into the Atlantic HMS fishery and then hail in with NOAA OLE at least three hours, and no more than 12 hours, before landing. NOAA Fisheries expected this rule could result in a substantial reduction in reporting burden for vessels not fishing for or retaining Atlantic HMS. NOAA Fisheries has not received any additional comments on this rule since the publication of the final rule.
Overlap with other State or Federal Rules	This final rule does not duplicate, overlap, or conflict with any other Federal rules.
Changes in Technology, Economic Conditions, or Other Factors since Last Evaluation	There have been some changes in VMS technology since this regulation was implemented. VMS units have improved in their capabilities. Some units are now available in tablet form and have touch screens. Some VMS units have improved durability, better display screens, and there are some lower cost models now available. None of these technological changes currently require a revision to these regulations.
Recommendation to Continue, Rescind, or Amend and Rationale	NOAA Fisheries recommends continuing this action. It continues our critical at sea monitoring program that is used to monitor and enforce time/area closures and gear restricted areas under the Magnuson-Stevens Act and the 2006 Consolidated Atlantic HMS FMP.

8.7 Chapter 8 References

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9 Community Profiles

9.1 Background

National Standard 2 of the Magnuson-Stevens Act requires that each SAFE Report contain, among other things, "pertinent economic, social, community, and ecological information for assessing the success and impacts of management measures or the achievement of objectives of each [FMP]" (50 CFR 600.315(d)(3)). This chapter updates information on the Atlantic HMS fishing communities identified and described in the 2006 Consolidated Atlantic HMS FMP and its amendments. Background information on the legal requirements and summary information on the community studies conducted to choose the communities profiled in this document can be found in previous SAFE Reports and was most recently updated in the 2011 SAFE Report. Some information that has been detailed in previous SAFE Reports, such as decadal census data, is not repeated here. The 2011 and 2012 SAFE Reports summarized demographic profiles from the results of the 2010 U.S. census, comparing 1990, 2000, and 2010 Census Bureau data. A profile for the U.S. Virgin Islands was not created because of the limited availability of 1990, 2000, and 2010 census data for the territory. In addition to 2010 census data, the descriptive community profiles in the 2011 SAFE Report include information provided by Wilson et al. (1998), Kirkley (2005), and Impact Assessment, Inc. (2004) and information obtained from MRAG Americas, Inc. (2008).

Of the 24 communities profiled in previous SAFE Reports, 10 were originally selected due to higher proportions of Atlantic HMS landings in the town, the relationship between the geographic communities and the fishing fleets, the existence of other community studies, and input from the Atlantic HMS and Billfish Advisory Panels, which preceded the combined Atlantic HMS Advisory Panel that currently exists. Profiles of the remaining 14 communities, although not selected initially, were incorporated because they were identified as communities that could be impacted by changes to Atlantic HMS regulations due to the number of Atlantic HMS permits associated with them. The communities profiled are not intended to be an exhaustive record of all Atlantic HMS-related communities in the United States; rather the objective is to give a broad perspective of representative areas.

9.2 Community Impacts From Hurricanes

This section is an overview of the impacts on Atlantic HMS communities caused by hurricanes during 2019 (National Hurricane Center 2019). For an analysis of the impacts of past hurricanes, download previous SAFE Reports at www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-stock-assessment-and-fisheries-evaluation-reports.

During the 2019 Atlantic hurricane season, 18 named storms formed. Six of those became hurricanes and three reached major hurricane strength based on the Saffir-Simpson Hurricane Wind Scale (category 3–5). Of the 18 named storms that formed during the 2019 Atlantic hurricane season, five made landfall on the continental United States and U.S. territories. Those storms were Hurricane Barry, Major Hurricane Dorian, Tropical Storm Imelda, Tropical Storm Nestor, and Tropical Storm Olga.

Hurricane Barry made landfall on July 13, 2019, as a category 1 hurricane over the remote south central Louisiana coast and produced a large area of heavy rainfall and flooding along and to the east of its center over the Mississippi Valley. Sustained hurricane force winds are estimated to have occurred over a relatively small area near the Louisiana coast. After landfall, Barry turned north-northwestward and weakened, falling below hurricane strength by July 13, 2019, when the center passed near Intracoastal City, Louisiana. The tropical storm's center then moved across the western portion of Louisiana and Barry weakened to a tropical depression while centered just south of the Arkansas border by July 15, 2019. While moving northward over western Arkansas, the cyclone continued to weaken.

Major Hurricane Dorian was the strongest hurricane to hit the northwestern Bahamas in modern records,

resulting in numerous deaths and causing devastation on Great Abaco and Grand Bahama Islands. After striking the Bahamas, a large mid-level trough over the eastern United States swung eastward, and contributed to a flow pattern that favored Dorian turning north-northwest and northward. This kept the intense core of the hurricane east of Florida from September 3–5, 2019, while still causing significant damage. The hurricane then weakened as it moved northward toward an environment of high shear and cooler waters. But, as its core moved over the Gulf Stream, Dorian re-strengthened back to category 3 status offshore the coasts of Georgia and South Carolina. Dorian's large eye passed directly over a NOAA buoy just offshore of South Carolina on September 5, 2019. Dorian continued its northeastward motion, with its eye passing near the Outer Banks of North Carolina for several hours and making landfall over Cape Hatteras on September 6, 2019, with 85-kt winds. These category 2 winds occurred mostly over water, and it is analyzed that North Carolina experienced category 1 winds. After clearing the Outer Banks, the hurricane accelerated northeastward and reached Nova Scotia as a very strong post-tropical cyclone.

Tropical Storm Imelda was a short-lived tropical storm that made landfall on September 17, 2019, near Freeport, Texas, and then moved inland over Texas just after it developed. After moving inland, Imelda quickly weakened to a tropical depression by September 18, 2019, while located just north of Houston. During the next 24 hours, Imelda remained a tropical depression and moved slowly northward while producing very heavy rainfall and isolated tornadoes across portions of southeastern Texas and southwestern Louisiana. By September 19, 2019, the depression degenerated into a trough. The remnants meandered and continued to produce heavy rainfall over southeastern Texas and southwestern Louisiana during the next 24 hours, then lifted northward and produced heavy rainfall over southeastern Oklahoma before dissipating. The storm and its remnants produced historic rainfall totals and devastating flooding over portions of southeastern Texas.

Nestor was a short-lived tropical storm that formed over the central Gulf of Mexico. The cyclone became extratropical and weakened before moving inland on October 19, 2019, along the coast of the Florida Panhandle. Within a few hours after Nestor moved inland, the winds over land fell below gale force. However, at the same time, winds began to increase over the Atlantic waters off the southeast U.S. coast as the extratropical low moved northeastward over southern Georgia early on October 20. Tropical Storm Nestor produced a few damaging tornadoes in Florida along with localized flooding.

Tropical Storm Olga was centered about 340 nmi south-southwest of Lake Charles, Louisiana, when it formed. Olga was a short-lived tropical storm that became an extratropical cyclone shortly before making landfall in southeast Louisiana on October 26, 2019, accompanied by gale-force winds. Strong and damaging winds associated with this system spread well inland over the southeastern United States. After landfall, the post-tropical cyclone accelerated north-northeastward over Mississippi, western Tennessee, and extreme western Kentucky on October 26, 2019. The weakening system passed over eastern Illinois and moved over Michigan. Shortly after crossing Lake Huron later that day, the low dissipated over Canada.

9.3 Community Impacts From 2010 Deepwater Horizon/BP Oil Spill

On April 20, 2010, an explosion and subsequent fire damaged the *Deepwater Horizon* MC252 oil rig, which capsized and sank approximately 50 miles southeast of Venice, Louisiana. Oil flowed for 86 days into the Gulf of Mexico from a damaged wellhead on the sea floor. In response to the *Deepwater Horizon* MC252 oil spill, NOAA Fisheries issued a series of emergency rules (75 FR 24822, May 6, 2010; 75 FR 26679, May 12, 2010; 75 FR 27217, May 14, 2010) closing a portion of the Gulf of Mexico Exclusive Economic Zone to all fishing and analyzed the environmental impacts of these closures in an environmental assessment. Between May and November of 2010, NOAA Fisheries closed additional portions of the Gulf of Mexico to fishing. The maximum closure was implemented on June 2, 2010, when fishing was prohibited in approximately 37 percent of the Gulf of Mexico Exclusive Economic Zone. Significant portions of state territorial waters in Alabama (40 percent), Louisiana (55 percent), and Mississippi (95 percent) were closed to fishing (Upton 2011), along with 2 percent of waters in Florida. After November 15, 2010, approximately 0.4 percent of the federal fishing area, or 1,041 square miles, immediately around the *Deepwater Horizon* wellhead was kept closed. That continued through April 19, 2011, when the final oil spill closure area was lifted (NOAA 2011). Socioeconomic impacts from the oil spill on Atlantic HMS communities include losses

in revenue and negative psychological impacts. One study (Sumaila et al. 2012) estimated the loss in commercial pelagic fish revenue, which includes Atlantic HMS species, at $35–58 million over the next seven years. That study also estimated that Gulf of Mexico recreational fisheries could lose 11,000–18,000 jobs and face an overall economic loss of $2.5–4.2 billion.

On April 20, 2011, BP agreed to provide up to $1 billion toward early restoration projects in the Gulf of Mexico (*Deepwater Horizon* Oil Spill Final Phase IV Early Restoration Plan and Environmental Assessments 2015). The intention of the agreement was to expedite the start of restoration in the Gulf in advance of the completion of the injury assessment process.

In September 2015, the *Deepwater Horizon* Oceanic Fish Restoration Project (previously referred to as the Pelagic Longline Bycatch Reduction Project) was initiated to restore pelagic fish that were affected by the spill. The project aims to reduce the number of fish (including marlin, sharks, bluefin tuna, and smaller individuals of target species) incidentally caught and killed in pelagic longline fishing gear by compensating pelagic longline fishermen who agree to voluntarily refrain from pelagic longline fishing in the Gulf during an annual six-month repose period that coincides with the bluefin tuna spawning season. The project also provides participating fishermen with two alternative gear types (green-stick and buoy gear) to allow for the continued harvest of yellowfin tuna and swordfish during the repose period when pelagic longline gear is not used.

Demographic data for coastal counties was evaluated, taking into consideration communities that could be disproportionately affected by the Oceanic Fish Restoration Project. It found that the dispersed low-income minority Vietnamese-American populations in Louisiana who actively participate in the Gulf of Mexico pelagic longline fishery and commute to fishing ports exist; however, the project would not disproportionately affect minority or low income populations. The project is voluntary in nature and, as such, any fishermen in the Gulf of Mexico pelagic longline fishery can choose whether to participate in the repose and alternative gear provisioning. During the repose project, fish dealers, fuel suppliers, and ice, bait, and equipment suppliers may experience negative economic effects; however, these effects are anticipated to be minor and short term due to the limited duration of the repose period. Furthermore, negative economic effects may be partially mitigated by the use of alternative fishing gear.

A pilot project was implemented in 2017 for a shortened four-month repose from March 1 through June 30, 2017. Seven eligible vessel owners, all based in Louisiana, were selected to participate in the pilot. Pilot participants were limited to one state to allow for effective communication of best practices and detailed analysis of a regional-specific segment of the Gulf market. Participants fished using green-stick gear on 25 fishing trips for a total of 280 days at sea, averaging 3–4 trips per vessel. Observer records showed clear bycatch reduction benefits, with fewer bycatch species caught using the alternative gear and live releases of what bycatch was caught.

The 2020 repose period was set from January 1 to June 30. Participation expanded throughout the Gulf States, with the Gulf of Mexico separated into two focus regions. The two regions are defined as the western Gulf, which includes vessels with hailing ports in Louisiana, Mississippi, Alabama, and Texas, and the eastern Gulf, with vessels hailing from Florida and along the Atlantic Coast. All participating vessels were required to have a history of pelagic longline fishing in the Gulf of Mexico, valid permits required for the pelagic longline fishery, Gulf of Mexico Individual Bluefin Tuna Quota, and no prior violations of applicable regulations. Participants were able to fish using alternative gear, including green-stick gear options for yellowfin tuna, buoy gear for swordfish, buoy gear for yellowfin tuna, and deep drop gear for swordfish, for up to 60 sea-days. They were compensated for alternative gear trips taken during the repose period. Motorized haulers were authorized for use with buoy gear during the project time under an exempted fishing permit in 2020 for the purpose of data collection on buoy gear configured in this manner.

Additional information on the Deepwater Restoration Plan and Environmental Assessments can be found at www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Final-Phase-IV-ERP-EA.pdf and www.gulfspillrestoration.noaa.gov.

9.4 Social Indicators of Fishing Community Vulnerability and Resilience

The NOAA Fisheries Office of Science and Technology presents community profiles by region at www.fisheries.noaa.gov/national/socioeconomics/fishing-community-profiles. Information on community vulnerability and resilience is presented by the same office in a technical memo at www.fisheries.noaa.gov/national/socioeconomics/social-indicators-fishing-communities-0.

Jepson and Colburn (2013) originally developed a series of social indicators of vulnerability and resilience for over 3,800 U.S. coastal communities. These indices are regularly updated based on new data, and the most recent indices and scores can be found on the NOAA Fisheries Social Indicators webpage listed above. Nine social indicators are presented in this document for 25 communities selected for having a greater than average number of Atlantic HMS permits associated with them. These indicators are presented below with discussion in Table 9.1. This series of indices developed by NOAA Fisheries used social indicator variables that could assess a coastal community's vulnerability or resilience to potential economic disruptions such as those resulting from drastic changes in fisheries quotas and seasons or natural and anthropogenic disasters. Indices and index scores were developed using factor analyses of data from the U.S. Census, permit sales, landings reports, and recreational fishing effort estimates from the MRIP survey (Jepson and Colburn 2013). The nine social indices developed by Jepson and Colburn (2013) can be divided into two categories: 1) fishing engagement and reliance and 2) social vulnerability. For each index, the community is ranked as scoring high (one standard deviation or more above the mean score), medium high (0.5 to 0.99 standard deviations above the mean score), medium (0 to 0.49 standard deviations above the mean score), or low (below the mean score) on the index scale.

9.4.1 Fishing Reliance and Engagement Indices

Jepson and Colburn (2013) developed two indices each to measure community reliance and engagement with commercial and recreational fishing, respectively. Commercial fishing engagement was assessed based on pounds of landings, value of landings, number of commercial fishing permits sold, and number of dealers with landings. Commercial fishing reliance was assessed based on the value of landings per capita, number of commercial permits per capita, dealers with landings per capita, and data on the percentage of people employed in agriculture, forestry, and fishing from the Bureau of Labor Statistics. The recreational fishing engagement index was measured using MRIP estimates of the number of charter, private boat, and shore recreational fishing trips originating in each community. The recreational fishing reliance index was generated using the same fishing trip estimates adjusted to a per capita basis. MRIP data is not available for the state of Texas, so the recreational indexes for Texas were instead calculated based on recreational permit data from NOAA Fisheries and boat ramp data from the state of Texas. As such, recreational index scores for Texas communities are only comparable to other communities within the state.

In Table 9.1, fishing reliance and engagement index scores are presented for 25 Atlantic HMS communities. Ten of the 25 Atlantic HMS communities scored either high or medium high on at least three indicators of fishing reliance and engagement, and all scored at least medium high on one of the four indices. Four communities that scored high on all four indices included Montauk, New York; Barnegat Light, New Jersey; Cape May, New Jersey; and Grand Isle, Louisiana, indicating that these communities have greater than normal dependence on the recreational and commercial fishing sectors for jobs and economic support. Beaufort, North Carolina, and Panama City, Florida, both scored high or medium high on both fishing engagement indices while scoring medium or low on both fishing reliance indices, indicating that while both have a significant fishing community, it is not a massive component of either city's overall population. Conversely, Atlantic Beach, North Carolina; Orange Beach, Alabama; and Port Aransas, Texas, all scored high on the recreational fishing indices while scoring low or medium on both commercial fishing indices, suggesting these communities have greater than normal dependence on the recreational fishing sector for jobs and economic support.

9.4.2 Social Vulnerability Indices

Five indices of social vulnerability developed by Jepson and Colburn (2013) are also presented in Table 9.1. The personal disruption index includes the following community variables representing disruptive forces in family lives: percent unemployment, crime index, percent with no diploma, percent in poverty, and percent separated females. The population composition index shows the presence of populations that are traditionally considered more vulnerable due to circumstances associated with low incomes and fewer resources. The poverty index includes several variables measuring poverty levels within different community social groups, including the percent receiving government assistance, percent of families below poverty line, percent over age 65 in poverty, and percent under age 18 in poverty. The labor force index characterizes the strength and stability of the labor force and employment opportunities that may exist. A higher ranking indicates fewer employment opportunities and a more vulnerable labor force. Finally, the housing characteristics index is a measure of infrastructure vulnerability and includes factors that indicate housing that may be vulnerable to coastal hazards such as severe storms or coastal flooding.

The only Atlantic HMS community to score high or medium high on all five social vulnerability indices was Fort Pierce, Florida. Communities that scored high or medium high on four indices include New Bedford, Massachusetts; Pompano Beach, Florida; Port Salerno, Florida; and Freeport, Texas. Six other Atlantic HMS communities scored high or medium high on three social vulnerability indices: Beaufort, North Carolina; Morehead City, North Carolina; Apalachicola, Florida; Panama City, Florida; Dulac, Louisiana; and Grand Isle, Louisiana. These scores suggest these communities would likely experience greater difficulty recovering from economic hardships caused by job losses in the recreational and commercial fishing sectors.

Table 9.1 Social Indicators of Resilience and Vulnerability for 25 Highly Migratory Species Communities

Community	Pop. (2018)	Commercial Engagement[1]	Commercial Reliance[1]	Recreational Engagement[1]	Recreational Reliance[1]	Personal Disruption[2]	Population Composition[2]	Poverty[2]	Labor Force[2]	Housing[2]
Gloucester, MA	30,401	High	Medium	High	Medium	Low	Low	Low	Low	Medium
Nantucket, MA	11,327	Medium	Low	Med high	Medium	Low	Low	Low	Low	Low
New Bedford, MA	95,315	High	Medium	Medium	Medium	Med high	Med high	High	Low	Med high
Narragansett, RI	15,464	High	Medium	High	Med high	Low	Low	Low	Medium	Low
Montauk, NY	3,655	High	High	High	High	Low	Low	Low	Medium	Low
Barnegat Light, NJ	588	High	High	High	High	Low	Low	Low	High	Low
Brielle, NJ	4,691	Medium	Low	Med high	Medium	Low	Low	Low	Low	Low
Cape May, NJ	3,448	High	High	High	High	Low	Low	Low	High	Medium
Ocean City, MD	6,927	High	Medium	High	High	Low	Low	Low	Med high	Med high
Atlantic Beach, NC	1,505	Medium	Medium	High	High	Medium	Low	Low	Low	High
Beaufort, NC	4,391	High	Medium	High	Medium	Med high	Low	Med high	Medium	Med high
Morehead City, NC	9,304	High	Low	High	High	Med high	Low	Med high	Medium	Med high
Wanchese, NC	1,832	High	High	Med high	High	Low	Low	Low	Low	High
Fort Pierce, FL	46,071	High	Low	High	Medium	High	High	High	Med high	Med high
Islamorada, FL	6,383	Med high	Low	Low	Low	Low	Low	Low	Medium	Low

Community	Pop. (2018)	Commercial Engagement[1]	Commercial Reliance[1]	Recreational Engagement[1]	Recreational Reliance[1]	Personal Disruption[2]	Population Composition[2]	Poverty[2]	Labor Force[2]	Housing[2]
Pompano Beach, FL	111,954	Med high	Low	Med high	Low	Med high	Med high	Med high	Medium	Med high
Port Salerno, FL	11,317	Med high	Low	Med high	Low	Med high	Med high	Med high	Medium	Med high
Apalachicola, FL	2,344	High	Medium	Medium	Medium	Medium	Low	Medium	Medium	Med high
Destin, FL	14,077	High	Low	High	High	Low	Low	Low	Low	Medium
Madeira Beach, FL	4,327	Med high	Medium	Medium	Medium	Low	Low	Low	Med high	Medium
Panama City, FL	36,908	High	Low	High	Medium	Med high	Medium	Med high	Medium	Med high
Orange Beach, AL	5,927	Low	Low	High	High	Low	Low	Low	Med high	Medium
Dulac, LA	1,504	High	High	Medium	Med high	Med high	Medium	High	Med high	N/A
Grand Isle, LA	1,461	High	High	High	High	Low	Low	Medium	Med high	Med high
Freeport, TX	12,098	Med high	Low	High	Medium	High	High	High	Low	Med high
Port Aransas, TX	4,167	Medium	Low	High	High	Low	Low	Low	Low	Medium

Note: Social indicator scores are based on 2016 Marine Recreational Information Program, commercial landings, and permit data and on U.S. Census Bureau data. [1]Index scores for fishing engagement and reliance indices. [2]Index scores for social vulnerability indices. Source: Jepson and Colburn 2013.

9.5 Chapter 9 References

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10 Appendix

10.1 Descriptions of Gear Used in Highly Migratory Species Fisheries

This section provides descriptions of the gear types used to fish for Atlantic HMS and how those gears are deployed or used. Gears are defined for NOAA Fisheries under regulations implementing the Magnuson-Stevens Act (50 CFR 600.10).

10.1.1 Pelagic Longline

Pelagic longline gear is composed of several parts (Figure 10.1). The primary fishing line, or mainline of the longline system, can vary from 5 to 40 miles in length, with approximately 20–30 hooks per mile. The depth of the mainline is determined by ocean currents and the length of the floatline. The floatline connects the mainline to several buoys and periodic markers that can have radar reflectors or radio beacons attached. Each individual hook is connected by a leader, or gangion, to the mainline. Lightsticks, which contain light-emitting chemicals, are used, particularly when targeting swordfish. When attached to the hook and suspended at a certain depth, lightsticks attract baitfish, which may, in turn, attract pelagic predators (NOAA Fisheries 1999).

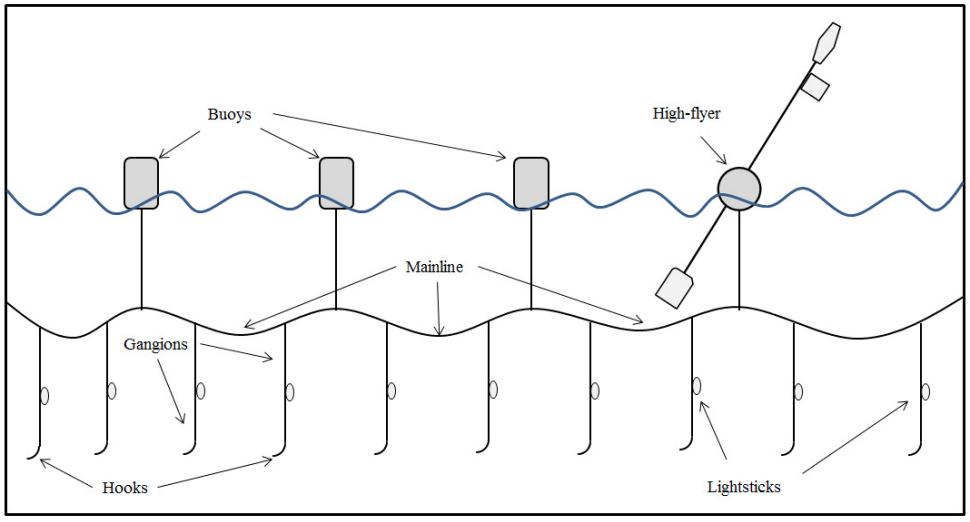

Figure 10.1 Typical U.S. Pelagic Longline Gear

Source: Redesign from original in Arocha (1997).

When targeting swordfish, pelagic longline gear is generally deployed at sunset and hauled at sunrise to take advantage of swordfish's nocturnal, near-surface feeding habits (NOAA Fisheries 1999). In general, longlines targeting tunas are set in the morning, fished deeper in the water column, and hauled back in the evening. Except for vessels in the distant water fleet, which undertake extended trips, fishing vessels preferentially target swordfish during periods when the moon is full to take advantage of increased densities of pelagic species near the surface. Basic differences between shallow swordfish and deep tuna pelagic longline sets are illustrated in Figure 10.2. Swordfish sets are buoyed to the surface, have fewer hooks between floats, and are relatively shallow. This same type of gear arrangement is used for mixed target species sets. Tuna sets use a different type of float placed much farther apart. Compared with swordfish sets, tuna sets have more hooks between the floats and the hooks are set much deeper in the water column. It is believed that tuna sets hook fewer turtles than the swordfish sets because of the difference in fishing depth. In addition, tuna sets use bait only, while swordfish sets use a combination of bait and lightsticks. Compared with vessels targeting swordfish or mixed species, vessels specifically targeting tuna

are typically smaller and fish different grounds. Pelagic longline vessel operators are opportunistic, switching gear style and making subtle changes to target the best available economic opportunity on each individual trip. Pelagic longline gear sometimes attracts and hooks non-target finfish with little or no commercial value, as well as species that cannot be retained by commercial fishermen due to regulations, such as billfish. Pelagic longline gear may also interact with protected species such as marine mammals, sea turtles, and seabirds. Thus, this gear has been classified as a Category I fishery with respect to the Marine Mammal Protection Act. Any species that cannot be landed due to fishery regulations is required to be released, regardless of whether the catch is dead or alive. More information on fishery interactions and reduction measures is available in Chapter 6.

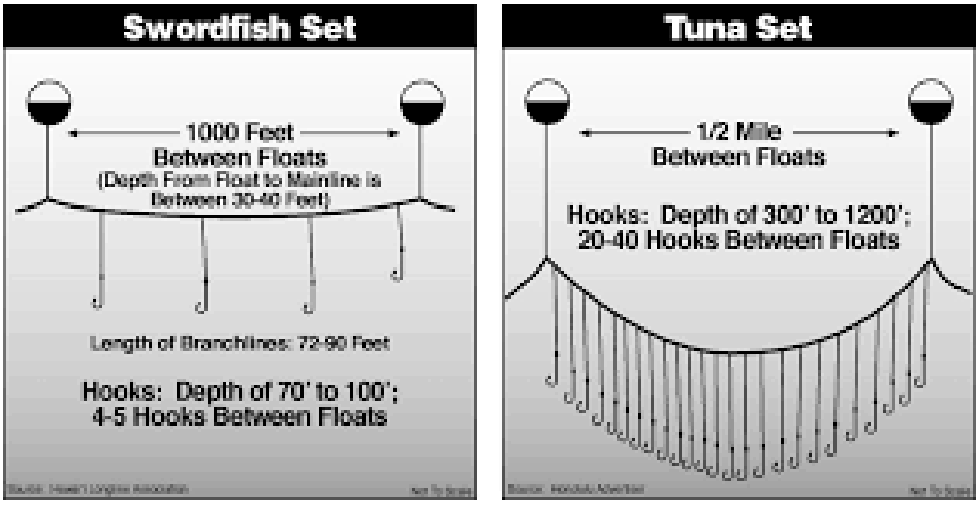

Figure 10.2 Pelagic Longline Gear Deployment Techniques

Note: This figure is included to show basic differences in pelagic longline gear configuration and to illustrate that this gear may be altered to target different species. Source: Hawaii Longline Association and Honolulu Advertiser.

10.1.2 Purse Seine

A purse seine is a large wall of netting deployed around an entire area or school of fish. The gear, illustrated in Figure 10.3, consists of a floated top line with a weighted bottom lead line, or purseline, threaded through rings along the bottom that can be closed by a drawstring. Once a school of fish is located, a skiff encircles the school with the net. The lead line is then pulled in, "pursing" the net closed on the bottom, preventing fish from escaping by swimming downward. The efficiency of this gear can be enhanced by the assistance of spotter planes used to locate schools of tuna.

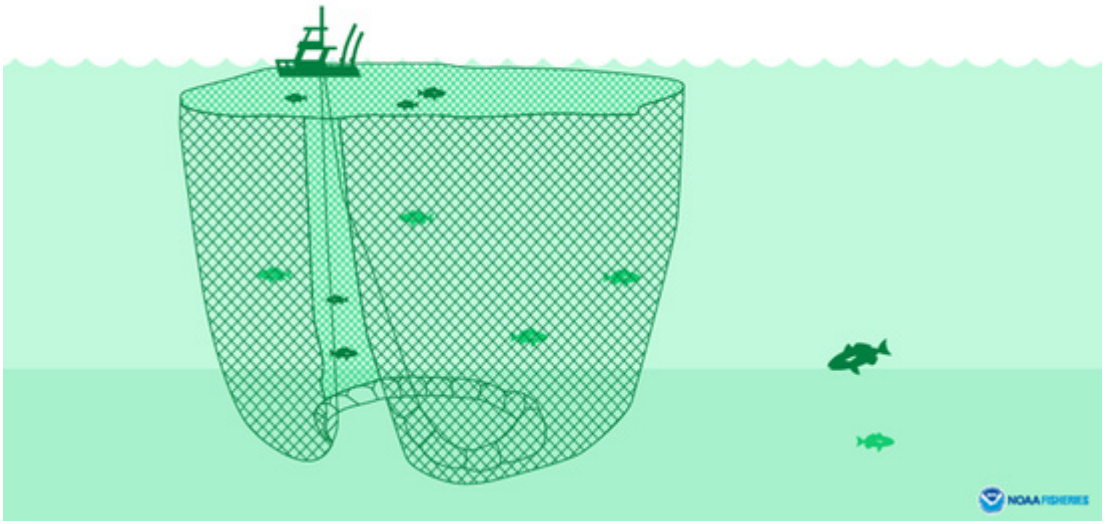

Figure 10.3 Purse Seine Gear Illustration

Source: NOAA Fisheries.

Purse seines can reach more than 6,500 feet (2,000 meters) in length and 650 feet (200 meters) in depth, varying in size according to the vessel, mesh size, and target species. They are used to target schooling pelagic fish of all sizes, from small sardines to large tunas, and squid.

Information on fishery interactions and reduction measures is available in Chapters 5 and 6.

10.1.3 Handgear

Handgears, including rod and reel, handline, harpoon, and bandit gear are often used to fish for Atlantic HMS by fishermen on private vessels, charter vessels, and headboat vessels. Green-stick may also be considered as commercial handgear for swordfish, but it is described separately below. Buoy gear is a relatively recent handgear used in swordfishing, primarily off the east coast of Florida. Each of these gears is described below.

Rod and reel gear is a handheld fishing rod with a manually or electronically operated reel attached. It is a popular gear type in the commercial Atlantic Tunas General category fishery as well as in all recreational Atlantic HMS fisheries. It may be deployed from a vessel that is anchored, drifting, or underway and can be used to present artificial lures or flies and live or dead baits.

Rod and reel gear used while the vessel is underway is referred to as trolling. Trolling involves dragging baits, artificial lures, or combinations of the two, through or on top of the water's surface, similar to green-stick fishing. While trolling, vessels often use outriggers to assist in spreading out or elevating multiple baits or lures and to prevent fishing lines from tangling. Trolling arrays for Atlantic HMS can include upwards of a dozen lines at a time and in some cases upwards of a dozen artificial lures on a single line. Trolling in Atlantic HMS fisheries is used primarily to target billfish and tuna. Trolling rigs for billfish typically combine an artificial lure with a plastic skirt and a dead bait, such as a ballyhoo, herring, or mullet, rigged on a circle or J-hook. These baits are usually fished to skip along the surface to draw in marlin and sailfish. Trolling rigs for tuna often involve umbrella rigs with multiple soft plastic artificial lures that are fished below the surface.

Fishing with rod and reel gear from an anchored or drifting boat is a popular way to present artificial lures and live or dead baits to all Atlantic HMS, particularly tunas, swordfish, and sharks. Artificial lures may be fished by casting to surface feeding fish chasing baitfish or by vertically jigging under the boat for schools of fish located with

a fish finder or along bottom ledges known to hold fish. Live and dead baits may be allowed to drift or swim with the current or be weighted down to fish at depth. Deep-drop fishing is a popular technique used for swordfish that allows recreational anglers to fish baits over a thousand feet deep. Deep-drop fishing employs the use of a large mechanical reel spooled with wire to lower heavy weights to great depths and baited lines on rod and reel gear attached to the wire line using quick-release clips. When a fish bites, the quick-release clips release the wire line so the fish can be fought to the surface without the heavy weight. Chumming is another popular technique when fishing from an anchored vessel, especially for sharks, and involves putting ground-up fish meal and blood in the water to attract fish to baited hooks drifting behind the boat. Chunking is a variation on chumming that involves cutting up bait fish into chunks and throwing them overboard to attract fish to the boat, particularly tuna.

Handline gear must be attached to, or be in contact with, a vessel. It consists of a mainline with no more than two gangions or hooks attached. A handline must be released and retrieved by hand instead of by mechanical means. There are gear marking requirements for floats attached to the handline.

Harpoon gear is attached to a pole that is propelled only by hand instead of through mechanical means. A harpoon is a pointed dart or iron attached to the end of a line several hundred feet in length, the other end of which is attached to a floatation device. Atlantic HMS targeted with harpoon gear include large tuna, swordfish, and sharks.

Similar to harpoon gear, spearfishing gear uses heavy rubber bands to launch small spears at great speed underwater. Spearfishing is popular among divers, and is an authorized method for targeting bigeye, albacore, yellowfin, and skipjack tunas.

Bandit gear is a vertical hook and line gear with rods attached to the vessel when in use. Lines may be retrieved with manual, electric, or hydraulic reels.

Buoy gear is primarily used as a handgear for swordfish. This commercial handgear swordfish fishery exists chiefly off the east coast of Florida but also occurs in other locations of the Atlantic, Gulf of Mexico, and U.S. Caribbean. The gear is generally used at night when fishing for swordfish and consists of one or more floatation devices supporting a single mainline, to which no more than two hooks or gangions are attached. Authorized permit holders may not possess or deploy more than 35 floatation devices and may not deploy more than 35 individual buoy gears per vessel. Buoy gear must be constructed and deployed so that the hooks and/or gangions are attached to the vertical portion of the mainline. Floatation devices may only be attached to one end of the mainline, and no hooks or gangions may be attached to any floatation device or horizontal portion of the mainline. If more than one floatation device is attached to a buoy gear, no hook or gangion may be attached to the mainline between them. Individual buoy gears may not be linked, clipped, or connected together in any way. Buoy gears must be released and retrieved by hand. All deployed buoy gear must have some type of affixed monitoring equipment, such as radar reflectors, beeper devices, lights, or reflective tape. If only reflective tape is affixed, the vessel deploying the buoy gear must possess on board an operable spotlight capable of illuminating deployed floatation devices. If a gear monitoring device is positively buoyant and rigged to be attached to a fishing gear, it is included in the 35 floatation device vessel limit and must be marked appropriately.

10.1.4 Bottom Longline

Bottom longline gear is a longline that is deployed with enough weights or anchors to maintain contact with the ocean bottom (Figure 10.4). While bottom longline may have floats and high flyers, they are used only to mark the location of the gear and not to float the gear.

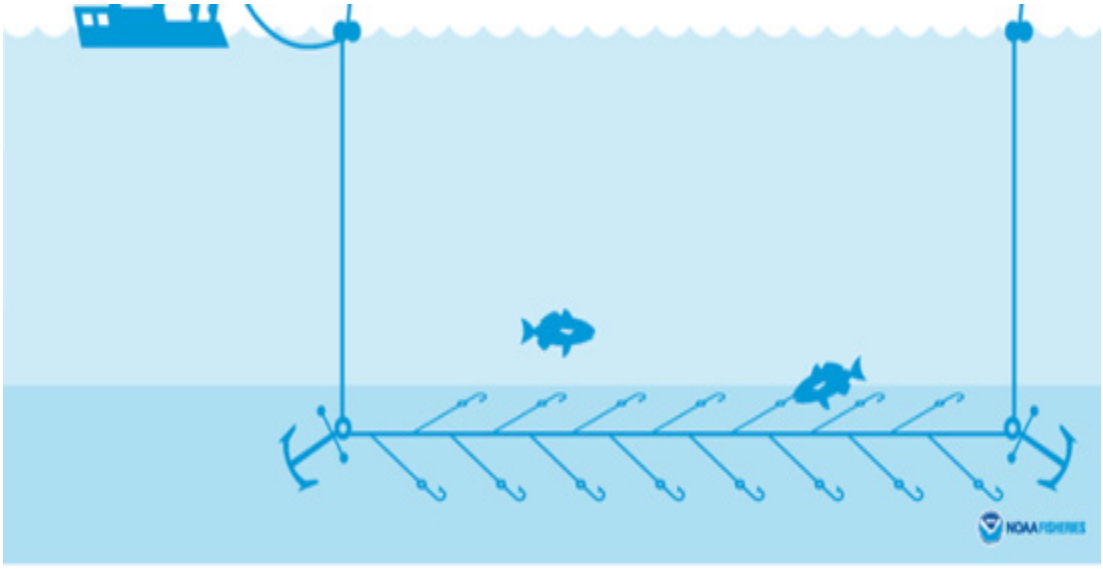

Figure 10.4 Bottom Longline Gear Illustration

Source: NOAA Fisheries.

Bottom longline is the primary commercial gear employed for targeting large coastal sharks in all regions. Small coastal sharks are also caught on bottom longline gear. This gear rarely, if ever, interacts with other Atlantic HMS.

Gear characteristics vary by region and target species. Since January 1, 2018, Shark Directed permit holders using bottom longline gear have been required to use circle hooks as implemented by Amendment 5b to the 2006 Consolidated Atlantic HMS FMP.

10.1.5 Gillnet

A gillnet is a wall of netting that hangs in the water column, typically made of monofilament or multifilament nylon (Figure 10.5). The gillnet itself can be composed of different panels of netting that may have different mesh sizes depending on the target species. Gillnets used while fishing for Atlantic HMS cannot have a total length of more than 2.5 kilometers.

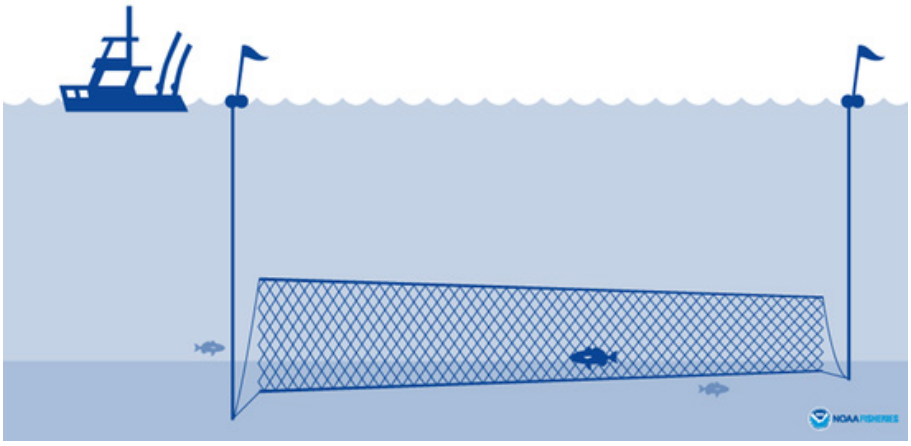

Figure 10.5 Generalized Gillnet Diagram

Source: NOAA Fisheries.

Gillnets are designed to allow fish to get only their head through the netting but not their body. The fish's gills then get caught in the mesh as the fish tries to back out of the net. A variety of regulations and factors determine the mesh size, length, and height of commercial gillnets, including the area fished and target species. In Atlantic HMS fisheries, fishermen can only use gillnets to catch sharks, primarily small coastal sharks and smooth dogfish. Gillnets cannot be used for swordfish, billfish, or tuna fishing.

Regulations on gillnet use are dependent on gillnet type. Under Atlantic HMS regulations at CFR 635.2, two types of gillnets are defined: sink and drift gillnets.

A sink gillnet is designed to be or is fished on or near the ocean bottom in the lower third of the water column by means of a weight line or enough weights and/or anchors that the bottom of the gillnet sinks to, on, or near the ocean bottom. Sink gillnets used to fish for Atlantic HMS cannot remain in the water longer than 24 hours from when the gillnet first enters the water. The gear must be completely removed within that 24-hour period. Generally, fishermen use sink gillnet to target smooth dogfish in the Northeast.

A drift gillnet is one that floats unattached to the ocean bottom and is not anchored, secured, or weighted to the ocean bottom. Drift gillnets used to fish for Atlantic HMS must remain attached to the vessel at one end at all times unless the vessel is checking the net for sea turtles or marine mammals, which must be done at least every two hours. Fishermen can use drift gillnets in different ways. One way is to allow the gillnet to drift in the water. The other way is to target and encircle a group of fish, similar to how purse seine gear is used. When used in this way, the gillnet is called a strike gillnet or strike net. Endangered and threatened species or protected marine mammals have never been observed taken in strike net sets.

10.1.6 Green-Stick

Green-stick gear consists of an actively trolled mainline attached to a vessel and elevated or suspended above the surface of the water with no more than 10 hooks or gangions attached to the mainline (Figure 10.6). The suspended line, attached gangions and/or hooks, and catch may be retrieved collectively by hand or mechanical means.

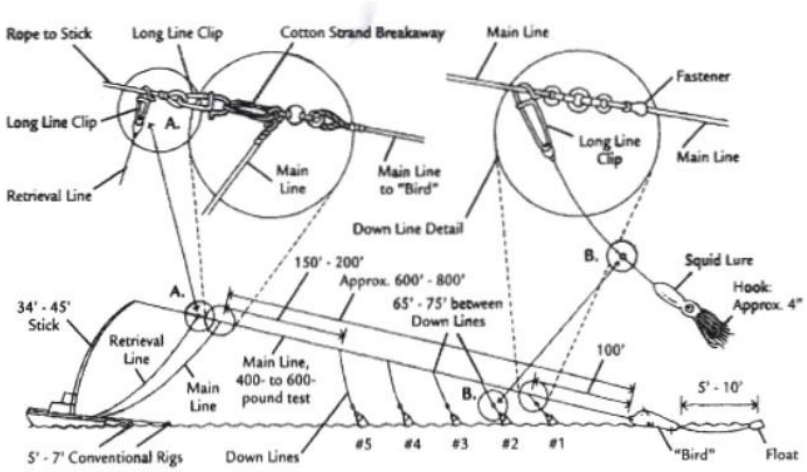

Figure 10.6 Green-Stick Gear Configuration

Source: NOAA Fisheries.

Green-stick gear may be used to harvest bigeye, albacore, yellowfin, skipjack, and bluefin tunas aboard vessels with Atlantic Tunas General category, Atlantic HMS Charter/Headboat, and Atlantic Tunas Longline category permits.

Atlantic Tunas Longline category permitted vessels may possess up to 20 J-hooks onboard for use with green-stick

gear, and no more than 10 J-hooks may be used with a single green-stick gear. The J-hooks may not be used with pelagic longline gear, and no J-hooks may be possessed onboard a pelagic longline vessel unless green-stick gear is also onboard. J-hooks possessed and used onboard pelagic longline vessels may be no smaller than 1.5 inches (38.1 millimeters) when measured in a straight line over the longest distance from the eye to any other part of the hook.

10.2 Atlantic HMS Management History

10.2.1 Historical Fishery Management Plans

During the 1980s, Atlantic HMS were managed under the authority of the five Atlantic regional fishery management councils: New England, Mid-Atlantic, South Atlantic, Gulf of Mexico, and Caribbean. In 1985 and 1988, the councils published joint FMPs for swordfish and billfish.

In 1993, the newly established Atlantic HMS Management Division finalized the 1993 Atlantic Shark FMP. That was later replaced by the 1999 Atlantic Tunas, Swordfish, and Sharks FMP. The 1999 FMP was the first for Atlantic tunas. Management measures that changed in the 1999 FMP included:

- Expanding the list of prohibited shark species to 19 species.
- Establishing a shark public display quota.
- Identifying essential fish habitat for all Atlantic tunas, swordfish, and sharks.
- Establishing the Swordfish Directed, Swordfish Incidental, Swordfish Handgear, Shark Directed, Shark Incidental, and Atlantic Tunas Longline category permit types.

As part of the 1999 FMP, the regulations for all Atlantic HMS, including billfish, were consolidated into one part of the Code of Federal Regulations, 50 CFR Part 635. The implementing regulations were published on May 28, 1999 (64 FR 29090).

Also in 1999, NOAA Fisheries updated the Billfish FMP originally passed by the councils. In 2003, NOAA Fisheries finalized Amendment 1 to the 1999 FMP, which implemented substantial changes to the shark fishery including the time/area closure for sandbar and dusky sharks off North Carolina (68 FR 74746; December 24, 2003). NOAA Fisheries upheld management measures maintained in both the Billfish FMP (Amendment 1) and the Atlantic Tunas, Swordfish, and Sharks FMP until 2006.

10.2.2 Current Fishery Management Plan and Amendments

In 2006, NOAA Fisheries finalized a consolidated FMP for Atlantic tunas, swordfish, billfishes, and sharks. This FMP combined the FMPs for all Atlantic HMS and amended certain management objectives to the 1999 FMP and the 1999 Billfish FMP amendment. Besides consolidating Atlantic HMS management into one FMP, some of the major changes in the 2006 Consolidated Atlantic HMS FMP included time area closures in the Gulf of Mexico consistent with regulations implemented by the Gulf of Mexico Fishery Management Council, mandatory workshops for commercial fishermen and shark dealers, and modifying the management process of bluefin tuna. Since the finalization of the 2006 Consolidated Atlantic HMS FMP, NOAA Fisheries has finalized a variety of amendments for Atlantic HMS. Table 10.1 summarizes all finalized amendments. For additional information on these and to view amendments currently in the rulemaking process, visit www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-hms-fishery-management-plans-and-amendments.

Table 10.1 Amendments to the 2006 Consolidated Atlantic Highly Migratory Species Fisheries Management Plan

Amendment	Year	Primary Impact	Actions
1	2009	All Atlantic HMS	Revised existing essential fish habitat (EFH), established a new Habitat Areas of Particular Concern (HAPC) for bluefin tuna in the Gulf of Mexico, and provided conservation recommendations for fishing and non-fishing impacts on EFH.
2	2008	Sharks	Established measures to rebuild overfished species and prevent overfishing of Atlantic sharks. Measures included developing rebuilding plans for porbeagle, dusky, and sandbar sharks, implementing commercial quotas and retention limits, modifying recreational measures to reduce fishing mortality of overfished/overfishing stocks, modifying reporting requirements, requiring that all Atlantic sharks be offloaded with fins naturally attached, collecting shark life history information via the implementation of a shark research program, and implementing time/area closures recommended by the South Atlantic Fishery Management Council.
3	2010	Sharks	Implemented conservation and management measures to rebuild blacknose sharks and end overfishing of blacknose and shortfin mako sharks. This amendment also placed smooth dogfish and Florida smoothhound into a complex managed under this FMP.
4	2012	Caribbean	Amended regulations in Puerto Rico and the U.S. Virgin Islands to better manage the traditional, small-scale commercial Atlantic HMS fishing fleet in the region, enhancing fishing opportunities, improving profits, and providing NOAA Fisheries with improved capability to monitor and manage those fisheries. This amendment also created the Atlantic HMS Commercial Caribbean Small Boat permit and stipulated that it cannot be held in combination with any other Atlantic HMS permit.
5a	2013	Sharks	Implemented measures to maintain the rebuilding of sandbar sharks, end overfishing and rebuild scalloped hammerhead and Atlantic blacknose sharks, establish total allowable catch and commercial quotas for Gulf of Mexico blacknose and blacktip sharks, and establish new recreational shark fishing management measures.
5b	2017	Sharks	Established measures to end overfishing of and rebuild the dusky shark stock. Measures included modifying the rebuilding plan to ensure fishing mortality levels are maintained at or below levels needed to meet the goal of achieving a 35 percent mortality reduction relative to 2015 levels and rebuild the stock by 2107, as well as clarifying annual catch limits and implementing preventative accountability measures for the prohibited shark species complex.
6	2015	Sharks	Increased management flexibility to adapt to the changing needs of Atlantic shark fisheries, prevent overfishing while achieving optimum yield, and rebuild overfished stocks.
7	2014	Bluefin tuna	Implemented measures related to the pelagic longline fishery, including individual bluefin quotas, two new gear restricted areas, closure of the pelagic longline fishery when the annual bluefin tuna quota is reached, elimination of target catch requirements associated with retention of incidental bluefin tuna in the pelagic longline fishery, mandatory retention of legal-sized bluefin tuna caught as bycatch, expanded monitoring requirements, and transiting provisions for pelagic and bottom longline vessels. This amendment also required vessel monitoring system use and reporting by the Purse Seine category, required the use of the Automated Catch Reporting System by the General and Harpoon categories, provided additional flexibility for inseason adjustment of the General category quota and Harpoon category retention limits, and changed the allocation of the Angling category Trophy South subquota for the Gulf of Mexico.

Amendment	Year	Primary Impact	Actions
8	2013	Swordfish	Implemented new and modified commercial vessel permits allowing holders to retain and sell a limited number of swordfish caught on rod and reel, handline, harpoon gear, green-stick, and bandit gear.
9	2015	Sharks	Established Atlantic and Gulf of Mexico regional smoothhound shark annual commercial quotas, implemented the shark gillnet requirements of the 2012 Shark and Smoothhound Biological Opinion, modified regulations related to the use of vessel monitoring systems by Atlantic shark fishermen using gillnet gear, and implemented the smooth dogfish-specific provisions in the Shark Conservation Act of 2010.
10	2017	All Atlantic HMS	Revised existing EFH, modified the HAPCs for bluefin tuna and sandbar sharks, and created new HAPCs for juvenile and adult lemon sharks.
11	2019	Shortfin mako sharks	Implemented new retention requirements for commercial and recreational fisheries to reduce fishing mortality of shortfin mako sharks and establish the foundation for rebuilding the shortfin mako shark population.

10.3 Descriptions of Atlantic HMS Data Collections

This section provides a summary of some of the data sources referenced in this report.

10.3.1 Commercial Vessel Logbook Data

10.3.1.1 Background

Almost all federally permitted commercial vessels are required to report their fishing activities in a logbook, with some limited exceptions. Logbooks typically require information on the gear used, the date a fishing trip occurred, the quantity of fish landed, and the fishing location. Because commercial fishermen are reporting this data themselves, it is referred to as "self-reported" data. Different logbooks are required and used depending on the data collection needs and requirements of the different fisheries.

Owners of permitted vessels are required to maintain and submit logbooks as specified in federal regulations, consistent with the conditions of their federal permits. Not all federal permits currently require logbooks to be submitted at this time.

10.3.1.2 Atlantic HMS Logbook

Atlantic HMS permit holders using pelagic longline gear are required to use this logbook; however, Atlantic HMS permit holders who are selected to report and who use other gears, including rod and reel, green-stick, and bottom longline gear, may also report fishing activities in this logbook. The fishermen using this logbook primarily target swordfish and tunas.

There are three forms that must be submitted for a logbook report to be complete: the trip report form, the set report form, and the dealer weigh-out tally sheet. The trip report form provides information on the trip itself, such as the start and end dates, the vessel name and identification number, and economic information, such as the total cost of trip expenses (e.g., groceries and fuel) and which dealers landings were sold to. The set form provides information on an individual fishing set, including the specific latitude/longitude coordinates at which gear was set and hauled back, the amount of gear used, and the number and species of fish and protected species kept, released alive, and discarded dead. Each logbook submission will include only one trip form but may include numerous set forms. Weigh-out slips or tally sheets must be submitted by the fishermen along with the trip and set forms. Permitted dealers provide these slips, which records the fish purchased by the dealer, to the fishermen and must include, at a minimum, the numbers and weights of the fish landed. These tally sheets frequently list the weights of each Atlantic HMS purchased.

If no fishing trips occurred during a given month, the no-fishing form is required, which allows NOAA Fisheries to confirm that permit holders are not fishing, as opposed to not reporting.

10.3.1.3 Southeast Coastal Fisheries Logbook

This logbook is primarily used by fishermen with commercial shark permits who do not use pelagic longline gear and by fishermen with permits in the South Atlantic and Gulf of Mexico regions to report fishing activity in the Gulf of Mexico reef fish, South Atlantic snapper/grouper, king and Spanish mackerel, shark, and Atlantic dolphinfish/wahoo fisheries. This logbook is primarily used for bottom longline, gillnet, and vertical line (including bandit) gears, but other gears can also be reported here. As with the Atlantic HMS Logbook, the Southeast Coastal Fisheries Logbook has several associated forms. Unlike the Atlantic HMS Logbook, though, additional forms are not required by every fisherman or for every trip.

The trip form includes information specific to the trip, such as vessel name and identification number and dates of the trip. However, unlike the trip form in the Atlantic HMS Logbook, the Southeast Coastal Fisheries Logbook trip form collects information on the gear used, location, and species kept for an entire trip rather than on every set of the fishing trip. Gear effort information (e.g., number of hooks, lines fished, and length of longline) is reported as the average for an entire trip, as opposed to the specific number of hooks or length of line for each set. "Species

kept" is also reported in total weight for the entire trip, not in numbers of fish per set like for the Atlantic HMS Logbook. Economic information, such as the total cost of groceries and fuel, is collected on this form and is required for each trip from a group of fishermen representing 20 percent of the active fleet randomly selected annually.

Also unlike the Atlantic HMS Logbook, the trip form does not record information on released or discarded fish or protected species. A separate discard form for that information exists; however, not all permit holders using the logbook are required to complete a discard form. Every year, NOAA Fisheries requires approximately 20 percent of those fishermen selected randomly to report to the Southeast Coastal Fisheries Logbook program to also report discards using a discard logbook form. This discard form is also trip based and does not have specific location data available for each set. Additionally, this logbook form does not provide specific information on individual fish that are discarded dead or alive. For each species reported on the discard form, fishermen are required to report whether all the fish were discarded dead, most were discarded dead, all were discarded alive, most were discarded alive, some were kept but not sold (e.g., if they used the fish as bait), or the fishermen was unable to determine which category to check. Fishermen may also report "no discards" when submitting a discard logbook form and remain in reporting compliance. Such reporting means that no individuals of any species were discarded during the fishing trip.

This logbook also has a no-fishing form. As with the Atlantic HMS Logbook, fishermen are required to submit this form if they did not take fishing trips during a month.

10.3.1.4 Northeast Vessel Trip Reports

Any fisherman with a permit issued out of the Greater Atlantic Regional Fisheries Office (GARFO) is required to use this logbook to report all fish landed, regardless of species. Most non-HMS fishermen from the Mid-Atlantic to Maine use this logbook program to report their landings. For the most part, the fishermen reporting in this logbook use trawls, dredges, or gillnet gear and are fishing for non-HMS such as scallops, squid, herring, groundfish, skates, and spiny dogfish. Except for some smoothhound shark permit holders who also hold GARFO permits that require reporting and a few swordfish permit holders that target *Loligo* squid and land swordfish incidentally, no Atlantic HMS permit holders use this logbook. Unlike the Atlantic HMS Logbook and the Southeast Coastal Fisheries Logbook, this logbook is used not only by commercial permit holders but also by charter/headboat fishermen when fishing recreationally.

The Northeast Vessel Trip Reports logbook has only one form. Permit holders use that form to report trip-level information, gear information, location by both grid and longitude and latitude, and, for commercial trips, the weight of each species kept or discarded. There is no indication on the form whether the discards are alive or dead. A new form must be filled out when the fisherman moves to a new area or uses a different gear. "Species kept" is reported in total weight for the entire trip, not in numbers of fish per set like for the Atlantic HMS Logbook.

From 2000 to 2015, fishermen using this logbook were required to submit a monthly no-fishing report if they did not fish. These no-fishing reports are no longer required by GARFO.

10.3.2 Observer Data

10.3.2.1 Northeast Fisheries Observer Program

This program covers the states in the Northeast and Mid-Atlantic regions in non-HMS fisheries, such as groundfish, monkfish, squid, skates, herring, and scallops, as well as the Atlantic HMS Mid-Atlantic smoothhound shark fishery. These fisheries primarily use trawls, gillnets, and dredges. Trips in each fishery are randomly selected for observer coverage. Coverage rates vary year-to-year and by gear type and fishery, but on average this program observes approximately 8 percent of trips in this region.

10.3.2.2 Southeast Bottom Longline Observer Program

This observer program collects data on temporal and spatial catch, release mortality, bycatch, and discards on trips targeting Atlantic HMS, primarily sharks, and non-HMS such as snapper/grouper on vessels that fish from North

Carolina to Louisiana. Vessels are selected at random each quarter based on reported use of longline and targeted shark interactions in the same season of the previous year. The coverage level of all southeast and Gulf of Mexico trips that use bottom longline gear is 5 to 10 percent.

This observer program also observes the shark research fishery. The shark research fishery started in 2008 to ensure that data critical to effective shark management could continue to be gathered, even after commercial shark quotas were significantly cut that year in Amendment 2 to the 2006 Consolidated Atlantic HMS FMP. There are approximately 5 to 10 vessels in the research fishery each year, and they must carry an observer on 100 percent of all research fishery trips. These vessels generally make only one or two research fishery trips per month.

10.3.2.3 Southeast Gillnet Observer Program

This observer program focuses on all anchored, sink, strike, or drift gillnet fishing by vessels that fish from Florida to North Carolina and in the Gulf of Mexico. Similar to the Southeast Bottom Longline Observer Program, vessels are randomly selected on a quarterly basis from a pool of vessels that had reported fishing with gillnet gear during the same quarter the previous year in the Southeast Coastal Fisheries Logbook. The coverage level for this observer program is approximately 8 to 10 percent of all trips in the Southeast that use gillnet gear.

10.3.2.4 Gulf of Mexico Reef Fish Observer Program

This observer program, which began in 2006, provides quantitative biological, vessel, and some gear-selectivity information relative to the directed reef fish fishery in the Gulf of Mexico. This program primarily focuses on bottom longline and vertical line (bandit or handline). More recently, it has included limited observer coverage on modified buoy gear trips. Although many reef fish species are retained, the predominant target species are snapper/grouper. The coverage level for this observer program is approximately 2 to 5 percent of all Gulf of Mexico trips that fish for reef fish.

10.3.2.5 Gulf of Mexico Shrimp Trawl Observer Program

This observer program provides quantitative biological, vessel, and gear-selectivity information relative to the southeastern shrimp fishery. This program provides general fishery bycatch characterization and catch rates for finfish species by area and target species and provides catch rates to estimate protected species bycatch levels. Until the late 2000s, this observer program did not identify sharks to species. The coverage level for this observer program is approximately 2 percent of all Gulf of Mexico shrimp trawl trips.

10.3.2.6 Pelagic Observer Program

Data from this program is collected during trips on pelagic longline vessels with Atlantic HMS permits. These vessels are generally targeting swordfish and yellowfin and bigeye tunas. Once a set is retrieved, information like the length, dressed weight, sex, and tag number of each individual fish is recorded. In recent years, coverage levels have been approximately 10 to 15 percent of vessels, based on the fishing effort of the fleet. There have been times and areas where the agency has required 100 percent coverage over specific times or areas such as during bluefin tuna spawning time period in the Gulf of Mexico for a number of years and in the Mid-Atlantic Bight.

10.3.3 Recreational Data

10.3.3.1 Marine Recreational Information Program

MRIP uses a network of complementary surveys to collect recreational fishing data to estimate fishing effort and catch from Maine to Mississippi. The primary MRIP surveys are the Access Point Angler Intercept Survey, the Fishing Effort Survey, and the For-Hire Survey.

APAIS is conducted by state fisheries agency partners. Interviewers survey individual recreational anglers at marinas and other known fishing access sites to collect data on the angler's catch, including the length, weight, and species of fish caught. They also collect information on number of fish released and general information about

the fishing trip, including its length and mode (i.e., shore, private boat, or for-hire charter boat or headboat). The primary purpose of this survey is to estimate average catch rates per angler. In this survey, most harvested fish are directly observed by the on-site interviewers who are trained to identify fish to the species level, while the collection of data on released fish relies on anglers to identify the species or a more generic category like "shark."

The FES is a mail survey of licensed recreational anglers and coastal households used to collect data on the number of saltwater fishing trips taken by recreational anglers on privately owned boats or from shore. Data are collected at the end of two-month waves to minimize recall bias that would result from asking individuals to recollect the number of trips taken over a longer period. The FES fully replaced the historic Coastal Household Telephone Survey in 2018 following three years of both surveys being conducted side by side (2015-2017). Side by side data collection was conducted to facilitate the development of a calibration model used to adjust the historic time series of MRIP catch estimates to preserve their use in stock assessments. More information on the current survey methods, reasons for the survey redesigns, how they have affected catch and effort estimates, and implications for management can be found at www.fisheries.noaa.gov/recreational-fishing-data/effort-survey-improvements#transition-process.

FHS is a telephone survey of known charter boat and headboat vessel operators used to collect data on the number of saltwater fishing trips taken by recreational anglers on for-hire vessels. To minimize recall bias, FHS asks vessel operators to report vessel fishing activity for one-week periods, including the number of anglers fishing per trip, hours spent fishing, areas fished, and species targeted. The primary purpose of FHS is to estimate total fishing effort by recreational anglers fishing from for-hire charter boat and headboat vessels.

MRIP estimates total annual catch and harvest per species and mode by multiplying average catch rates obtained by APAIS by estimates of total fishing effort obtained by FES and FHS. Thus, MRIP estimates are extrapolated estimates of catch. When data are extracted, the MRIP database provides confidence intervals.

10.3.3.2 Large Pelagics Survey

LPS, which began in 2001, collects information regarding the recreational fishery directed at large pelagic species (e.g., tunas, billfishes, swordfish, sharks, wahoo, dolphinfish, amberjack) in the offshore waters from Maine through Virginia from June through October. The purpose of LPS is to collect more precise estimates of fishing effort and catch for large pelagic species that are rarely encountered in the general MRIP surveys. LPS includes two independent surveys: Large Pelagics Telephone Survey (LPTS) and Large Pelagics Intercept Survey (LPIS). These provide effort and average catch-per-trip estimates needed to estimate total catch by species.

LPIS is a dockside survey of known offshore fishing access sites primarily designed to collect catch data from private and charter boat captains who completed fishing trips directed at large pelagic species. LPIS data are used to estimate the average recreational catch per large pelagic boat trip by species. Unlike APAIS, LPIS collects aggregate catch data for all anglers fishing on a given vessel.

LPTS is a telephone survey that collects data used to estimate the total number of boat trips on which anglers fished for large pelagic species with rod and reel or handline. For-hire Atlantic HMS vessels are covered by FHS (listed above), and private boats are covered by LPTS, a biweekly survey. LPTS covers both commercial fishing by vessels with Atlantic Tunas General category permits and true recreational fishing by vessels with Angling category permits.

LPS estimates total annual catch and harvest per large pelagic species and mode (i.e., private boat or for-hire) by multiplying the average catch rates obtained by LPIS by estimates of total fishing effort obtained by LPTS and FHS. Thus, LPS estimates are extrapolated estimates of catch. As with MRIP, LPS confidence intervals are generated online when reviewing the extrapolated estimates (www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index).

10.3.3.3 Texas Parks and Wildlife Department Recreational Survey

The Texas Parks and Wildlife Marine Recreational Fishing Survey collects recreational data regarding bait and gear

used, species composition and size, trip length, etc. Information is collected via on-site, post-fishing trip interviews of anglers at coastal boat access sites. The amount of angling activity and harvest are estimated with data collected from anglers during coastal harvest surveys (tpwd.texas.gov/fishboat/fish/didyouknow/coastal/creel.phtml). This survey is the only source of recreational landings estimates for Texas. The landings estimates are extrapolated estimates.

10.3.3.4 Southeast Region Headboat Survey

SRHS focuses on monitoring and sampling data from the recreational headboat fisheries in the South Atlantic and Gulf of Mexico. Data collected from this survey consist of trip-level logbook records submitted by captains and biological samples collected dockside by port agents.

SRHS is composed of three main components: the dockside intercept biological sampling program, which collects data on the length, weight, age, and sex of fish caught on headboats; the headboat activity report, which collects data on the number and type of trips taken by headboats and the number of anglers per trip; and the logbook/trip report, which collects data on the number of fish caught and released per headboat trip by species. SRHS landings estimates are extrapolated from the logbook data to account for non-reporting.

10.3.3.5 Louisiana Recreational Creel Survey

LA Creel was implemented by Louisiana in 2014 to replace MRIP data collection. LA Creel uses a combination of data gathered through interviews at public fishing areas and weekly phone and email surveys to produce weekly estimates of recreational fish harvests.

In January 2018, NOAA Fisheries certified LA Creel as an alternative for MRIP. LA Creel catch statistics could not be used in stock assessments and management actions until they were converted into a "common currency" that makes them comparable to historical MRIP estimates. Implementation of such a conversion required development of peer-reviewed, scientifically valid methods. LA Creel data were used for the first time in the 2019 SAFE Report.

10.3.3.6 Atlantic HMS Tournament Registration and Reporting System

The Atlantic HMS Tournament Registration and Reporting system was implemented in August 2017, and is important for the management of swordfish, billfishes, tunas, and sharks, because it characterizes a portion of the recreational fishing effort on these species. This includes the location and targeted species, and provides catch and landings data that are used in stock assessments and for United States overall catch limit monitoring as established by the International Commission for the Conservation of Atlantic Tunas (ICCAT).

The ATR is the evolution and replacement of the Recreational Billfish Survey (RBS), which was developed as a key element in complying with Phase I of the ICCAT marlin rebuilding plan and improving the monitoring of recreational billfish and swordfish landings by establishing a comprehensive monitoring program for all recreational landings of marlin, sailfish, and swordfish, particularly those landed outside of fishing tournaments.

Tournament operators are required to register tournaments and to report tournament results of all Atlantic HMS at https://grunt.sefsc.noaa.gov/apex/secapxdv/f?p=127:1:18166670817507:::::.

10.3.4 Seafood Dealer Data

10.3.4.1 Pelagic Dealer Compliance System

This reporting system was implemented for federally permitted Atlantic HMS seafood dealers primarily to monitor landings of tunas and swordfish, but sharks purchased by these dealers were also reported. All commercial HMS permit holders are required to sell to federally permitted dealers, and all federally permitted dealers were required to report all Atlantic HMS fish purchases to the Pelagic Dealer Compliance System until 2013. This system was replaced by the electronic dealer reporting system described below.

10.3.4.2 Electronic Dealer Reporting System

Since 2013, the electronic dealer reporting system, known as eDealer, has provided self-reported data from federally permitted Atlantic HMS dealers. BFT-reporting, with its distinct 24-hour report submission requirement, coast-wide range encompassing the Atlantic Ocean and adjoining seas, and unique data elements such as tags and length, switched from a system in which landing cards were faxed by the dealer to Atlantic HMS to an electronic dealer reporting in 2016. As of 2020, one of the two types of systems available for eDealer reporting can be used for BFT reporting Standard Atlantic Fisheries Information System (SAFIS), including file upload. As of January 1, 2013, all federally permitted Atlantic HMS dealers have to submit electronic dealer reports on a weekly basis. The eDealer program pulls in all federally submitted Atlantic HMS landings from other electronic dealer reporting systems from Maine to Texas, including the U.S. Caribbean, to provide one complete dataset for all electronically submitted Atlantic HMS dealer data.

NOAA Fisheries regularly cross-validates the weight of fish and the purchase dates provided in dealer reports with the logbook trip information, including the weigh-out slips, to ensure all fish are accounted for throughout the fishery. When discrepancies are found, NOAA Fisheries works to ensure the fish are correctly entered in the appropriate dealer reporting system and in the logbook. Similarly for BFT, information in the dealer landings dataset is compared to the open-access vessel catch report data set for quality assurance of each. Vessel catch reporting became a requirement for commercial BFT in 2015 with A7.

10.3.4.3 Gulf Fisheries Information Network

GulfFIN is a self-reported, state-federal cooperative program to collect, manage, and disseminate statistical data and information on the marine and estuarine commercial and recreational fisheries. It includes data for Texas to Florida as well as Puerto Rico. The program originally collected data via paper, but information is now collected through both paper and via electronic methods. Electronic reporting by federal dealers was implemented and made available to dealers in Texas, Louisiana, Alabama, and Florida by 2011 and in Mississippi by 2014. Federal dealers were always required to report landings of federally managed species to both state and federal agencies. State regulations dictated whether or not a state-only dealer (purchasing fish caught within the Exclusive Economic Zone) was required to report or could report voluntarily.

GulfFIN metadata indicates that landings exist for all five Gulf States and Puerto Rico from 1985 to 2020. The GulfFIN commercial landings database stores Gulf landings data captured by state commercial dealers via the Trip Ticket Program, which are reported by state commercial fishermen. The data used in the GulfFIN data management system for recreational catch, harvest, and effort estimates are based on the NOAA Fisheries Marine Recreational Fishery Statistics Survey; however, in 2017, GulfFIN completed its MRIP Regional Implementation Plan. Non-confidential data include yearly summary landings, marine recreational fishery catch and effort estimates, and biological samples. Commercial dealer reports are comprised by year, state, and species. When combined with the Atlantic Coastal Cooperative Statistics data, information from the GulfFIN reflect landings across all states from Maine to Texas.

10.3.4.4 Atlantic Coastal Cooperative Statistics Program

This program is the Atlantic coast complement to GulfFIN. It includes state reports from seafood dealers who purchase fish in both state and federal fisheries. The program covers landings from Maine to Florida's east coast. When combined with GulfFIN data, information from the Atlantic Coastal Cooperative Statistics Program reflect landings across all states from Maine to Texas.

10.3.4.5 Northeast Dealer Database

The Northeast dealer database contains data from federally permitted seafood dealers in Virginia to Maine. Prior to May 2004, Northeast landings data were collected directly from federally permitted dealers through federal field agents during dockside interviews, and non-federal data were obtained through a state's trip ticket program. After May 2004, regulations mandated that all dealers with a federal permit issued by GARFO submit their landings

data for each trip electronically. GARFO also made available to all dealers the SAFIS: an online application allowing seafood dealers in the Northeast to enter landings statistics that met the reporting requirements of both the respective state and NOAA Fisheries. The Atlantic Coastal Cooperative Statistics Program now oversees the SAFIS and works closely with the Northeast Science Center and GARFO in the maintenance of this database.

For each species purchased, dealers provide the following information: fisherman, vessel, trip data (e.g., start date, end date), gears used, and the unit of measure, quantity, market information, price paid for the species, and area where a fish was caught or removed from the water.

10.3.5 Exempted Fishing Permits

10.3.5.1 Exempted Fishing Permits Database

Exempted fishing permits (EFPs) are issued to individuals for the purpose of conducting scientific research or other fishing activities aboard private, non-research vessels. NOAA Fisheries also issues Scientific Research Permits to agency or state scientists or academics who conduct research aboard research vessels. The type of EFP issued depends not only on the type of fishing vessel but also on the species being researched. Display permits, another type of EFP, are issued to individuals who are fishing for, catching, and then transporting Atlantic HMS to certified aquariums for public display. One hundred percent of Atlantic HMS catches on all EFP trips are reported to NOAA Fisheries.

10.4 Appendix References

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