SUMMARY OF THE ANNUAL REPORT OF THE UNITED STATES TO ICCAT

U.S. Department of Commerce, NOAA Fisheries

September 2019

Total (preliminary) reported U.S. catch of main tunas (YFT, SKJ, BET, ALB, BFT) and swordfish, including dead discards, in 2018 was 6,104 MT, a decrease of about 12% from 6,908 MT in 2017. Swordfish catches (including estimated dead discards) decreased from 1,438 MT in 2017 to 1,275 MT in 2018, and provisional landings from the U.S. fishery for yellowfin tuna decreased in 2018 to 2,700 MT from 3,372 MT in 2017. U.S. vessels fishing in the northwest Atlantic caught in 2018 an estimated 1,028 MT of bluefin tuna, an increase of about 31 MT compared to 2017 (997 MT). Provisional skipjack tuna landings decreased by about 121 MT to 78 MT from 2017 to 2018, bigeye tuna landings increased by 85 MT compared to 2017 to an estimated 921 MT in 2018, and albacore landings decreased from 2017 to 2018 by 135 MT to 103 MT.

U.S. government (NOAA) and university scientists, working independently or in collaboration (including collaborations with scientists from other CPCs), conducted research in 2018 involving a variety of ICCAT and bycatch species. Such research included larval surveys, the development of abundance indices, electronic and conventional tagging to investigate movements, habitat usage and post-release mortality, and the collection and analysis of biological samples to study topics such as age, growth, stock structure, spawning areas, fecundity, and genetics (including direct estimates of stock size). Additional topics included the influence of environmental factors on distribution and catch rates, and the development of stock assessment models and operating models as part of management strategy evaluations.

ANNUAL REPORT OF THE UNITED STATES TO ICCAT
U.S. Department of Commerce, NOAA Fisheries
September 2019

1. National Fisheries Information

Total (preliminary) reported U.S. catch of main tunas (YFT, SKJ, BET, ALB, BFT) and swordfish, including dead discards, in 2018 was 6,104 MT, a decrease of about 12% from 6,908 MT in 2017. Swordfish catches (including estimated dead discards) decreased from 1,438 MT in 2017 to 1,275 MT in 2018, and provisional landings from the U.S. fishery for yellowfin tuna decreased in 2018 to 2,700 MT from 3,372 MT in 2017. U.S. vessels fishing in the northwest Atlantic caught in 2018 an estimated 1,028 MT of bluefin tuna, an increase of about 31 MT compared to 2017 (997 MT). Provisional skipjack tuna landings decreased by about 121 MT to 78 MT from 2017 to 2018, bigeye tuna landings increased by 85 MT compared to 2017 to an estimated 921 MT in 2018, and albacore landings decreased from 2017 to 2018 by 135 MT to 103 MT.

2. Statistics and Research

2.1 Fisheries Statistics

2.1.1 Tropical Tuna Fishery Statistics

Yellowfin Tuna. Yellowfin tuna is the main species of tropical tuna landed by U.S. fisheries in the western North Atlantic. Total estimated landings decreased to 2,700 MT in 2018 from the 2017 landings estimate of 3,372 MT (Table 2.1-YFT). The 2018 estimate is considered provisional and may change owing to incorporation of late reports of commercial catches as they become available and to possible revisions in estimates of rod & reel catches made by recreational anglers. An important proportion of the 2018 estimated landings were due to rod & reel catches of recreational anglers in the NW Atlantic (1,770 MT). Estimates of U.S. recreational harvests for tuna and tuna-like species are periodically reviewed and this may result in the need to report additional revisions to the available estimates in the future. In the case of the commercial landings, a large proportion of landings in 2018 corresponded to the U.S. longline fleet operating in the Gulf of Mexico (368 MT). Total commercial and total recreational landings in 2018 were 930 MT and 1,770 MT, respectively. Nominal catch rate information from logbook reports (longline catch per 1,000 hooks) for yellowfin by general fishing areas is shown in Figure 2.1.

Table 2.1-YFT. Annual Landings (MT) of Yellowfin Tuna from 2014 to 2018						
		671.0	**438.9**	**480.4**	**731.4**	**398.2**
		1.3	**0.8**	**2.3**	**0.5**	**0.3**
	Handline	**82.1**	**64.3**	**31.4**	**32.4**	**15.4**
	Troll	**28.7**	**25.6**	**16.6**	**35.5**	**31.2**
	Rod and Reel*	**1,263.9**	**976.1**	**1,936.2**	**2,427.4**	**1463.9**
	Unclassified	**7.7**	**2.5**	**2.5**	**28.6**	**11.0**
Gulf of Mexico	Longline	**704.5**	**490.8**	**695.2**	**595.0**	**367.9**
	Handline	**0**	**1.9**	**5.6**	**5.8**	**4.0**
	Rod and Reel*	**341.9**	**678.7**	**776.2**	**463.8**	**306.3**
	troll	**0**	**0**	**1.3**	**5.9**	**31.1**
	Unclassified	**0**	**0**	**0.03**	**0**	**0**
		80.7	**109.9**	**123.6**	**103.2**	**70.1**
		0.6	**0.6**	**1.3**	**0.1**	**0.07**
		14.6	**5.7**	**30.3**	**13.2**	**0.0**
		0	**1.8**	**1**	**1.1**	**0.5**
	TOTAL	**3,197.0**	**2,797.6**	**4,103.9**	**4,443.9**	**2,700.4**

* Rod and Reel catches and landings represent estimates of landings based on statistical surveys of the U.S. recreational harvesting sector.

Skipjack Tuna. Skipjack tuna also are caught by U.S. vessels in the western North Atlantic, but it is a minor component of the U.S. total tuna landings. Total reported skipjack landings (preliminary) decreased from 199 MT in 2017 to 78 MT in 2018 (Table 2.2-SKJ). Estimates of recreational harvests of skipjack continue to be reviewed and could be revised again in the future. Figure 2.2 presents nominal catch rate information (longline catch per 1,000 hooks) based on logbook reports.

Table 2.2-SKJ. Landings (MT) of Skipjack Tuna from 2014 to 2018

Area	Gear	2014	2015	2016	2017	2018
NW Atlantic	Longline	**0.3**	**0.2**	**0.9**	**0.3**	**0.2**
	Gillnet	**6.7**	**0.2**	**0.7**	**0.09**	**0.1**
	Handline	**1.3**	**0.2**	**0.8**	**1.6**	**0.8**
	Trawl	**0**	**1.1**	**0**	**0.06**	**0.02**
	Rod and Reel*	**148.6**	**49.9**	**130.1**	**80.9**	**63.5**
	Unclassified	**2.7**	**0.06**	**0.2**	**1.0**	**0.2**
Gulf of Mexico	Longline	**0.01**	**0**	**0.2**	**0.3**	**0.2**
	Handline	**0.01**	**0**	**0**	**0**	**0.01**
	Rod and Reel*	**14.3**	**34.3**	**34.0**	**113.2**	**12.6**
Caribbean	Handline	**0.7**	**0.5**	**0.9**	**0.2**	**0.5**
	Rod and Reel*	**9.1**	**7.6**	**11.4**	**1.0**	**0**
	TOTAL	**183.7**	**94.6**	**179.2**	**198.6**	**77.9**

* Rod and Reel catches represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.

Bigeye Tuna. The other large tropical tuna reported in the catches by U.S. vessels in the western North Atlantic is bigeye tuna. Total reported landings (preliminary) for 2018 increased by approximately 85 MT from 836 MT in 2017 to 921 MT in 2018 (Table 2.3-BET). Note that, like yellowfin tuna, the estimates of rod & reel catch are considered provisional and may be revised based on results of a future review of recreational harvest estimates. Figure 2.3 presents nominal catch rates (longline catch per 1,000 hooks) estimated from logbook reports.

Table 2.3-BET. Annual Landings (MT) of Bigeye Tuna from 2014 to 2018

Area	Gear	2014	2015	2016	2017	2018
NW and North Central Atlantic	Longline	**574.5**	**557.7**	**360.2**	**540.4**	**380.5**
	Gillnet	**0.08**	**0.5**	**0.2**	**0**	**0**
	Handline	**16.4**	**51.3**	**9.4**	**4.0**	**24.3**
	Trawl	**0**	**0.1**	**0.1**	**0**	**0.9**
	Troll	**4.5**	**6.4**	**1**	**1.7**	**4.9**
	Rod and Reel*	**283.6**	**448.5**	**170.5**	**259.7**	**493.9**
	Unclassified	**3.5**	**0.5**	**0.4**	**2.9**	**2.8**
Gulf of Mexico	Longline	**6.8**	**9.2**	**6.6**	**10.5**	**8.0**
	Rod and Reel	**0.06**	**0.01**	**0.2**	**0**	**0.7**
	Troll	**0**	**0**	**0**	**0**	**2.6**
Caribbean	Longline	**5.4**	**7.5**	**5.6**	**7.7**	**0.8**
	Handline	**0**	**0**	**0.2**	**0**	**0**
	Rod and Reel*	**1.4**	**0.5**	**0**	**0**	**0**
SW Atlantic	Longline	**0.05**	**0**	**13.8**	**9.4**	**1.2**
	TOTAL	**896.3**	**1082.2**	**568.2**	**836.3**	**920.8**

* Rod and Reel catches represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.

2.1.2 Temperate Tuna Fishery Statistics

Albacore Tuna. Albacore tuna are landed by the U.S. vessels; however, historically, albacore has not been a main target of the U.S. commercial tuna fisheries operating in the North Atlantic. Reported commercial catches were relatively low prior to 1986; however, these catches increased and have remained at higher levels with nearly all of the production coming from the northeastern U.S. coast. The U.S. landings from the Caribbean increased in 1995 to make up over 14% of the total U.S. harvest of albacore, but have since remained below 4% of the total. Nominal catch rates from U.S. pelagic longline logbook reports are shown in Figure 2.4. Estimated total catches of albacore were about 103 MT in 2018, a decrease of 135 MT from 2017 (Table 2.4-ALB).

Table 2.4-ALB. Annual Landings (MT) of Albacore Tuna from 2014 to 2018

Area	Gear	2014	2015	2016	2017	2018
NW and North Central Atlantic	Longline	**187**	**83.9**	**59.9**	**94.0**	**44.9**
	Gillnet	**3.7**	**0.5**	**3.3**	**0.2**	**0.5**
	Handline	**2.3**	**2.7**	**0.7**	**0.1**	**0.2**
	Trawl	**0**	**1.7**	**0.5**	**1.7**	**0.05**
	Troll	**0.2**	**0**	**0.03**	**0**	**0**
	Rod and Reel*	**136.7**	**120.5**	**41.4**	**27.5**	**8.9**
	Unclassified	**6.8**	**0**	**0**	**0**	**0**
Gulf of Mexico and Caribbean	Longline	**122.6**	**145.0**	**143.1**	**114.7**	**48.1**
	Rod and Reel*	**0**	**0.08**	**1.2**	**0**	**0**
	Handline	**0.07**	**0**	**0.1**	**0**	**0**
	TOTAL	**459.4**	**354.4**	**250.2**	**238.3**	**102.6**

* Rod and Reel catches represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.

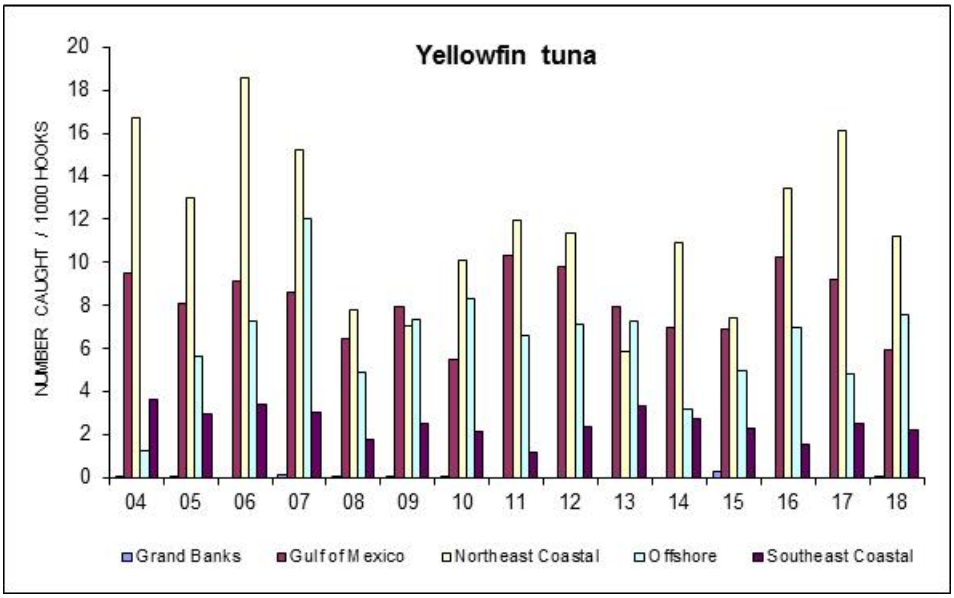


Figure 2.1 – YFT. *Nominal catch rates for YFT in U.S. pelagic longline logbook reports*

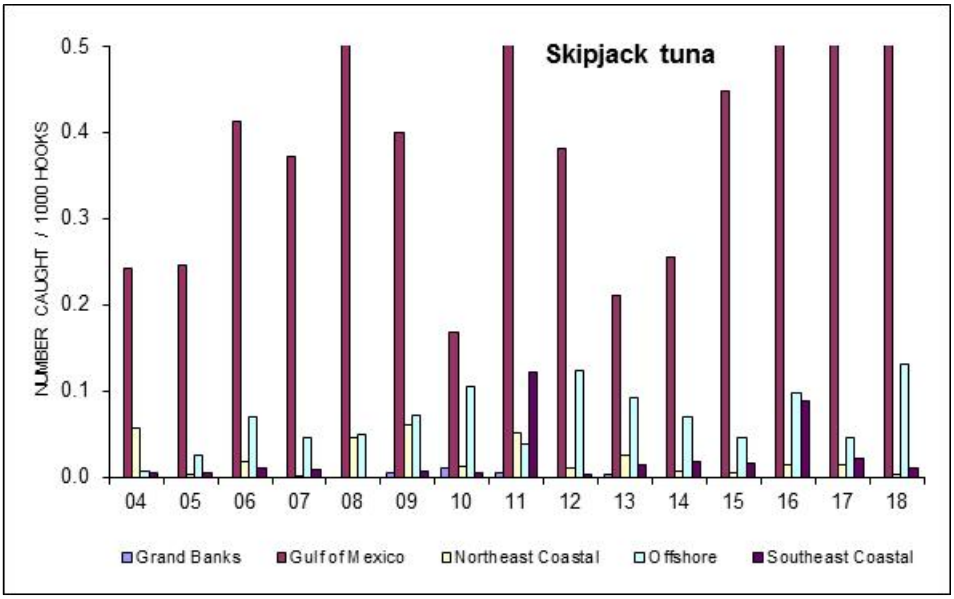


Figure 2.2 – SKJ. *Nominal catch rates for SKJ in U.S. pelagic longline logbook reports.*

\

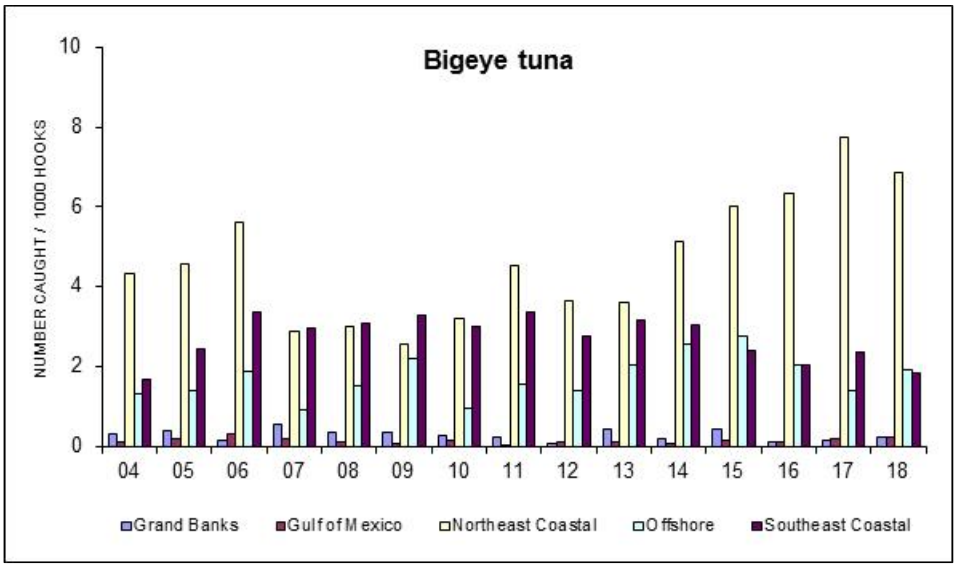


Figure 2.3 – BET. *Nominal catch rates for BET in U.S. pelagic longline logbook reports.*

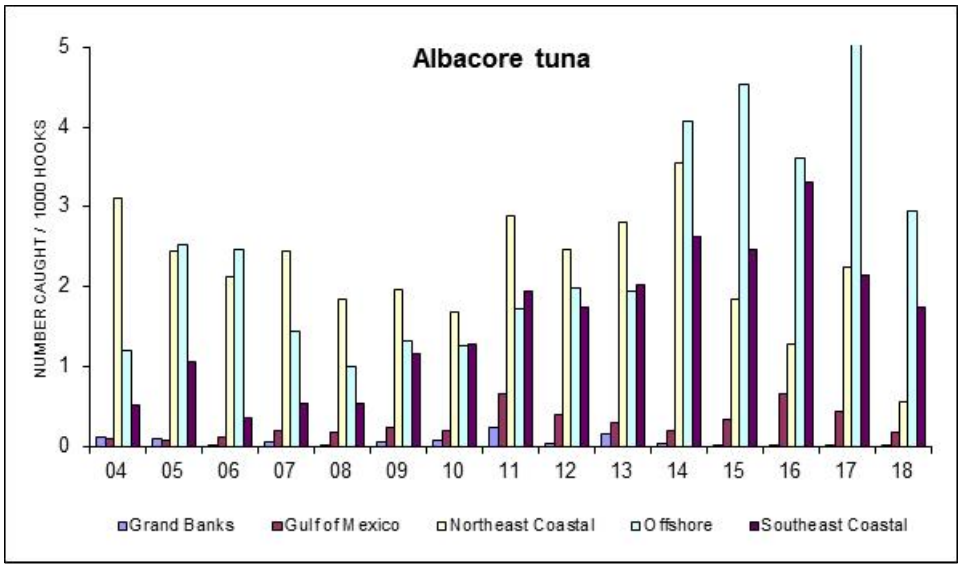


Figure 2.4 – ALB. *Nominal catch rates for ALB in U.S. pelagic longline logbook reports.*

Bluefin Tuna. The U.S. bluefin tuna fishery continues to be regulated by quotas, seasons, gear restrictions, limits on catches per trip, and size limits. To varying degrees, these regulations are designed to manage total U.S. landings to conform to ICCAT recommendations. U.S. 2018 provisional estimated landings and dead discards from the northwest Atlantic (including the Gulf of Mexico) were approximately 1,013 MT and 14.6 MT, respectively. Those estimated landings and dead discards represent an increase of approximately 31 MT from the 2017 estimates. The 2018 catches by some of the gears used in the U.S. bluefin tuna fisheries were: 43.7 MT by harpoon, 766 MT by commercial rod and reel and 114 MT by recreational rod and reel, 103 MT by longline (including discards) of which 8 MT were from the Gulf of Mexico (Table 2.5-BFT).

In response to 1992 regulations limiting the allowable catch of small fish by U.S. fishermen, in conformity with ICCAT agreements, enhanced monitoring of the recreational rod and reel fishery was implemented in 1993 for the purpose of providing near real-time advice on catch levels by this fishery. This monitoring activity has continued and has included estimation of catches by finer scale size categories than reported above. The preliminary estimates for the 2018 recreational rod and reel fishery off the northeastern U.S. for landings in several size categories were 55.8 MT of fish 66-114 cm, 11.8 MT of fish 115-144 cm, 33.9 MT of fish 145-178 cm, and 12.6 MT of fish >178 cm SFL.

Table 2.5-BFT. Annual Catches (MT) of Bluefin Tuna from 2014 to 2018

Area	Gear	2014	2015	2016	2017	2018
NW Atlantic	Longline**	**171.7**	**70.1**	**82.4**	**70.8**	**90.9**
	Handline	**0**	**0**	**1.1**	**5.0**	**1.4**
	Harpoon	**67.5**	**77.1**	**52.9**	**81.7**	**43.6**
	Purse seine	**41.8**	**38.8**	**0**	**0**	**0**
	Commercial Rod and Reel	**378.9**	**581.4**	**722.1**	**652.8**	**765.7**
	Recreational Rod and Reel*	**99.6**	**112.9**	**143.7**	**140.1**	**112.5**
Gulf of Mexico	Longline**	**41.3**	**9.3**	**10.7**	**11.7**	**8.0**
	Recreational Rod and Reel*	**0**	**0**	**1.7**	**1.7**	**1.6**
NC Atlantic	Longline**	**8.9**	**8.3**	**12.0**	**32.9**	**4.0**
Caribbean	Longline**	**0**	**0**	**0.2**	**0**	**0**
	TOTAL	**810.0**	**898.8**	**1,026.8**	**996.8**	**1027.8**

* Recreational Rod and Reel catches represent estimates of landings and dead discards when available based on statistical surveys of the U.S. recreational harvesting sector.

** includes *landings* and *estimated discards* from scientific observer and logbook sampling programs

2.1.3 Swordfish Fishery Statistics

For 2018, the provisional estimate of U.S. vessel landings and dead discards of swordfish was 1,275 MT (Table 2.6-SWO). This estimate represents a decrease from the 1,377 MT estimated for 2017. The provisional landings, including discard estimates, by ICCAT area for 2018 (compared to 2017) were: 203 MT (263 MT) from the Gulf of Mexico (Area BIL91); 992 MT (875 MT) from the northwest Atlantic (Area BIL92); 4 MT (89 MT) from the Caribbean Sea (Area BIL93); and 76 MT (151 MT) from the North Central Atlantic (Area BIL94A).

U.S. swordfish landings are monitored in-season from reports submitted by dealers, vessel owners and captains, NMFS port agents, and mandatory logbook reports submitted by U.S. commercial vessels permitted to fish for swordfish. Since 1992, the U.S. swordfish longline fishery is also being monitored via a scientific observer

sampling program. Approximately 8% of the longline fleet-wide fishing effort is selected for observation during the year. Vessels operating in the Gulf of Mexico during the bluefin tuna spawning season have observer coverage of about 50%. Approximately 10,190 fish were discarded dead in 2018. For the North Atlantic (including Gulf of Mexico and Caribbean Sea), the estimated tonnage discarded dead in 2018 was 138 MT, a 31 MT increase compared to 2017 and corresponded to approximately 10.8% of the commercially landed catch. The 2018 estimates of recreational rod and reel landings of swordfish based on surveys of recreational anglers and self-reported catches by recreational anglers was 36.2 MT.

Table 2.6-SWO. Annual Catches (MT) of Swordfish from 2014 to 2018

Area	Gear	2014	2015	2016	2017	2018
NW Atlantic	Longline**	**1,200.4**	**1088.6**	**835.4**	**774.8**	**838.9**
	Handline	**86.9**	**70.7**	**71.2**	**59.5**	**127.6**
	Harpoon	**0**	**0**	**0**	**0.3**	**0.1**
	Trawl	**5.3**	**2.8**	**6**	**6.8**	**1.0**
	Rod and Reel*	**35.1**	**45.1**	**22.5**	**22.6**	**24.4**
	Unclassified	**0.4**	**0**	**0**	**0.02**	**0.1**
Gulf of Mexico	Longline**	**307.4**	**127.4**	**175.8**	**250.6**	**186.6**
	Handline	**0.3**	**5.5**	**3.5**	**2.7**	**4.8**
	Rod and Reel*	**1.5**	**1**	**4.8**	**10.6**	**11.4**
Caribbean	Longline**	**16.5**	**8.8**	**72.4**	**88.4**	**3.2**
	Handline	**0.3**	**0.2**	**0.9**	**0**	**0**
	Rod and Reel*	**0.07**	**0**	**0**	**0.7**	**0.4**
NC Area 94A	Longline**	**308.0**	**367.9**	**304.9**	**187.7**	**76.2**
S Atlantic	Longline**	**0**	**0**	**0**	**0**	**0**
	TOTAL	**1,962.2**	**1,718.4**	**1,497.5**	**1377.2**	**1,274.9**

* Rod and Reel catches represent estimates of landings and dead discards when available based on statistical surveys of the U.S. recreational harvesting sector.
** includes *landings* and *estimated discards* from scientific observer and logbook sampling programs

2.1.4 Marlins and Sailfish Fishery Statistics

Blue marlin, white marlin, spearfishes and sailfish are landed by U.S recreational rod and reel fishermen and are a bycatch of the U.S. commercial tuna and swordfish longline fisheries. The U.S. Fisheries Management Plan for Atlantic Billfishes was implemented in October, 1988. The Plan allows billfish that are caught by recreational gear (rod and reel) to be landed only if the fish is larger than the minimum size specified for each species covered by the Plan. Recreational landings of each billfish species are monitored through: (a) the Southeast Fisheries Science Center (SEFSC) Recreational Billfish Survey (RBS) which provides the number of billfish caught during tournaments held along the southeastern U.S. coast (south of 350 N latitude), in the Gulf of Mexico, and U.S. Caribbean regions (i.e., U.S. Virgin Islands and Puerto Rico); (b) the Large Pelagic Recreational Survey (LPS) conducted by the National Marine Fisheries Service (NMFS) which provides estimates of recreational harvest of highly migratory species (including billfish), from waters along the northeastern U.S. (north of 35o N latitude); (c) Marine Recreational Information Program (MRIP); (d) a Headboat survey (large multi party charter boats); and (e) a coastal sport fishing survey of the Texas recreational fishery (TPW). In addition, recreational catch statistics by self-reported catch cards also document billfish landings in some states.

The 2018 estimates of U.S. recreational rod and reel landings for these billfish species, combining the geographical areas of the Gulf of Mexico (Area BIL91), the northwestern Atlantic Ocean west of the 60o W longitude (Area BIL92), and the Caribbean Sea (Area BIL93) are: 20.2 MT for blue marlin, 2.4 MT for white marlin, 2.6 MT for sailfish, and 0.5 for roundscale spearfish. The estimates for 2017 were: 12.8 MT for blue marlin, 2.4 MT for white marlin, and 2.7 MT for sailfish.

In addition to restrictions on U.S. recreational harvest, the Management Plan also imposed regulations on commercial fisheries by prohibiting retention and sale of these species at U.S. ports. For this reason, there are no U.S. commercial landings for any of these Atlantic species. Estimates of dead discards in the U.S. longline fleet are obtained using data collected through the mandatory Pelagic Logbook Program and the Pelagic Observer Program. The procedure for estimating the historical bycatch of blue marlin, white marlin, and sailfish was detailed in SCRS/96/97-Revised. Revisions to historical landings of billfish previously reported to ICCAT were based on review of the estimates conducted at the 1996 ICCAT Billfish Workshop held in Miami, FL (U.S.A). Estimates of the billfish bycatch discarded dead in the U.S. commercial longline and other commercial fisheries in 2018 were 22.3 MT for blue marlin, 1.6 MT for white marlin, and 6.2 MT for sailfish.

2.1.5 Shark Fishery Statistics

Landings and dead discards of sharks by U.S. pelagic longline fishermen are monitored and reported to ICCAT. In 2018, the species of shark with largest amount of landings (in weight) was shortfin mako with a total of 164.8 MT (of which 125.1 MT were landed by the U.S. recreational fishery), followed by blue sharks with 19.1 MT. Landings of porbeagle shark amounted to 3.3 MT.

In 2018, estimates of dead discards for silky shark (an ICCAT prohibited species) by the U.S. pelagic longline fleet amounted to 22.9 MT, the largest amount of any shark species discarded by this fleet, and dead discard estimates for blue shark were 11 MT.

Dead discards of some of ICCAT prohibited species were 21.5 MT for all hammerhead sharks combined, 8.9 MT of bigeye thresher, 1.4 MT of oceanic whitetip sharks.

2.2. Research Activities

2.2.1 Bluefin Tuna Research

As part of its commitment to the Atlantic-wide Research Program for Bluefin Tuna (GBYP), research supported by the United States has concentrated on tagging, biological sampling from fisheries and modeling. This includes 4 grants to University, academic and NGO partners administered through the 2018 U.S. Bluefin Tuna Research Program (BTRP):

- **University of Maine System acting through University of Maine**. Evaluating Age Structure, Aging Bias and Mixed Stock Composition of Atlantic Bluefin Tuna in the Northwest Atlantic
- **University of Massachusetts Dartmouth**. Facilitating Stakeholder Engagement in Management Strategy Evaluation of Atlantic Bluefin Tuna Fisheries
- **Monterey Bay Aquarium Foundation**. Historical data mining to inform Bluefin tuna stock assessments
- **The Ocean Foundation**. Improving Estimates of Natural Mortality of Atlantic Bluefin Tuna with Electronic Tags

An additional 4 projects were funded to start in 2019:

- **University of Maine System acting through University of Maine.** Evaluating Age Structure, Aging Bias and Mixed Stock Composition of Atlantic Bluefin Tuna in the Northwest Atlantic
- **University of Southern Mississippi.** Modeling Abundance and Dispersal of Larval Atlantic Bluefin Tuna *Thunnus Thynnus* in the Gulf of Mexico
- **The Ocean Foundation**. Electronic Tagging of Bluefin Tuna: Improving Life History Estimates Utilized in ICCAT Models
- **Gulf of Maine Research Institute**. Spatio-temporal associations of western bluefin tuna indices of abundance with ocean climate conditions

The results from several of these other U.S.-sponsored bluefin tuna research projects are summarized below.

Ichthyoplankton surveys in the northern Gulf of Mexico were continued on a standard grid in spring 2018 for the purposes of providing the annual larval index and for collecting larvae for genetics and other biological studies.

An additional larval sampling cruise was conducted for the purpose of evaluating the effects of nitrogen sources and plankton food-web dynamics on habitat quality for Bluefin tuna larvae in Gulf of Mexico. The objective of this work is to elucidate the mechanisms that link variability in nitrogen sources and food-web dynamics to habitat quality, feeding, growth, and survival for Bluefin larvae. The work focused on using compound specific stable isotope analyses, gut content analysis, age and growth estimation for larvae as well as nitrogen sources for primary productivity and plankton community biomass and composition. All components of this research will be synthesized into an inverse food-web model. This sampling program also targeted areas of high larval catch rates and obtained over 3000 bluefin larvae making it the highes total collections to date and providing a vast number of larvae for genetic close-kin research.

NOAA, SEFSC and the Spanish IEO recently updated the larval indices of spawning stock biomass for both the Gulf of Mexico and the western Mediterranean up to 2018. A research initiative (ECOLATUN) is ongoing which builds upon existing datasets and collaborations to examine trophic ecology in the two main spawning grounds. This initiative includes population genetics, larval growth, larval assemblages, as well as contributing to the various modelling efforts in both ecosystems.

Stanford University and The Ocean Foundation (*Tag a Giant*) continued efforts to place electronic tags on Atlantic bluefin tuna. 37 acoustic tags 19 satellite tags and 9 archival tags were deployed in the Gulf of St. Lawrence fishery in September 2018. Advanced biologging tags to gather video, accelerometry and kinematics were also deployed. Ten tags were recovered (archival, satellite, acoustic) and we decoded a complete 5.9 year archival tag track from a 2012 North Carolina deployed fish. We collaborated with Irish and UK scientists to deploy 24 satellite tags on eastern Atlantic bluefin and also worked with Israeli scientists to put out 5 satellite tags in the eastern Mediterranean Sea. DNA samples and mRNA samples were collected from most tagged fish in 2018. A spatially-structured Bayesian mark recapture model was applied to the Canadian acoustic detection data for Atlantic bluefn tuna electronically tagged in the GSL to estimate the rate of instantaneous annual natural

mortality. We updated our prior estimates and reported a median estimate of 0.10yr−1 for acoustic data using a 2 box survivorship estimation model. The Stanford team delivered approximately 40 new data sets (bringing a total of 440 from the US team) of satellite and archival tags deployments by the TAG team for inclusion in the ICCAT tagging data base which have been used to parameterize the BFT operating models.

Stanford has also developed a new spatial tag data model to increase the ability to assess and manage the individual populations in the North Atlantic and Gulf of Mexico. We aggregated tag data for known-stock individuals across three decades and produced monthly distribution maps tracking the relative positions of the stocks along the Atlantic seaboard during their annual foraging/spawning migrations. By comparing densities in a particular region and month, we were able to estimate the likelihood that any particular fish caught in that place and time is Gulf stock or Mediterranean stock. We also helped improve the integration of movement data into ICCAT's M3 management model, producing more realistic seasonal stock migrations and minimizing 'cryptic biomass.

DNA analysis of 24 microsatellite loci has been used to genotype Atlantic bluefin tuna to help identify spawning origins of Atlantic bluefin tuna tagged or caught commercially on foraging grounds (in Canada) and in other areas of the western Atlantic. In addition, the team is comparing genotypes with otolith assignments made by Canadian colleagues. Combining DNA analysis with migration tracks obtained from electronically tagged bluefin tuna allows us to outline the geographic distributions of each genetic stock. In addition, combining tag tracks with genetic data leads us to genetically identify individuals and map locations of new spawning grounds outside the two main spawning basins. Stanford University and Pacific Biosciences scientists worked together to assemble genomic sequences of bluefin tunas using SMRT long read sequencing technology with the goal of assembling the genomes of Atlantic and Pacific bluefin tunas.

In 2010, the SEFSC in collaboration with its scientific partners at the University of Maine, the University of Massachusetts and the Gulf of Maine Research Institute initiated a comprehensive sampling program to learn more about the life history of Atlantic bluefin tuna captured in US commercial and recreational fisheries. A sampling design was established to collect tissues representative of the catch including five gear categories (handgear, harpoon, purse seine, pelagic longline, recreational). Samples collected included sagittal otoliths, dorsal spines, gonads, muscle tissue and occasionally stomach. From June of 2010 to November 2019, >7000 sets of otoliths, >1000 dorsal spines (paired to an otolith), >1300 gonads and >6000 muscle samples have been collected from bluefin tuna ranging in size from 69-326 cm curved fork length.

In 2018, the SEFSC Panama City Laboratory received bluefin tuna biological samples from Quantech Inc., the NOAA Pelagic Observer Program and the North Carolina Division of Marine Fisheries. In total, 266 otoliths, 63 gonads, and 295 muscle samples were collected. Muscle samples were sent to the SEFSC Miami Laboratory for genetic analysis. All 2018 otoliths have been sectioned and cored for stable isotope analysis and final ages have been assigned. All gonads have been microscopically staged. Other tissues (spine, liver, skin) collected were archived.

Scientists from the SEFSC's Panama City Laboratory and the University of Massachusetts are collaborating on a project that will update the reproductive parameters for the western Atlantic bluefin tuna stock from gonads collected from 2007-2018. These parameters include length and age at maturity, spawning fraction and periodicity, and batch fecundity estimates. The dataset includes 1400 gonad stages from bluefin caught in the US Atlantic and Gulf of Mexico. Preliminary results from this study were presented at an ICCAT sponsored workshop on the reproductive biology of bluefin tuna in Madrid, Spain in November 2018.
The Gulf of Maine Research Institute in collaboration with the University of Massachusetts Dartmouth, University of Maryland, and University of Maine are developing and simulation testing a management strategy evaluation (MSE) for Atlantic bluefin tuna focused on evaluating the current ICCAT management procedure ($F_{0.1}$) under life history and movement uncertainty. The MSE framework consists of an operating model conditioned on results from the 2017 bluefin tuna stock assessment, has two stocks (East and West) that are spatially explicit, and movement informed between seven geographic zones by satellite-based telemetry. The stock assessment model being tested is a Virtual Population Analysis and the management procedure being applied is constant $F_{0.1}$. Operating model scenarios being evaluated have alternate natural mortality-at-age, western maturity-at-age, and projected stock-recruitment relationships. Preliminary results indicate that $F_{0.1}$ management produced some medium-term decreases in stock and yield but performed well for maintaining or increasing long-term stock and yield metrics across scenarios.

The University of Massachusetts and the Gulf of Maine Research Institute are collaboratively working to conduct workshops on management strategy evaluation (MSE) of bluefin tuna with US fishery stakeholders. The

focus of the first workshop in New Bedford Massachusetts on April 2019 centered on explaining MSE as a tool for fisheries management, how it is being used by ICCAT, and getting feedback on a preliminary Atlantic bluefin tuna MSE configurations. US stakeholder participants consisted of commercial fishermen, recreational fishermen, conservation groups, and scientists from research institutions, state agencies, and federal agencies. Input about operating model scenarios, management procedures and performance metrics was solicited and is being implemented into the previously developed MSE framework. A second workshop for US stakeholder engagement is tentatively scheduled for late Fall 2019 or early spring 2020 where results from MSE input from the first workshop will be presented.

In 2018, 1,165 pairs of bluefin tuna otoliths were collected by the University of Maine from the bluefin fishery, with most coming from the Gulf of Maine commercial sector as part of the Evaluating Age Structure, Aging Bias and Mixed Stock Composition of Atlantic Bluefin Tuna in the Northwest Atlantic project. Characterizing the effects of stock mixing has been identified as a priority for improving the management of Atlantic bluefin tuna. Identifying the stock composition of landings from the Gulf of Maine is of particular importance, because approximately 70% of the U.S. western Atlantic total allowable catch is removed from this region annually. Collaborators with the Gulf of Maine Research Institute applied otolith chemistry techniques to characterize the origin of bluefin tuna caught in the U.S. rod and reel fishery in the Gulf of Maine and to demonstrate how this information can be applied in fisheries management. The Gulf of Maine Research Institute has continued micromilling bluefin otoliths for stable isotope analysis for δ13C and δ18O. In 2018, 300 otolith samples were milled from 2015 collections and 205 otolith samples were milled from 2016 collections. These milled samples were sent to the University of Arizona for stable isotope analysis and added to a master dataset with otolith isotopic values with collections ranging back to 2009. Chemistry data from 782 otoliths collected from 2010-2013 were analyzed and results indicated that the majority of fish caught in the Gulf of Maine during these years were of eastern origin. We found the highest proportion of eastern origin fish were caught in 2012 and the proportion of eastern origin fish was greater in late summer to fall. A manuscript by Kerr et al. based on this analysis of stable isotope data was accepted to Fisheries Research. Chemistry work is continuing with more sampling years being added to the master dataset for future analysis.

Researchers from the Massachusetts Division of Marine Fisheries, the University of South Alabama, the University of Delaware, the University of Southern Mississippi, Texas A&M University, University of Massachusetts, and NOAA SEFSC are in the process of analyzing archived bluefin muscle samples collected from 2007-2014 by NMFS fisheries observers in the Gulf of Mexico to assess both natal origin and recent migratory history. To date, over 250 samples have been analyzed for natal origin (otolith carbon and oxygen stable isotopes) and migratory history (muscle bulk carbon and nitrogen stable isotopes). Preliminary results classify 100% of individuals as being of western natal origin. Muscle bulk isotope data classify the majority of individuals (n=218; 85.8%) as recent shelf migrants while the remainder (n=36; 14.2%) were classified as offshore migrants. Subsequent amino acid nitrogen stable isotope analyses of a subset (n=66) of samples including both "shelf" and "offshore" classified individuals demonstrated that observed differences in bulk nitrogen isotope values were a result of baseline (i.e., migratory) influences rather than inter-individual trophic variability based on relative differences in "source" and "trophic" classes of amino acids. These compound specific data support the assumption that bulk isotope variability is mainly driven by movements between foraging grounds with different baseline isotope values. Organochlorine chemical analyses (*trans*-nonachlor, *cis*-nonachlor, PCB 153, PCB 187) have been completed but are still undergoing further quality assurance prior to biological interpretation of east vs. west recent migratory patterns.

The identification of the Slope Sea as a spawning area has presented interesting possibilities that warrant additional research to determine the importance of spawning outside of traditionally known areas or by different contingents of fish. Sampling across a broad area of the Slope Sea last occurred during the summer of 2016. Larval bluefin tuna distribution and abundance in 2016 was comparable to the 2013 sampling that was originally used to document this spawning area. Unlike in 2013, the majority of 2016 samples were preserved in ethanol allowing for their use in genetics and otolith aging studies. Larval bluefin tuna (n=40) collected in the Slope Sea in 2016 have been provided to AZTI to support a population genetics study; this work will expand upon the recently published study (Rodriguez-Ezpeleta et al. 2019) that used a limited (n=7) sample size of larvae collected in 2013. Recent work to characterize the potential larval distribution, retention and habitat suitability in the Slope sea using oceanographic modeling indicates that this area provides suitable larval habitat (Rypina et al., 2019) . Further plankton sampling across a broad area of the Slope Sea during the bluefin spawning season is anticipated during a marine mammal survey that is planned for the summer of 2021.

The SEFSC has been working with scientists from CSIRO (Australia) and the Virginia Institute of Marine Science on a pilot project to evaluate feasibility of genetic abundance estimator for Atlantic Bluefin tuna. Larval

samples collected in 2016 (176) and 2017 (349) indicate between 12-51% relatedness, respectively with 102 half-siblings and 23 full-siblings. The samples collected in 2017 came from targeted surveys and had higher percentage of relatedness but much higher sample sizes. While the targeted sampling in areas of high catch rates had higher percentage of sibling relatedness, the higher total numbers provides enough marks to be useful. Similar targeted sampling in 2018 yielded over 3000 larvae, providing the potential for a close-kin abundance estimator in the near future. Adult samples for 2016 (1681), 2017 (2292) and 2018 (~2500) indicate a high probability of multiple parent-offspring pairs.

2.2.2 Swordfish Research

U.S. scientists published on swordfish larval habitat dynamics and described swordfish spawning site selection and timing (Suca et al. 2018). The researchers identify and characterize larval swordfish distributions during peak swordfish spawning throughout the Gulf of Mexico and western Caribbean Sea. The researchers reported that the highest probability of larval swordfish catch occurred at sub-surface temperatures, sea surface height anomaly, and eddy kinetic energy values indicative of boundary currents. Standard lengths of larvae were larger further downstream in the boundary currents, despite high variability in length with location due to multiple spawning locations of swordfish near these currents. Probability of larval swordfish catch also peaked during the crescent and gibbous moons, indicating a lunar periodicity to swordfish spawning. These results suggest that swordfish may spawn during select moon phases near boundary currents that transport their larvae to larval and juvenile habitat including the northern Gulf of Mexico and coastal waters of the southeast United States.

Scientists at The University of Southern Mississippi's Center for Fisheries Research and Development collected biological samples from swordfish recreationally landed in the northern Gulf of Mexico. This research is ongoing and is primarily focusing on life history investigations. To date 51 swordfish have been collected opportunistically. Of which, 51 anal spines have been prepped for ageing, 49 gonads have been histologically examined, 29 stomachs with contents have been analyzed, and 51 muscles samples have been obtained.

Additional activities in 2018 by U.S. scientists included contributing to the development of operating models for the North Atlantic swordfish (Xiphias gladius) management strategy evaluation and ICCAT MSE capacity building training courses. For the swordfish MSE, a grid of Stock Synthesis models was constructed based on identified structural uncertainty in the current stock assessment. The resulting grid comprised 288 model runs based on alternative combinations of life history assumptions and producing alternative population trajectories and productivity estimates.

2.2.3 Tropical Tunas Research

U.S. scientists participated in the 2018 ICCAT Bigeye Tuna data preparatory and stock assessment meetings. Scientists from NOAA Fisheries – Southeast Fisheries Science Center also contributed to a collaborative study to develop a joint index for longline fisheries that catch bigeye tuna. This collaboration included national scientists from China, Japan, Korea, Chinese-Taipei, and the United States, and was funded by the International Commission for the Conservation of Atlantic Tunas (ICCAT) and the International Seafood Sustainability Foundation (ISSF).

Scientists from United States, including NOAA Fisheries – Southeast Fisheries Science Center participated in the development and review of Phase One of the Tropical Tuna Management Strategy Evaluation (MSE), in collaboration with EU scientists. The eventual objectives of this work are to develop an MSE framework for Atlantic stocks of bigeye, yellowfin and skipjack using a specifically adapted bioeconomic model (FLBEIA), and the evaluation of alternative Management Procedures to support the potential adoption of a Harvest Control Rule for tropical stocks.

In response to the Deepwater Horizon oil spill event, NOAA Fisheries – Southeast Fisheries Science Center scientists initiated a study in 2010 to evaluate the movements, migration patterns and site fidelity of yellowfin tuna in the Gulf of Mexico in order to assess the potential exposure of the stock to contaminants, as well as optimal fishery closure strategies for future events. However, tagging activities were largely curtailed during most of 2018 due to insufficient funding. There are plans to continue tagging in 2019 in conjunction with a scientist from the Gulf of Maine Research Institute, with funding from the Atlantic Ocean Tropical Tunas Tagging Programme (AOTTP). Longline and recreational vessels will be used as deployment platforms to achieve a broad geographic representation of deployment locations, corresponding more closely to the range of

the fishery. In addition to the main study objectives, the resulting data is expected to enhance stock assessments by improving our understanding of stock structure, movement rates, mortality, essential habit and factors affecting catch rates.

Scientists at the NOAA-Southeast Fisheries Science Center continue to conduct fishing gear research to inform the Deepwater Horizon Oceanic Fish Restoration Project (DHOFRP). The DHOFRP is designed to help restore fish species that were injured as a result of the oil spill by reducing fishing mortality during a temporary, voluntary, six-month repose period each year where participating vessel owners will refrain from pelagic longline fishing. During the repose, vessels are provided with alternative gear that specifically target yellowfin tuna and swordfish and result in lower bycatch of other fish species. In early 2017, the OFRP was launched as a pilot, with a four-month repose from March 1 through June 30, 2017. Seven vessels participated in the pilot, all from Louisiana and all electing to fish with alternative gear. The first full repose period began January 1, 2018 with 10 vessels from Florida and Louisiana selected to participate in the 2018 season. Nine participants elected to fish with alternative gear. This is a five-year project, and preliminary results are not yet available.

Scientists from Texas A&M University received a NOAA Saltonstall/Kennedy award to examine the origin of yellowfin tuna in the western Atlantic Ocean, and the importance of outside production to U.S. fisheries. Primary tasks in 2018 included the analysis of otolith cores from sub-adult and adult yellowfin tuna from two U.S. fisheries (Gulf of Mexico and Mid Atlantic Bight). In addition, the investigators plan to expand the young-of the year baseline with samples collected in 2017. A recent paper resulting from this work was published in the journal Marine Ecology Progress Series (Kitchens et al. 2018). It establishes the young-of the year baseline required for sourcing sub-adults and adult yellowfin tuna from U.S. fisheries. This study clearly demonstrates that baseline chemical signatures in the otoliths of young-of-the-year yellowfin tuna are distinct and can therefore serve as an effective tool for assigning older individuals to their nursery of origin, ultimately providing a way to improve our understanding of the population connectivity and mixing rates of this species in the Atlantic Ocean. Findings to date suggest that a significant fraction of the sub-adult and adult yellowfin tuna from U.S. fisheries operating in the Gulf of Mexico and Mid Atlantic Bight originated in the E. Atlantic Ocean (Gulf of Guinea/Cape Verde).

In 2018, the SEFSC Panama City laboratory received yellowfin tuna biological samples received from Quantech Inc. and from recreational dock-side sampling in Venice, Louisiana. In total, 198 otoliths, 75 gonads, and 37 muscle samples have been collected. A cooperative ageing project between the SEFSC Panama City laboratory, Louisiana Department of Wildlife and Fisheries, and University of Maine is underway to estimate new growth curves for Atlantic yellowfin tuna. Preliminary analyses on growth, longevity, and natural mortality were presented at the 2019 Yellowfin Tuna ICCAT Data Preparatory meeting in Madrid, Spain.

SEFSC Panama City Laboratory scientists and a scientist from University of Florida are collaborating on a project to update the reproductive parameters of Atlantic yellowfin tuna from gonads collected from 2010-2017 (n=725). These parameters include length and age at maturity and spawning fraction and periodicity, and batch fecundity estimates. Preliminary data were presented at the 2019 Yellowfin Tuna ICCAT Data Preparatory meeting in Madrid, Spain.

2.2.4 Albacore Research

The U.S. participation was in the north Atlantic albacore Management Strategy Evaluation (MSE) project was paused in 2018 as the entire project was presented to the ICCAT before full implementation.

NOAA scientists engaged in a study of albacore CPUE. They compiled and analysed logbook data from the French trawl albacore fishery covering the period 1991–2015. The dataset comprised catch and effort data for the French fleet operating in the Bay of Biscay and Celtic Sea, as well as spatiotemporal and gear characteristics. Generalized linear modelling was used to model spatial, seasonal, environmental, and gear covariates of fleet CPUE rates. A long-term index of relative abundance is provided that can be integrated into the stock assessment of North Atlantic albacore. The analysis revealed higher albacore CPUE associated with relatively low sea surface temperature and distinct seasonal effects. The derived abundance trend for the French trawl fishery agreed with the estimated time series of stock abundance from recent assessments. https://www.alr-journal.org/articles/alr/abs/2018/01/alr170144/alr170144.html

2.2.5 Mackerels and Small Tunas Research

King mackerel:

In 2018, NOAA SEFSC scientists were carrying out activities for conducting U.S. domestic stock assessments for Gulf of Mexico and South Atlantic king mackerel populations scheduled for 2019 (http://sedarweb.org/sedar-38) . Important considerations in the forthcoming stock evaluations will include revisions to marine recreational fisheries statistics. In 2018, SEFSC scientists continued to make routine collections of otolith samples from the directed commercial and recreational fisheries for use in developing age length keys. These updated age length keys will be incorporated into future updated population models. The estimates of age composition from the updated age length keys will enable analysts to evaluate changes in year class strength since the previous 2016 stock assessment; additional samples can be acquired through cooperative efforts with state entities. New studies are also underway to reevaluate methods previously used for otolith shape analysis. These new procedures have led to significant increase in number of ageing structures available to inform the shape analyses and could lead to significant increases in the information available to address multiple questions (e.g., stock unit determinations, separation of spawning groups, etc.). This research updates the previous procedures of DeVries, D. A., C. B. Grimes, and M. H. Prager. 2002

Studies proposing to quantify the role of mesoscale and submesocale processes on productivity of king mackerel and other coastal pelagic stocks in the south Atlantic Bight were initiated in 2015 (https://www.st.nmfs.noaa.gov/Assets/fate/documents/Project-PDFs/2015/15-05/15-05.pdf). The research will involve a modeling approach to explore a variety of hypotheses related to how eddy forces affect stock dynamics, including catch rates, condition and recruitment success. This research follows on earlier hypotheses put forward in the 2014 stock assessment that climate may have effects on temporal patterns in Catch rates (http://sedarweb.org/docs/wpapers/S38_AW_04_Hartford.pdf) and also by Wall et al. 2009.

The last U.S. domestic stock assessments for Gulf of Mexico and South Atlantic Spanish mackerel populations were conducted during 2012 (http://sedarweb.org/sedar-28). Updated stock assessment is planned in 2020 in the South Atlantic. An updated evaluation of the ecological sustainability of Spanish mackerel in the South Atlantic and Gulf of Mexico was provided by the Monterey Bay Aquarium's Seafood Watch in 2015 (https://www.seafoodwatch.org/-/m/sfw/pdf/reports/m/mba_seafoodwatch_mackerel_spanish_king_report.pdf)

During 2018, NOAA SEFSC scientists continued efforts to acquire otolith samples from the directed commercial and recreational fisheries for use in developing age length keys. These updated age length keys will be incorporated into future updated population models. The estimates of age composition from the updated age length keys will enable analysts to evaluate changes in year class strength since the previous 2012 stock assessment; additional samples can be acquired through cooperative efforts with state entities.

2.2.6 Shark Research

Many of the shark research activities conducted in 2018 were part of the SCRS Shark Research and Data Collection Program (SRDCP), which aims to develop and coordinate science and science-related activities needed to support provision of sound scientific advice for the conservation and management of pelagic sharks in the Atlantic Ocean. These collaborative activities among members of the SCRS Shark Species Group (SSG) were initiated several years ago and continued in 2018 and included four projects covering different aspects of the life history, stock structure, and fisheries of the shortfin mako (*Isurus oxyrinchus*): a pan-Atlantic age and growth study; a population genetics study to estimate the stock structure and phylogeography of Atlantic shortfin mako; a post-release mortality study focusing on pelagic longline fisheries; and a satellite tagging study for determining movements and habitat use:

Age and growth of shortfin mako in the Atlantic Ocean− This project updated the available estimates of age and growth parameters of shortfin mako by ageing specimens from multiple areas in the Atlantic Ocean. The results of the study for the North Atlantic stock were used in the 2017 Shortfin Mako stock assessment. In 2018, results for the South Atlantic stock based on data from 332 specimens, ranging in size from 90 to 330 cm fork length (FL) for females and 81 to 250 cm FL for males, were analyzed. The von Bertalanffy growth equation with fixed L_0 (size at birth = 63 cm FL) with resulting growth parameters of Linf = 218.5 cm FL, k = 0.170 year-

[1] for males and Linf = 263.1 cm FL, k = 0.112 year^{-1} for females, seemed to underestimate asymptotic size for this species, while overestimating k. Given the poorly estimated parameters, the Group did not yet recommend the use of the growth curves for the South Atlantic stock. It was noted that more samples are still required to develop more credible growth curves, particularly specimens from the southeast region. In that regard, scientists from Japan indicated that they have collected some samples (n=33) from that area and the scientist from Namibia also expressed its willingness to provide vertebral samples from the region to contribute to the age and growth study. It was also discussed the exploration of alternative growth models and a meta-analysis to incorporate variability in the growth curves to be used in future stock assessments.

Genetic analysis of shortfin mako in the Atlantic Ocean− The goal of this ongoing study led by Japanese scientists is to estimate the stock structure and phylogeography of the Atlantic shortfin mako using mitochondrial and microsatellite DNA of specimens collected across the Atlantic Ocean. To date, the mitochondrial analyses indicated the differentiation of populations in the northern, southwestern, and southcentral and southeastern areas, which supports current stock structure hypotheses of Atlantic shortfin makos, and also suggested the possibility of multiple stocks within the South Atlantic; however, no significant genetic structuring was found based on the microsatellite analyses. Additional analyses to investigate the fine-scale genetic structure, especially in the North Atlantic, were conducted in 2017 and results of the new analyses confirmed previous findings. In 2018, a new approach using mitochondrial-genome sequencing was proposed to investigate the genetic population structure of shortfin mako. The Group welcomed this proposal that could help elucidate the stock delimitation of this species in the Atlantic, particularly the differences between the southwest and southeast Atlantic related to the high heterogeneity and low genetic diversity from the Uruguayan samples.

Post-release mortality of shortfin mako in the Atlantic Ocean− The main purpose of this project is to quantify the post-release mortality of Atlantic shortfin makos on pelagic longlines, which is currently non-existent, to potentially contribute to their assessment and management. To that end, Survivorship Popup Satellite Archival Transmitting Tags (sPATs) were acquired and distributed to the participating laboratories for deployment in three main areas of the Atlantic: the northwest Atlantic, the tropical northeast Atlantic and equatorial region, and the southwest Atlantic. A total of 14 sPATs have been deployed thus far by scientific observers from IPMA (EU-Portugal), DINARA (Uruguay), and NOAA (USA) with 13 transmitting tags, and additional information from 20 miniPATs was also available to estimate post-release mortality. Of the 28 specimens with available information, seven died (25%) whereas the remaining 21 (75%) survived, at least the first 30 days after tagging. The updated results from this project were reported and published in Domingo *et al.* (2018. Post-release mortality of shortfin mako in the Atlantic using satellite telemetry: preliminary results. SCRS/2018/105 (withdrawn)).

Movements, stock boundaries and habitat use of shortfin mako in the Atlantic Ocean− The main purpose of this study is to use satellite telemetry to gather and provide information on stock boundaries, movement patterns, and habitat use of shortfin mako in the Atlantic Ocean to potentially contribute to their assessment and management. All phase 1 (2015-2016) tags (23 tags: 9 miniPATs and 14 sPATs) and 11 tags (out of 13) from phase 2 (2016-2018) have been deployed by scientific observers on Portuguese, Uruguayan, U.S., and Brazilian vessels in the temperate Northeast, temperate Northwest and Southwest Atlantic. Additional tags from other projects (n=15) involving the same partners may also be deployed in these same areas, which cover both hemispheres and both sides of the Atlantic. In all, data from 32 of the 34 tags/specimens are available for a total of 1260 tracking days. The preliminary movement analysis shows that specimens tagged in the temperate northeast moved to southern areas, while specimens tagged in the tropical northeast region close to the Cabo Verde Archipelago moved easterly to the African continent shelf. One specimen was tagged in equatorial waters and moved south to Namibia. The specimens tagged in the southwest Atlantic off Uruguay stayed in the same general area, and the specimens tagged in the temperate Northwest Atlantic showed some general southward movements. Shortfin makos spent most of their time above the thermocline (0-90 m), between 18 and 22 °C. The updated results from this project were reported and published in Santos et al. 2018. The main plan for the next phase of the project is to continue tag deployment (12 additional tags were acquired) during the rest of 2018 and 2019 in several regions of the Atlantic.

Other SRDCP research projects

Reproduction of porbeagle in the Atlantic Ocean−This project was initiated in 2016 with the aim of filling important gaps in the reproductive biology of the porbeagle so that results can be available for the next stock assessment. In 2018, 2 female porbeagle were dissected and all samples collected during 2012-2018 were analyzed. Although previous research based on specimens collected from the western North Atlantic Ocean indicated that this lamnid shark has an annual reproductive cycle, the results of a recent evaluation of

reproductive tracts from a geographically segregated group of porbeagles within the western North Atlantic Ocean indicate the presence of females in a resting stage of maturity. The observation of a resting stage has implications not only for the reproductive cycle (biennial versus annual), but also in the lifetime productivity of the species. This finding indicates that this shark follows the typical lamnid resting period between pregnancies, a period that would decrease the lifetime output of young sharks (Natanson et al. 2019. Presence of a resting population of female
porbeagles (*Lamna nasus*), indicating a biennial reproductive cycle, in the western North Atlantic Ocean). Fish. Bull. 117: 70-77).

Movements, stock boundaries and habitat use of porbeagle in the Atlantic Ocean−A total of 16 miniPATs acquired for this project were distributed to scientists from EU-France, EU-Portugal, and Norway, to be deployed in the North Atlantic, and Uruguay to be deployed in the South Atlantic. Relevant to this activity and that related to shortfin mako, the SSG was informed of other ongoing national programmes that can contribute data, such as Canada's, which is currently deploying 30 sPATs on shortfin mako and 30 sPATs on porbeagle during 2018-2019; and 12 new sPATs for porbeagle from a US/NOAA project that will be deployed in EU-Portugal, Uruguayan, and U.S. vessels.

Movements, stock boundaries and habitat use of silky sharks in the Atlantic Ocean− The SSG also decided that of 20 satellite tags that were acquired in 2018 for the SRDCP, 12 should be deployed on shortfin mako as initially planned, but that other tags could be allocated to other priority shark species, with particular emphasis on species that are currently prohibited to be retained in ICCAT fisheries. After a review of satellite tags previously deployed on these other species in the Atlantic, the SSG recommended that 8 tags should be deployed on silky sharks because virtually nothing is known of their movements in the Atlantic (only three animals tagged off Cuba) and they were ranked as the most vulnerable species in the 2010 ERA (Cortés et al., 2010. Ecological risk assessment of pelagic sharks caught in Atlantic pelagic longline fisheries. Aquatic Living Resources. 23. 25-34). In collaboration with the Cape Eleuthera Institute, and Florida State University, archival satellite tags are being deployed in the U.S. Gulf of Mexico, Caribbean Sea, and Atlantic Ocean.

Studies involving NOAA researchers

Defining environmental parameters to inform key habitat requirements for the oceanic whitetip shark, Carcharhinus longimanus−Since 2011, expeditions conducted by Florida International University and the Cape Eleuthera Institute have documented the prevalence of adult oceanic whitetip sharks off the seamounts near Cat and San Salvador Islands, Bahamas. A recent expedition also found oceanic whitetip sharks near seamounts in Mayaguana, Bahamas. Many of these adult sharks were female close or near term to giving birth. Satellite archival tagging studies suggest that these individuals exhibit site fidelity to these areas even after traveling long distances, which suggests philopatry may exist in this species (Howey-Jordan et al., 2013). This indicates that certain oceanographic features present in these areas may be beneficial to the species. Oceanic whitetips are hypothesized to have a biennial reproductive cycle, which suggests that some of the differences in individual movements may correspond to migrations by gravid and non-gravid females to disjunct pupping and mating areas. The capture by Haitian and Cuban fishers of very small oceanic whitetips (Valdés et al. 2016; M. Bond pers. comm.) suggests areas north of the Windward Passage might be a pupping ground for oceanic whitetips. An examination of commercial catches from the US pelagic longline fishery of oceanic whitetip further confirms that the majority of young-of-the-year sharks are also from this area. Thus, the Bahamas and areas in the Caribbean Sea may represent the major pupping area for the northwest Atlantic. The project focuses on enhancing the current data on habitat needs of the oceanic whitetip shark. Sharks captured are assessed for maturity using ultrasound detection of pregnancy in females, and analysis of circulating steroid hormone. Fin clips are taken for genetic analysis and new and archived samples used to reconstruct parental genotypes and potentially identify genetic connectivity. Individuals, in particular, juveniles, gravid females, or males as these are the underrepresented in the current data set are tagged with an archival satellite tags or acoustic tags to further improve movement and residency.

Life history of pelagic sharks−Data collection and sampling of biological tissues for determining life history characteristics of several pelagic species including shortfin mako, silky (*Carcharhinus falciformis*), porbeagle (*Lamna nasus*), bigeye thresher and common thresher (*Alopias vulpinus*)) continued in 2018, with the number of archived samples exceeding 500. Reproductive tissues are processed and sectioned using histological techniques. Morphological data on organ measurements have been plotted and will be compared to the histological results. Vertebrae are also processed using histology and image analysis and are currently being read.

Post-release survival of dusky sharks−Dusky sharks (*Carcharinus obscurus*) are a large coastal-pelagic shark

species that occurs in waters of the western Atlantic and Gulf of Mexico. Management regulations include listing dusky sharks as a prohibited species and creating a time-area closure to protect juveniles. Despite strict regulations, dusky sharks are still caught as bycatch on bottom and pelagic longlines where at-vessel mortality rates are up to 85%. Research began in 2015 to address these needs by producing estimates of long term, post-release survival of dusky sharks in longline fisheries; quantifying at-vessel mortality in the longline fisheries and evaluating the efficacy of alternative fishing practices to decrease bycatch mortality; determining the best method for identifying the timing and location of dusky shark "hotspots" based on available historical data; and evaluating the efficacy of the time/area closures on a migratory species, through satellite tagging data.

Post-release survival of porbeagle sharks−Under ICCAT regulations all porbeagle sharks captured alive are required to be released. However, there is very little information on post-release mortality of porbeagle shark. Campana et al. (2016) reported a post-release mortality rate of 27–31% but this was for Canadian longline fisheries only and results may not be applicable across all ICCAT fisheries. Since a re-assessment of the status of porbeagle shark by ICCAT is scheduled, there is an immediate need to provide a better understanding of post-release survival in both recreational and commercial fishing gear. Post-release survivorship tags are currently being deployed by NOAA researchers in collaboration with the University of New England in the U.S. and the Portuguese and Uruguayan governments.

2.2.7 Billfish Research

U.S. scientists participated in the ICCAT Enhanced Research Program for Billfish in 2017-18, with a U.S. scientist (CIMAS-SEFSC) serving as the overall and western Atlantic coordinator. An ongoing ICCAT international collaboration on billfish genetic research started in 2008 continued in 2017-18, and included U.S. scientists from NOVA Southeastern University, University of Miami, and SEFSC. One of the primary goals is to develop accurate estimates of white marlin/round scale spearfish ratios in the Atlantic Ocean, including retrospective analyses.

During 2018-2019, U.S. scientists from the Virginia Institute of Marine Science, College of William & Mary conducted genetic studies on the stock structure of Atlantic istiophorid billfishes.

U.S. scientists from SEFSC, ICCAT, RSMAS/University of Miami, and GEOMAR Helmholtz Centre for Ocean Research (Kiel, Germany) were investigating the escalating Atlantic longline harvest of tropical pelagic fishes above an expanding oxygen minimum zone.

U.S. scientists from SEFSC, CIMAS, RSMAS/University of Miami, and the Universidad de Oriente (Venezuela) published research on age, growth, and maximum longevity of Atlantic blue marlin.

U.S. scientists from NOVA University completed a project with the PLL fishery in Grenada to assess catch rate differences between circle and J hooks, with eyes on the possibility of using circle hooks and live release in combination to reduce billfish mortality. This project was funded through the Consortium on Billfish Management and Conservation (CBMC.

Representatives of the International Game Fish Association, as part of the IGFA Great Marlin Race, continued deploying pop-up satellite archival tags on blue marlin during 2018.

During 2018 researchers from SEFSC deployed electronic tags on two blue marlin in the Bahamas.

Stanford University and The Ocean Foundation (*Tag a Giant*) has continued to expand tagging efforts to both billfish and YFT in addition to their extensive and long-term tagging commitment to BFT.
.

2.2.8 Seabird research

Pinpointing hotspots of seabird bycatch in the 1992-2017 U.S. Atlantic pelagic longline observer program (POP) data base was the focus of new research at Virginia Polytechnic Institute and University in collaboration with the Southeast Fisheries Science Center (SEFSC) Seabird Project in 2018. Bayesian spatiotemporal methods were applied using R-INLA. The probability of bycatching a seabird in the high bycatch zones was found to show spatial-temporal patterns, and the temporal changes in predicted hotspots were found to be related to large scale

oceanographic indices. Models based on these results might be used for real- or near-time predictions that, in combination with close communication among fishing participants and between participants and the POP, could bring about spatial or temporal changes in the application of fishing effort to reduce seabird bycatch potential. Three other research initiatives that were started by the SEFSC-Virginia Tech team in previous years were advanced toward publication in 2018, and one was accepted for publication by the end of the year.

2.2.9 Tagging

Participants in the Southeast Fisheries Science Center's Cooperative Tagging Center (CTC) and The Billfish Foundation (TBF) Tagging Program tagged and released 2,937 billfishes (including swordfish) and 117 tunas in 2018. This represents an increase of 25.2% for billfish and a decrease of 61.51% for tunas from 2017 levels. Several electronic tagging studies involving yellowfin tuna, bluefin tuna and billfish in the Atlantic Ocean and adjacent waters continued during 2018. These are discussed in the corresponding research sections above. There were 52 billfish recaptures from the CTC and TBF projects in 2018. This represents an increase of 30% from 2017. These recaptures included 25 sailfish, 6 white marlin, 9 swordfish, 1 roundscale spearfish, and 11 blue marlin. A total of 12 tunas were recorded as recaptures in 2018, 8 bluefin tuna, and 4 yellowfin tuna. This represents a decrease of 7.7% from 2017.

2.2.10 Fishery Observer Deployments

Domestic Pelagic Longline Observer Coverage:

In accordance with ICCAT recommendations, randomized observer sampling of the U.S. pelagic longline fleet was continued into 2018 through the U.S. Pelagic Observer Program (POP). Representative scientific observer sampling of this fleet has been underway since 1992. The data collected through this program have been used to quantify the composition, disposition, and quantity of the total catch (both retained and discarded at sea) by this fleet which fishes in waters of the northwest Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea. Selection of the vessels is based on a random sampling of the number of sets reported by the longline fleet. The percent of fleet coverage has varied over time, for example in 1992 it reached 2.5% coverage; while in 2018 it reached 13% (includes Gulf of Mexico Bluefin Tuna Enhanced Coverage). The targeted sampling fraction of the U.S. pelagic longline fleet was increased from 5% to 8% in 2002.

A total of 22,778 longline sets (16,506,603 hooks) were recorded by POP personnel from May of 1992 to December of 2018. During this period, observers recorded over 730,545 fish (primarily swordfish, tunas, and sharks), in addition to marine mammals, sea turtles, and seabirds. Documents SCRS/04/168 and SCRS/08/034 provided a more detailed summary of the data resulting from observer sampling, observer coverage, and sampling strategy. Similar to 2007-2017, from approximately February 20th through June 15th, the pelagic observer program increased the coverage of the longline fleet operating in the Gulf of Mexico. The goal of this increase was to collect data to better characterize the interaction between the longline fleet and bluefin tuna during the spawning season. A total of 177 longline sets were observed (146,412 hooks) from 22 vessels (10 distinct) which accounted for approximately 42.5% of the longline sets during that period.

Shark Bottom Longline Observer Coverage

The commercial shark bottom longline fishery is active in the U.S. Atlantic Ocean from around North Carolina to Florida and throughout the eastern Gulf of Mexico. The fishery is active year-round, but is subject to seasonal closures based on quota limits and activity in other fisheries. Bottom longlines normally consist of about 1-32 kilometers of longline mainline with weights placed at the start, middle and end and about 25-1200 hooks attached at intervals. Bait can vary from elasmobranchs to different kinds of teleosts. The longline is generally set at sunset and allowed to soak overnight before hauling back in the morning. Currently about 219 U.S. fishers are permitted to target sharks in the Atlantic Ocean and Gulf of Mexico, and an additional 264 fishers are permitted to land sharks incidentally caught. Amendments to the Consolidated Atlantic Highly Migratory Species Fishery Management Plan implemented a shark research fishery, which allows NMFS to select a limited number of commercial shark vessels on an annual basis to collect life history data and catch data for future stock assessments (NMFS, 2007). Specifically, only commercial shark fishers participating in the research fishery are allowed to land sandbar sharks, Carcharhinus plumbeus, and must carry an observer on 100% of all trips (compared to a target coverage level of 5-10% outside the research fishery). Outside the research fishery, fishers are permitted to land other large coastal sharks (e.g. blacktip shark, Carcharhinus limbatus, and bull shark, Carcharhinus leucas). From January to December 2018, a total of 97 trips (defined as from the time a vessel

leaves the port until the vessel returns to port and lands catch, including multiple hauls therein) on 11 vessels with a total of 159 bottom longline hauls (defined as setting gear, soaking gear for some duration of time, and retrieving gear) were observed. Sharks comprised over 98% of the catch, with teleost and batoids comprising a small portion of bycatch. In the Shark Research Fishery,
Sandbar shark comprised 63.0 % of the shark catch, other large coastal shark species comprised 29.4 % of the shark catch, and small coastal shark species comprised 6.7 %. Prohibited shark species were also caught including dusky shark (3.1 %) and sand tiger shark, Carcharhias taurus (1.2 %), and white shark, Carcharodon carcharias (0.1 %). Outside the Shark Research Fishery, large coastal shark species (excluding sandbar shark) comprised 69.3% of the shark catch and small coastal shark species comprised 23.8 %. Prohibited shark species were also caught, including sandbar shark (5.9 %).

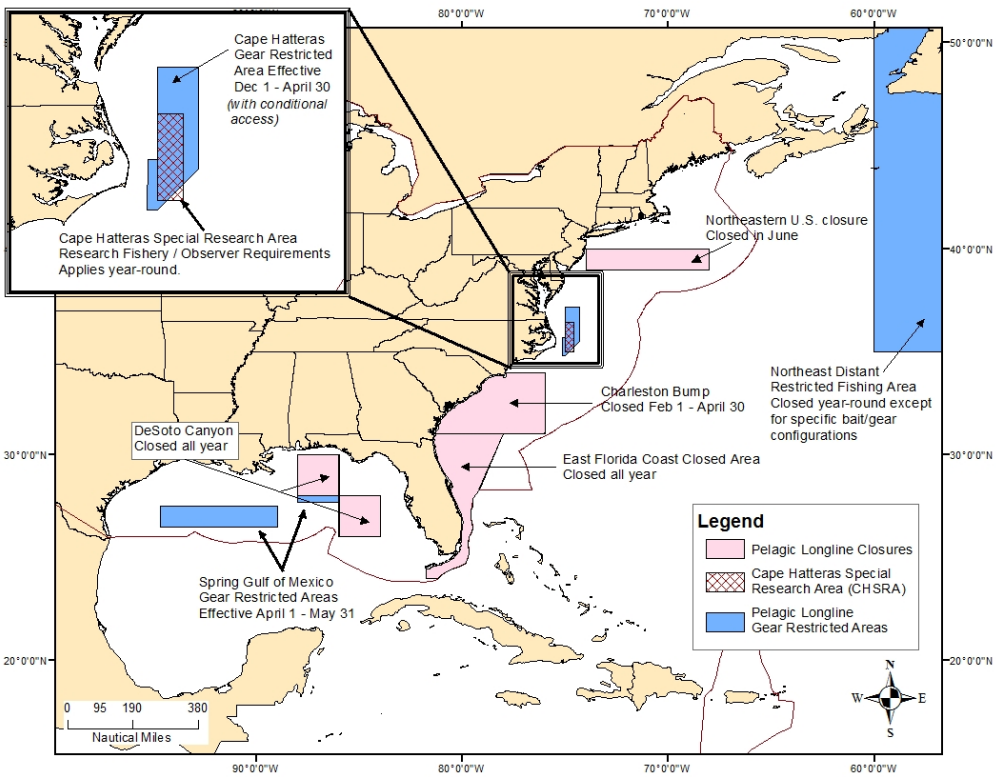
2.2.11 Ecosystem Considerations

The US Deprtment of Commerce has compiled and distributed the "Atlantic Highly Migratory Species Ecosystem-Based Fisheries Management Road Map Implementation Plan" for 2018-2022. The Atlantic HMS EBFM engagement strategy will leverage meetings that the Atlantic HMS Management Division and SEFSC and NEFSC staff working on HMS either host or attend, with key partners and stakeholders, to provide updates on HMS EBFM activities and be supportive of partner EBFM actions. The Atlantic HMS Management Division will also reach out to regional fishery management councils and interstate marine fisheries commissions to increase the level of communication regarding EBFM issues, as well as use the NOAA Fisheries website and the Atlantic HMS email listserv to communicate EBFM information to fshery stakeholders and the public. In addition, there may be opportunities to participate in the meetings of scientific societies (e.g., American Fisheries Society, American Elasmobranch Society, American Society of Ichthyologists and Herpetologists) and associated symposiums or workshops to share and learn about new work on ecosystem studies relevant to Atlantic HMS. Finally, the Atlantic HMS Management Division will work to collaborate with domestic and international partners on cross-jurisdictional issues, as well as on data collection and monitoring, related to EBFM Implementation. Details of the Road Map can be found
https://www.fisheries.noaa.gov/national/ecosystems/ecosystem-based-fishery-management-implementation-plans

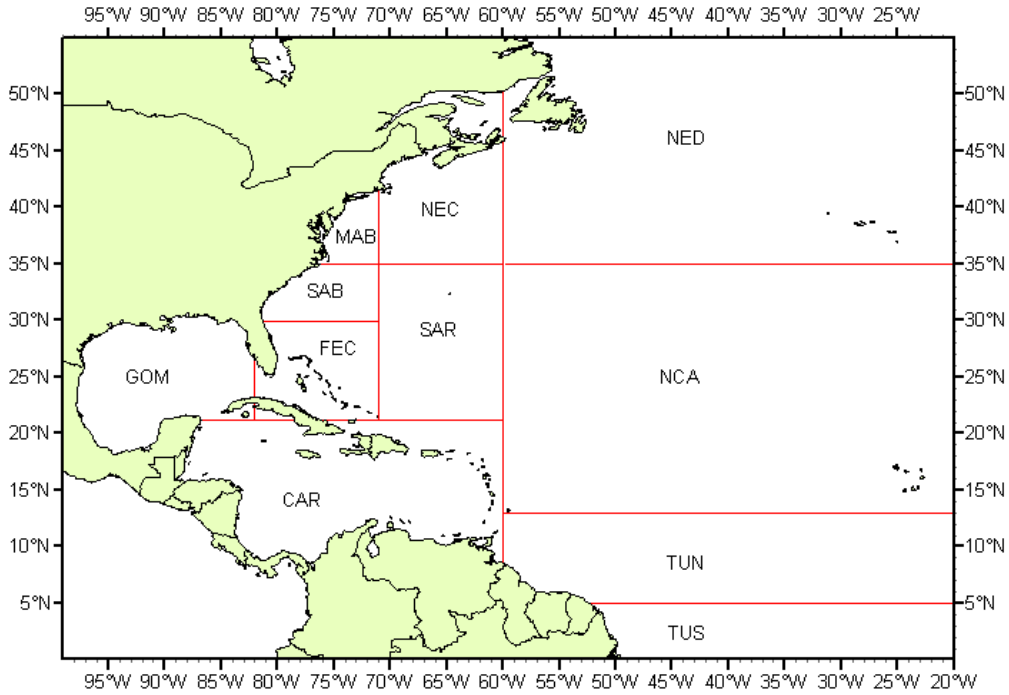
Appendix 1. Effects of time/area closures on the U.S. swordfish fishery.

Pelagic longline fishing in the U.S. Atlantic is prohibited or restricted in the areas shown in Appendix Figure 1.1. Three of the southern areas, (Charleston Bump, Florida East Coast, and Desoto Canyon), were selected, at least in part, to reduce the catch of swordfish < 125 cm and other bycatch species. The Northeastern closed area (close in June) was primarily established to reduce the catch of bluefin tuna smaller than the legal size for sale by U.S. fishers. The Northeast Distant area is opened to fishing year round to all longline vessels with a gear restriction that requires only using non-offset 18/0 circle hooks and whole finfish bait. The spring Gulf of Mexico gear restricted area is closed from April 1- May 31; while the Cape Hatteras gear restricted area is only opened for a selected group of longline vessels December 1 – April 30 (the rest of the year is opened to all vessels). These 2 areas were established, together with a number of other management measures, to reduce the incidental catches of bluefin tuna by the U.S. pelagic longline fleet.

The number of longline vessels in the U.S. fishery targeting swordfish declined steadily from the mid-1990s, reached a low numbers in 2006 and showed a variable increasing trend since then. However, a steady declined in the number of active vessels has been observed since 2012 (Appendix Table 1.1). Year 2018 showed the lowest number in both active vessels (75 vessels) and number of hooks deployed (3.7 million) in the entire time series. The percentage effort in number of hooks and swordfish discarded dead in numbers (reported) and in metric tons (estimated) in 2016, 2017, and 2018 are compared to the average effort and numbers/estimates from 1997 through 1999 (Appendix Table 1.2). There was some overall reduction in effort, reported in hooks fished. The years 2016, 2017, and 2018 and the average (1997-1999) swordfish discarded dead in numbers (reported) and in metric tons (estimated) and effort in hooks are reported by area and time/area status in Appendix Table 1.3.



Appendix Figure 1.1- Time/area closures for the U.S. longline fishery in 2017.



Appendix Figure 1.2- U.S. domestic fishing areas: Caribbean (CAR), Florida East coast (FEC), Gulf of Mexico (GOM), Mid Atlantic Bight (MAB), Northeast Central (NEC), Northeast Distant (NED), South Atlantic Bight (SAB), Sargasso Sea (SAR), North Central Atlantic (NCA), Tuna North (TUN), and Tuna South (TUS).

Appendix Table 1.1. *Number of Active U.S. Pelagic Longline Vessels. "Vessels" indicates the number of vessels that submitted at least one positive fishing report during that year, "Vessels that caught SWO" corresponds to the number of vessel that reported catching at least one swordfish during that year and "Vessels that caught SWO in 5month period" indicates the number of vessels that reported catching at least one swordfish per month in at least five months of that year. "Hooks Reported" includes all submitted logbooks single pelagic longline sets and summary records.*

Year	Vessels	Vessels that caught SWO	Vessels that caught SWO in 5 month period	Hooks reported
1990	419	363	209	7,500,095
1991	342	308	176	7,754,127
1992	340	304	184	9,076,717
1993	435	306	177	9,735,806
1994	501	306	176	10,351,805
1995	489	314	198	11,270,539

1996	367	275	194	10,944,660
1997	352	265	167	10,213,780
1998	288	233	139	8,120,273
1999	226	200	143	7,996,685
2000	206	185	135	8,158,390
2001	185	168	114	7,897,037
2002	149	140	107	7,107,958
2003	123	119	94	6,862,091
2004	117	114	96	7,345,048
2005	112	108	79	5,973,150
2006	103	102	77	5,522,236
2007	119	117	90	6,312,406
2008	122	122	89	6,273,257
2009	116	114	88	6,772,732
2010	116	115	63	5,565,170
2011	117	116	81	5,900,451
2012	122	122	101	7,756,277
2013	115	114	96	7,241,340
2014	110	109	83	6,748,965
2015	103	102	76	5,423,566
2016	84	82	61	4,905,240
2017	88	84	63	5,159,788
2018	75	74	54	3,746,553

Appendix Table 1.2 Numbers (reported) and metric tons (estimated) of swordfish discarded dead, and reported number of hooks in years 2016-2018 by pelagic longline vessels expressed as percentage of the mean values from years 1997-1999 by area Caribbean (CAR), Florida East coast (FEC), Gulf of Mexico (GOM), Mid Atlantic Bight (MAB), Northeast Central (NEC), Northeast Distant (NED), and South Atlantic Bight (SAB).

	Number of SWO				Number of Hooks				Metric tons			
	Mean	2016	2017	2018	Mean	2016	2017	2018	Mean	2016	2017	2018
CAR	433	0%	44%	7%	233,291	67%	116%	20%	7	0%	0%	0%
FEC	2,488	4%	5%	5%	579,777	79%	65%	47%	40	4%	0%	0%
GOM	1,806	40%	52%	52%	1,465,689	42%	53%	40%	21	49%	46%	47%
MAB	1,195	49%	146%	119%	730,291	76%	126%	111%	19	50%	1%	0%
NEC	767	50%	18%	2%	622,812	48%	23%	4%	12	51%	83%	84%
NED	972	4%	8%	9%	494,842	39%	40%	22%	15	5%	0%	0%
SAB	2,391	30%	36%	85%	556,779	99%	101%	114%	41	27%	148%	120%

Appendix Table 1.3. Numbers (reported) and metric tons (estimated) of swordfish discarded dead, and number of hooks reported by pelagic longline vessels in years 2016-2018 and the average for years 1997-1999 by area Caribbean (CAR), Florida East coast (FEC), Gulf of Mexico (GOM), Mid Atlantic Bight (MAB), Northeast Central (NEC), Northeast Distant (NED), and South Atlantic Bight (SAB) and U.S. of time/area closure.

		Number of SWO				Number of Hooks				Metric tons				Change in MT.		
		Mean	2016	2017	2018	Mean	2016	2017	2018	Mean	2016	2017	2018	2016	2017	2018
CAR	Open	433	0	191	32	233,291	155,259	270,199	47,175	7	0.0	0.0	0.0	-7	-7	-7
FEC	Closed	2,158	13	3	7	364,950	72,576	23,560	25,960	35	0.3	0.1	0.1	-34	-34	-34
FEC	Open	330	75	125	128	214,828	382,608	352,124	244,549	5	1.4	2.4	2.5	-4	-3	-3
GOM	Closed	426	0	2	0	103,274	0	760	0	5	0.0	0.0	0.0	-5	-5	-5
GOM	Open	1,380	721	942	944	1,362,414	609,580	772,344	591,956	16	10.3	13.5	13.5	-6	-3	-3
MAB	Closed	2	0	0	0	5,750	0	0	0	0.03	0.00	0.00	0.0	-0.03	0	0
MAB	Open	1,194	587	1,740	1,417	726,458	555,115	920,742	808,754	18	9.2	27.1	22.1	-9	9	4
NEC	Closed	11	0	0	0	0	0	0	0	0.2	0.0	0.0	0.0	0	0	0
NEC	Open	760	382	138	13	598,478	300,180	143,946	25,324	12	6.0	2.2	0.2	-6	-9	-11
NED	Open	972	36	75	83	494,842	191,979	199,423	108,221	15	0.7	1.5	1.7	-14	-13	-13
SAB	Closed	660	0	0	0	175,767	805	695	600	11	0.0	0.0	0.0	-11	-11	-11
SAB	Open	1,734	719	864	2,028	381,013	553,054	561,841	636,731	30	11.1	13.3	31.2	-18	-16	2

Annex 1 to Part I of 2019 Annual Report (Scientific Report)

SUBMITTED BY: United States

Number	Information required	Response
	GENERAL - all species	
S1	Annual Reports (Scientific)	15/9/2019
S2	Fleet Characteristics	26/7/2019
S3	Estimation of nominal catch Task I	26/7/2019
S4	Catch & Effort (Task II)	26/7/2019
S5	Size samples (Task II)	26/7/2019
S6	Catch estimated by size	26/7/2019
S7	Tagging declarations (conventional and electronic)	31/7/2019
S8	Information on tagging surveys	No tagging surveys. Information on tagging programs provided in U.S. Annual Report and data submitted on 31/7/2019
S9	Information collected under conventional tagging programs	31/7/2019
S10	Information collected under electronic tagging programs	31/7/2019
S11	Information on implementation of Rec. 16-14	15/9/2019
S12	Information and data on pelagic Sargassum	None available
S13	Specific information for the fishing vessels that were authorized to carry out pelagic longline fisheries and harpoons in the Mediterranean during the preceding year	Not applicable; The United States does not fish in the Mediterranean Sea.
	BLUEFIN TUNA	
S15	Size sampling from farms	Not applicable; The United States does not farm Atlantic bluefin tuna.
S17	The results of programme using stereoscopical camera systems or alternative techniques that provide the equivalent precision at the time of caging (covering 100% of all cagings)	Not applicable; The United States does not farm Atlantic bluefin tuna.
S18	Information on and data collected under the national BFT observer programmes	Not applicable; This requirement is specific to the eastern Atlantic and Mediterranean bluefin tuna fishery, in which the United States does not participate; The United States provides information from its national observer program to ICCAT per SCRS requirements.
S21	Details of cooperative research programs on W-BFT to be undertaken	Not applicable; The United States did not receive any transfer of quota to support such cooperative research.
S22	Updates to abundance indices and other fishery indicators	23/9/2019
S23	Information resulting from GBYP related research including new information resulting from enhanced biological sampling activities	Information provided in bluefin tuna section of Part I of the U.S. Annual Report
S53	Report on the scientific activities conducted by vessels operating in the context of a scientific project of a research institute integrated in a scientific research program	N/A - the United States does not prosecute an fishery for eastern Atlantic and Mediterraean bluefin tuna for research or other purposes
	TROPICAL TUNA	
S24	Information from logbooks on BET/YFT/SKJ vessels, including discards	26/7/2019 [1]
S25	Management Plans for the use of fish aggregating devices	Not applicable; The United States does not have purse seine or baitboat fisheries for tropical

Number	Information required	Response
		tunas.
S44	The number of FADs actually deployed on a monthly basis per 1°x1° statistical rectangles, by FAD type, etc.	Not applicable; The United States does not have purse seine or baitboat fisheries for tropical tunas.
S45	For each support vessel, the number of days spent at sea, per 1 degree grid area, month and flag State and associated to PS/BB	Not applicable; The United States does not have purse seine or baitboat fisheries for tropical tunas.
S46	Information collected by observers , including coverage levels	26/7/2019 [2]
S47	Data and information collected from port sampling programme	Not applicable; The United States does not fish in the vicinity of the Gulf of Guinea time/area closure.
S48	Historical data mining on the use and number of FADs deployed	Not applicable; The United States does not have purse seine or baitboat fisheries for tropical tunas or a history of such fishing.
S49	Scientific data collected in the EEZ of another CPC	Not applicable; The United States does not fish for tropical tunas in the area identified in Rec. 16-01 Para 39.
	SHARK	
S32	Plan for improving data collection for sharks on a species specific level	Not applicable; The United States provides species specific shark data in accordance with ICCAT requirements
S50	Results of research on shortfin mako	20/5/2019 [3]
S51	Information on blue sharks	20/5/2019 [3]
	OTHER BY-CATCH	
S37	Provision of Existing identification guides for sharks, seabirds and turtles and marine mammals caught in the Convention Area	Links provided in Part II, Section 4 of the 2014 U.S. Annual Report
S38	Information on interactions of its fleet with sea turtles in ICCAT fisheries by gear type	26/7/2019
S39	CPCs shall record data on seabird incidental catch by species through scientific observers in accordance with the Recommendation 10-10 and report these data annually.	26/7/2019
S41	Notification of measures taken on the collection of by-catch and discard data in artisanal fisheries through alternative means	Not applicable; The United States does not have fisheries subject to the exemption from the use of observers.
S42	CPCs shall report on steps taken to mitigate by-catch and reduce discards, and on any relevant research	Information on steps taken to mitigate bycatch and reduce discards is included in Part II, Sections 3 and 4 of the U.S. Annual Report. Relevant research is described in Part I, Section 1.

[1] Data from logbooks of U.S. vessels <20m reported as part of U.S. Task I and Task II data submission.

[2] Information on observer coverage levels is included in the National Report.

[3] Relevant current information and research results reported to the SCRS Sharks Working Group and summarized in the Annual Report

NOTE: Available species-specific Task I and II data, as well as abundance indices, needed for 2019 intersessional data preparatory meetings were provided earlier than the dates shown here, as required.

SUBMITTED BY THE UNITED STATES

ANNUAL REPORT – SECTION 3 – REPORTING SUMMARY

Req	Nº	Information required	Response
GEN	0001	Annual Reports	Parts I and II of U.S. Annual Report submitted on 14/09/2019
GEN	0002	Report on implementation of reporting obligations for all ICCAT fisheries, including shark species	Part II of U.S. Annual Report submitted on 15/09/2019
GEN	0003	ICCAT Compliance Reporting Table	U.S. Compliance Reporting Tables submitted on 12/08/2019
GEN	0004	Vessel Chartering - summary report	N/A; no U.S. chartering operations in the ICCAT Convention Area
GEN	0005	Vessel Chartering - arrangements and termination	N/A; no U.S. chartering operations in the ICCAT Convention Area
GEN	0006	Transhipment reports (at sea and in-port)	N/A; Transhipment prohibited; no transhipment in the ICCAT Convention Area
GEN	0007	Transhipment declaration (at sea)	N/A; Transhipment prohibited; no transhipment in the ICCAT Convention Area
GEN	0008	Carrier vessels authorised to receive transhipments of tuna and tuna-like species in the Atlantic Ocean, either at-sea or in-port	N/A;The United States has no carrier vessels authorized to receive transhipments
GEN	0009	LSPLVs which are authorised to tranship to carrier vessels in the Atlantic Ocean (and subsequent modifications)	N/A; Transshipment prohibited; no U.S. flagged large-scale pelagic longline vessels authorized to tranship to carrier vessels
GEN	0010	Points of contact for port entry notifications and contact points for receiving copies of Port Inspection reports	Submitted to ICCAT on 09/07/2013; no subsequent changes to report.
GEN	0011	List of designated ports into which foreign fishing vessels may request entry	Submitted to ICCAT on 09/07/2013; no subsequent changes to report.
GEN	0012	Advance notification period required for entry into port of foreign fishing vessels	Submitted to ICCAT on 09/07/2013; no subsequent changes to report.
GEN	0013	Report of Denial of Entry or Denial of Use of port	No decisions to deny port entry or use to report.
GEN	0014	Copies of port inspection reports containing findings of potential non-compliance or apparent infringement (and others where practicable)	None at this time. The United States generally prohibits foreign fishing vessels from landing or transhipping in U.S. ports fish or fish products that were harvested or taken onboard on the high seas, with the exception of activities in certain U.S. territories or pursuant to a treaty. Under U.S. domestic law, all fishing vessels, including those carrying fish species subject to regulations pursuant to a recommendation of ICCAT, as well as their catch, gear, fishing logbooks and manifests are subject to inspection.
GEN	0015	Action taken following port inspection if apparent infringement is found	N/A; see GEN 0014 explanation
GEN	0016	Notification of results of investigation of apparent infringements following port inspection	N/A; see GEN 0014 explanation
GEN	0017	Information of bilateral or multilateral agreements/arrangements that allow for an inspector exchange program designed to promote cooperation	N/A; no bilateral arrangements for port inspection at this time
GEN	0018	Access agreements and changes	N/A; The U.S. has no access agreements at this time
GEN	0019	Summary of activities carried out pursuant to access agreements, including all catches	N/A; The U.S. has no access agreements at this time

Req	Nº	Information required	Response
GEN	0020	List of vessels of 20 metres or greater	At the time of reporting, 452 U.S. flagged vessels 20 meters and above are included on the vessel list.
GEN	0021	Vessels 20 m or greater internal actions report	We have reviewed internal actions, consistent with the requirements of Rec. 13-13, paragraph 6, and have no updates to report.
GEN	0022	Redundant	
GEN	0023	Techniques used to manage sport and recreational fisheries	As summarized in a report to the 2009 ICCAT Working Group on Sport and Recreational Fisheries, the United States employs a broad array of management tools in the recreational fishery for Atlantic tunas, swordfish, billfish, and sharks, including: vessel permits; authorized and prohibited species; restrictions regarding gear use, possession and retention, and areas fished; and prohibition on sale of recreationally caught fish. Recreational landings are estimated through the Marine Recreational Information Program (MRIP), and a combination of the Recreational Billfish Survey, the Large Pelagics Survey, mandatory reporting requirements for non-tournament landings of Atlantic blue and white marlins, roundscale spearfish, sailfish, swordfish, and Atlantic bluefin tuna, and state landings data, including from catch card programs. Regulations require selected HMS charter/headboat vessels that do not already complete a logbook to do so. Registration of all recreational fishing tournaments for Atlantic HMS is required. All tournaments are required to submit landing reports. All non-tournament landings of Atlantic bluefin tuna, billfish, and swordfish are required to be reported within 24 hours of landing via an internet-based reporting system. The online bluefin tuna landings reporting requirement was expanded in 2015 to require the reporting of bluefin tuna retained *or* discarded dead by all commercial and recreational handgear vessels, within 24 hours of the end of each trip. The United States continues to make significant improvements to its recreational fisheries data collection programs. In 2018, the United States revised MRIP as part of its recent transition from the Coastal Household Telephone Survey to the new, mail-based Fishing Effort Survey (FES). The change resulted in revised catch and effort estimates from 1981-2017. The FES is a more accurate method of collecting saltwater recreational fishing effort. As a result of the improved survey, FES estimates are generally higher than telephone survey; however, analyses indicate that the increase in effort estimates is because the FES does a better job of estimating fishing activity, not a sudden rise in fishing. More information is available at: https://www.fisheries.noaa.gov/topic/recreational-fishing-data
GEN	0024	Vessels involved in IUU Fishing	No vessels identified at this time.
GEN	0025	Comments on IUU allegations	None at this time.
GEN	0026	Trade measures; submission of import and landing data	The United States collects information through a combination of programs, including the bluefin tuna catch documentation program, bigeye and swordfish statistical document programs, and the U.S. domestic International Trade Data System (ITDS). Relevant

Req	Nº	Information required	Response
			information is provided to the Commission. Reports were submitted on 01/04/2019 and 15/09/2019 (for bigeye tuna and swordfish) and on 12/09/2019 for bluefin tuna.
GEN	0027	Data on non-Compliance	See Appendix II regarding U.S. enforcement information.
GEN	0028	Findings of investigations in relation to allegations of non-compliance	See Appendix II regarding U.S. enforcement information.
GEN	0029	Vessels sightings	N/A; no vessel sightings to report at this time.
GEN	0030	Actions taken with regard to reports of vessel sightings	N/A; no vessel sightings to report at this time.
GEN	0031	National authority responsible for at-sea inspection and other supporting maritime agencies as may be appropriate	Submitted 4/04/2019 and available on the ICCAT website
GEN	0032	Designated point(s) of contact (POC) within that authority with responsibility for program implementation	Submitted 4/04/2019 and available on the ICCAT website
GEN	0033	Report on any activities carried out under the pilot program for exchange of inspection personnel	No new exchanges evolved this year specific to the ICCAT Convention; however, professional exchanges inspecting fishing vessels continue with Contracting Parties to ICCAT. This includes Canada, Nigeria, Cabo Verde, and Ghana. The United States continues discussions with potential partners for ICCAT professional exchanges.
GEN	0034	Request for removal of vessel from final IUU vessel list	N/A; no vessels on the IUU list at this time.
BFT	1001	Bluefin tuna farming facilities	N/A; the United States has no bluefin tuna farming facilities
BFT	1002	Bluefin tuna farming reports	N/A; the United States has no bluefin tuna farming facilities
BFT	1003	Carry over of caged fish declaration	N/A; the United States has no bluefin tuna farming facilities
BFT	1004	Bluefin tuna caging report/declaration	N/A; the United States has no bluefin tuna farming facilities
BFT	1005	Bluefin tuna traps	N/A; the United States has no bluefin tuna traps
BFT	1006	Redundant	
BFT	1007	Fishing, inspection and capacity plans	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1008	Farming capacity plan and revisions if appropriate	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1009	Modifications to fishing plans	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1010	Information on regulations and other related documents adopted for implementation of Rec. 18-02	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1011	Bluefin tuna catches 2018	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1012	Bluefin tuna catching vessels	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1013	Bluefin tuna other vessels	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1014	Joint Fishing Operations	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1015	VMS messages	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1016	Joint Inspection Scheme plans	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1017	List of inspection vessels	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1018	List of inspectors [and agencies]	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery

Req	№	Information required	Response
BFT	1019	Copies of inspection reports from JIS	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1020	Bluefin tuna transhipment ports	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1021	Bluefin tuna landing ports	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1022	Bluefin tuna weekly catch reports (including traps)	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery
BFT	1023	Bluefin tuna monthly catch reports	Yes, 12 monthly reports submitted during calendar year 2018; to date, reports submitted each month in 2019
BFT	1024	Dates when entire quota of bluefin tuna has been utilized	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery.
BFT	1025	Report on steps taken to encourage tag and release of all fish less than 30 kg/115 cm	Through Federal regulations, the United States requires that any Atlantic Highly Migratory Species (HMS) that is caught but not kept be released in a manner that maximizes its probability of survival and without removing the fish from the water. NOAA Fisheries has issued a *Careful Catch and Release* brochure to provide advice on compliance with this requirement. It is available at: https://www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-fishery-compliance-guides U.S. Atlantic HMS fishermen are encouraged to obtain free conventional streamer tags and tagging kits from the NOAA Fisheries Cooperative Tagging Center (https://www.sefsc.noaa.gov/species/fish/tagging.htm). NOAA Fisheries' Apex Predator Program also distributes tags for sharks (https://www.nefsc.noaa.gov/nefsc/Narragansett/sharks/) to help provide valuable information about movement patterns and life history of HMS. Tournaments also provide fisheries biologists with an opportunity to promote voluntary angler tagging programs. The United States limits the take of bluefin measuring less than 115 cm through subquotas and retention limits, and no commercial retention of bluefin measuring less than 178 cm is allowed. There is a low recreational daily retention limit (e.g., one fish measuring 66 cm to less than 178 cm per vessel for private vessels), and vessel captains must release fish after the retention limit is reached. NMFS outreach efforts are designed to inform vessel captains of this requirement and the importance of releasing fish carefully.
BFT	1026	Redundant	
BFT	1027	BCD Annual Report	12/09/2019
BFT	1028	Validation seals and signatures for BCDs	Yes; details are available on the ICCAT website (http://www.iccat.int/en/BCD.asp).
BFT	1029	BCD Contact points	Yes; updates provided to ICCAT on 21/11/2012. eBCD POCs provided on 28/04/2016.
BFT	1030	BCD legislation	Yes; information provided on 12/10/2012 (as part of the 2012 U.S. Annual Report). Relevant citation for the U.S. Code of Federal Regulations is 50 CFR Part 300 and 635.
BFT	1031	BCD tagging summary, sample tag	Submitted 12/10/2012 (as part of 2012 U.S. Annual Report). The United States requires that bluefin tuna be fitted with a tail tag upon sale to a domestic dealer. The tag (or tag number in the case of a cut carcass) must

Req	Nº	Information required	Response
			remain with the fish, thereby tracking bluefin tuna product from domestic harvest to international markets.
BFT	1032	Vessels not included as BFT fishing vessels but known or presumed to have fished E-BFT	No vessels with this description at this time.
BFT	1033	Data needed for registration in eBCD system	01/05/2016; all required data allowing U.S. use of the eBCD system was entered on or before the system implementation date of May 1, 2016.
BFT	1034	Report on intra farm transfers and random controls	N/A; the United States does not participate in the eastern Atlantic bluefin tuna fishery.
TRO	2001	List of BET/YFT/SKJ vessels and subsequent changes	The list of authorized tropical tuna vessels 20 meters LOA or greater has been submitted to ICCAT and kept up-to-date through monthly updates provided in accordance with the procedures of the Large-Scale Fishing Vessel List.
TRO	2002	List of authorized vessels which fished bigeye and/or yellowfin and/or skipjack tunas in previous year	List submitted on 1/07/2019; revisión submitted 31/07/2019
TRO	2003	Reports on investigation of IUU activity by BET/YFT/SKJ vessels	The United States has received no notifications concerning possible violations that would trigger the need for investigatione.
TRO	2004	Annual Report on implementation of the area/time closure for BET/YFT/SKJ	N/A; the United States does not participate in the tropical tunas fishery in the closure area.
TRO	2005	Redundant	
TRO	2006	Data from ICCAT statistical document programs	Reports submitted biennially as required: 01/04/2019 and 14/09/2019
TRO	2007	Validation seals and signatures for SDPs	Yes. Last updated on 21/11/2012.
TRO	2008	Redundant	
TRO	2009	Quarterly catches of bigeye	The report from Quarter 3 of calendar year 2018 was submitted on 18/12/2018 and Quarter 4 was submitted on 29/03/2019; Quarters 1 and 2 of calendar year 2019 submitted on 27/06/2019 and 25/09/2019.
TRO	2010	Steps taken to minimalise ecological impacts of FADs (include in FAD management plan - see also requirement S25)	N/A; the United States does not currently have purse seine or baitboat vessels fishing in association with FADs.
TRO	2011	Redundant	

SWO	3001	Data from ICCAT statistical document programs	Reports submitted biennially as required: 01/04/2019 and 14/09/2019
SWO	3002	Validation seals and signatures for SDPs	Yes. Last updated on 21/11/2012.
SWO	3003	List of vessels targetting MED-SWO	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3004	List of sport/recreational vessels authorized to catch Med-SWO	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3005	List of special fishing permits for harpoons or longline for highly-migratory pelagic stocks in the Mediterranean for the previous year	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3006	Report on implementation of Med-SWO closure	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3007	Development or fishing/management plan for North swordfish	15/09/2017
SWO	3008	Redundant	

Req	Nº	Information required	Response
SWO	3009	Redundant	
SWO	3010	List of authorised ports for MED-SWO	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3011	Quarterly reports of MED-SWO catches	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3012	Summary of implementation of tagging programme	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3013	List of inspection vessels	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3014	List of inspectors [and agencies]	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3015	Specific authorisation for vessels 20m+ for N. SWO	The list of authorized NSWO vessels 20 meters LOA or greater has been submitted to ICCAT through monthly updates provided in accordance with the procedures of the Large-Scale Fishing Vessel List.
SWO	3016	Specific authorisation for vessels 20m+ for S. SWO	N/A; the United States does not currently authorize vessels to fish for South Atlantic swordfish
SWO	3017	Maximum onboard by-catch limit of N. SWO	N/A; the United States does not authorize vessels to fish for or retain NSWO without a permit
SWO	3018	Maximum onboard by-catch limit of S. SWO	N/A; the United States does not authorize vessels to fish for or retain SSWO without a permit
SWO	3019	Copies of inspection reports from JIS	N/A; the United States does not participate in the Mediterranean swordfish fishery.
SWO	3020	Fishing plan for Mediterranean swordfish	N/A; the United States does not participate in the Mediterranean swordfish fishery.
ALB	4001	Redundant	
ALB	4002	Redundant	
ALB	4003	List of Vessels authorised to fish for Mediterranean albacore	N/A; the United States does not participate in the Mediterranean albacore fishery.
ALB	4004	Specific authorisation for vessels 20m+ for North Atlantic albacore	The list of authorized North Atlantic albacore vessels 20 meters LOA or greater has been submitted to ICCAT through monthly updates provided in accordance with the procedures of the Large Scale Fishing Vessel List.
ALB	4005	Specific authorisation for vessels 20m+ for South Atlantic albacore	N/A; the United States does not currently authorize vessels to fish for South Atlantic albacore
ALB	4006	Maximum onboard by-catch limit of N. ALB	N/A; the United States does not authorize vessels to fish for or retain NALB without a permit
ALB	4007	Maximum onboard by-catch limit of S. ALB	N/A; the United States does not authorize vessels to fish for or retain SALB without a permit
BIL	5001	Report on the implementation of Rec. 15-05/18-04 and 16-11	Information contained in billfish checksheet submitted on 13/09/2019
BIL	5002	Redundant	
BIL	5003	Redundant	
SHK	7001	Redundant	
SHK	7002	Redundant	
SHK	7003	Redundant	
SHK	7004	Redundant	
SHK	7005	Details of implementation of and compliance with shark conservation and management measures	Information contained in shark checksheet; revised document submitted on 13/09/2019
SHK	7006	Redundant	
SHK	7007	Redundant	

Req	Nº	Information required	Response
BYC	8001	Report on implementation of Rec. 10-09, Paras 1, 2 and 7, and relevant actions taken to implement the FAO guidelines	14/09/2019 (Annual Report); U.S. regulations adopted in 2004 for all U.S. Atlantic pelagic longline vessels include: mandatory attendance at protected species safe handling release and identification workshops, mandatory bait specifications, use of circle hooks (size of hook depending on fishing locale), and the mandatory possession and use of sea turtle handling and release gear on board all vessels with pelagic longline gear. The United States continues to modify the suite of disentanglement and release gears required to be onboard longline vessels as new gears and information on best practices are developed. Sea turtle interactions in the U.S. pelagic longline fleet are reported annually to ICCAT.
BYC	8002	Report on implementation of seabird mitigation measures and NPOA for seabirds	N/A; The United States does not fish in the area south of 25 degrees South latitude or the Mediterranean where the requirements of Rec. 11-09 apply. Information on the U.S. NPOA for Seabirds was included in the 2009 U.S. Annual Report to ICCAT.
BYC	8003	Report on steps taken to mitigate by-catch & reduce discards and any relevant research in this field	Relevant rsearch activities are described in Part I, Section 1 of the U.S. Annual Report. Also see Appendix II for information on this topic.
SDP	9001	Description of pilot electronic statistical document systems	Executive Order in 2014--*Streamlining the Export/Import Process for America's Businesses*--mandated the use of a single electronic system, the International Trade Data System (ITDS), to streamline transactions for the import and export of products regulated by any U.S. Federal Agency. The United States published a final rule in 2016 establishing regulations to integrate the collection of trade documentation within ITDS and requiring electronic filing of information through a single automated portal. Given this need to collect information from the trade community (shippers, carriers, brokers, etc.) in an electronic format, the United States has integrated ICCAT's statistical and catch document programs into this internet-based electronic data collection system. A document imaging system allows brokers to attach electronic images of paper certificates to the entry and export filings. In addition, certain key information from paper documents (or electronic records in the case of the eBCD system) must be entered directly into ITDS. More information can be found at www.itds.gov.
MISC	9002	Information and clarification regarding objections to ICCAT Recs	N/A; the United States has not objected to any ICCAT recommendation.

Section 4

Recommendation to Establish Minimum Standards for Fishing Vessel Scientific Observer Programs (16-14)
The U.S. observer program has two main objectives: monitoring interactions between fishing gear and protected species (marine mammals, sea turtles, and seabirds) and monitoring fishing effort and catch (estimation of total landings of target species and/or bycatch of non-target or prohibited species). The U.S. observer coverage goal is

eight percent of all sets in each area/quarter stratum. The target coverage rate is 8% and the actual observer coverage of the U.S. pelagic longline fleet was 13.1 percent of the fishing sets in 2018. No purse seine vessels fished during 2018. Additional information is available in CP-11 (National Observer Program Info) and online at: https://www.fisheries.noaa.gov/topic/fishery-observers.

Minimum Standards for the Establishment of a Vessel Monitoring System (14-09)
The United States implemented a fleet-wide VMS requirement in the Atlantic pelagic longline fishery in 2003. All vessels away from port with pelagic longline gear onboard are required to operate their VMS units with hourly position reporting. The United States also requires VMS operation for vessels with bottom longline gear onboard between 33°00' N. latitude and 36°30' N. latitude or near the mid-Atlantic shark closed area and for shark gillnet vessels operating during the right whale calving season. Vessel operators provide position reports 24 hours a day, 7 days a week. Catch reports of BFT are required via VMS for both purse seine and pelagic longline. More information is available online at: https://www.fisheries.noaa.gov/national/enforcement/regional-vessel-monitoring-information#atlantic-highly-migratory-species.

Measures to Ensure Effectiveness of ICCAT Conservation and Management Measures and to Prohibit Illegal, Unreported and Unregulated Fishing (Recs. 03-12 and 18-08; Res. 01-18)
The United States is implementing these measures through various means (e.g., licensing requirements, monitoring control, and surveillance measures, maintaining up-to-date records of U.S. vessels authorized to fish species managed by ICCAT in the Convention area, etc.). U.S. laws and regulations prohibit the import of tuna and tuna-like species from vessels included in the IUU vessel list (as established pursuant to Rec. 11-18, revised by Rec. 18-08) or which are not on ICCAT's authorized vessel list as established pursuant to Rec. 11-12 (*50 CFR Part 635.41*), which was revised by Rec. 13-13. The United States has regulations in place to clarify domestic implementation of other aspects of Rec. 11-18, now Rec. 18-08, including restriction of entry into port and access to port services for vessels on the ICCAT IUU vessel list. Such vessels may also be prohibited from engaging in commercial transactions, if allowed entry into port. Any actions taken against listed IUU vessels would be in accordance with the relevant conservation and management measure(s) and based on consultations among relevant U.S. agencies.

The United States established a Seafood Import Monitoring Program through a final rule published in 2016. This is a risk-based traceability program requiring the importer of record to provide data from the point of harvest to point of entry into U.S. commerce. More information is available online at: http://www.iuufishing.noaa.gov/.

Recommendation by ICCAT to Promote Compliance By Nationals of Contracting Parties, Cooperating Non-Contacting Parties, Entities, or Fishing Entities with ICCAT Conservation and Management Measures (06-14)
U.S. fisheries enforcement is undertaken by the NOAA Office of Law Enforcement (OLE), the U.S. Coast Guard, and, pursuant to cooperative enforcement agreements, by U.S. States and territories with maritime boundaries in the Atlantic Ocean, Gulf of Mexico, and/or Caribbean Sea. Enforcement activities include monitoring and inspecting offloads at landing facilities and marinas in conjunction with dealer record checks and at-sea boarding and inspection. The U.S. Coast Guard is the primary Federal agency responsible for monitoring compliance with U.S. regulations on the fishing grounds. For a summary of recent enforcement actions to ICCAT species, including those actions concerning U.S. domestic regulations that exceed the requirements of ICCAT, see Appendix I.

Recommendation by ICCAT on Port State Measures to Prevent, Deter and Eliminate IUU Fishing (18-09)
The United States generally prohibits foreign fishing vessels from landing or transshipping in U.S. ports those fish or fish products that were harvested or taken onboard on the high seas, with the exception of activities in certain U.S. territories or pursuant to a treaty. Under U.S. domestic law, all fishing vessels, including those carrying fish species subject to regulations pursuant to a recommendation of ICCAT, as well as their catch, gear, fishing logbooks and manifests are subject to inspection.

NOAA Fisheries published a final rule in 2014 to revise its regulations for U.S.-permitted vessels landing tuna, tuna-like species or other HMS in foreign ports or making port calls in foreign ports. The rule describes additional information about notification requirements prior to arrival in a foreign port, items that may be inspected by an authorized official of a Port State, and procedures for reporting the results of any port inspection conducted by an authorized official of a Port State when landing HMS in a foreign port. These regulations ensure that U.S.-permitted vessels have the most current information when landing HMS in foreign ports.

In addition to ICCAT's requirements, the United States supported the development of the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate IUU Fishing, and, upon its adoption in November 2009, was one of the first to sign it. The United States ratified the Port State Measures Agreement in February 2016. This will complement existing regulations that restrict port entry and access to port services to vessels included on the IUU lists of ICCAT and other RFMOs of which the United States is a party.

Steps Taken to Mitigate Bycatch and Reduce Discards, and Relevant Research (Rec. 11-10)
See Appendix II.

Recommendation by ICCAT Concerning the Establishment of an ICCAT Record of Vessels 20 Meters in Length Overall or Greater Authorized to Operate in the ICCAT Convention Area (Rec. 13-13*)*
NOAA Fisheries published a final rule in 2014 to address the requirement for vessels 20 meters or greater to obtain an International Maritime Organization (IMO)/Lloyd's Registry (LR) number. All eligible U.S. vessels on the ICCAT record now have IMO/LR numbers.

Additional information

Recent U.S. management actions for Atlantic highly migratory species can be found online at:https://www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species.

Federal Register notices containing the full text of proposed and final regulations can be found at: https://www.federalregister.gov/.

Section 5

Difficulties encountered in implementation of and compliance with ICCAT conservation and management measures

None to report.

APPENDIX I
NOAA ENFORCEMENT ACTIONS TAKEN ON ICCAT SPECIES
October 1, 2018-September 10, 2019

During this reporting period, enforcement efforts consisted of dockside monitoring of offloads at major landing facilities in conjunction with dealer record checks, as well as at-sea boardings and visits to recreational marinas. Enforcement officials detected the following violations:

ENFORCEMENT ACTIONS	#
CASES OPENED THIS REPORTING PERIOD	208
COMPLIANCE ASSISTANCE GIVEN	52
WRITTEN WARNINGS ISSUED	6
SUMMARY SETTLEMENTS ISSUED	15
REFERRED TO OFFICE OF GENERAL COUNSEL	2
REFERRED TO ANOTHER AGENCY	2
FIX IT ASSISTANCE	3
ONGOING	52
CLOSED – No violation, lack of evidence, etc.	76

VIOLATION CITE	NUMBER OF VIOLATON TYPE
General Prohibitions under ATCA:	
Fish for, catch, possess, retain or land Atlantic HMS without a valid vessel permit	37
Fail to make available or have in possession a HMS permit	1
Purchase Atlantic HMS landed by non-permitted vessel	1
Commercial sale of Atlantic HMS to a non-permitted dealer	2
Falsify, fail to record or maintain a required record	3
Fail to use or activate VMS when required	1
Fish for HMS with longline gear and no sea turtle bycatch mitigation gear	1
Fail to maintain Atlantic HMS in proper form	6
Catch or retain undersized Atlantic HMS	8

Over the limit of HMS	4
Fail to make HMS available for inspection	3
Violate terms of a permit	3
Safe handling and release of HMS	13
Failure to take an observer as required	1
Failure to submit an electronic dealer report	2
Failure to register an HMS tournament	1

Specific Prohibitions for Atlantic Tunas:

Fail to report a bluefin Tuna	19
Exceed a bluefin catch limit	4
Fish for, retain, land or possess a bluefin during a closure	3
Possession of undersized bluefin tuna	4
Possession of bluefin tuna with improper gear on board	1

Specific Prohibitions for Billfish:

Fail to report a billfish while permitted in the charter / headboat fishery	1

Specific Prohibitions for Sharks:

Possession of shark-fins at sea	3
Retain prohibited sharks	4
Use of prohibited gear for sharks	3

Specific Prohibitions for Swordfish:

Failure to mark or properly mark buoy gear	1
Undersized Swordfish	1
Failure to maintain swordfish in proper form	2

This completes the NOAA Fisheries, Office of Law Enforcement Report of ICCAT-Related Actions.

Appendix II: Steps Taken to Mitigate Bycatch and Reduce Discards, and Relevant Research (Rec. 11-10)

The reduction of bycatch mortality is an important component of Federal fisheries management in the United States. In 1998, the United States developed a national bycatch reduction plan, *Managing the Nation's Bycatch*. The overarching goal is to implement conservation and management measures for living marine resources that will minimize, to the extent practicable, bycatch and the mortality of bycatch that cannot be avoided. The plan also established a definition of bycatch as fishery discards, retained incidental catch, and unobserved mortalities resulting from a direct encounter with fishing gear. In 2004, the United States published a report entitled "*Evaluating Bycatch: A National Approach to Standardized Bycatch Monitoring Programs*" that established goals for developing bycatch estimates. In 2016, the United States published its *National Bycatch Reduction Strategy* to guide and coordinate efforts to reduce bycatch and bycatch mortality in support of sustainably managing fisheries and recovering and conserving protected species. This national strategy highlights the U.S. commitment to continuing to reduce and minimize bycatch now and into the future. For the purposes of this Strategy, reducing bycatch includes efforts to minimize the amount of bycatch, as well as minimize the mortality, serious injury, and adverse impacts of bycatch that does occur. In addition, reducing bycatch can also include actions that increase utilization of fish that would otherwise be economic discards, taking into account conservation and management requirements. In keeping with national goals regarding bycatch, U.S. legislation requires that fishery conservation and management measures shall, to the extent practicable, minimize bycatch and, for those species that cannot be avoided, minimize bycatch mortality.

Bycatch Reduction Methods in the Atlantic HMS Fisheries

Commercial Fisheries	Recreational Fisheries
Gear Modifications (including hook/bait types)	Circle Hooks (mortality reduction only)
Circle Hooks	Formal Voluntary or Mandatory Catch-and-Release Program for all Fish or Certain Species
Weak Hooks	Prohibiting retention of fish
Time/Area Closures	Education/Outreach
Performance Standards	De-hooking Devices (mortality reduction only)
Education/Outreach	
Effort Reductions (i.e., Limited Access)	
De-hooking Devices (mortality reduction only)	
Prohibiting retention of fish	

Fishery closures designed to minimize bycatch

The U.S. Atlantic pelagic longline fishery, which typically targets ICCAT-managed species, is subject to several discrete time/area closures. These closures are designed to reduce bycatch (*e.g.*, undersized swordfish, billfish, *etc.*) by prohibiting pelagic longline fishing for ICCAT-managed species in those areas during specified times. The closures affect offshore fishing areas up to 200 nm from shore (see Figure 1). These closures are as follows: (1) Florida East Coast: 50,720 nm^2 year-round; (2) Charleston Bump: 49,090 nm^2 from February through April each year; (3) DeSoto Canyon: 32,860 nm^2 year-round; and (4) the Northeastern United States: 21,600 nm^2 during the month of June each year. The Northeast Distant Statistical Sampling Area (NED) (2,631,000 nm^2), which had been closed year-round (per regulations at 50 CFR part 223 and 635) from 2001 through mid-2004, has been reclassified as a gear restricted area.

To reduce sea turtle mortality, pelagic longline vessels may only fish for HMS in the NED if they observe strict circle hook and bait restrictions and use approved sea turtle release gear in accordance with release and handling protocols. Outside of the NED, in order to reduce sea turtle mortality, the U.S. HMS pelagic longline fishery is required to use circle hooks with certain bait combinations, depending on the region, as well as the required, approved sea turtle release gear and release and handling protocols. If selected, pelagic longline vessels must carry observers.

Effective June 2009, in order to conduct research to minimize marine mammal interactions, there is also a Cape Hatteras Special Research Area that is located in the mid-Atlantic Bight, which requires vessels fishing with pelagic longline gear to carry observers, when fishing in that area. Additionally, since June 2009, U.S. pelagic longline vessels must limit the length of the longline mainline to 20 nm in length to reduce serious injuries and mortalities of both pilot whales and Risso's dolphins in the Mid-Atlantic Bight. Observers may conduct additional scientific investigations while on board pelagic longline vessels fishing in the area.

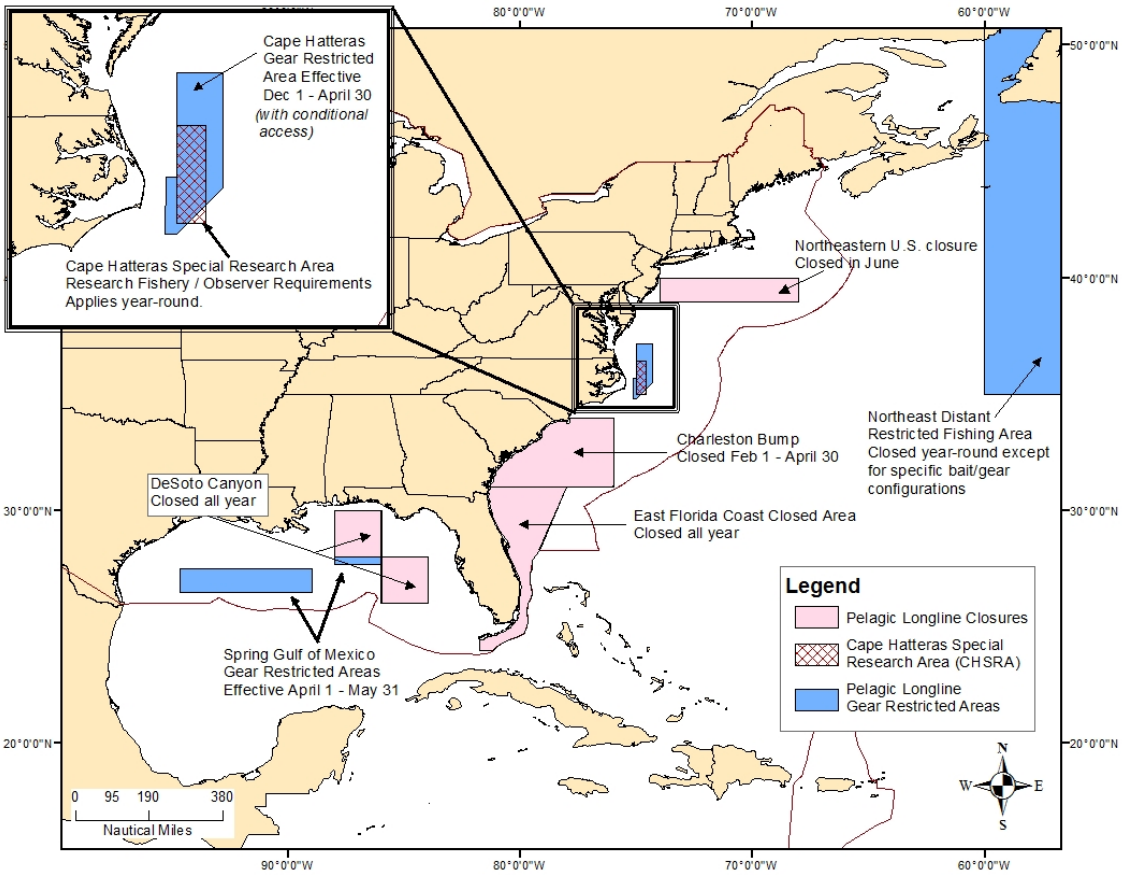


Figure 1. *Selected U.S. time/area closures in HMS fisheries (2015). Note: the Northeast Distant (NED) was a closed area to all vessels as of 2001. It became the NED Restricted Fishing Area on 30 June 2004, when it was opened to those participating in the NED experiment. The Cape Hatteras Special Research Area requires vessels fishing with pelagic longline gear to carry observers, when needed, and limit longline mainline to 20 nm in length.*

Regulatory efforts to minimize dead discards

As directed fishing for bluefin tuna is prohibited in the Gulf of Mexico, the United States has taken steps to minimize dead discards. Effective May 2011, pelagic longline vessels fishing in the Gulf of Mexico must use "weak hooks" to reduce bycatch of spawning bluefin tuna. A weak hook is a circle hook that meets current U.S. hook size and offset restrictions for the Gulf of Mexico pelagic longline fishery but is constructed of round wire stock that is

thinner-gauge than what is more commonly used in constructing circle hooks and is no larger than 3.65 mm in diameter. Weak hooks can allow incidentally hooked bluefin tuna to escape capture because the hooks are more likely to straighten when a large fish is hooked. The purpose of the requirement is to reduce pelagic longline catch of bluefin tuna in the Gulf of Mexico, consistent with SCRS advice that ICCAT may wish to protect the strong 2003 year class until it reaches maturity and can contribute to spawning.

NOAA Fisheries published a final rule in 2014 to implement Amendment 7 to the 2006 Consolidated HMS FMP, which focused primarily on the Atlantic bluefin tuna fishery. Amendment 7 contained provisions to reduce and account for bluefin tuna dead discards through gear restricted areas and individual transferable quotas, optimize fishing opportunities in all categories within the U.S. quota, and enhance monitoring and reporting, among other things. It also included measures to: (a) reallocate quota among fishing categories; (b) implement gear restricted areas and access based on performance criteria; (c) implement individual bluefin quotas in the pelagic longline fishery; (d) close the pelagic longline fishery when the bluefin tuna quota is attained; (e) require daily catch reporting of bluefin via vessel monitoring systems for purse seine and pelagic longline vessels; (f) require electronic monitoring for pelagic longline vessels; and (g) implement other regulatory changes in the bluefin tuna fisheries.

NOAA Fisheries published a rule to change the minimum size regulations to address retention, possession, and landing of bigeye and yellowfin tuna damaged through predation by sharks and other marine species. Bigeye or yellowfin tuna that is damaged through predation by sharks and other marine species may be retained, possessed, or landed only if the length of the remainder of the fish is equal to or greater than 27 inches (69 cm). These regulatory changes allow retention, possession, and landing of yellowfin and bigeye tuna for which a measurement to the fork of the tail may not be possible, provided that the remainder of the fish meets the current minimum size (*e.g.*, 27 inches for yellowfin and bigeye tuna), thus minimizing discards.

Species identification guides can be found online at:
https://www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-fishery-compliance-guides.