ANNUAL REPORT OF THE UNITED STATES OF AMERICA

U.S. Department of Commerce, NOAA Fisheries

Part I

Section 1: Annual Fisheries Information

Total (preliminary) reported U.S. catch of tuna and tuna-like fishes (including swordfish, but excluding other billfishes) in 2005 was 19,295 MT, a decrease of about 24 % from 25,336 MT in 2004. Estimated swordfish catch (including estimated dead discards) decreased 171 MT to 2,423 MT, and provisional landings from the U.S. fishery for yellowfin in the Gulf of Mexico decreased in 2005 to 1,403 MT from 2,087 MT in 2004. The estimated 2005 Gulf of Mexico landings of yellowfin tuna accounted for about 24% of the estimated total U.S. yellowfin landings in 2005. U.S. vessels fishing in the northwest Atlantic landed in 2005 an estimated 848 MT of bluefin , a decrease of 123 MT compared to 2004. Provisional skipjack landings decreased by 74 MT to 28.8 MT from 2004 to 2005, estimated bigeye landings increased by 67 MT compared to 2004 to an estimated 483 MT in 2005, and estimated albacore landings decreased from 2004 to 2005 by 159 MT to 487 MT.

Section 2: Research and Statistics

2.1 Fisheries Statistics

2.1.1 Tropical Tuna Fishery Statistics

Yellowfin Tuna. Yellowfin is the principal species of tropical tuna landed by U.S. fisheries in the western North Atlantic. Total estimated landings decreased 949 MT in 2005, from the 2004 landings estimate of 6,515 MT (Appendix Table 2.1-YFT). The 2005 estimate is considered provisional and may change due to additional commercial catch reports that become available later. In addition, a high proportion of the estimated landings were due to rod & reel catches of recreational anglers in the NW Atlantic (3,504 MT). Estimates of U.S. recreational harvests for tuna and tuna-like species continue to be reviewed and this may result in the need to revise the available estimates in the future. Nominal catch rate information from logbook reports (longline catch per 1,000 hooks) for yellowfin by general fishing areas is shown in Appendix Figure 2.1-YFT.

Skipjack Tuna. Skipjack tuna also are caught by U.S. vessels in the western North Atlantic. Total reported skipjack landings (preliminary) decreased from 102.6 MT in 2004 to 28.8 MT in 2005 (Appendix Table 2.1-SKJ). Estimates of recreational harvests of skipjack continue to be reviewed and could be revised again in the future. Appendix Figure 2.1-SKJ presents nominal catch rate information (longline catch per 1,000 hooks) based on fishing logbook reports.

Bigeye Tuna. The other large tropical tuna reported in catches by U.S. vessels in the western North Atlantic is bigeye tuna. Total reported catches and landings (preliminary) for 2005 increased by 67 MT from 416 MT in 2004 to 483 MT (Appendix Table 2.1-BET). Estimates of rod & reel catch are considered provisional and may be revised based on results of a future review of recreational harvest estimates. Appendix Figure 2.1-BET presents nominal catch rate information (longline catch per 1,000 hooks) based on fishing logbook reports.

2.1.2 Temperate Tuna Fishery Statistics

Bluefin Tuna. The U.S. bluefin fishery continues to be regulated by quotas, seasons, gear restrictions, limits on catches per trip, and size limits. Such provision regulate total U.S. landings and effect other conservation and management measures consistent with ICCAT recommendations and domestic management. U.S. 2005 provisional estimated landings and discards from the northwest Atlantic (including the Gulf of Mexico) were 717 MT and 131 MT, respectively. Those estimated landings and discards represent a decrease of 123 MT from the 2004 estimates. The 2005 landings by gear were: 178 MT by purse seine, 32 MT by harpoon, 2 MT by handline, 211MT by longline (including discards) of which 118 MT were from the Gulf of Mexico.

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 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 2005 rod and reel fishery off the northeastern U.S. (including the North Carolina winter fishery) for landings in several size categories were 347 fish < 66 cm, 7664 fish 66-114 cm, 1675 fish 115-144 cm and 476 fish 145-177 cm (an estimated 1.2, 107, 63, and 36 MT, respectively). Note that additional rod and reel landings of bluefin >177 cm SFL, monitored through a sales reporting system, are included in Table 2.2-BFT.

Albacore. Albacore are landed by U.S. vessels; however, historically, albacore has not been a main focus 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 substantially and have remained at higher levels throughout the 1990s, 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 rate information from U.S. longline logbook reports are shown in Appendix Figure 2.1-ALB. Estimated total catches of albacore were 487 MT in 2005, a decrease of 159 MT from 2004 (Appendix Table 2.2-ALB).

2.1.3 Swordfish Fishery Statistics

For 2005, the provisional estimate of U.S. vessel landings and dead discards of swordfish was 2,424 MT (Appendix Table 2.3-SWO). This estimate is lower than the estimate of 2,595 MT for 2004. The provisional landings, excluding discard estimates, by ICCAT area for 2005 (compared to 2004) were: 414MT (457 MT) from the Gulf of Mexico (Area 91); 1,061 MT (1,050MT, from the northwest Atlantic (Area 92); 137 MT from the Caribbean Sea (Area 93); and 550 MT (593 MT,from the North Central Atlantic (Area 94A).

U.S. swordfish landings are monitored in-season from reports submitted by dealers, vessel owners and captains, NMFS port agents, and mandatory daily logbook reports submitted by U.S. vessels permitted to fish for swordfish. This fishery is also being monitored via a scientific observer sampling program, instituted in 1992. Approximately 8% of the longline fleet-wide fishing effort is randomly selected for observation during the fishing year. The observer sampling data, in combination with logbook reported effort levels, support estimates of approximately 19,543 fish discarded dead in 2005. For the North Atlantic, the estimated tonnage discarded dead in 2005 is 262 MT, of which 252 is estimated due to longline gear. Overall, the estimates of dead discarded catch slightly decreased by 14 MT compared to the 2004 level, but remained about 11% of the landed catch.

Total weight of swordfish sampled for sizing U.S. landings by longline, otter trawl, and handline was 2,042 MT, 3 MT, and 31.3 MT in 2005. The weight of sampled swordfish landings in 2005 were 99%, 36%, and 94% of the U.S. total reported annual landings of swordfish for longline, trawl, and handline, respectively. Again, incorporation of late reports into the estimated 2005 landings figure will likely result in changes in the sampled fraction of the catch. Recent estimates of rod and reel landings of swordfish based on surveys of recreational anglers, range from about 5-48 MT per year within the period 1996-2005.

2.1.4 Marlins and Sailfish Fishery Statistics

Blue marlin, white marlin, and sailfish are landed by U.S recreational rod and reel fishermen and are a discarded by-catch 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 can be estimated using: (a) the SEFSC Recreational Billfish Survey (RBS) which provides the number of billfish caught during tournaments held along the southeastern U.S. coast (south of 35^0 N latitude), in the Gulf of Mexico, and U.S. Caribbean Sea regions (i.e., U.S. Virgin Islands and Puerto Rico); (b) the Large Pelagics Recreational Survey (LPS) conducted by the National Marine Fisheries Service which provides estimates of recreational billfish harvest from waters along the northeastern U.S. (north of 35^o N latitude); (c) Marine Recreational Fishery Statistics Survey (MRFSS); (d) a Headboat survey (large multi-party charter boats); and/or (e) a coastal sportfishing survey of the Texas recreational fishery (TPW). Studies conducted indicate that use of a time-series running average from the MRFSS in combination with data from the RBS or other surveys may provide the most reliable estimates of overall recreational catch and landings for marlins. These methods have been applied for white marlin and sailfish.

Due to concerns over estimates of rod and reel catches landings of marlins, estimates for 2003 and 2004 were reviewed by a scientific committee convened to advise on the appropriateness of the methods and data used and to recommend future improvements needed to reduce uncertainty in the estimates. The preliminary estimates of 2005 U.S. rod and reel landings for these billfish species, combining the geographical areas of the Gulf of Mexico (Area 91), the northwestern Atlantic Ocean west of the 60^{o} W longitude (Area 92), and the Caribbean Sea (Area 93) are: 15 MT for blue marlin, 0.8 MT for white marlin, and 0.08 MT for sailfish. The estimates for 2004 were 26 MT, 0.7 MT, and 0.2 MT, respectively, for the three species.

In addition to restrictions on U.S. recreational harvest, the Management Plan also imposed regulations on commercial fisheries by prohibiting retention and sale of the three species at U.S. ports. For this reason, no U.S. commercial landings were reported for any of the three Atlantic species. However, estimates of by-catch mortality in the U.S. longline fleet are made using the data from mandatory pelagic logbooks and scientific observer data collected on this fleet. The procedure for estimating the historical by-catch of blue marlin, white marlin, and sailfish was detailed in SCRS/96/97-Revised. This procedure was implemented for estimating by-catch mortalities from the U.S. longline fleet. 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 (USA). Estimates of the billfish by-catch discarded dead in the U.S. commercial longline and other commercial fisheries for 2005 were 34 MT for blue marlin, 22 MT for white marlin, and 11 MT for sailfish. The estimated 2004 U.S. discarded dead bycatch was 35 MT, 27 MT, and 5 MT, respectively for the three species.

2.1.5 Shark Fishery Statistics

The U.S. Federal Fisheries Management Plan (FMP) implemented in 1993 (NMFS 1993) identified three management groups: large coastal sharks, small coastal sharks, and pelagic sharks. The pelagic complex included ten species: shortfin mako (*Isurus oxyrinchus*), longfin mako (*Isurus paucus*), porbeagle (*Lamna nasus*), thresher (*Alopias vulpinus*), bigeye thresher (*Alopias superciliosus*), blue (*Prionace glauca*), oceanic whitetip (*Carcharhinus longimanus*), sevengill (*Heptranchias perlo*), sixgill (*Hexanchus griseus*), and bigeye sixgill (*Hexanchus vitulus*). The 1993 FMP classified the status of pelagic sharks as unknown because no stock assessment had been conducted for this complex. The Maximum Sustainable Yield (MSY) for pelagic sharks was set at 1,560 mt dressed weight (dw), which was the 1986-1991 commercial landings average for this group. In 1997, as a result of indications that the abundance of Atlantic sharks had declined, commercial quotas for large coastal, small coastal, and pelagic sharks were reduced. The quota for pelagic sharks was set at 580 mt. In 1999, the U.S. FMP for Atlantic Tunas, Swordfish, and Sharks (NMFS 1999) proposed the following measures affecting pelagic sharks: 1) a reduction in the recreational bag limit to 1 Atlantic shark per vessel per trip, with a minimum size of 137 cm fork length for all sharks, 2) an increase in the annual commercial quota for pelagic sharks to 853 mt dw, apportioned between porbeagle (92 mt), blue sharks (273 mt dw), and other pelagic sharks (488 mt dw), with the pelagic shark quota being reduced by any overharvest in the blue shark quota, and 3) making the bigeye sixgill, sixgill, sevengill, bigeye thresher, and longfin mako sharks prohibited species that cannot be retained. Regulations on prohibited species went into effect in 2000, whereas those on pelagic shark quotas were enacted in 2001. Presently, the commercial quotas for pelagic sharks (and other species groups) are split equally between three trimester seasons.

Landings of sharks by U.S. longline fishermen holding permits to land and sell swordfish caught in the Atlantic and dead discards of sharks in the US longline fleet targeting tunas and tuna-like species are monitored and reported to ICCAT. There are also additional catches and landings of Atlantic pelagic sharks across the range of US fleets that harvest them, including recreational fisheries, that are updated annually. These total catches are updated herein through 2005 (although recreational landings for 2005 were not yet available and some of the commercial catch data for 2005 are preliminary and subject to change). Commercial landings of pelagic sharks in weight steadily increased from the early 1980s, peaked in 1996, declined the next three years, and showed an increasing trend from 1999 to 2004. The magnitude of commercial landings was reduced again in 2005, although the data are preliminary (Appendix Table 2.6a-SHK). Recreational landings in numbers estimated from the MRFSS survey during 1981-2004 peaked to a maximum of 93,000 fish in 1985, and showed a declining trend since that year, fluctuating between about 42,600 fish in 1986 to about 3,800 fish in 2001 (Appendix Table 2.6a-SHK). Pelagic longline dead discards also fluctuated between 1987 and 2005, but generally declined from a maximum of 30,500 fish in 1993 to a minimum of about 2,600 fish in 2004. Total catches ranged from about 12,600 fish in 1981 (no commercial landings or discard estimates were available for that year) to about 95,000 fish in 1985, as a result of the peak in recreational landings that year.

Blue shark (*Prionace glauca*) commercial landings were generally very low (Appendix Table 2.6b-SHK). Recreational landings in numbers ranged from 0 fish in several years to over 20,000 fish in 1987. Pelagic longline discards reached 29,000 fish in 1993, but otherwise oscillated between a minimum of about 1,500 fish in 2005 to a maximum of about 19,000 fish in 1996. In general, there was a decreasing trend in dead discards of blue sharks (Appendix Table 2.6b-SHK). The trends in recreational landings and dead discards were very similar from 1992 to 1997. Total catches ranged from 0 fish in 1982 (a year in which no commercial or recreational landings were reported) to about 43,500 fish in 1993, the year in which dead discard estimates peaked (Appendix Table 2.6b-SHK).

Shortfin mako (*Isurus oxyrinchus*) commercial landings never exceeded 7,000 fish according to available estimates and assumptions about average weights (Appendix Table 2.6c-SHK). Most of the landings were attributable to the recreational fishery, whose landings in numbers peaked in 1985 to about 80,000 fish, and ranged from less than 1,400 fish to over 31,000 fish in the remaining years. Pelagic longline discards of shortfin makos were negligible since the meat of this species is highly valued. Total catches ranged from less than 4,000 fish in 1999 to almost 82,000 fish in 1985, when recreational catches peaked (Appendix Table 2.6c-SHK).

Catches of other pelagic species, such as longfin mako (*Isurus paucus*), oceanic whitetip shark (*Carcharhinus longimanus*), porbeagle (*Lamna nasus*), bigeye thresher (*Alopias superciliosus*), and thresher shark (*Alopias vulpinus*) were very small. Total catches of thresher sharks peaked at about 5,300 fish in 1984 and 1999. A maximum of about 1,800 fish was estimated to have been landed by the commercial fishery in 1997, whereas recreational landings peaked at about 5,250 fish in 1984. The maximum estimate of dead discards from the pelagic longline fishery was about 700 fish in 1989, and no dead discards were reported for 1998-2005. Total catches of longfin makos in any given year were under 450 fish. Very few longfin makos were landed by the commercial fishery, there were no reported landings from recreational fisheries, and only some fish were reported discarded dead from 1992 to 1995. Very few oceanic whitetip sharks were landed by the commercial fishery, except for a peak of about 1,250 fish in 1983, but otherwise total catches never exceeded 450 fish. Total reported catches of porbeagle, and especially bigeye thresher, were also very low.

2.2. Research Activities

2.2.1 Bluefin Tuna Research

As part of its commitment to the Bluefin Program, research supported by the United States has concentrated on ichthyoplankton sampling, reproductive biology, methods to evaluate hypotheses about movement patterns, spawning area fidelity, stock structure investigations and population modeling analyses.

Ichthyoplankton surveys in the Gulf of Mexico during the bluefin spawning season were continued in 2004 and 2005. Data resulting from these surveys, which began in 1977, are used to develop a fishery-independent abundance index of spawning West Atlantic bluefin tuna. This index has continued to provide one measure of bluefin abundance that is used in SCRS assessments of the status of the resource (SCRS/2006/082). During the 2004 U.S. ichthyoplankton survey, a plankton net of a type used in the Spanish surveys was fished in addition to the nets normally used to determine the impact of using a wider net mouth and larger mesh on the size and catch rates of bluefin in the Gulf of Mexico. The results of this work will be reported as they become available. US scientists also collaborated in development of the larval working group agenda for the CLIOTOP program.

Since 1998, researchers from Texas A & M University and the University of Maryland with assistance of researchers from Canada, Europe, and Japan have studied the feasibility of using otolith chemical composition (microconstituents and isotopes) to distinguish bluefin stocks. Recent research has investigated the value of using additional microconstituent elements (transitional metals) to enhance classification success. By themselves the transitional metals provided little discriminatory power, but when combined with the other trace elements (for 13 elements in all), the classification success for several year-classes has been moderate ranging from 60-90%, and classification functions show strong year-to-year variability. In SCRS/2005/083 the utility of an alternative chemical marker in otoliths, carbon and oxygen stable isotopes, to discriminate bluefin tuna from natal regions was reported upon. The discriminatory power of stable isotopes (δ13C, δ18O) in otoliths of yearlings (age-1) was high, with 91% of individuals classified correctly to eastern and western nurseries. These stable isotopes and in particular δ18O can be used to reliably predict nursery origin of Atlantic bluefin tuna. An initial application suggests that a large fraction (~43-64%) of the Atlantic bluefin tuna collected in the western Atlantic fishery (comprised primarily of large school and medium category fish) originated from nurseries in the east. Alternatively, medium and giant category bluefin tuna from the Mediterranean were largely (~82-86%) of eastern origin.

Scientists from the University of Maryland, Virginia Institute of Marine Science and Texas A&M University were able to collect collect otoliths and muscle samples from 55 fish for stock structure analyses in 2004 for fish in the 39-64 cm size class (yearlings) from the western Altantic (NJ and MA) Sampling was not conducted in 2005, but is to be conducted in 2006. In addition limited sampling of ages 1 and older continues.

Several projects were initiated in response to the ICCAT Commission's request for options for alternative approaches for managing mixed populations of Atlantic bluefin tuna (3rd Meeting of Working Group to Develop Coordinated and Integrated Bluefin Tuna Management Strategies). Document SCRS/2005/108 further examined some implications of incorporating electronic tagging information on transfer rates into virtual population analyses, SCRS/2005/084 examined yield and spawner per recruit consequences of different assumed levels of mixing between eastern and western bluefin stocks, SCRS/2006/091 examined the effect of various minimum size limits, and SCRS/2006/92 analyzed three new potential time/area closures in the Gulf of Mexico to reduce discards and bycatch of bluefin tuna.

Researchers at the Imperial College, London, continue work with the University of Miami, the University of New Hampshire and the National Marine Fisheries Service to develop methods to estimate bluefin movement and fishing mortality rate patterns (SCRS/2005/048). Researchers at the University of New Hampshire's Large pelagic research are collaborating with ICCAT scientist from several nations to develop operating models (which will use conventional and electronic tagging data and fishing effort by management area) to evaluate possible harvest control rules management procedures. Documents SCRS/2006/85 and SCRS/2006/086 sumarize the progress made in this area, denoting some initial specifications for the modeling process including spatial boundaries, size groupings, potential control rules, performance criteria and estimation models.

The TAG A Giant research program from Stanford University and the Monterey Bay Aquarium continued the tagging of Atlantic bluefin tuna off the coast of North Carolina in the winter of 2006. This effort brought the total number of electronic tags deployed on Atlantic bluefin by the TAG team to 925. In addition, to tagging in North Carolina, the TAG program has continued or initiated collaborative bluefin tagging efforts with the Irish Sea Fisheries Board to tag in the waters offshore of Galway, the recreational fishers in Spain and France (Big Game Fishing Club of France), and Canadian fishers in an effort to expand the techniques being used for tag implantation. The recovery of implanted archival tags has continued as well, with the total number of recoveries reaching 110 tags. The tags deployed in 2006 showed movement patterns similar to those deployed in prior years (Block et al. 2001, 2005, Boustany et al. In press). The movement patterns, diving behavior, and thermal biology of Atlantic bluefin tuna on the Gulf of Mexico spawning ground was examined with electronic tags (Teo et al., 2006). The results indicate that electronic tags can be used to predict the breeding areas of bluefin and improve the capacity for managers and fishers to discern how best to lower interaction probability, which would increase the capacity to ensure a recovery of the species.

U.S. scientists from Stanford University, in collaboration with and Italian scientist from the University of Bari, have examined population structuring through sequencing of 860 base pairs of the control region of the mitochondrial genome (SCRS/2006/089). Bluefin tuna populations from the Gulf of Mexico and the Mediterranean Sea were found to be genetically distinct based on Φ_{st}, sequence nearest neighbor and AMOVA analyses, supporting the hypothesis that these two major spawning areas are independent stocks. Another study by scientists from the Virginia Institute of Marine Science also found significant genetic differentiation at nuclear microsatellite loci and at the mitochondrial control region among young of the year Atlantic bluefin tuna captured on spawning grounds in the Gulf of Mexico, and in the western and eastern basins of the Mediterranean Sea. The existence of genetic diversity among Atlantic bluefin tuna from different spawning grounds, combined with the high fidelity of tagged adults to the same spawning areas for multiple years, supports the hypothesis that Atlantic bluefin tuna are exhibiting spawning ground fidelity.

US scientist from the University of New Hampshire's Large Pelagics Research Lab (LPRC) have placed over 200 pop-up satellite archival tags have on New England bluefin tuna. Ongoing efforts include examining short and long-term dispersals of bluefin in the Gulf of Maine, the identification of spawning grounds, the spatial correlation between bluefin locations and oceanographic features and determination of migratory paths. Results from much of this tagging effort were recently published in the journal Marine Biology (Wilson, *et.al.* 2005. Movements of bluefin tuna (*Thunnus thynnus*) in the northwestern Atlantic Ocean recorded by pop-up satellite archival tags. Marine Biology 146: 409- 423.) Thirteen PSAT tags were deployed on giant bluefin tuna off the coast of SW Nova Scotia, Canada, in Oct, 2005, in collaboration with DFO scientists. In April, 2005, the LPRC hosted a workshop which examined possible approaches for developing new indices of abundance for juvenile bluefin. Also in 2005, 98 juvenile bluefin tuna were released with implanted archival tags in collaboration with scientists from the Virginia Institute of Marine Science, and Mass. Div. of Marine Fisheries. Fish were tagged off the US coasts of Virginia and Massachusetts. As results become available they will be reported upon. The UNH LPRC also completed a study of the reproductive status of New England bluefin during 2000-2003, and continued long-term studies of somatic condition, stable isotopes, fatty acids, stomach contents, and age and growth.

U.S. scientists also examined the size distribution of bluefin tuna caught by U.S. and Japanese longliners in the Gulf of Mexico (SCRS/2006/90). Results indicated that approximately 98% of all fish present in the Gulf of Mexico were 9 year old or older and that the age of 50% maturity was about 12 years. A study from the University of Maryland cited tagging data that corroborated these findings (i.e., occurrence of large fish outside known spawning areas during the spawning season) and showed that egg per recruit calculations are sensitive to the assumed maturity schedule (SCRS/2006/88).

2.2.2 Swordfish Research

Data from observer samples were compared against self-reported information from the U.S. large pelagic mandatory logbook reporting system, and estimates of discard mortality of swordfish, billfish, sharks and other species from the U.S. fleet were developed from that analysis for the 2005 SCRS. Estimates of small swordfish bycatch for 2003-2005 were compared to the average levels estimated for the late 1990's and were found to be substantially lower (see Appendix, pg. 37-38).

Fisher reported and observed swordfish catch, size and catch rate patterns through 2004 were examined in support of monitoring the recovery of north Atlantic swordfish. Standardized indices of abundance were updated for the Western North Atlantic using data from the U.S. pelagic longline fleet (SCRS/2005/085).

Collaborative research with Venezuelan scientists continues on estimating the age-structure of the catch of swordfish. Results of this research will be available for the next assessment of north Atlantic swordfish.

US scientists collaborated with Brazilian scientists in conduct of catch rate standardization procedures by offering a course on the topic in Brazil in mid-2005. Central to this collaboration is development of fisheries research capacity in Brazil through graduate student training and of stronger scientific cooperation between Brazil and the US.

Research on measures to mitigate the interactions between pelagic longline and bycatch of marine turtles continued under a cooperative research program involving the US Atlantic pelagic longline fishery. The Northeast Distant Fishery Experiment was conducted from 2001 through 2003 on the high seas of the Western Atlantic Ocean, in an area off New Foundland known as the Grand Banks. Results of this research into reducing mortality of marine turtles interacting with pelagic longlines was recently published (Watson, *et.al.* 2005. Fishing methods to reduce sea turtle mortality associated with pelagic longlines. Can. J. Fish. Aquat. Sci.. 62(5): 965-981). Additional cooperative research in the Gulf of Mexico was carried out in 2004 and in additional regions in 2005. Results of these research projects will be reported to SCRS as they become available.

A simulation study (SCRS/2006/029) was conducted to evaluate the effects of stock mixing on management benchmarks as estimated by the current surplus production assessment model. Specifically, two distinct stocks were modeled under several hypothetical mixing scenarios, and simulated data sets were generated. Performing assessments using these datasets demonstrated that a stock could look more or less productive than it actually was.

2.2.3 Tropical Tunas Research

In addition to monitoring catch and effort statistics for tropical tunas, 4 US scientists participated in the 2005 ICCAT Workshop on Methods to Reduce Mortality of Juvenile Tropical Tunas, held in Madrid from 4-8 July 2005. Document SCRS/2005/063 used the ICCAT Task 2 catch and effort data to estimate expected changes in the catches of tropical tunas attributable to replacing the current moratorium with a time-area closure [Recommendation 04-01]. The results indicate that catches of tropical tunas are expected to increase substantially if the time-area closure replaces the current moratorium. Considering that the current ICCAT hypothesis is that purse-seine fleet efficiency gains 3% per year, the net change could in fact be a large overall increase to levels above the pre-moratoria fishing mortality rate levels. SCRS/2005/079 explored the expectations for catches of undersized bigeye tuna considering the agreement reached in [04-01]. In all cases examined, total catches can be expected to increase from 5.5 to 6.7% as a result of [04-01], and catches of BET can be expected to increase from 16-22.1%. In all cases, catch of juvenile bigeye tuna increases.

U.S. scientists also participated in the ICCAT SCRS Inter-Sessional Meeting of the Tropical Species Group, held in Sète, France, April 24-28, 2006. Participants continued the recent work of the Group in evaluating alternative measures to protect juvenile tropical tunas.

US scientists from the University of Miami's Rosenstiel School of Marine and Atmospheric Science continue to collaborate with EC scientists on the EU-funded FEMS project, on management strategy evaluations related to tropical tuna fisheries. U.S. scientists have continued to conduct cooperative research with scientists from Mexico using combined longline observer data from the Gulf of Mexico, pursuing the development of indices of abundance for species of concern to ICCAT as well as descriptive analyses of that fishery.

2.2.4 Albacore Research

US scientists prepared document SCRS/2005/081 which described population models for North Pacific albacore (*Thunnus alalunga*) that have been developed and reviewed within the North Pacific Albacore Workshop (NPALBW) forum since 2000. Currently, the NPALBW relies on a Virtual Population Analysis (VPA) model for purposes of formulating an international-based consensus regarding the 'status' of this fish stock. Recently, an equally important research directive from the Workshop has been to develop alternative, more detailed statistical-based models, in efforts to evaluate more fully the relationship between this species' population dynamics and associated fishery operations (i.e., areas of uncertainty in an overall stock assessment). We have developed one candidate model based on the Age-structured Assessment Program (ASAP), which generally represents a maximum likelihood-based numerical approach for conducting relatively straightforward, forward-simulation catch-at-age analyses. In addition the document presents a brief discussion concerning development of other alternative stock assessment models, particularly length-based/age-structured platforms (e.g., MULTIFAN-CL and Stock Synthesis 2).

2.2.5 Mackerels and Small Tunas Research

U.S. small tuna research is directed mainly on king and Spanish mackerel stocks, as the amount landed of other small tunas such as cero mackerels by U.S. fishermen is generally low. The focus of research is collection of primary fishery catch statistics, and biostatistical sample data, fishery age samples, and abundance indices. Critical research areas regarding mackerels relate to the adequacy of sampling of the age structure of the stocks, the amount of mixing between management units, and increasing the precision associated with the mackerel assessment abundance indices. Because assessment and management are by necessity by geographical units, continued research on migration of king mackerel in particular is important. An updated assessment of king and Spanish mackerel stock status was recently completed, including evaluations of stock status under various hypotheses about interchange rates between Gulf of Mexico and US Atlantic migratory groups. The results of the assessment were used to advise the Gulf and South Atlantic Fishery Management Councils on biologically appropriate harvest levels corresponding with the Councils' objectives for sustainable harvest.

In 2004 and 2005, US scientists collaborated with Caribbean nations under the banner of the Caribbean Regional Fisheries Mechanism in initiating stock assessment analyses for small tuna (and other) stocks of mutual concern.

2.2.6. *Shark Research*

The ICCAT Sub-Committee on Bycatches conducted an assessment of blue sharks and shortfin makos in Tokyo, Japan, in June 2004. US scientists contributed 8 working documents for this meeting on various aspects of shark biology and methods to assess stock status. In response to a Commission request, document SCRS/2005/086 provided an evaluation of the validity of the continued use of the 5% fin weight to carcass weight ratio using available data from various fishery-independent and fishery-dependent sources. The fin to carcass ratio is highly variable, depending on species, fin set, and finning procedure. If species-specific management is not feasible, the available data suggest that the aggregated 5% ratio is not inappropriate when using the primary fin set in the calculations. In all, the only guaranteed method to avoid shark finning is to land sharks with all fins attached. A cooperative shark research project between Brazil (Universidade Federal Rural de Pernambuco) and the U.S. (NOAA Fisheries and the University of Florida's Florida Museum of Natural History) has been developed and is scheduled to start in late 2006. Central to conducting the research is development of fisheries research capacity in Brazil through graduate student training and of stronger scientific cooperation between Brazil and the U.S.

2.2.7. Billfish Research

The NMFS SEFSC again played a substantial role in the ICCAT Enhanced Research Program for Billfish in 2005, with SEFSC scientists acting as general coordinator and coordinator for the western Atlantic Ocean. Major accomplishments in the western Atlantic in 2005 were documented in SCRS/05/082. Highlights include 13 at-sea sampling trips with observers on Venezuelan industrial longline vessels in September 2005. Of the trips accomplished to date, 5 observer trips were on Korean type vessels fishing under the Venezuelan flag. Most of these vessels are based out of Cumana targeting tuna, swordfish, or both at the same time. Biological sampling of swordfish, Istiophorids, and yellowfin tuna for reproductive and age determination studies, as well as genetics research were continued during the 2005 sampling season. Shore-based sampling of billfish landings for size frequency data, as well as tournament sampling was obtained from Venezuela, Grenada, U.S. Virgin Islands, Bermuda, Barbados, and Turks and Caicos Islands. Program participants in Venezuela, Grenada, and Barbados continued to assist in obtaining information on tag-recaptured billfish, as well as numerous sharks, in the western Atlantic Ocean during 2005; a total of 77 tag recovered billfish and sharks were submitted to the Program Coordinator in 2005. Age, growth, and reproductive samples (Bermuda) from several very large billfish were obtained during 2005.

A study conducted by the Virginia Institute of Marine Science (VIMS) to evaluate post release survival and habitat use from the recreational fishery for Atlantic white marlin using pop-up satellite archival tags (PSATs) was published in the Fishery Bulletin in 2005. Two separate studies were also conducted by VIMS on U.S. longline vessels to evaluate post release survival of white marlin (published in Fishery Bulletin in early 2006) and sailfish (SCRS/2006/149). The SEFSC has conducted several studies in the Northwest Atlantic and along the Pacific coast of Central America to evaluate habitat use and reproductive biology of billfish using PSAT technology. About 200 PSATs have been deployed in this effort over the last 5 years with deployments ranging from a month to 5.5 months. Several peer review papers summarizing these results are in press at this time, while other papers are currently in preparation. In addition, SEFSC is also currently conducting pelagic longline research to evaluate gear behavior, and the effects of gear modification on catch rate and survival of target and non-target species. Three cruises have been completed to date. This work in ongoing and should be finished sometime in 2006.

Cooperative billfish research between U.S. and Brazilian scientists was initiated in 2005 (SCRS/2006/159). Preliminary results of the billfish hook comparison research with the Brazilian pelagic longline fishery are presented in document SCRS/2006/150. Additional research in Brazil will also focus on PSAT tagging of billfish and the collection of biological materials for ageing and molecular genetic analyses. The Fishery Management Group of the University of Miami is carrying out research on Atlantic billfish in three areas, population parameter estimation, population modeling and development of socio-economic indicators. Others at the University of Miami's Rosenstiel School and elsewhere are conducting research on early life history, reproductive biology and ecology of billfishes, as well as age and growth estimation.

The fourth International Billfish Symposium was held in Catalina Island October 31-November 3, 2005. The SEFSC Migratory Fishery Biology Branch staff and associated collaborators presented 12 of the 70 papers (and 2 posters) during the meeting,. This effort represented about 17% of the papers presented during the entire program and reflects, in a positive way, progress of research on Atlantic billfish.

Document SCRS/2006/066 presented an update of standardized CPUE for blue and white marlin from the US LL fishery in the NW Atlantic and Gulf of Mexico. Regarding the treatment of Area in the model, the authors explained that all areas were treated equally independent of the size of the area.

Document SCRS/2006/067 presented an update of standardized CPUE for blue and white marlin from the US recreational tournament fishery in the NW Atlantic and Gulf of Mexico. There were questions about the merging of statistics from different sources (the Recreational Billfish Survey used in the analyses and other more general fishery surveys). It was noted that occasionally some tournaments catch billfish as a by catch, and a filtering procedure for deleting these tournaments from the CPUE computations was described and implemented for this update of the time series for both marlin.

Document SCRS/2006/064 used a Bayesian production model to assess the status of white marlin. The model used numerous assumptions relative to the intrinsic rates of increase and the biomass at the beginning of the fishery relative to un-fished biomass. The model was fitted to the most recent indices of abundance data (last decade or so), including GLM and habitat standardization of CPUE series. Several alternative methods were used to weight the indices and the indices were also fitted separately to assess whether results provided consistent information about trends in white marlin abundance.

Document SCRS/2006/068 provided an update on progress of an age and growth project on Atlantic white marlin. A total of 988 white marlin have been sampled for hard parts (i.e. annual spines) from commercial longline and artisanal gillnet fisheries in Venezuela. These samples are part of a larger ocean scale effort to obtain the necessary data to estimate age and growth of white marlin. Of the total marlin sampled, 575 spines have been sectioned and read for age and growth analysis. Relative marginal increment analysis is being used to validate age estimates. Preliminary results suggest that a single increment is formed once a year. However, sample sizes for the months of April, May, and June are still insufficient to reject the possibility that a second increment could be forming in these months. More samples need to be obtained in these months to resolve this question.

Document SCRS/2006/043 identifies a problem with using general linear models to standardize CPUE estimates of population abundance indices. Often there is a lack of balance in the number of observations by factor and year sometimes including instances where gear, area, or other factors or combinations are missing for a year or years. This imbalance diminishes the robustness of the GLM estimates of population trends. Software packages differ in the way they handle these missing strata in the calculation of marginal means. This can lead to “fitted” marginal means that may radically misrepresent the actual population abundance trend. Analysts must be vigilant of the conventions applied by different software packages when interpreting fitted results.

2.2.8 Tagging

Participants in the Southeast Fisheries Science Center’s Cooperative Tagging Center (CTC) and the Billfish Foundation Tagging Program (TBF) tagged and released 3,333 billfishes (including swordfish) and 329 tunas in 2005. This represents a decrease of 12.3% for billfish and a decrease of 81.5% for tunas from 2004 levels. There continues to be several electronic tagging studies involving bluefin tuna and billfish in the Atlantic Ocean and adjacent waters during 2005. These are discussed in the bluefin and billfish research sections above. There were 27 billfish recaptures from the CTC and TBF projects in 2005. This represents an increase of 28.6% from 2004. These recaptures were one blue marlin, 20 sailfish, one white marlin and five swordfish. A total of 11 tunas were recorded as recaptures in 2005. These were seven bluefin, two yellowfin, one bigeye tuna and one albacore tuna. This recapture level was equal to the year 2004 values. The ICCAT Enhanced Research Program for Billfish (IERPBF) in the western Atlantic Ocean has continued to assist in reporting tag recaptures to improve the quantity and quality of tag recapture reports, particularly from Venezuela, Barbados, and Grenada.

2.2.9 Fishery Observer Deployments

Domestic Longline Observer Coverage. In accordance with ICCAT recommendations, randomized observer sampling of the U.S. large pelagic longline fleet was continued into 2005 (see Appendix Figure 2.2-Observers). 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, 8% sampling of the number of sets reported by the longline fleet. A total of 8,479 sets (6,278,046 hooks) were recorded by observer personnel from the SEFSC and NEFSC programs from May of 1992 to December of 2005. Observers recorded over 309,600 fish (primarily swordfish, tunas, and sharks), in addition to marine mammals, turtles, and seabirds during this time period. The percent of fleet coverage through 2005 ranged from 2.5% in 1992 to 9.0% in 2002. Fleet effort for 2005 has not been finalized, but percent observer coverage is estimated near 8% for the year. Sampling fraction of the U.S. pelagic longline fleet was increased in 2002 to 8%. Document SCRS/04/168 provides a more detailed summary of the data resulting from observer sampling between 1992 and 2002. Data collected by the SEFSC, Miami Laboratory Pelagic Observer Program is available on the internet at http://www.sefsc.noaa.gov/observerdata.jsp for the years 1992 to 2005.

In 2005, an experimental gear design study was initiated in cooperation with six U.S. pelagic longline vessels that fished in the northwestern Atlantic and Gulf of Mexico to compare differences in catch rates of target species and bycatch using various hook/bait combinations. A total of 247 sets (157,138 hooks fished) were observed aboard these six vessels; results of this gear design experiment are not yet available, pending complete analyses.

Southeast U.S. Shark Gillnet Fishery Observer Coverage. The directed shark gillnet fishery operates year round in coastal waters off the US southeast coast. Sharks are the primary target species. On-board observers have conducted observations of this fishery from 1993-1995 and 1998-present and reports of the catch and bycatch from these observations are available. Starting in 2005, a pilot observer program was begun to include all vessels that have an active directed shark permit and fish with sink gillnet gear. These vessels were not previously subject to observer coverage because they either were targeting non-highly migratory species or were not fishing gillnets in a drift or strike fashion. In 2005, a total of 31 drift and 33 strike gillnet sets on 30 and 53 trips were observed from 4 and 7 vessels, respectively. For those vessels fishing sink gillnet gear, a total of 88 sets were observed on 30 trips from 8 vessels in 2005.

U.S. Shark Bottom Longline Observer Coverage. The shark bottom longline fishery is active in the Atlantic Ocean from about the Mid-Atlantic Bight to south Florida and throughout the Gulf of Mexico. The bottom longline gear targets large coastal sharks, but small coastal sharks, pelagic sharks, and dogfish species are also caught. Observations of the Atlantic shark directed bottom longline fishery have been conducted since 1994 by the Commercial Shark Fishery Observer Program, Florida Museum of Natural History, University of Florida, Gainesville, FL. Starting with the 2nd trimester season of 2005, responsibility for the fishery observer program was transferred to National Marine Fisheries Service, Southeast Fisheries Science Center, Panama City Laboratory. For the 2nd and 3rd trimester seasons 2005, shark bottom longline observers spent 117 days at sea on 35 trips. A total of 92 sets were observed.

Part II

Section 3: U.S. Implementation of ICCAT Conservation and Management Measures

3.1 Catch Limits and Minimum Sizes

Rebuilding Program for West Atlantic Bluefin Tuna (Rec 98-7; 02-07)
Recommendation 02-07 revised the annual WBFT quota for the United States to 1489.6 mt and allocated 25 mt of this total to account for incidental catch by pelagic longline vessels in the vicinity of the management area boundary. This quota and the 2004 underharvest were applied to the 2005 fishing year (1 June 2005 through 31 May 2006) resulting in an adjusted quota of 2055.0 mt. During the 2005, calendar year, the United States landed an estimated 848.3 mt of bluefin tuna, which includes an estimated 130.8 mt of dead discards.

Recommendation to Establish a Plan to Rebuild Blue Marlin and White Marlin Populations (Rec 00-13; 01-10; 02-13; 04-09)
Phase I of the ICCAT rebuilding plan requires countries to reduce commercial landings of Atlantic white marlin captured in pelagic longline and purse seine fisheries by 67 percent and reduce blue marlin landings by 50 percent from 1996 or 1999 landings (whichever is greater). The United States has prohibited all commercial retention of

billfish since 1988. For its part of the rebuilding program, the United States agreed to maintain regulations that prohibit all landings of marlins by U.S. pelagic longline fishermen, and to continue monitoring billfish tournaments through scientific observer coverage of at least 5 percent initially, with an objective of 10 percent coverage by 2002. The United States now exceeds these observer requirements. The United States also agreed to limit annual landings by U.S. recreational fishermen to 250 Atlantic blue and white marlins, combined, through 2006. Recommendation 04-09 extended Phase I of the blue and white marlin rebuilding plan through 2006, and also specified that stock assessments for these species would be conducted in that year. Recreational catch and release rates for marlin are estimated to be very high (90 – 99%) based on tournament data, and minimum sizes have been established at 168 cm (66 inches) for white marlin and 251 cm (99 inches) for blue marlin.

A final rule was published in October, 2006, that codified the ICCAT 250 fish limit and established procedures to remain within the limit. In addition, this final rule contained measures that require all permitted anglers to use only non-offset circle hooks when using natural baits or natural bait/artificial lure combinations when participating in billfish tournaments; prohibited the retention of billfish on most commercial vessels; and established a permit condition requiring that recreational vessels possessing an HMS permit abide by Federal regulations regardless of where fishing, unless a state has more restrictive regulations. These management measures are expected to substantially reduce marlin mortality. As noted in section 2.1.4 Marlins and Sailfish Fishery Statistics of this report, the United States is working to resolve uncertainty pertaining to estimation methodologies for rod and reel catches and landings of marlins. Preliminary 2005 calendar year data from the Recreational Billfish Survey (RBS) recorded landings of 66 blue marlin and 26 white marlin. Preliminary 2005 fishing year (June '05-May '06) data from the RBS indicate landings of 62 blue marlin and 26 white marlin from recreational fishing tournaments. This survey is not inclusive of fishing activities outside of tournaments. The United States implemented a mandatory reporting program for billfish landed by recreational anglers who are not participating in registered tournaments in March 2003. In addition, the United States has taken steps to improve statistical information collection on recreational fishing in the Commonwealth of Puerto Rico and the U.S. Virgin Islands. These efforts have resulted in qualitative information that indicates that billfish landings may have been underestimated in past years. Efforts to produce quantitative historical estimates of non-tournament billfish landings for both U.S. mainland and Caribbean ports have been problematic due to estimation techniques that are subject to imprecision and bias. In an effort to reduce mortality in U.S. recreational fisheries, steps have been taken to improve data collection in Puerto Rico, and to increase enforcement activities in response to reports of illegal sales, unregistered tournaments and non-permitted anglers. Also, the U.S. Congress appropriated $2.5 million in fiscal year 2004 to enhance research programs on billfish, including means of reducing mortality. As the results of these research projects are obtained, the United States will continue to implement appropriate changes to its management programs.

Recommendation to Establish a Rebuilding Program for North Atlantic Swordfish (Rec 99-7; 02-02; 04-02)
The 1999 recommendation established an annual landings quota of 2,951 mt for the United States. Recommendation 02-02 established new quotas for the United States for 2003-2005, a dead discard allowance of 80 mt for 2003, a provision allowing up to 200 mt of North Atlantic swordfish to be caught between 5 degrees North latitude and 5 degrees South latitude, and a provision to transfer 25 mt to Canada. The landings quota and discard allowance are applied to a fishing year of June 1 - May 31. During the 2004 fishing year, there was an underharvest of North Atlantic swordfish which was added to the landings quota for the 2005 fishing year. Landings and discard estimates for the 2004 fishing year and 2005 calendar years are provided in the U.S. Compliance Tables. The United States has a minimum size of 33 lb (15 kg) dressed weight, and a required minimum size of 29" (73 cm) cleithrum to caudal keel length or 47" (119 cm) lower jaw fork length, which are designed to correspond to the 119 cm minimum size limit, with zero tolerance. Information on compliance with the minimum size is provided in the U.S. compliance tables. The United States codified the provisions from Recommendation 02-02 in November 2004. Recommendation 04-02 amended the Rebuilding Program for North Atlantic Swordfish by extending for one year management measures in place for 2005 as identified in paragraphs 2, 3c, and 7 of ICCAT Recommendation 02-02.

Recommendation on South Atlantic Swordfish (02-03)
This recommendation establishes catch limits for the United States of 100 mt for 2003 through 2005 and of 120 mt for 2006, and allowed underharvests in 2000 to be carried over to 2003. The United States landed 16 mt in fishing year 2004 and preliminary data indicate 0.0 mt of South Atlantic swordfish in fishing year 2005.

Recommendation on Revision and Sharing of the Southern Albacore Catch Limit (02-06; 03-07; 04-04)

The United States was subject to a catch limit of 100 mt in 2004 and 2005; however, the United States does not have a directed fishery for southern albacore. Estimated U.S. landings of southern albacore tuna were 0.5 mt in fishing year 2004 and preliminary data indicate 0.0 mt in calendar year 2005.

Recommendation on North Atlantic Albacore Catch Limits (02-05; 03-06)
The United States was allocated a landings quota of 607 mt ww for 2005, which is a level consistent with average landings for the United States since the mid-1990s. The 2002 recommendation applied for one year only, whereas the 2003 recommendation applies to three fishing years (2004-2006). The 2003 recommendation provides that overages/underages of this annual catch limit should be deducted from, or added to, the catch limit established for the year 2005 and/or 2006. The United States landed 646.5 mt during the 2004 fishing year. The 2005 calendar year landings were 487.3 mt.

In addition, pursuant to ICCAT's recommendation concerning the limitation of fishing capacity on North Atlantic albacore (1998), the United States submits the required reports providing a list of U.S. vessels operating in the fishery on an annual basis. The 2006 submission indicated that there were 379 vessels authorized to harvest North Atlantic albacore in the convention area.

Recommendation on Bigeye Tuna Conservation Measures (02-01; 03-01; 04-01)
No catch limits apply to the United States, since 1999 catch was less than 2100 mt. The United States has implemented a higher minimum size than that required by ICCAT, which provides additional protection for juvenile bigeye. This minimum size of 27 inches (approximately 6.8 kg) applies to all U.S. fisheries landing bigeye tuna, both commercial and recreational. The United States landed 416.1 mt in fishing year 2004 and 483.4 mt in the calendar year of 2005.

Recommendation on Yellowfin Size Limit (72-01; 05-01)
In 2005 ICCAT repealed the minimum size limit of 3.2 kg that had been in place since 1972. The United States maintains a minimum size limit of 27 inches fork length in both recreational and commercial fisheries for yellowfin tuna.

Resolution on Atlantic Sharks (01-1; 03-10)
The 2001 shark resolution calls for the submission of catch and effort data for porbeagle, shortfin mako, and blue sharks; encourages the release of live sharks to the extent possible; encourages the minimization of waste and discards in accordance with the Code of Conduct for Responsible Fisheries; and calls for voluntary agreements not to increase fishing targeting Atlantic porbeagle, shortfin mako, and blue sharks until an assessment can be conducted. Furthermore, the 2003 shark resolution requests ICCAT parties and cooperating parties, in preparation for the 2004 shark assessment, to provide the SCRS bycatch committee with information on shark catches, effort by gear type, and landings and trade of shark products, and calls for the full implementation of National Plans of Action (NPOAs) by ICCAT parties and cooperating parties, in accordance with the FAO International Plan of Action for the Conservation and Management of Sharks.

The United States submits catch and effort data for sharks and has catch limits in place for pelagic sharks, including, Atlantic porbeagle, shortfin mako, and blue sharks. In addition to providing data to the SCRS for the 2004 shark assessment, scientists from the United States participated in the shark assessment meeting. In 2002, pursuant to the 2000 Shark Finning Prohibition Act, the United States banned the practice of finning nationwide (67 FR 6194, February 11, 2002), to reduce discards and waste associated with finning. Additionally, the United States adopted a National Plan of Action for the Conservation and Management of Sharks in February 2001, consistent with the International Plan of Action for Sharks, which calls for management measures to reduce waste to the extent practicable and to protect vulnerable life history stages, such as juveniles.

The United States has managed sharks in the Atlantic Ocean under domestic fishery management plans (FMP) since 1993. The 1993 FMP, among other things, established a fishery management unit for Atlantic sharks, prohibited shark finning by requiring that the ratio between wet fins/dressed carcass not exceed 5 percent, and established other commercial and recreational shark management measures. The 1999 Atlantic Highly Migratory Species FMP established further management measures for Atlantic sharks, including a limited access permit system, recreational retention limits, reduced commercial quotas, and expansion of the prohibited shark list to 19 species. In 2002, the United States completed stock assessments for large and small coastal sharks, and began to develop Amendment 1 to the 1999 FMP to reassess shark management. Amendment 1, which was completed at the end of 2003, addressed, among other things, commercial quotas, quota management and administration, a time/area closure for sandbar and dusky shark nursery and pupping areas, and vessel monitoring system requirements for shark vessels to facilitate enforcement of closed areas.

A new Consolidated Fishery Management Plan (FMP)was completed in July 2006, which replaced the 1999 FMP, and which contained measures that will enhance U.S. data collection efforts by improving identification of dressed shark carcasses. These measures prohibit removal of the 2nd dorsal and anal fin from sharks prior to landing, and require all U.S. shark dealers to attend shark identification workshops. Also included are actions to address overfishing of finetooth sharks and a complete review of all new information related to essential fish habitat (EFH) for sharks. The final rule implementing these measures is expected in October 2006. Other management activities occurring in 2006 include the completion of the large coastal (LCS) stock assessment in June of 2006, an assessment of the Atlantic dusky shark stock, and a review of the Atlantic porbeagle shark stock as reported in the 2005 Canadian Stock Assessment and Recovery Assessment reports. The United States is also currently planning a Small Coastal Shark stock assessment for 2007, and is in the process of developing a Shark FMP for State waters.

Recommendation by ICCAT (05-05) to Amend Recommendation 04-10 Concerning the Conservation of Sharks Caught in Association with Fisheries Managed By ICCAT – (Rec 04-10; 05-05)
The original 2004 Recommendation established a timeline for review of the shortfin mako population assessment and development of recommendations for management alternatives (2005), as well as reassessment of blue sharks and shortfin mako (2007) by SCRS. Following the 2005 assessment, Recommendation 04-10 was amended to include additional requirements for CPCs to implement and report on measures taken to reduce fishing mortality of North Atlantic shortfin mako sharks. The United States currently tracks the annual quota for pelagic sharks, which includes landings of shortfin mako, to ensure that catches of these species are well under the designated quota. Tracking of the pelagic shark quota in recent years indicates that pelagic sharks, including shortfin makos, do not constitute a significant portion of U.S. shark landings. The United States has catch limits in place for Atlantic porbeagle, shortfin mako, and blue sharks and will continue to submit catch and effort data for sharks.

Recommendation 04-10 also included reporting requirements for shark catches, including available historical data on catches; full utilization of shark catches; a requirement that CPCs prevent their vessels from having shark fins onboard that total more than 5% of the weight of sharks; a requirement that the ratio of fin-to-body weight of sharks be reviewed by the SCRS by 2005; and prohibitions on fishing vessels retaining, transshipping or landing any fins harvested in contravention to the Recommendation. In addition, the Recommendation encourages the release of live sharks, especially juveniles in fisheries not directed at sharks, as well as additional research to improve the selectivity of fishing gears and identify shark nursery areas. Recommendation 05-05 required CPCs to implement the provisions of Recommendation 04-10 for North Atlantic shortfin mako shark populations. The United States continues to fulfill the requirements of these recommendations through data collection programs and a variety of fishery restrictions including the Shark Finning Prohibition Act of 2000. This law prohibited the practice of finning nationwide and the possession or landing of shark fins without the associated carcass (67 FR 6194, February 11, 2002). Additionally, the United States adopted a National Plan of Action for the Conservation and Management of Sharks in February 2001, consistent with the International Plan of Action for Sharks, which calls for management measures to reduce waste to the extent practicable and to protect vulnerable life history stages, such as juveniles. The United States also currently enforces a minimum size limit and bag limits for recreationally caught sharks, and has established a time/area closure for shark bottom longline fishing in the mid-Atlantic to protect sharks in the nursery grounds.

3.2 Closed Seasons

Recommendation on the Establishment of a Closed Area/Season for the Use of Fish-Aggregation Devices (Rec 99-3)
No U.S. action is necessary for this measure. The United States does not have any surface fleets fishing in the area covered by this recommendation.

Domestic Time/Area Closures for ICCAT Species
At present, the Atlantic pelagic longline fishery of the United States is subject to several discrete time/area closures that are designed to reduce bycatch in the pelagic longline fishery by prohibiting pelagic longline fishing for ICCAT

species in those areas during specified times. These closures affect offshore fishing areas up to 200 nautical miles (nm) from shore (see Figure 1). Those 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. Effective January 1, 2005, the United States implemented a Mid-Atlantic shark closed area for bottom longline gear from January through July of each year to protect dusky shark and juvenile sandbar sharks in pupping and nursery areas. In addition, all HMS gear types are prohibited year-round, except for surface trolling only from May through October, in the Madison Swanson and Steamboat Lumps Marine Reserves (Figure 2). These closures were implemented for the protection of spawning aggregations of gag grouper, and the HMS management measures will expire on June 16, 2010, consistent with Gulf of Mexico Fishery Management Council recommendations. Both of these reserves are located shoreward of the Desoto Canyon Closed Area (Figure 2). The Madison-Swanson Marine Reserve is 115 nm^2 in size, and the Steamboat Lumps marine reserve is 104 nm^2 in size. Finally, on March 29, 2006, NMFS published a proposed rule (71 FR 15680) to complement regulations that the Caribbean Fishery Management Council (CFMC) implemented on October 28, 2005 (70 FR 62073) that would close six small distinct areas off of Puerto Rico and the U.S. Virgin Islands to bottom longline gear, year-round. The purpose of these closed areas is to protect essential fish habitat of reef-dwelling species. A final rule implementing these closed areas is anticipated in the fall of 2006. These areas are defined in Title 50, section 622.33 (a) of the Code of Federal Regulations.

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. Pelagic longline vessels may only fish for highly migratory species in this area 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, the U. S. HMS PLL 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. NMFS published a proposed rule on March 26, 2006 (71 FR 15680) that would require participants in the Atlantic shark bottom longline fishery to possess, maintain, and utilize the same equipment and follow the same protocols for the safe handling and release of sea turtles and other protected species as required in the pelagic longline fishery. A final rule implementing these measures is expected in the fall of 2006.

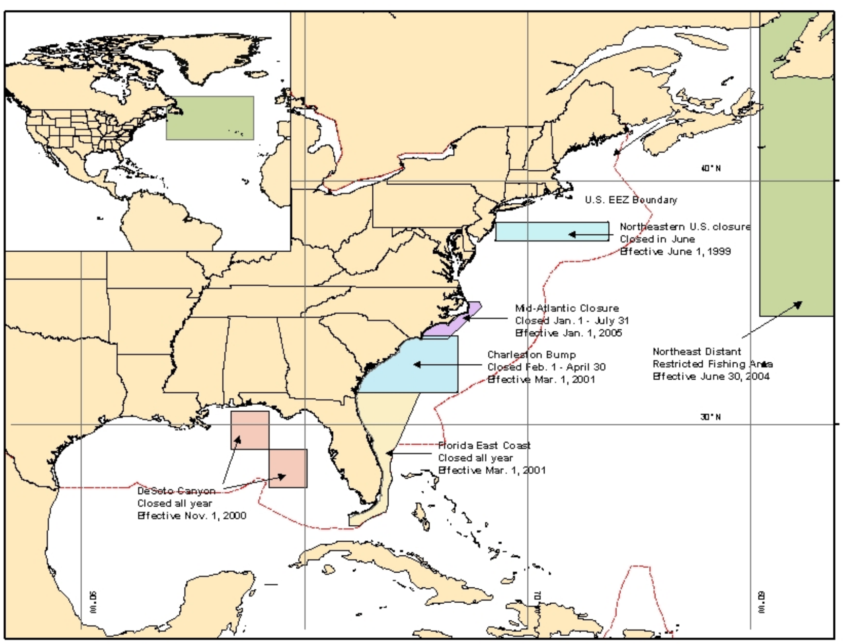

Figure 1. Existing time/area closures in HMS fisheries. Inset shows extent of the Northeast Distant restricted fishing area. All closures except the Mid-Atlantic are applicable to PLL gear only. The Mid-Atlantic Closure is applicable to bottom longline gear only. Note: the Northeast Distant (NED) was a closed area to all vessels as of 2001. It became the NED Restricted Fishing Area on June 30, 2004 when it was opened to those participating in the NED experiment.

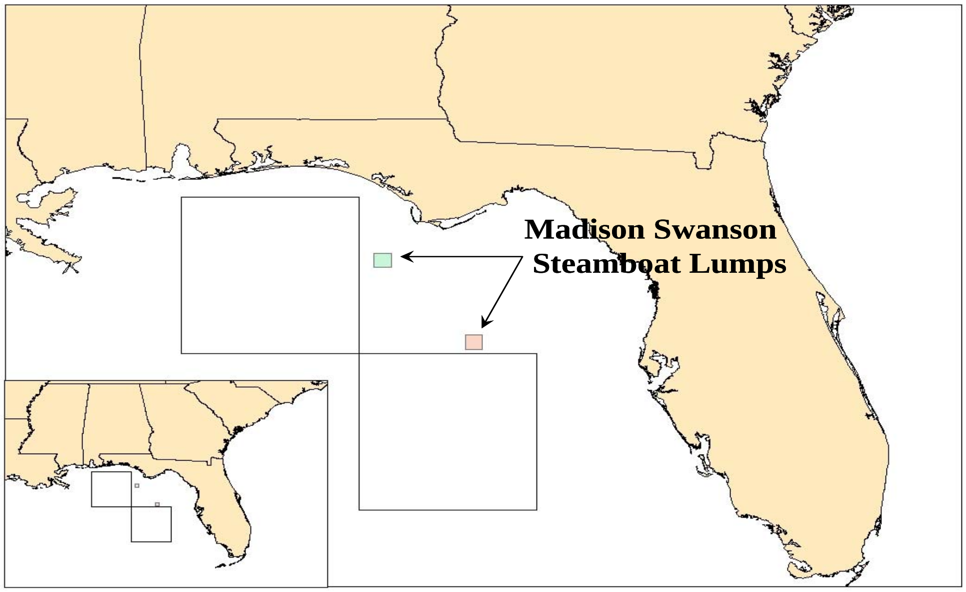

Figure 2. Madison-Swanson (upper left) and Steamboat Lumps (lower right) Marine Reserves. The Desoto Canyon closure is also shown for reference.

3.3 Ban on Imports

Trade Restrictive Recommendations adopted in 2005 (Rec 01-15; 02-16; 02-17; 02-18; 02-19; 02-20; 03-17; 03-18; 04-13; 04-14; 04-15)
On December 6, 2004, the United States published a final rule (69 FR 70396) that implemented or lifted trade restrictions on several countries which were adopted at the 2001, 2002, and 2003 ICCAT meetings. Trade restrictions were implemented against bigeye tuna, bluefin tuna, and swordfish imports from Sierra Leone (02-19) and bigeye tuna imports from both Georgia (03-18) and Bolivia (02-17). This rule lifted trade restrictions on Honduras for bigeye tuna (02-18), bluefin tuna (01-15), and swordfish (01-15). Trade restrictions were also lifted against Belize for bluefin tuna (02-16), bigeye tuna (02-16), and swordfish (02-16) imports. Lastly, trade restrictions for bigeye tuna (02-20) imports from St. Vincent's and the Grenadines were also lifted. In 2005, the United States published a final rule on May 17, 2005 (70 FR 28218) that implemented recommendations 04-13, 04-14, and 04-15 to lift the trade restrictions on imported bigeye tuna (04-15) from Cambodia, bigeye and bluefin tuna from Equatorial Guinea (04-13), and bigeye tuna, bluefin tuna, and swordfish from Sierra Leone (04-14). At the 2005 Annual meeting there were no additional trade restrictive measures passed by the commission.

Statistical Documentation Programs
The United States' Bluefin Tuna Statistical Document program has been in place since the 1990s, and statistical document programs for swordfish and frozen bigeye tuna were implemented in 2005. Prior to 2005, the United States had a domestic documentation program for swordfish called the Certificate of Eligibility (COE) which has now been fully replaced by the statistical document program. As required under the program, the United States submits reports to ICCAT twice-yearly providing information on import, export and re-export activity involving these species products.

3.4 Observer Programs

The U.S. observer program currently meets two main objectives: monitoring of interactions between fishing gear and protected species (marine mammals, sea turtles, and to a lesser degree, sea birds), and monitoring of fishing effort and catch (estimation of total landings of target species and/or bycatch of non-target or prohibited species). An overview of observer programs in the United States can be found online at: http://www.st.nmfs.noaa.gov/st4/nop/index.html. Click on the bullets under "About US" for info about both the National Observer Program, which is a coordinating office for NMFS observer programs in our headquarters outside of Washington, DC, and the Regional Programs. Observers for U.S. vessels in ICCAT fisheries are deployed from Miami, Florida and Panama City, Florida.

3.5 Vessel Monitoring

Recommendation Concerning Minimum Standards for the Establishment of a Vessel Monitoring System(VMS) in the ICCAT Convention Area (Rec 03-14; 04-11)
The United States implemented a fleet-wide VMS requirement in the Atlantic pelagic longline fishery effective September 1, 2003 (June 25, 2003, 68 FR 37772), consistent with the terms of recommendations 03-14 and 04-11. In addition, for domestic management purposes, the United States issued a rule in December of 2003 (December 24, 2003, 68 FR 74746), requiring VMS for bottom longline vessels operating near a time/area closure and for shark gillnet vessels operating during the right whale calving season.

3.6 Measures to Ensure Effectiveness of ICCAT Conservation and Management Measures and to Prohibit Illegal, Unreported and Unregulated Fishing

Management Standard for the Large-Scale Tuna Longline Fishery
In 2001, ICCAT resolved [Res. 01-20] that minimum management standards should be established for issuance of fishing licenses to tuna longline vessels greater than 24 meters in overall length and that an annual report should be submitted to ICCAT using a specific format. As per Recommendation 02-22, the United States has submitted its list of vessels of more than 24m LOA that are licensed to fish for tuna and tuna-like species in the Convention Area, which included licensed tuna longline vessels. The U.S. submission regarding Resolution 01-20 is provided in the Appendix on page 19**.**

3.7 Other Recommendations

Resolution on Seabirds (2002)
This resolution encourages ICCAT parties to inform the SCRS and the Commission of the status of their National Plans of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries (NPOA-Seabirds) and to voluntarily submit all available information on interactions with seabirds, including incidental catches in all fisheries under the purview of ICCAT, to the SCRS. The United States submitted an update on the implementation of its NPOA-Seabirds and observer data on seabird interactions in the Appendix, pg. 39.

Resolution on Sea Turtles (03-11)
The 2003 resolution on sea turtles encourages ICCAT parties and cooperating parties to collect and provide the SCRS with information on interactions with sea turtles in ICCAT fisheries, including incidental catches and other impacts on sea turtles. The measure also encourages the release of all sea turtles that are incidentally caught alive and to share information, including technical measures, to reduce the incidental catch of sea turtles, and to ensure the safe handling of all turtles that are released to improve their survivability. The resolution also calls for the development of data collection and reporting methods for the incidental by-catch of sea turtles and to support efforts by the FAO to address the conservation and management of sea turtles. The United States complies with all of these requests.

In addition to the above activities, the United States has undertaken extensive research activities in its longline fleet for ways to reduce sea turtle interactions and increase survivability of sea turtles incidentally caught in longline fisheries. Results from U.S. research in the Atlantic Ocean have shown that larger circle hooks significantly reduce turtle catches in the pelagic longline fishery (e.g. with mackerel bait, the number of loggerhead turtles caught was reduced by 65%). Unlike “J” hooks, which are often swallowed, circle hooks often become anchored in the mouth, and therefore hook extraction is easier and safer for sea turtles. There are a number of devices available to remove hooks and line from turtles caught on pelagic longlines. Long handled line cutters and long handled de-hookers are used to remove gear from turtles too large to be boated. The Epperly Biopsy Pole is used with a stainless steel corer to take tissue samples for genetics. Short handled de-hookers are used to remove hooks from animals that are boated. Miscellaneous tools have been developed to remove line, hooks, or the barb or eye of hooks on boated turtles. A dip net is used to bring small (<50 kg) turtles aboard. Mouth openers and gags are used on boated turtles to allow access to internally lodged hooks. U.S. gear experts have presented this bycatch reduction technology and data from the research activities at approximately 15 international events that included fishing communities and resource managers between 2002 and mid-2005.

In 2004 (6 July, 2004; 63 FR 40734), the United Stated codified regulations that implemented measures to reduce sea turtle bycatch. These measures pertain to the entire U.S. Atlantic pelagic longline fishery, and include: mandatory bait specifications depending on fishing locale, 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 U.S. pelagic longline fleet has seen a precipitous decline in the number of sea turtle interactions since implementation of the circle hook regulations in mid-2004. U.S. pelagic longline leatherback sea turtle interactions declined from an estimated 1,362 in 2004 to 368 in 2005; loggerhead sea turtle interactions declining from an estimated 734 in 2004, to 283 in 2005. As new technological solutions are discovered, the United States will continue to help share these innovations with other fishing nations.

Recommendation by ICCAT on Vessel Chartering (02-21; 03-21)
A final rule was published on December 6, 2004, (69 FR 70396) to implement recommendation 02-21 concerning vessel chartering. Recommendation 03-12 implemented monitoring measures for contracting parties, including maintaining up to date records of fishing vessels entitled to fly its flag and/or authorized to fish species managed by ICCAT in the convention area which is an integral component of vessel chartering arrangements. The United States complies with these recommendations by collecting all relevant information before chartering arrangements. In late 2004, the U.S. authorized one vessel to participate in chartering activities in the ICCAT convention area during 2005.

Recommendation by ICCAT Concerning the Recording of Catch by Fishing Vessels in the ICCAT Convention Area (03-13)
The United States requires all commercial fishing vessels over 24 m in length to maintain either bound or electronic logbooks. For information on the implementation of this recommendation relative to recreational fishing vessels, see the section, *Resolution on Improving Recreational Fishery Statistics*, below.

Resolution on Improving Recreational Fishery Statistics (Rec 99-13)
Recreational landings are estimated through a combination of tournament surveys (the Recreational Billfish Survey), the Large Pelagic Survey (LPS), the Marine Recreational Fishing Statistics Survey (MRFSS), mandatory non-tournament landings reporting requirements for Atlantic blue and white marlins, sailfish, swordfish, and bluefin tuna, as well as state landings data. Final regulations adopted in 1999 require selected HMS charter/headboat vessels that do not already do so to complete a logbook; implementation of this requirement is underway. In 1999, NMFS mandated the registration of all recreational tournaments for Atlantic highly migratory species. All tournaments are now required to submit landing reports, if selected. Currently, 100 percent of billfish tournaments are selected for reporting. Effective in March 2003, U.S. regulations implemented a mandatory recreational landings self-reporting system for Atlantic blue and white marlin, west Atlantic sailfish, and North Atlantic swordfish (68 FR 711). The United States is in the process of improving the non-tournament reporting system for Atlantic billfish, including swordfish, by allowing reporting via the internet.

Recommendation by ICCAT Concerning the Establishment of an ICCAT Record of Vessels over 24 Meters authorized to operate in the Convention Area (Rec 02-22)
The United States submitted the list of vessels required, pursuant to this recommendation, to the Secretariat in July 2006. At that time there were 146 U.S. vessels that met the appropriate criteria.

Recommendation by ICCAT on Bluefin Tuna Farming (03-09; 05-04)
The United States does not currently engage in bluefin tuna farming, therefore, no regulations are necessary for compliance with this recommendation. The United States is in the process of beginning a rulemaking to amend the BSD program which could, among other things, address the need to ensure that imported, farmed fish are only imported from farms on the ICCAT farm list.

Recommendation by ICCAT Concerning the Duties of Contracting Parties and Cooperating Non-Contracting Parties, Entities, Fishing Entities in relation to their vessels in the ICCAT Convention Area (03-12)

The United States currently implements all elements of this measure. A list detailing the enforcement actions taken on ICCAT species is provided in the Appendix, page 20.

Recommendation by ICCAT Establishing a Programme for Transshipment by Large-Scale Longline Fishing Vessels (05-06)
This recommendation establishes a program of transshipment affecting tuna longline and carrier vessels, including the establishment of an ICCAT record of authorized carrier vessels, documentation requirements, and extensive obligations and procedures pertaining to transshipment to assist in combating IUU fishing, ensure adequate monitoring of transshipment activities, and collecting catch data from large-scale vessels. No U.S. action is necessary on this recommendation, as current U.S. regulations prohibit transshipment of HMS products in the convention area.

Recommendation by ICCAT on Compliance with Statistical Reporting Obligations (05-09)
Recommendation 05-09 is intended to address compliance issues with statistical reporting obligations. It requires the Secretariat to identify data gaps, the SCRS to evaluate the impacts of data gaps on stock assessments and formulation of management advice, and for Contracting parties and CPCs, to provide explanations regarding reporting deficiencies and data gaps along with plans for corrective action. The United States is prepared to respond to the Secretariat as required under this recommendation.

U.S. Enforcement Actions
A summary of actions taken in ICCAT fisheries is provided in the Appendix, page 20.

4. OTHER ACTIVITIES

Recent U.S. management actions for Atlantic highly migratory species can be found online at:
http://www.nmfs.noaa.gov/sfa/hms.

Federal Register notices containing the full text of proposed and final regulations can be found at:
http://www.gpoaccess.gov/fr/index.html

ANNUAL REPORTING OF IMPLEMENTATION OF THE ICCAT MANAGEMENT STANDARD FOR LARGE-SCALE TUNA LONGLINE VESSELS

a. Management in the Fishing Grounds

	Scientific Observer Boarding	Satellite-Based Vessel Monitoring System	Daily or Required Period Catch Report	Entry/Exit Report
	Yes	Yes	Yes	Yes
Note	See section 2.29	Required on all vessels with pelagic longline gear on board and permitted to fish for swordfish/tuna using longline gear (effective 9/1/2003)	Vessel logbook program	Vessel logbook program

b. Management of transshipment (from the fishing grounds to the landing ports)

	Transshipment Report	Port Inspection	Statistical Document Program
Note	*No*		
	Transshipment prohibited per 50 CFR 635.29	See below	See below

[1]Vessel logbook program. Annual vessel permits are required for commercial and recreational vessels targeting Atlantic tunas (bluefin, yellowfin, bigeye, albacore, and skipjack), U.S. commercial vessels fishing for swordfish, and commercial vessels fishing for Atlantic sharks in the U.S. Exclusive Economic Zone (EEZ). All commercially permitted vessels may be selected for submission of vessel logbooks. Logbooks contain information on fishing vessel activity, including dates of trips, number of sets, area fished (lat./long.), number of fish and other marine species caught, released and retained. Submission of social and economic data such as volume and cost of fishing inputs is mandatory, if selected. Logbooks must be filled out within 48 hours of completing a day's fishing activities for multiple-day fishing trips or, before offloading for 1-day trips. Logbooks must be mailed within 7 days of offloading.

[2]Port sampling program. Port sampling agents are stationed at major ports along the Atlantic and Gulf of Mexico coasts to collect biological samples and size frequency, age-at-length, catch per unit effort, and catch composition data. Port samplers routinely visit major fish dealers and randomly sample catches.

[3]Dealer reporting program. Dealer permits are required for the commercial receipt of Atlantic tuna, swordfish, and sharks. Bluefin tuna dealers report imports through the Bluefin Statistical Document, as described below, while swordfish dealers report through the dealer import form. Dealer reports must be submitted to NMFS twice a month for all swordfish, sharks and tunas. Dealers are required to record each purchase of Atlantic bluefin tuna on a landing card and provide the information to NMFS within 24 hours of the purchase or receipt of the fish. The landing cards, which are used to monitor the bluefin tuna quota, include the following information: dealer number, dealer name, date the fish was landed, harvest gear, fork length, weight (whole or dressed), identification tag number, area where fish was caught, port where landed, Atlantic tuna permit number, vessel name, and the name and dated signature of the vessel's master.

NOAA ENFORCEMENT ACTIONS TAKEN
ON ICCAT SPECIES

September 1, 2005 – August 31, 2006

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 a limited number of concerned recreational marinas. Enforcement officials detected the following violations:

ENFORCEMENT ACTIONS	#
CASES OPENED THIS REPORTING PERIOD	**141**
REMAINING OPEN	**95**
CASES COMPLETED	**46**
WARNINGS ISSUED	**25**

VIOLATION	CASE NUMBER
General Requirements of the Atlantic Tunas Convention Act (ATCA) and Magnuson-Stevens Act (MSFCMA)	**10**
General Prohibitions under the ATCA and MSFCMA to include:	**120**
Falsification of Permit Application Information	1
Violating terms of a Permit	1
Fishing, Catching, Possessing, Retaining Atlantic Highly Migratory Species without a Valid Permit	46
Selling Atlantic Highly Migratory Species without a Valid Dealer Permit	7
Selling Atlantic Highly Migratory Species to a Non-Permitted Dealer	1
Falsification or Failure to Record Required Information	5
Failure to Posses a permit on Board a Vessel	1
Failure to Maintain a HMS Carcass in Manner Specified	11
Possession of Under-Sized HMS	10
Failure to Notify NMFS upon Termination of a Chartering Arrangement	6

Importation of Fish or Products under Regulation	1
Use of Live Bait with Pelagic Longline Gear in Gulf of Mexico	5
Closed Area Violation with Pelagic Longline Gear	1
Possession of ICCAT Species Contrary to U.S. or Foreign Law	3
Failure to Comply with Gear Restrictions	3
Failure to Carry Required Sea Turtle Bycatch Mitigation Gear	1
Failure to Comply with At-Sea Observer Coverage	5
VMS Requirement Violations	5
Violation of any Regulations under the ATCA or MSFCMA	4
Operating a CHB or HB w/o a USCG Vessel License on Board	3
Specific Prohibitions for Atlantic Tunas:	**4**
Exceeding BFT Catch Limit	3
Unlawful Sale of Specified BFT Caught Angling or CHB	1
Specific Prohibitions for Billfish:	**0**
No Reported Violations	
Specific Prohibitions for Sharks:	**7**
Possession of Prohibited Shark	4
Sale or Purchase of Shark Fins Inconsistent with Carcass Weight	2
Possession of Shark during Closed Season	1
Specific Prohibitions for Swordfish	**0**
No Reported Violations	

Appendix Table 2.1-YFT. Annual Landings (MT) of Yellowfin Tuna from 2001 to 2005.

Area	Gear	2001	2002	2003	2004	2005
NW Atlantic	Longline	632	400	272	659	397
	Rod and reel*	3,691	2,624	4,672	3,434	3,504
	Gillnet	8	5	1	3	0.1
	Trawl	3	0	2	2	0.2
	Handline	243	137	148	213	101
	Uncl	7	**	0	11	4
Gulf of Mexico	Longline	1,506	2,109	1,828	1,812	1,210
	Rod and reel*	494	200	640	247	147
	Handline	43	100	59	28	46
Caribbean	Longline	23	12	7	4	140
	Handline	14	7	9	7	10
	Gillnet	0	0	**	**	**
NC Area 94a	Longline	4	0	5	**	0.5
SW Atlantic	Longline	36	52	42	17	0
	Total	**6,703**	**5,646**	**7,685**	**6,437**	**5,560**

Note: not all gears are represented in this Table; therefore total values in the Table are a portion of the total U.S. landings of YFT.
* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.
** $\leq$= 0.05 MT

Appendix Table 2.1-SKJ. Landings (MT) of Skipjack Tuna from 2001 to 2005

Area	Gear	2001	2002	2003	2004	2005
NW Atlantic	Longline	0.1	**	0.9	0.1	**
	Rod and reel*	32.9	23.3	34.0	27.3	8
	Gillnet	3.6	**	0.9	16.7	2
	Trawl	0.2	**	0.5	0.2	0.06
	Handline	0.2	0.2	0.2	0.6	0.9
	Trap	0.0	**	1.5	**	0
Gulf of Mexico	Longline	0.2	**	**	0.3	0.3
	Rod and reel*	16.1	13.2	11	6.3	3.1
	Handline	0.0	0.0	**	0.2	**
Caribbean	Longline	4.0	2.5	3.3	0.3	0.2
	Gillnet	1.6	0.6	0.4	0.3	0.06
	Handline	10.3	12.5	9.2	9.6	9.7
	Rod and reel*	?	33	16	40	4
	Total	**69.2**	**85.3**	**77.9**	**101.9**	**28.3**

Note: not all gears are represented in this Table; therefore total values in the Table are a portion of the total U.S. landings of SKJ.

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

** $\leq$= 0.05 MT

Appendix Table 2.1-BET. Landings (MT) of Bigeye tuna by year for 2001-2005.

Area	Gear	2001	2002	2003	2004	2005
NW Atlantic	Longline	506.1	328.6	168.7	267.0	271.9
	Rod and reel*	366.2	49.6	188.5	94.6	165
	Gillnet	0.2	0.0	0.0	0.0	0.0
	Handline	33.2	13.8	6.0	3.3	6.1
	Trawl	0.4	0.5	**	0.9	0.6
	Pound	0.0	0.0	0.1	0.0	0.0
	Uncl	1.8	0.0	0.0	0.5	0.6
Gulf of Mexico	Longline	15.3	41.0	27.5	20.2	25.2
	Rod and reel*	0.0	0.0	0.0	6.0	0.0
	Handline	0.5	0.6	0.3	0.2	0.2
Caribbean	Longline	31.9	29.7	7.2	3.5	6.9
	Handline	0.0	0.0	0.0	0.06	**
NC Area 94a	Longline	61.0	45.2	36.9	5.0	6.9
SW Atlantic	Longline	68.2	91.3	44.6	14.4	0
	Total	**1084.7**	**600.3**	**479.8**	**415.7**	**483.4**

Note: not all gears are represented in this Table; therefore total values in the Table are a portion of the total U.S. landings of BET.
* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.
** ≤= 0.05 MT

Appendix Table 2.2-BFT. Landings (MT) of Bluefin tuna for 2001 to 2005.

Area	Gear	2001	2002	2003	2004	2005
NW Atlantic	Longline	17.7	7.8	16.3	28.8	22.3
	Handline	9.0	4.5	2.5	1.5	2.3
	Purse Seine	195.9	207.7	265.4	31.8	178.3
	Harpoon	101.9	55.5	87.9	41.2	31.5
	* Rod and reel (>145 cm LJFL)	993.4	1008.4	684.8	329.0	254.4
	* Rod and reel (<145 cm LJFL)	249.3	519.3	314.6	387.4	170.4
	Uncl	0.5	0.0	0.0	0.0	0.0
Gulf of Mexico	Longline	19.8	32.8	53.8	67.3	45.7
	* Rod and reel	1.7	1.5	0.0	0.0	0.0
	Total	**1,213.7**	**1,837.5**	**1,416.9**	**887.2**	**704.9**

Appendix Table 2.2-ALB. Landings (MT) of Albacore tuna for 2001 to 2005.

Area	Gear	2001	2002	2003	2004	2005
NW Atlantic	Longline	171.7	124.0	95.6	106.6	88.9
	Gillnet	3.3	2.6	0.1	4.9	6
	Handline	1.7	3.9	1.4	6.1	2.5
	Trawl	0.0	0.3	**	2.7	1.7
	Rod and reel*	122.3	323.0	333.8	500.5	356
	Uncl	0.1	0.0	0.0	3.6	9.8
Gulf of Mexico	Longline	4.9	9.5	7.7	9.8	6.6
	Handline	0.0	0.0	**	0.0	0.1
Caribbean	Longline	8.7	8.4	4.0	3.2	12
	Gillnet	0.5	**	**	**	**
	Trap	0.3	0.6	0.2	0.0	0.0
	Handline	2.2	2.7	2.0	2.1	1
NC Area 94a	Longline	6.1	4.8	1.6	0.2	0.6
SW Atlantic	Longline	2.4	8.3	2.0	0.5	0.0
	Total	**324.2**	**488.1**	**448.4**	**640.2**	**485.2**

Note: not all gears are represented in these Tables; therefore total values in the Table are a portion of the total U.S. landings of ALB and BFT.

** <= 0.05 MT

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

Appendix Table 2.3-SWO. Catches and Landings (MT) of Swordfish for 2001 to 2005.						
Area	Gear	2001	2002	2003	2004	2005
NW Atlantic	* Longline	1,220.8	1,132.8	1,341.3	1,169.6	1122.1
	Gillnet	0.0	0.1	0.0	**	0.0
	Handline	8.6	8.8	10.8	18.7	32.9
	Trawl	2.5	3.9	6.0	8.3	8.2
	* unclassified	1.8	0.1	1.6	0.0	0.0
	Harpoon	7.4	2.8	0.0	0.5	0.0
	Rod and Reel***	1.5	21.5	5.9	24.3	53.1
	Trap	0.0	**	0.1	0.0	0.0
Gulf of Mexico	* Longline	494.6	549.1	507.6	453	491.6
	Handline	0.3	2.9	9.8	4	0.2
Caribbean	* Longline	347.0	329.0	274.5	295.9	143.4
	Trap	0.0	0.1	**	0.0	0.0
NC Atlantic	* Longline	420.6	587.9	632.8	599.9	554.1
S Atlantic	* Longline	43.2	199.9	20.9	15.7	0.0
	TOTAL	**2,548.3**	**2,838.9**	**2,811.3**	**2,589.6**	**2,405.1**

Note: not all gears are represented in this Table; therefore total values in the Table are a portion of the total U.S. landings of SWO.

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

** $\leq$ = 0.5 MT

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

Appendix Table 2.6a-SHK. Estimates of commercial and recreational landings and dead discards for pelagic sharks in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

	Commercial					Recreational			Discards			Total	
Year	mt (ww) [1]	mt (dw) [2]	lb (dw) [3]	av. weight[4]	number [5]	number [6]	av. weight[7]	lb (dw)	number	mt (ww)	lb (dw) [8]	number	lb (dw)
1981						12,603	50.035	630,591				12,603	630,591
1982	45.41	23.17	51,077		1,354	20,015	50.996	1,020,685				21,369	1,071,762
1983	51.89	26.48	58,367		1,627	21,968	117.64	2,584,316				23,595	2,642,683
1984	49.12	25.06	55,250		1,538	23,295	67.489	1,572,156				24,833	1,627,406
1985	57.99	29.59	65,227		1,969	92,998	38.224	3,554,756				94,967	3,619,982
1986	68.50	34.95	77,049	66.850	2,385	42,572	65.631	2,794,043				44,957	2,871,091
1987	87.46	44.62	98,375	69.171	2,786	37,153	39.002	1,449,041	13,092	560.64	630,606	53,031	2,178,022
1988	129.48	66.06	145,639	68.958	3,915	32,993	41.271	1,361,654	13,655	468.74	527,237	50,563	2,034,530
1989	141.36	72.12	159,001	57.574	4,937	18,255	73.228	1,336,777	13,480	538.21	605,376	36,672	2,101,155
1990	102.74	52.42	115,566	67.221	3,274	11,630	41.246	479,691	13,955	795.97	895,300	28,859	1,490,557
1991	114.32	58.33	128,587	76.681	3,290	10,070	62.061	624,954	17,232	813.21	914,695	30,592	1,668,236
1992	139.81	71.33	157,258	73.737	4,111	16,304	39.219	639,427	8,939	298.31	335,538	29,354	1,132,222
1993	387.30	197.60	435,638	81.631	5,278	29,861	50.988	1,522,553	30,545	1191.52	1,340,217	65,684	3,298,407
1994	513.46	261.97	577,535	82.713	6,688	5,638	68.28	384,963	13,410	637.71	717,294	25,736	1,679,791
1995	393.93	200.98	720,219	75.676	9,517	32,673	47.629	1,556,182	10,864	710.27	798,909	53,054	3,075,310
1996	402.03	205.12	760,364	81.934	9,280	18,534	33.697	624,540	22,153	949.22	1,067,682	49,967	2,452,586
1997	381.08	194.43	739,486	85.937	8,605	8,743	54.834	479,414	7,754	250.42	281,671	25,102	1,500,571
1998	267.07	136.26	624,483	83.184	7,507	11,762	35.977	423,161	6,002	280.09	315,044	25,271	1,362,688
1999	113.10	57.70	376,471	88.388	4,259	11,122	48.304	537,237	3,464	117.63	132,310	18,845	1,046,018
2000	191.15	97.53	407,647	69.280	5,884	13,353	16.749	223,649	7,495	216.13	243,102	26,732	874,399
2001	193.58	98.77	411,574	62.978	6,535	3,777	83.938	317,034	6,158	155.75	175,187	16,470	903,795
2002	174.06	88.81	533,247	60.717	8,782	4,673	87.152	407,261	5,335	92.73	104,302	18,790	1,044,811
2003	158.08	80.65	643,883	58.673	10,974	4,298	35.88	154,212	4,341	71.93	80,907	19,613	879,002
2004	205.15	104.67	810,526	66.435	12,200	5,072	55.796	282,997	2,597	63.92	71,897	19,869	1,165,420
2005	194.87	99.42	421,115	65.746	6,405	5,072	31.204	158,267	2,861	194.00	218,210	14,338	797,592

[1] In whole weight from weighout data sheets; [2] Whole weight to dressed weight conversion ratio is 1.96; [3] 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; 4 In pounds dressed weight from weightout data sheets; [5] 1982-1994 data are taken directly from weighout data sheets, 1995-2005 by dividing values in fourth column (lb dw) by those data obtained in fifth column (av. weight); [6] Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; [7] In pounds dressed weight; [8] Whole weight to dressed weight conversion ratio is 1.96.

Appendix Table 2.6b-SHK. Estimates of commercial and recreational landings and dead discards for blue sharks in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

	Commercial					Recreational			Discards			Total	
Year	mt (ww) [1]	mt (dw) [2]	lb (dw) [3]	av. weight[4]	number [5]	number [6]	av. weight[7]	lb (dw)	number	mt (ww)	lb (dw) [8]	number	lb (dw)
1981						4,925	45.435	223,765				4,925	223,765
1982	0	0	0		0	0	45.435	0				0	0
1983	0	0	0		0	14,593	45.435	663,027				14,593	663,027
1984	0	0	0		0	2,579	45.435	117,176				2,579	117,176
1985	0	0	0		0	11,621	33.003	383,528				11,621	383,528
1986	0.40	0.20	450	148.500	6	18,898	66.182	1,250,707				18,904	1,251,157
1987	0	0	0	100.318	0	20,683	47.545	983,373	12,506	526.20	591,868	33,189	1,575,241
1988	0.10	0.05	112	100.318	4	12,235	32.620	399,106	12,934	421.16	473,719	25,173	872,937
1989	0	0	0	100.318	0	7,419	41.011	304,261	12,525	480.00	539,902	19,944	844,163
1990	0.25	0.13	286	100.318	6	1,745	56.134	97,954	13,141	741.33	833,845	14,892	932,084
1991	0	0	0	100.318	0	6,643	52.120	346,233	16,562	772.32	868,702	23,205	1,214,936
1992	0.47	0.24	529	67.769	14	5,853	41.191	241,091	7,043	184.39	207,401	12,910	449,021
1993	7.88	4.02	8,860	75.188	85	14,114	53.567	756,045	29,329	1,136.33	1,278,139	43,528	2,043,044
1994	7.82	3.99	8,796	79.960	105	507	45.435	23,035	11,986	572.24	643,653	12,598	675,485
1995	3.61	1.84	7,162	66.557	108	464	45.435	21,082	9,725	618.15	695,293	10,297	723,536
1996	5.40	2.76	24,005	70.819	339	9,150	34.070	311,741	18,996	710.69	799,381	28,485	1,135,127
1997	1.42	0.72	2,491	52.933	47	4,236	55.740	236,115	6,614	184.61	207,643	10,897	446,249
1998	2.87	1.46	3,925	40.873	96	6,085	45.435	276,469	5,295	195.25	219,616	11,476	500,011
1999	0.16	0.08	1,048	6.725	156	5,218	45.435	237,078	2,772	98.96	111,310	8,146	349,435
2000	0.61	0.31	4,124	62.634	66	7,010	45.435	318,496	6,298	137.19	154,311	13,374	476,931
2001	3.09	1.58	3,548	40.579	87	950	45.435	43,163	5,219	105.87	119,082	6,256	165,793
2002	0.20	0.10	228	56.500	4	0	45.435	0	4,335	67.87	76,340	4,339	76,568
2003	1.43	0.73	7,933	67.083	118	376	45.435	17,083	3,362	54.79	61,628	3,856	86,644
2004	6.96	3.55	7,834	47.994	163	0	45.435	0	2,697	63.92	71,897	2,860	79,731
2005	1.78	0.91	2,006	62.406	32		45.435	0	1,487	75.84	85,301	1,519	87,307

[1] In whole weight from weighout data sheets; [2] Whole weight to dressed weight conversion ratio is 1.96; [3] 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; 4 In pounds dressed weight from weightout data sheets; [5] 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); [6] Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; [7] In pounds dressed weight; [8] Whole weight to dressed weight conversion ratio is 1.96.

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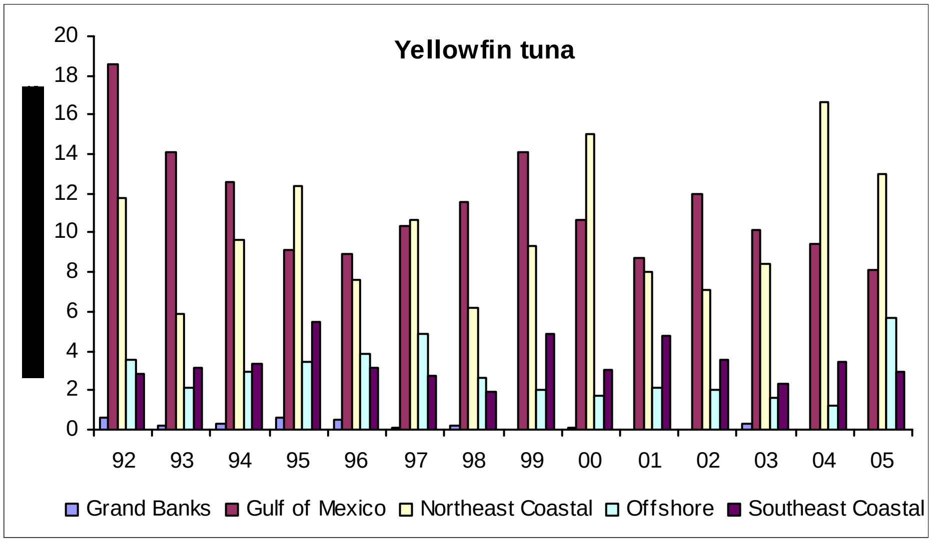
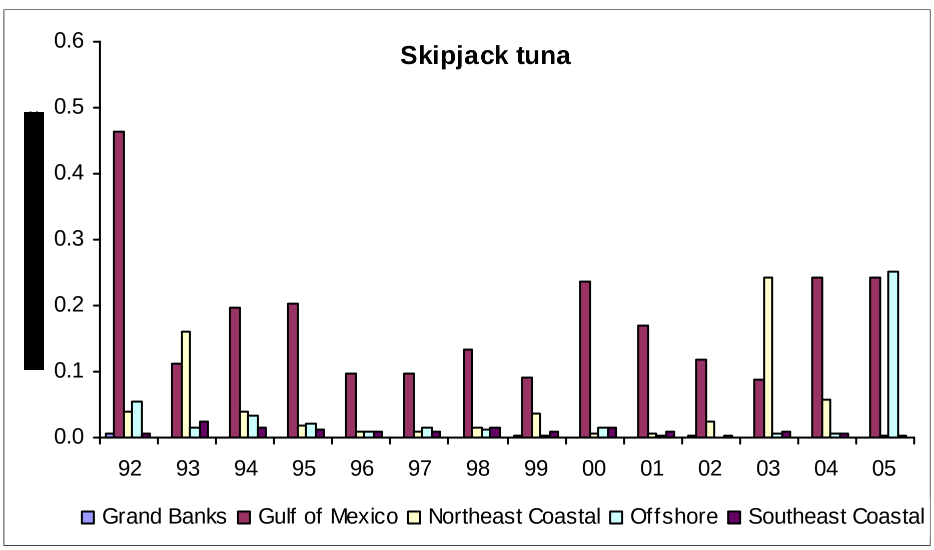
Appendix Table 2.6c-SHK. Estimates of commercial and recreational landings and dead discards for shortfin mako sharks in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

	Commercial					Recreational			Discards			Total	
Year	mt (ww) [1]	mt (dw) [2]	lb (dw) [3]	av. weight[4]	number [5]	number [6]	av. weight[7]	lb (dw)	number	mt (ww)	lb (dw) [8]	number	lb (dw)
1981						7,678	56.395	433,001				7,678	433,001
1982	42.12	21.49	47,376		1298	13,522	50.996	689,568				14,820	736,944
1983	6.78	3.46	7,626		225	7,375	51.597	380,529				7,600	388,155
1984	42.46	21.66	47,759		1436	15,474	67.531	1,044,975				16,910	1,092,734
1985	53.24	27.16	59,884		1877	79,912	41.487	3,315,309				81,789	3,375,193
1986	64.76	33.04	72,842	64.936	2,318	20,792	70.107	1,457,665				23,110	1,530,507
1987	77.84	39.71	87,554	65.771	2,592	14,809	35.069	519,337	217	8.72	9,808	17,618	616,699
1988	101.37	51.72	114,021	63.095	3,398	19,998	44.693	893,771	127	5.08	5,714	23,523	1,013,505
1989	124.56	63.55	140,105	55.771	4,608	8,367	90.117	754,009	249	9.01	10,134	13,224	904,248
1990	91.77	46.82	103,223	63.843	3,081	8,509	35.483	301,925	259	10.31	11,593	11,849	416,741
1991	104.87	53.51	117,957	75.502	3,085	3,422	69.020	236,186	245	11.16	12,553	6,752	366,697
1992	125.97	64.27	141,691	71.833	3,782	8,382	33.589	281,543	771	38.41	43,203	12,935	466,437
1993	281.09	143.41	316,164	77.355	4,044	15,034	49.883	749,941	562	24.03	27,029	19,640	1,093,134
1994	324.66	165.64	365,177	76.717	4,623	4,496	79.296	356,515	558	21.45	24,127	9,677	745,818
1995	288.83	147.36	460,767	71.209	6,471	31,212	51.227	1,598,897	446	28.44	31,989	38,129	2,091,653
1996	238.05	121.46	427,020	83.239	5,130	8,618	30.265	260,824	0	0	0	13,748	687,844
1997	245.46	125.23	446,305	84.574	5,277	3,025	60.839	184,038	0	0	0	8,302	630,343
1998	199.76	101.92	401,491	82.327	4,877	5,633	29.590	166,680	0	0	0	10,510	568,171
1999	90.05	45.94	217,867	87.763	2,482	1,383	51.597	71,359	0	0	0	3,865	289,226
2000	166.74	85.07	286,764	66.185	4,333	5,813	51.597	299,934	0	0	0	10,146	586,698
2001	182.02	92.87	347,844	63.154	5,508	2,871	83.938	240,986	0	0	0	8,379	588,830
2002	165.59	84.48	314,736	61.024	5,158	3,206	87.152	279,409	0	0	0	8,364	594,145
2003	140.80	71.84	285,222	57.733	4,940	3,957	51.597	204,170	0	0	0	8,897	489,392
2004	188.31	96.07	392,628	66.006	5,948	5,144	55.796	287,015	0	0	0	11,092	679,643
2005	186.03	94.91	375,814	65.615	5,728	5,144	31.204	160,513	0	0	0	10,872	536,327

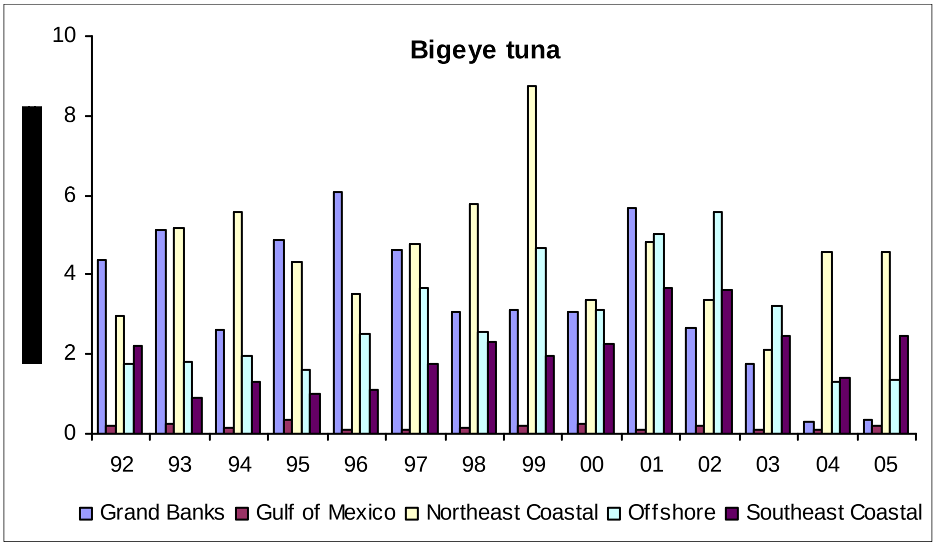
[1] In whole weight from weighout data sheets; [2] Whole weight to dressed weight conversion ratio is 1.96; [3] 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; 4 In pounds dressed weight from weightout data sheets; [5] 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); [6] Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; [7] In pounds dressed weight; [8] Whole weight to dressed weight conversion ratio is 1.96.



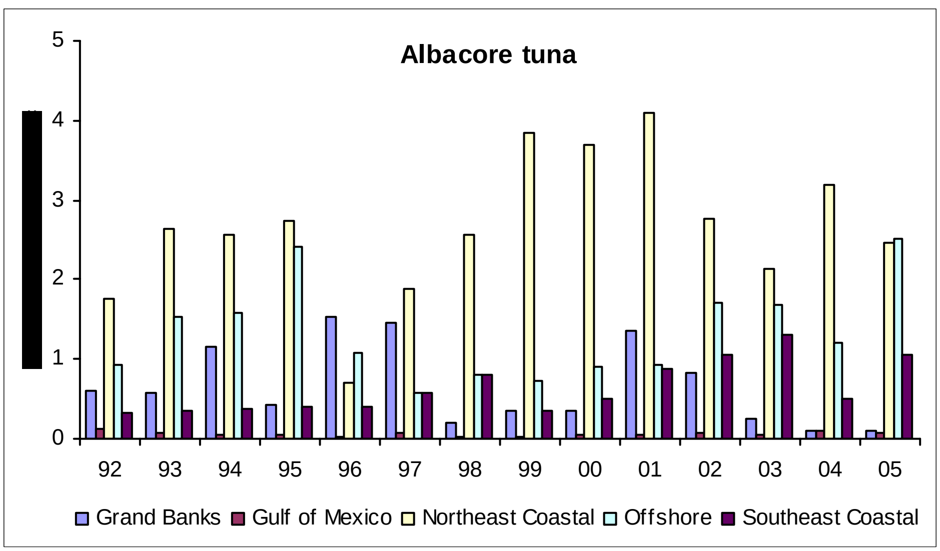
Appendix Figure 2.1 – YFT. *Nominal catch rates for YFT in U.S. pelagic longline logbook reports.*



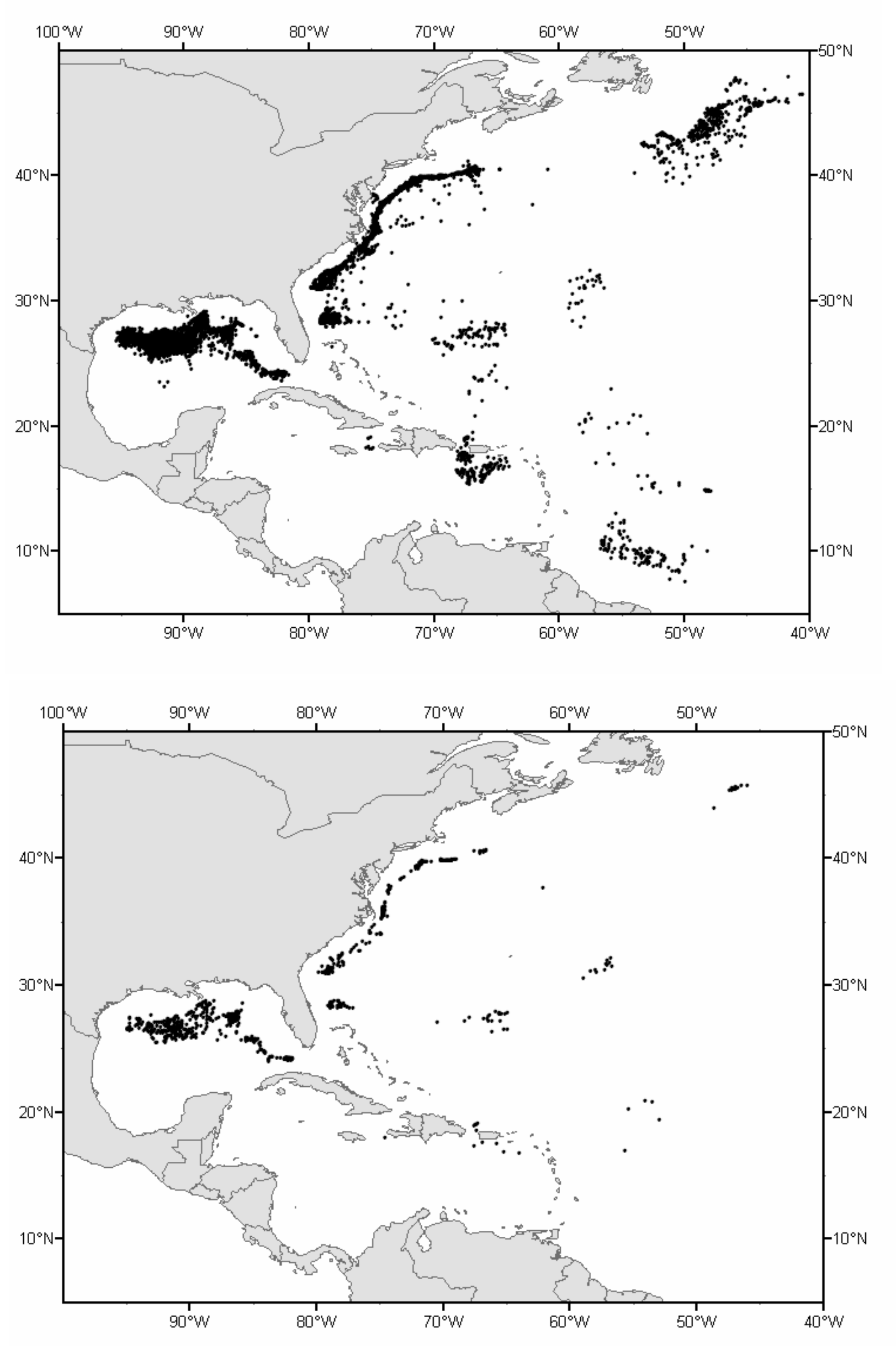
Appendix Figure 2.1 – SKJ. *Nominal catch rates for SKJ in U.S. pelagic longline logbook reports.*



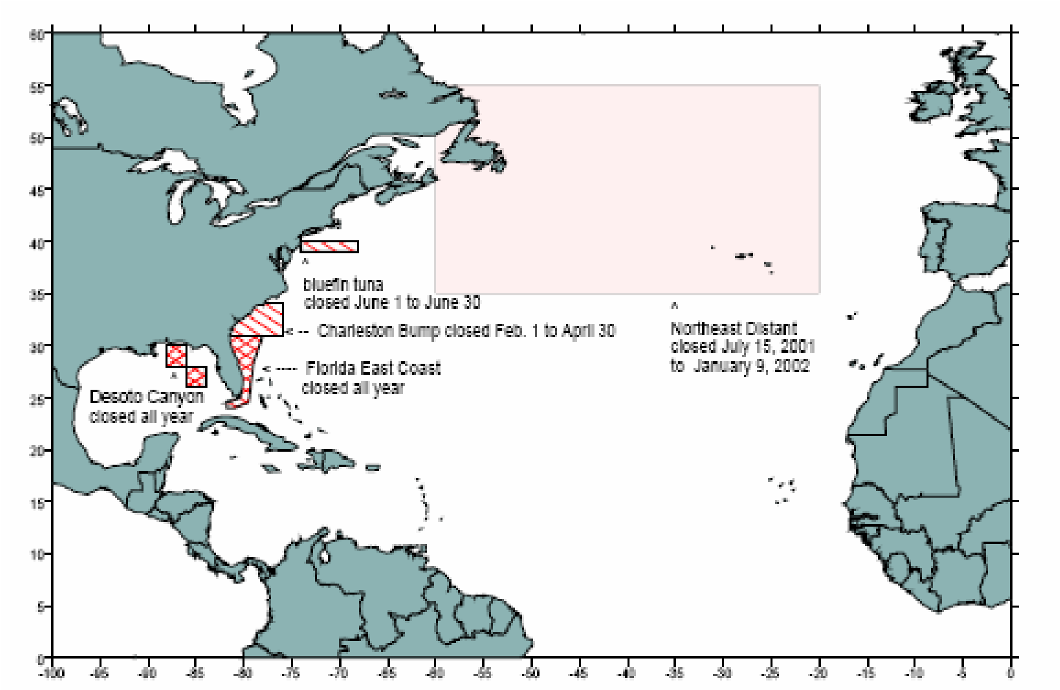
Appendix Figure 2.1 – BET. *Nominal catch rates for BET in U.S. pelagic longline logbook reports.*



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



Appendix Figure 2.2 – *Reported (upper) and observed (lower) longline sets position in 2005.*



Appendix Figure 2.3- Time/area closures for the U.S. longline fishery in 2005

***Appendix*. *Affect of time/area closures on U.S. swordfish catch* .**

Beginning in the year, 2001, U.S pelagic longline fishing was prohibited or restricted in the five areas and times shown in Figure 1. The three 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. The bluefin tuna area was closed primarily to reduce the catch of bluefin smaller than legal size for sale by U.S. fishers. Longline vessels were allowed to fish in the Northeast Distant area if they participated in a turtle study and carried an observer. In 2002 the Northeast Distant area was closed all year to vessels not participating in the turtle study.

The number of longline vessels in the U.S. fishery targeting swordfish has declined steadily since the mid 1990's. Reported effort (hooks) declined initially but has remained fairly stable since 1998 (Table 1)**.** The percentage effort in hooks and the catch of swordfish < 125 cm in numbers (reported) and in metric tons (estimated) in 2002, 2003, and 2004 are compared to the average effort and catch from 1997 through 1999 (Table 2). There was some overall reduction in effort, reported in hooks fished. Some of the effort previously reported from the Florida East Coast fishing area appears to have redistributed into the Gulf of Mexico and up to the south Atlantic and Mid Atlantic Bights. The years 2002, 2003, and 2004 and the average (1997-1999) catch of swordfish < 125 cm in numbers (reported) and in metric tons (estimated) and effort in hooks are reported by area and time/area status in Table 3. Although the metric tons of swordfish < 125 cm estimated caught increased in some areas compared to the 1997-99 average, notably the Caribbean and the Gulf of Mexico, the overall change in estimates was a reduction of approximately 50% in the years since implementation**.**

Table 1. *Numbers of Active 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 5 month 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 whether or not they represented single pelagic longline sets, summary records, bottom longline records, or sets with less than 100 hooks fished.

Year	Vessels	Vessels that caught SWO	Vessels that caught SWO in 5 month period	Hooks reported
1987	297	273	180	6,558,426
1988	388	338	210	7,009,358
1989	456	415	251	7,927,401
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

Table 2. Catch in numbers (reported) and in metric tons (estimated) of swordfish < 125 cm and reported number of hooks in years 2003-2005 by longline gear expressed as percentage of the mean 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	2003	2004	2005	Mean	2003	2004	2005	Mean	2003	2004	2005
CAR	434	36%	104%	46%	237,280	48%	122%	70%	6	33%	100%	70%
FEC	2,500	17%	6%	50%	619,099	73%	38%	47%	37	17%	5%	47%
GOM	1,820	113%	117%	109%	2,858,863	109%	123%	92%	17	117%	120%	92%
MAB	1,213	94%	87%	88%	1,008,860	53%	75%	74%	18	83%	84%	74%
NEC	769	62%	26%	23%	734,782	53%	53%	43%	11	56%	24%	43%
NED	983	53%	27%	8%	497,606	116%	90%	86%	13	57%	28%	86%
SAB	2,412	60%	42%	51%	601,499	77%	95%	68%	39	57%	37%	68%

Table 3. Catch in numbers (reported) and in metric tons (estimated) of swordfish < 125 cm and number of hooks reported by longline gear in year 2002-2004 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 status of time/area closure.

		Number of SWO				Number of Hooks				Metric tons				Change in mt.		
		Mean	2003	2004	2005	Mean	2003	2004	2005	Mean	2003	2004	2005	2003	2004	2005
CAR	Open	434	155	449	199	2,372,280	113,176	289,726	165,073	6	2	6	3	-4	0	-3
FEC	Closed	2,364	252	98	77	475,733	282,842	171,494	194,685	345	3	1	2	-31	-34	-32
FEC	Open	136	204	43	1,169	143,366	172,071	54,095	97,985	2	3	1	16	1	-4	14
GOM	Closed	426	0	3	2	237,572	8,750	4,900	6,480	4	0	0	0	-4	-4	-4
GOM	Open	1,394	2083	2,127	1,987	3,621,292	3,102,043	3,504,505	2,628,039	13	20	21	21	7	7	8
MAB	Closed	2	0	0	0	6,250	0	0	0	0	0	0	0	0	0	0
MAB	Open	1,211	1,181	1,053	1,066	1,002,610	530,713	747,390	740,759	18	15	15	16	-3	-3	-2
NEC	Closed	11	0	0	0	41,150	0	954	0	0	0	0	0	0	0	0
NEC	Open	769	477	202	178	734,782	388,706	412,808	316,401	11	6	3	2	-5	-8	-9
NED	Closed	983	516	262	82	496,806	576,727	446,477	425,910	13	7	4	1	-6	-9	-12
NED	Open	0	8	0	0	800	2,858	0	1,100	0	0	0	0	0	0	0
SAB	Closed	939	10	0	0	216,264	5,660	3,360	1,360	15	0	0	0	-15	-15	-15
SAB	Open	1,474	1,453	1,018	1,237	385,236	458,775	569,134	410,570	24	22	15	19	-2	-9	-4

THE U.S. NATIONAL PLAN OF ACTION FOR REDUCING THE INCIDENTAL CATCH OF SEABIRDS IN LONGLINE FISHERIES (NPOA): ITS IMPLMENTATION IN THE U.S. ATLANTIC TUNA, SWORDFISH, AND SHARK LONGLINE FISHERIES

ICCAT Resolution on Incidental Mortality of Seabirds

Increased concerns have arisen about the incidental capture of non-target species in various fisheries throughout the world. Incidental capture can be economically wasteful, it impacts living marine resources, and the accidental killing of non-harvested animals may be aesthetically averse. Furthermore, incidental catches of non-target species with low population numbers could contribute to population declines. Incidental catch of non-target marine species such as marine mammals, sea turtles, and seabirds has generated growing concern over the long-term ecological effects of such bycatch in longline and other fisheries conducted in many areas of the world's oceans.

A Resolution on Incidental Mortality of Seabirds (Resolution 02-14) was adopted by ICCAT at its 2002 annual meeting. This resolution urges parties to inform ICCAT's Standing Committee on Research and Statistics (SCRS) and the Commission of the status of their National Plans of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries (NPOA-Seabirds) and to implement such plans, where appropriate. Furthermore, the resolution encourages parties to collect and provide to SCRS all available information on interactions with seabirds, including incidental catches in all fisheries under the purview of ICCAT. The resolution further states that when feasible and appropriate, SCRS should present to the Commission an assessment of the impact of incidental catch of seabirds resulting from the activities of all the vessels fishing for tunas and tuna-like species, in the Convention Area. Visit the ICCAT website at http://www.iccat.es/ for additional information and a copy of the resolution. The United States included seabird information in its National Report to ICCAT in 2004 and 2005.

The *International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries* (IPOA-S) applies to "States" (hereafter Countries) in whose waters longline fishing is being conducted by their own or foreign vessels, and to Countries that conduct longline fishing on the high seas and in the exclusive economic zones (EEZs) of other Countries. The IPOA-S is a voluntary measure that calls on Countries to: (1) assess the degree of seabird bycatch in their longline fisheries; (2) develop individual national plans of action to reduce seabird bycatch in longline fisheries that have a seabird bycatch problem; and (3) develop a course of future research and action to reduce seabird bycatch. The IPOA-S calls for each Country to develop and implement a national plan consistent with the FAO *Code of Conduct for Responsible Fisheries* and all applicable rules of international law, and in conjunction with relevant international organizations.

NPOA-Seabird Executive Summary

The United States voluntarily developed the U.S. *National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries* (NPOA-S) to fulfill its responsibility to address seabird bycatch in longline fisheries. Development of the NPOA-S was a collaborative effort between the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS) and the Department of State (DOS), carried out in large part by the Interagency Seabird Working Group (ISWG) consisting of representatives from those three agencies. This partnership approach recognizes the individual agency management authorities covering seabird interactions with longline fisheries. NMFS manages U.S. fisheries under the authority of the Magnuson-Stevens Fishery Conservation and Management Act and the High Seas Fishing Compliance Act. FWS manages birds predominately under the authority of the Endangered Species Act and the Migratory Bird Treaty Act. In addition, DOS has the lead role in international negotiations on fisheries conservation and management issues that should help promote IPOA implementation by encouraging other nations to develop NPOAs. Given each agency's responsibilities, the NPOA-S was developed collaboratively by NMFS and FWS. This collaborative effort has increased communication between seabird specialists and fishery managers in FWS and NMFS. Maintaining this cooperation is a high priority for both agencies.

The NPOA-S contains the following themes:

1.) Action Items: NMFS, with the assistance of the Regional Fishery Management Councils (Councils), the NMFS Regional Science Centers, and FWS, as appropriate, should conduct the following activities:

- *Detailed assessments of its longline fisheries for seabird bycatch within 2 years of the adoption of the NPOA-S;*
- *If a problem is found to exist within a longline fishery, measures to reduce this seabird bycatch should be implemented within 2 years. These measures should include data collection, prescription of mitigation measures, research and development of mitigation measures and methods, and outreach, education, and training about seabird bycatch; and*
- NMFS, in collaboration with the appropriate Councils and in consultation with FWS, will prepare an annual report on the status of seabird mortality for each longline fishery, including assessment information, mitigation measures, and research efforts. FWS will also provide regionally-based seabird population status information that will be included in the annual reports.

2.) Interagency Cooperation: The continuation, wherever possible, of the ongoing cooperative efforts between NMFS and FWS on seabird bycatch issues and research.

3.) International Cooperation: The United States' commitment, through the DOS, NMFS and FWS, to advocate the development of National Plans of Action within relevant international fora. The development of the NPOA-S has emphasized that all U.S. longline fisheries have unique characteristics, and that the solution to seabird bycatch issues will likely require a multi-faceted approach requiring different fishing techniques, the use of mitigating equipment, and education within the affected fisheries. The NPOA-S does not prescribe specific mitigation measures for each longline fishery; rather, the NPOA-S provides a framework of actions that NMFS, FWS, and the Councils, as appropriate, should undertake for each longline fishery. By working cooperatively, fishermen, managers, scientists, and the public may use this national framework to achieve a balanced solution to the seabird bycatch problem and thereby promote sustainable use of our nation's marine resources.

Detailed assessments should address the following:

- Criteria used to evaluate the need for seabird bycatch mitigation and management measures
- Longline fishing fleet data (numbers and characteristics of vessels)
- Fishing techniques data (demersal, pelagic, and other pertinent technical information)
- Fishing areas (by season and geographic location)
- Fishing effort data (seasons, species, catch, number of sets, and number of hooks/year/fishery)
- Status of seabird populations in the fishing areas, if known
- Estimated total annual seabird species-specific catch and catch-per-unit-effort (number/1,000 hooks set/species/fishery)
- Existing area and species-specific seabird bycatch mitigation measures and their effectiveness in reducing seabird bycatch
- Efforts to monitor seabird bycatch (e.g., observer program and logbooks), and
- Statement of conclusions and decision to develop and implement mitigation measures as needed.

Bycatch of Seabirds in Atlantic Tuna, Swordfish, and Shark Longline Fisheries

The Secretary of Commerce manages Atlantic tunas, swordfish, and sharks - collectively known as highly migratory species or HMS - under the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks. The HMS FMP includes five species of Atlantic tunas (bluefin, yellowfin, albacore, bigeye, skipjack), swordfish, and 39 species of sharks in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. The HMS Management Division assesses seabird bycatch annually in the Stock Assessment and Fishery Evaluation Report for Atlantic HMS.

Description of the Fisheries

Longline fisheries for Atlantic HMS species include the pelagic longline fishery for Atlantic tunas and swordfish and the bottom longline fishery for sharks.

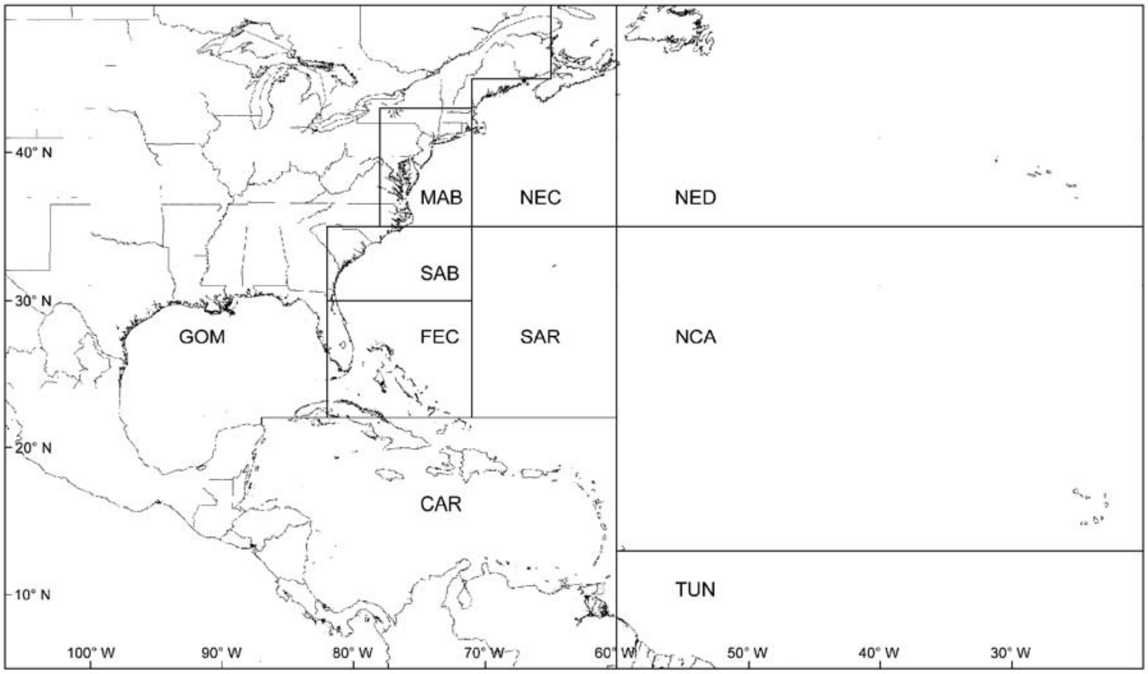


Figure 1. Map indicating National Marine Fisheries Service fishing regions used in analyses of pelagic longline data. The regions illustrated are: Caribbean (CAR), Gulf of Mexico (GOM), Florida East Coast (FEC), Middle Atlantic Bight (MAB), North-Central Atlantic (NCA), Northeast Coastal (NEC), Northeast Distant (NED), Sargasso Sea (SAR), South Atlantic Bight (SAB), and Tuna-North (TUN). The Tuna-South (TUS) region not depicted is south of the TUN.

NMFS observer coverage (by number of sets) covered approximately three to 5 percent annually between 1992 and 2000. Increased sampling in 2001, particularly in the Northeast Distant (NED) area, increased the sampling fraction to over 6 percent. Observer coverage in 2003 outside of the NED experimental fishery was approximately 6.5 percent with 100 percent observer coverage in the NED. Observers collect information about seabird bycatch by species and also photograph the birds. Fishermen are required to submit logbooks for every trip made; however they are not required to report seabird bycatch in logbooks at this time. Commercial pelagic longline fishing occurs throughout the Gulf of Mexico, the entire U.S. Atlantic coast over the continental shelf and slope, and in distant water areas including the central North Atlantic, the Canadian Grand Banks, and parts of the Caribbean Sea (Figure 1). See Garrison (2005) for further description of the Pelagic Observer Program (POP) and the logbook data as it relates to the incidental take of sea turtles and marine mammals.

The Commercial Shark Fishery Observer Program (CSFOP) has documented approximately 4% of the entire U.S. Atlantic commercial large coastal shark landings and 1.6% of all hooks set by the shark bottom longline fishery over the first nine years of the program from 1994-2002. During the 2002 second semi-annual season and the 2003 first semi-annual season, six observers logged 311 sea days on 68 shark fishing trips aboard 22 vessels for 3.8% coverage of all commercial large coastal shark landings. During the 2002 first and second semi-annual seasons, the CSFOP observed 2.5% of all hooks reported set by the shark bottom longline fishery. Observers collect information about seabird bycatch. Starting in 2001, 20 percent of shark fishermen will be selected to submit a supplemental discard form, which includes information on seabird bycatch, as part of their standard logbook submissions.

Seabird Bycatch Assessment.

Atlantic pelagic longline fishery

The observed seabird bycatch from 1992 through 2005 was relatively low (Table 1). Since 1992, a total of 132 seabird interactions have been observed, with 93 seabirds observed killed (70.45 percent) in the Western North Atlantic pelagic longline fishery. In 2005, there were 115 active U.S. pelagic longline vessels operating in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. Total logbook effort consisted of 7,894 sets, the lowest since

1986, when effort was first recorded in the fishery. Observers covered 796 sets in 2005.

Observed bycatch has ranged from 1 to 18 seabirds observed dead per year and 0 to 15 seabirds observed released alive per year from 1992 through 2005. Almost half of the seabirds observed have not been identified to species (n = 58). Of those seabirds identified to family, gulls represent the largest group (n = 36), followed by shearwaters (n = 27). Of those identified to species there were 26 greater shearwaters, 8 northern gannets, and 8 herring gulls (Table 2). The shearwater taxa experienced the highest mortality (89.66 percent), followed by unidentified seabirds (67.24 percent), and gulls (61.54 percent). Northern gannets had the lowest mortality rate (12.5 percent).

The highest number of seabirds observed caught (n = 55) and killed (n = 43; 78.18 percent) was in the Mid Atlantic Bight (MAB) (Table 3). The Northeast Coastal area (NEC) had the second highest number observed caught (n = 42), but the lowest mortality (52.38 percent). The South Atlantic Bight and Northeast Distant had lower numbers of seabirds observed caught (n = 17 and 16, respectively), but relatively high mortality rates (76.47 and 88.69 percent). All but one of the NED birds were reported caught in a special experimental program in which observers covered 100% of the pelagic longline effort. Seabird catches were extremely low in the Gulf of Mexico (GOM) (n=2, 1 killed). No seabird catches were observed in the Florida East Coast (FEC), North-Central Atlantic (NCA), Sargasso Sea (SAR), Caribbean (CAR), Tuna-North (TUN), or Tuna-South (TUS) regions.

Pelagic longline effort (logbook data) and associated observations of bycatch are reported for 11 regions. Over the period 1986-2005, the highest percentage of effort was in the Gulf of Mexico (33.81%), followed by the Florida East Coast (15.93%), the Mid Atlantic Bight (14.31%), and the South Atlantic Bight (9.42%). The other nine regions varied in percent effort from 8.13% in the NEC to less than 1% in the two equatorial regions (Tuna North and Tuna South). Observer coverage is unevenly distributed across regions relative to longline effort (Table 5). The number of birds reported is affected both by the distribution of observer effort in relation to both pelagic longline effort and the distribution of seabirds.

In a recent draft report, Hata (2006) estimated the seabird bycatch of the pelagic longline fleet from 1986 through 2005 (Tables 6 and 7). He used the delta-log normal method described by Yeung (1999) and observer data for the period 1992-2004 to estimate the bycatch, by species, or species group, and year, from 1992 to 2005. Hata used a regression equation based on combined data for the MAB and NEC to estimate bycatch for the period 1986-1991, when there was no observer coverage.

For comparison with Hata's (2006) figures, an annual bycatch estimate based on Yeung (1999) was calculated for this report using data for the period 1992-2005 (Table 8). In this latter approach, one estimator was calculated for each of four regions (MAB, NEC, NED, and SAB) separately and was applied to the logbook effort of each year. An estimate was not made for the GOM region because only two birds were observed caught during the entire 1992-2005 POP record. While the annual estimates differ between approaches, the Hata estimates being more variable from year to year, the average estimated annual catch is very similar: 209 from the Hata approach and 200 from the latter approach. The highest estimated bird bycatch was in the MAB, followed by the NEC, the SAB, and the NED. While less than half of all sets (39.45 percent) took place in the MAB, NEC, NED, and SAB (Table 8), 85.6% of the observed bird bycatch in the period 1992-2005 occurred in these four regions.

Hata (2006) found that number of longline sets, number of hooks deployed, and number of hooks per hour in the POP data were highly correlated, and he based his extrapolation to the logbook effort on the number of seabirds caught per set. Using sets, rather than hooks, as the measure of effort provided advantages in examining the effect of potential influencing factors on the bird bycatch and addressing identifying options for bird bycatch reduction.

The seabird catch was clustered within sets and within trips. A total of 7,256 longline sets was observed in the Pelagic Observer Program between 1992 and 2005 (excluding the NED experiment), and 54 sets were responsible for the 117 seabird captures observed (Table 9). Thirty-one sets caught only one seabird, whereas 23 sets caught more than one and as many as nine birds. The 54 occurrences (sets in which seabirds were captured) were distributed over only 31 trips, with seabirds caught on as many as five sets during a trip. One seabird was caught in each of 14 trips, but more than one bird was caught on 17 trips. One trip accounted for 18 seabirds, distributed among the aforementioned five sets. The bird catch was more distributed in the NED experiment. Twelve sets in 10 trips accounted for the 15 birds caught. No more than two were caught on a set, and no more than three were caught on a trip. This information is based on the draft Hata report for 2006, presently undergoing review and revision.

The 2005 Hata report is available at the Southeast Fisheries Science Center, and the 2006 Hata report will be available shortly (contact Dr. Joan Browder (joan.browder@noaa.gov)).

Table 1. **Seabird Bycatch in the U.S. Atlantic Pelagic Longline Fishery, 1992-2005**
Source: NMFS Pelagic longline fishery observer program (POP).

Year	Type of Bird	Status Alive	 Dead
1992	Gull		4
1992	Greater Shearwater		2
1993	Black-backed Gull	1	3
1993	Gull	1	
1993	Northern Gannet	4	
1994	Herring Gull		7
1994	Gull		4
1994	Greater Shearwater		4
1995	Gull	1	
1995	Northern Gannet	2	
1995	Storm Petrel		1
1995	Seabird		6
1997	Seabird	15	18
1998	Seabird		8
1999	Seabird		1
2000	Laughing Gull	1	
2000	Northern Gannet		1
2001	Greater Shearwater		8
2001	Seabird		1
2002	Laughing Gull		1
2002	Gull	6	1
2002	Northern Gannet	1	
2002	Greater Shearwater	1	4
2002	Shearwater		2
2002	Seabird	3	2
2003	Seabird	1	2
2004	Gull		5
2004	Greater Shearwater	1	4
2004	Seabird		1
2005	Herring Gull		1
2005	Cory's Shearwater		1
2005	Greater Shearwater	1	1
	Total	39	93

MAB - Mid Atlantic Bight, SAB - South Atlantic Bight, NEC - Northeast Coastal, GOM - Gulf of Mexico, NED - Northeast Distant

Note: This tabulation includes the 15 birds (5 alive, 10 dead) caught in the NED Experiment, 2001-2003 (Watson et al. 2005).

Table 2. **Status of Seabird Bycatch in the U.S. Atlantic Pelagic Longline Fishery, 1992-2005.** Source: NMFS Pelagic longline fishery observer program (POP).

Species	Release Status Dead	Release Status Alive	Total	Percent Dead
GREATER SHEARWATER	23	3	26	88.46
CORY SHEARWATER	1		1	100.00
UNID. SHEARWATER	2		2	100.00
HERRING GULL	8		8	100.00
GREAT BLACK-BACKED GULL	3	1	4	75.00
LAUGHING GULL	1	1	2	50.00
UNID. GULL	14	8	22	63.64
NORTHERN GANNET	1	7	8	12.50
STORM PETREL	1		1	100.00
UNID. SEABIRD	39	19	58	67.24
TOTAL ALL SEABIRDS	93	39	132	70.45

Note: This table includes the 15 birds total, 10 dead) of the 2001-2003 NED Experiment (Watson et al. 2005).

Table 3. **Seabird bycatch in the U.S. Atlantic Pelagic Longline Fishery by area, 1992-2005. Source: Modified from Hata (2006).**

Region	All	Dead	Percent dead
CAR	0	0	
FEC	0	0	
GOM	2	1	50.00
MAB	55	43	78.18
NCA	0	0	
NEC	42	24	62.97
NED	16	11	88.69
SAB	17	14	82.35
SAR	0	0	
TUN	0	0	
TUS	0	0	
Total	132	93	70.45

Note: This table includes the 15 birds total, 10 dead) of the 2001-2003 NED Experiment (Watson et al. 2005).

Table 4. **Pelagic longline effort (number of sets), by region, for 1986-1991, 1992-2005, and total period. (modified from Hata 2006).**

Region	Period		Total	
	1986-1991	1992-2005	Amount	Percent
CAR	8,806	9,662	18,468	6.93
FEC	19,124	23,314	42,438	15.93
GOM	26,464	63,601	90,065	33.81
MAB	10,670	27,448	38,118	14.31
NCA	445	4,483	4,928	1.85
NEC	7,788	13,884	21,672	8.13
NED	6,928	9,712	16,640	6.25
SAB	5,395	19,699	25,094	9.42
SAR	308	1,588	1,896	0.71
TUN	582	1,966	2,548	0.96
TUS	174	1,433	1,607	0.60
UNK	397	2,551	2,948	1.11
Total	87,081	179,341	266,422	100.00

Note: This table includes the observed effort (1,225 sets) of the 2001-2003 NED Experiment (Watson et al. 2005)

Table 5. **Observer coverage in relation to pelagic longline effort (sets), by region, 1992-2005, without and with NED Experiment of 2001-2003, in which observers covered 100% of effort.**

Region	Logbook sets (w/o NED 2001-2003)	Observed sets		Logbook sets (incl NED 2001-2003)	Observed sets	
		Number	Percent		Number	Percent
CAR	9,662	262	2.71	9,662	262	2.71
FEC	23,314	747	3.20	23,314	747	3.20
GOM	63,601	2,754	4.33	63,601	2,754	4.33
MAB	27,448	1,155	4.21	27,448	1,155	4.21
NCA	4,483	330	7.36	4,483	330	7.36
NEC	13,884	536	3.86	13,884	536	3.86
NED	9,712	502	5.17	9,712	1,727	17.78
SAB	19,699	819	4.16	19,699	819	4.16
SAR	1,588	83	5.23	1,588	83	5.23
TUN	1,966	33	1.68	1,966	33	1.68
TUS	1,433	35	2.44	1,433	35	2.44
UNK	2,551			2,551		
Total	179,341	7,256	4.05	179,341	8,481	4.73

Note: In the NED Experiment, 2001-2003, observers covered 100% of effort, 1,225 sets.

Table 6. **Expanded estimates of seabird bycatch (alive and dead) in the U.S. Atlantic pelagic longline fishery, 1986-2005.** Source: Hata (2006). (Draft report in review.)

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Ave.
Gulls							160	84	206	24					22		248		61	18	59
Gannets								83		48					22						11
Seabirds										140		1109	380	28			36	39	6		124
Shearwaters							80		74							283			75	*	37
Storm-petrels										24											2
All	19	136	136	194	229	219	240	167	280	235	0	1109	380	28	44	283	284	39	142	18	209

*2005 shearwater bycatch was underestimated by Hata (2006) due to inadvertent omission of data from the 2005 Experiment.

Table 7. **Expanded estimates of dead seabird bycatch in the U.S. Atlantic pelagic longline fishery, 1986-2005.** Source: Hata (2006). (Draft report in review.)

Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Ave.
Gulls							80	50	206						0		36		61	18	32
Gannets								0		0					22						2
Seabirds										140		623	380	28			36	20	6		88
Shearwaters							80		74							283			61	*	36
Storm-petrels										24											2
All	13	93	93	132	156	149	160	50	280	164	0	623	380	28	22	283	71	20	128	18	143

*2005 shearwater bycatch was underestimated by Hata (2006) due to inadvertent omission of data from the 2005 Experiment.

Table 8. **a. Pelagic longline effort (number of sets reported in logbooks), by year, for the Mid Atlantic Bight (MAB), Northeast Coast (NEC), South Atlantic Bight (SAB), and Northeast Distant (NED), 1992-2005,showing the proportion of total effort in these regions, and b. estimated number of seabirds taken in pelagic longline gear for the same regions and years.**

a.	Number of logbook sets					1992-2005		**b.** Estimated number of birds*				
Year	MAB	NEC	NED	SAB	Sum	Total	Percent	MAB	NEC	NED	SAB	Sum
1992	2,555	1,449	1,205	1,097	6,306	15,691	40.19	119	108	15	21	263
1993	2,833	1,303	1,088	1,658	6,882	15,603	44.11	132	97	13	31	274
1994	3,269	1,078	1,034	1,914	7,295	15,624	46.69	152	81	13	36	281
1995	3,387	1,315	978	1,680	7,360	16,254	45.28	158	98	12	31	300
1996	1,655	1,401	705	2,852	6,613	16,523	40.02	77	105	9	53	244
1997	1,888	1,529	764	1,715	5,896	15,243	38.68	88	114	9	32	244
1998	1,885	1,080	622	1,403	4,990	12,325	40.49	88	81	8	26	202
1999	1,829	736	409	1,402	4,376	12,138	36.05	85	55	5	26	172
2000	1,650	750	603	1,308	4,311	12,025	35.85	77	56	7	24	165
2001	1,664	1,016	333	1,257	4,270	10,857	39.33	78	76	4	24	181
2002	1,400	686	514	779	3,379	9,847	34.32	65	51	6	15	137
2003	964	557	538	895	2,954	9,524	31.02	45	42	7	17	110
2004	1,210	551	456	1,001	3,218	9,793	32.86	56	41	6	19	122
2005	1,259	433	463	738	2,893	7,894	36.65	59	32	6	14	111
Total	27,448	13,884	9,712	19,699	70,743	179,341	39.45	1,280	1,037	118	369	2,804
Average	1,961	992	694	1,407	5,053	12,810		91	74	8	26	200
Percent	15.30	7.74	5.42	10.98	39.45	100.00		45.64	36.99	4.22	13.15	100.00

*Estimated by delta method of Yeung [1999], using a multiplier calculated from data by region, combined across years.

Table 9. **Observed seabird catch rate in the U.S. Atlantic pelagic longline fishery, 1992-2005 (excluding the NED experiment of 2001-2003, in which coverage was 100%, differing from the rest of Pelagic Observer Program).**

			Number of seabirds		Number of occurrences		Catch rate	
Year	Sets	Hooks	All	Dead	All	Dead	per set	per 1000 hooks
1992	329	194,706	6	6	1	1	0.018	0.031
1993	817	524,551	9	3	5	2	0.011	0.017
1994	650	411,996	15	15	6	6	0.023	0.036
1995	686	472,105	10	7	6	5	0.015	0.021
1996	356	220,223	0	0	0	0	0	0
1997	451	311,520	33	18	11	8	0.073	0.106
1998	287	175,408	8	8	2	2	0.028	0.046
1999	424	285,083	1	1	1	1	0.002	0.004
2000	465	312,574	2	1	2	1	0.004	0.006
2001	398	284,198	8	8	4	4	0.02	0.028
2002	344	260,167	8	2	5	2	0.023	0.031
2003	551	427,575	2	1	2	1	0.004	0.005
2004	702	525,170	11	10	6	5	0.016	0.021
2005	796	581,607	4	3	2	2	0.005	0.007
Total	7,256	4,986,883	117	83	52	39	0.016	0.023

Current Seabird Mitigation Efforts

Management measures recently implemented in the U.S. Atlantic longline fisheries to protect other species may also provide protection for seabirds; however no protective measures have been implemented specifically for seabirds. Time/area closures for the pelagic longline fishery are in place in the Gulf of Mexico, along the east coast of Florida, in the Charleston Bump, in the Northeast Distant area, and in the Mid-Atlantic Bight. In addition, there is a bottom longline time/area closure off North Carolina, effective from January-June to protect juvenile and adult dusky sharks and juvenile sandbar sharks. Such closures may positively affect seabirds. Seabirds are known to concentrate in the area off Cape Hatteras (Lee 1999), (an area that spans the boundary between MAB and SAB). Forty-nine seabird species are known to occur in that area seasonally, and 17, including four rare petrel species may be of some conservation concern (Lee1999). Evidence presented at international workshops has indicated that streamer lines, line-shooters, and other measures can be effective in reducing the bycatch of seabirds in longline fisheries.

The requirement to use circle hooks in the U.S. Atlantic pelagic longline fishery, implemented in August 2004 to reduce the bycatch of turtles, also may reduce the seabird bycatch. Hata's 2005 report suggested an influence of hook type, with the number of birds caught on circle hooks less than would be expected by chance. Hata (2006) found that hook type significantly affected the occurrences of seabirds in longline sets, and the number of seabirds caught on J hooks was greater, and the number caught on circle hooks was less, than expected. A follow-up analysis of sets with birds vs. sets without birds that included the four seabird captures of 2005 (four birds on three sets, all on circle hooks) (Table 9) found that the distribution of sets that caught birds was significantly different ($p=0.015$) from the distribution of sets that did not catch birds across four categories: circle hooks, J-hooks, mixed hooks, and unidentified hook type.

The use of line weights may also reduce the seabird take. For the five regions in which seabird captures occurred, Hata (2006) found that the proportion of seabird capture sets using extra line weights was much lower than the proportion for all other sets in the regions, and a follow-up analysis confirmed this conclusion. Seabirds take baits from hooks floating at or near the surface during setting and, to a lesser degree, during gear haul (Brothers and Foster 1997). Added line weights and thawed baits increase sinking rates, shortening the time that seabirds are attracted to the bait. For this reason, the use of line weights and thawed baits are recommended mitigation measures to reduce seabird captures (FAO 1999).

The possible influence of target species on seabird capture is also being examined in order to expand our knowledge of factors influencing bird bycatch and, potentially, to improve the accuracy and precision of estimates of bird bycatch of the longline fleet. Table 10, modified from Hata (2006), shows the distribution of bird bycatch across target species, including swordfish, yellowfin tuna, big-eye tuna, unspecified tuna, dolphin (*Coryphaena* spp.), mixed species, and unspecified sharks. One can see that higher bird catches, proportionally, occur on sets with mixed-species and dolphin sets than on the swordfish, yellowfin, and mixed tuna sets, and Hata's analysis and follow-up analysis of data that include the 2004 and 2005 experiments suggests that this difference is significant.

The Hata (2006) analysis inadvertently did not include the 60 sets in the Gulf of Mexico of the 2004 Experiment and the 247 sets in the Gulf of Mexico and other regions of the 2005 Experiment (access provided courtesy of NOAA, S. Epperly and J. Watson). While no birds were observed caught in data of the 2004 Experiment, two Greater Shearwater, one alive and one dead, caught in the NEC, are part of the observed bycatch of the 2005 Experiment. The 2004 and 2005 Experiments, unlike the 2001-2003 NED Experiment, are a part of the routine POP program with the same percent coverage, and should be included in the analysis of bird bycatch (S. Epperly and J. Watson, pers. comm.). In addition, due to a new species code, a Cory's Shearwater caught in the SAB was inadvertently not included (Hata 2006). The inclusion of this specimen is important as it was the first recorded catch of this species in the POP. Thus, follow-up analyses were conducted to incorporate the additional records. Hata's significance tests were chi-square tests. The follow-up analyses used both chi-square and likelihood tests.

Table10. **Number and percent of longline sets made and seabirds captured by target species in the Pelagic Observer Program, 1992-2005. Also shown are percent of sets that used extra line weights and number of seabirds caught per set. Target species are: BET-bigeye tuna; DOL-dolphin (*Coryphaena* spp.); SHX-unspecified sharks; MIX-two or more target species; SWO-swordfish; TUN-unspecified tuna; YFT-yellowfin tuna.**

		Target species							
		BET	DOL	SHX	MIX	SWO	TUN	YFT	Total
Sets observed	n	142	20	32	1835	3062	1059	1106	7257
	%	1.96	0.28	0.44	25.29	42.20	14.59	15.24	100
Added line weight sets	n	14	0	3	706	383	180	417	1703
	%	9.86	0	9.38	38.47	12.51	17.00	37.70	23.47
Seabirds caught	n	1	11	0	66	16	15	8	117
	%	0.85	9.40	0.00	56.41	13.68	12.82	6.84	100
Birds per set		0.007	0.550	0.000	0.036	0.005	0.014	0.007	0.016

Modified from Hata (2006).

Status of Seabird Populations

Population estimates for the Western North Atlantic are being compiled for those taxa specifically noted in the U.S. Atlantic longline catch, as well as other seabird species of the region (David Lee, in prep.). The catch identified to species presently includes only Northern Gannet, Greater Shearwater, Cory's Shearwater, and three gull species: Herring, Laughing, and Great Black-Backed. In addition a storm petrel of unknown species was recorded. The Greater Shearwater is classified as a species at "high" risk in the North American Waterbird Conservation Plan (NAWCP) (Kushlan et al. 2002), although Williams (1984) estimated the breeding population at about 5 million pairs. The classification is based on the tendency of this species to aggregate in large groups for breeding (nests are concentrated on a few small islands in the South Atlantic) and migration, placing parts of the population at the same place at the same time. The Cory's Shearwater, a cosmopolitan species, is listed as a species of "moderate concern" by the NAWCP, although also abundant. The other four named species are classified as at "low" risk or "not currently at risk" in Kushlan et al. (2002), who estimate their North and Central American and Caribbean populations at 248,000 breeders (herring gull), 528,000-538,000 breeders (laughing gull), and 121,430 breeders (Great Black-Backed Gull) and 155,456 breeders (Northern Gannet). (All but the Herring Gull occurs almost exclusively in the Atlantic Ocean and Gulf of Mexico). On the other hand, based on Brown et al. (1984), Lee (in prep) estimates that there are about 33,000 pairs of Northern Gannets in the Western North Atlantic. Gannet age groups migrate separately, and some age groups might be more vulnerable to the longline than others.

Forty-four percent of the seabird catch of the U.S. Atlantic pelagic longline fleet from 1992-2005 was identified only as "seabird". Another 19 percent was identified only as unspecified gull, shearwater, or and storm petrel. Thus more than half of the bycatch was not identified to species. This must improve to adequately evaluate the potential risks of this added source of mortality to seabird populations. We anticipate improved seabird identifications with new training efforts in the Pelagic Observer Program, instituted in 2004, and support from seabird expert David Lee (formerly North Carolina State Museum). One hundred percent of the four seabirds observed captured in 2005 were identified to species, three on the basis of photographs submitted to David Lee.

Some seabird species with very small population sizes occur in the areas of the Western North Atlantic where seabird bycatch is reported. These include the rare and endangered Bermuda Petrel, which may be reduced to less than 50 pair (Lee in prep), and several other petrel species numbering from a few hundred to a few thousand. Seabirds as a group are vulnerable to added mortality because they are long-lived (some over 30 years) and late maturing (four or five years of age) and produce only a few young (often just one) in a nesting season. Their nesting success and survival is threatened especially at nesting sites by introduced predators, loss of habitat, and human disturbance—problems that continue to increase, despite conservation efforts. Actual and potential losses to U.S. and other longline fisheries need to be better known

Conclusion

Estimated seabird bycatch in Atlantic HMS pelagic and bottom longline fisheries is small compared to that in other parts of the world, and there does not appear to be a general problem with seabird bycatch in these fisheries. Accordingly, no mitigation measures are proposed at this time. It must be recognized that species-specific problems could exist and not be known. Events so rare in the fishery that they are not likely to be noted might be significant events in a bird population of very small size. Therefore, NMFS intends to continue to collect data on seabird bycatch through observer programs and supplemental logbooks programs and to increase the species-specific identification of seabirds observed. In addition, NMFS will continue to seek opportunities to reduce bird bycatch. NMFS will reassess seabird bycatch in these fisheries as new information becomes available.

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