4. FISHERY DATA UPDATE

In this section of the 2003 SAFE report, HMS fishery data, with the exception of some data on Atlantic sharks, are analyzed by gear type; section 4.6 provides a summary of landings by species. While HMS fishermen generally target particular species, the non-selective nature of most fishing gears promote more effective analysis and management on a gear-by-gear basis. In addition, issues such as bycatch, and safety are generally better addressed by gear type. A summary of catch statistics can be found in Section 4.6 of this report.

The revised list of authorized fisheries (LOF) and fishing gear used in those fisheries became effective December 1, 1999 (64 FR 67511). The rule applies to all U.S. marine fisheries, including Atlantic HMS. As stated in the rule, "no person or vessel may employ fishing gear or participate in a fishery in the exclusive economic zone (EEZ) not included in this LOF without giving 90 days' advance notice to the appropriate Fishery Management Council (Council) or, with respect to Atlantic highly migratory species (HMS), the Secretary of Commerce (Secretary)." Acceptable HMS fisheries and authorized gear types for Atlantic tunas, swordfish, and sharks include: swordfish handgear fishery - rod and reel, harpoon, handline, bandit gear; pelagic longline fishery - longline; shark drift gillnet fishery - gillnet; shark bottom longline fishery - longline; shark handgear fishery - rod and reel, handline, bandit gear; tuna purse seine fishery - purse seine; tuna recreational fishery- rod and reel, handline; tuna handgear fishery - rod and reel, harpoon, handline, bandit gear; and tuna harpoon fishery - harpoon. For Atlantic billfish, the only acceptable fishery and authorized gear type is recreational fishery - rod and reel. Species whose life history characteristics may lead to their eventual categorization as highly migratory, but which are not currently under Secretary of Commerce or Regional Council management authority, are covered in two broad categories: Recreational Fisheries (Non-FMP) and Commercial Fisheries (Non-FMP). Species that fit this description may be harvested with the gears listed for these catchall categories.

Due to the nature of SCRS data collection, Table 4.1 depicts a summary of U.S. and international HMS catches by species rather than gear type. International catch levels are taken from the 2002 Standing Report of the SCRS, while U.S. reported catches, other than sharks, are taken from the U.S. National Report. The U.S. percentage of regional and total catches for HMS species are presented (Table 4.1) to provide a basis for comparison of the U.S.' catches relative to other nations/entities. Catch of billfish includes both recreational landings and dead discards from commercial fisheries; catch for bluefin tuna and swordfish include commercial landings and discards. Historical catch levels dating back to 1950 can be found in the SCRS Report and a discussion of typical species-specific U.S. catch levels can be found in the HMS FMP. International catch and landings tables are included for the longline and purse seine fisheries in Sections 4.1.3 and 4.2.3 of this report. At this point, data necessary to assess the U.S. regional and total percentage of international catch levels for Atlantic shark species are unavailable.

Table 4.1 **Calendar Year 2001 U.S. vs International Catch of HMS (mt ww) other than sharks.** Source: SCRS, 2002; NOAA Fisheries, 2002b).

Species	Total International Reported Catch	Region of U.S. Involvement	Total Regional Catch	U.S. Catch	U.S. Percentage of Regional Catch	U.S. Percentage of Total Atlantic Catch
Atlantic Swordfish	39,486* (includes N. & S. Atlantic and Mediterranean)	North Atlantic (NA)	10,323*	2,505	24.27%	6.45%
		South Atlantic (SA)	14,539*	43	0.30%	
Atlantic Bluefin Tuna	Unknown**	West Atlantic	2,395	1,212 (173 mt discards)	50.61%	3.36%
Atlantic Bigeye Tuna	96,482	Total Atlantic	96,482	1085	1.12%	1.12%
Atlantic Yellowfin Tuna	157,269	West Atlantic	37,814	6,703	17.73%	4.26%
Atlantic Albacore Tuna	66,640 (includes N. & S. Atlantic and Mediterranean)	North Atlantic	24,955	322	1.29%	0.49%
		South Atlantic	34,616	2	0.005%	
Atlantic Skipjack Tuna	143,217	West Atlantic	33,230	70	0.21%	0.05%
Atlantic Blue Marlin	1,915	North Atlantic	515	39	7.57%	2.04%
Atlantic White Marlin	622	North Atlantic	222	19.6	8.83%	3.15%
Atlantic Sailfish	1741	West Atlantic	835	72.7	8.62%	4.17%

* Actual catches are likely higher given significant non-compliance with ICCAT reporting requirements.
** Significant non-compliance with ICCAT reporting requirements prevented SCRS from estimating aggregate 2001 eastern Atlantic bluefin tuna catches.

4.1 Fishery Data: PELAGIC LONGLINE

4.1.1 Overview of History and Current Management

U.S. pelagic longline fishermen began targeting HMS in the Atlantic Ocean in the early 1960s. However, U.S. landings of swordfish did not exceed 1500 mt (ww) until the mid-1970s. Since that time, the gear deployed has evolved several times. The majority of fishermen use monofilament mainline that is rigged differently depending upon whether the vessel is "targeting" tunas or swordfish. The term "targeting" is used because there are differences in the location, timing, and gear configuration that are specific to the tuna or swordfish target. For example, fishing for yellowfin tuna tends to occur during the day, while swordfish fishing usually occurs at night. However, the use of pelagic longline gear also results in the incidental catch of other pelagic species. The incidental catch includes species that are retained or discarded for economic and regulatory reasons. A complete discussion of the pelagic longline fishery may be found in the final environmental impact statement (EIS) to reduce bycatch in the Atlantic pelagic longline fishery (NOAA Fisheries, 2000) and in the final supplemental EIS to reduce sea turtle bycatch (NOAA Fisheries, 2002). This gear type is possibly the most regulated of all HMS gear types due to the nature of the gear and its catch/bycatch.

Bycatch in the pelagic longline fishery is discussed in Section 4.1.4 and in Section 8 of this document. Like fishermen using other fishing gears, pelagic longline fishermen are subject to minimum sizes for yellowfin, bigeye, and bluefin tuna, and swordfish to reduce the mortality of small fish. Pelagic longline fishermen are also subject to target catch requirements in order to retain bluefin tuna. These regulatory discards compose a large portion of the bycatch in the fishery. In some areas and at certain times of the year, much of the bycatch in this fishery is released dead. Because it is difficult for pelagic longline fishermen to avoid undersized fish in some areas, NOAA Fisheries has closed areas in the Gulf of Mexico and along the east coast. The intention of these closures is to relocate some of the fishing effort into areas where bycatch is expected to be lower. There are also time/area closures for pelagic longline fishermen designed to reduce the incidental catch of bluefin tuna and sea turtles. In order to enforce time/area closures and to monitor the fishery, NOAA Fisheries issued a rule to require all pelagic longline vessels to report positions on an approved vessel monitoring system (VMS), but this rule was suspended due to ongoing litigation. A court recently upheld the validity of the rule, and NOAA Fisheries is taking necessary steps to implement the VMS program.

In addition to regulations designed to reduce bycatch and bycatch mortality, pelagic longline fishermen are subject to quota management for swordfish, sharks, and bluefin tuna. Quota monitoring requires seasonal regulations, closures, and in some cases target catch requirements. In order to document catch and effort, pelagic longline fishermen are subject to permitting and reporting requirements, including logbooks and observer coverage. In 1999, NOAA Fisheries established a limited entry system for swordfish, shark, and tuna longline category permits. Pelagic longline fishermen who target swordfish or BAYS tunas must have swordfish, shark, and tuna longline category permits. NOAA Fisheries is re-evaluating the

limited access program and may consider gear-specific permits in the future. Refer to Section 9 for information relating to limited access permits.

4.1.2 Most Recent Catch and Landings Data

Pelagic longline fishermen encounter as many as 40 different species in a trip. Table 4.1.1 indicates the 1997-2001 catches of HMS by U.S. pelagic longline fishermen in the Atlantic Ocean.

Table 4.1.1 **Estimated U.S. Pelagic Longline HMS Catches: Calendar Years 1997-2001 (mt ww)***. Source: NOAA Fisheries 2002 National Report.

	1997	1998	1999	2000	2001
Swordfish *landings*	3,350.1	3,158.9	3,047.6	2,968.6	2,526.2
Swordfish *dead discards***	446	433	494	490	293
Yellowfin Tuna	3,773.6	2,447.9	3,374.9	2,901.2	2,200.1
Bigeye Tuna	794.8	695.3	929.1	531.9	682.5
Bluefin Tuna *landings*	49.8	48.8	73.5	66.1	37.5
Bluefin Tuna *dead discards****	37.1 - 148	64 - 102	30 - 151	67 - 173	25 - 86
Albacore Tuna	189.1	179.7	194.5	147.3	193.8
Skipjack Tuna	3.5	1.3	2.0	1.8	4.3
Blue Marlin*****	138.1	51.8	82.1	59.6	22.4
White Marlin*****	70.8	32.1	56.7	40.8	16.5
Sailfish*****	57.7	27.1	71.6	45.4	10.7
Total	**8,910.6 - 9,021.5**	**7,139.9 - 7,177.9**	**8,356.0 - 8,477.0**	**7,319.7 - 7,425.7**	**6,012.0 - 6,073.0**

* Atlantic sharks are caught on pelagic longlines, however, the methods for reporting data on Atlantic sharks do not allow for their inclusion in this table. The table also does not include other species caught by this gear, e.g., dolphin, wahoo, etc.
** Post-release mortality of swordfish released alive is not estimated by NOAA Fisheries at this time. Source: SCRS 2002.
*** Estimates of bluefin tuna discards vary depending upon the method used to calculate discards.
***** Indicates longline *dead discards* of these species.

4.1.3 U.S. vs. International Catch

For 2001, the provisional estimate of U.S. vessel landings and dead discards of swordfish (North and South Atlantic) was 2,568.4 mt (98 percent of these are longline landings and discards). This estimate is 27 percent lower than the estimate of 3,497.1 mt for 2000. A decline

in U.S. landings of swordfish in recent years is partially due to the U.S. implementation of quotas. The large decrease from 2000 to 2001 is attributable to the closures in the Gulf of Mexico, off the southeast coast, and in the northeast distant area. The 2002 stock assessment demonstrated that the status of North Atlantic swordfish has improved dramatically due to high levels of recruitment since 1997 and the catch restrictions implemented as part of the ICCAT recovery plan. Anecdotal evidence indicates that more small swordfish are being encountered by pelagic longline fishermen throughout the Atlantic Ocean. The following table shows the proportion of the total longline harvest that is landed by the United States.

Table 4.1.2 Estimated International Longline Landings of HMS, other than Sharks, for All Countries in the Atlantic: 1997-2001 (mt ww)*. Source: SCRS, 2002

	1997	1998	1999	2000	2001
Swordfish (N.Atl + S. Atl)	30,425	24,432	25,362	24,934	21,420
Yellowfin Tuna (W. Atl)**	8,823	8,795	11,805	11,370	11,816
Bigeye Tuna	68,251	71,825	78,864	70,377	55,159
Bluefin Tuna (W. Atl.)**	382	764	914	859	540
Albacore Tuna (N. Atl + S. Atl)	23,491	23,574	27,181	28,814	29,626
Skipjack Tuna (N. Atl + S. Atl)	65	99	51	60	70
Blue Marlin (N. Atl. + S. Atl.)***	3,477	2,467	2,378	2,108	1,499
White Marlin (N. Atl. + S. Atl.)***	905	885	923	854	557
Sailfish (W. Atl.)***	439	1,229	719	934	531
Total	**136,258**	**134,070**	**148,197**	**140,310**	**121,218**
U.S. Longline Landings (from U.S. Natl. Report, 2000)#	**8,910.6**	**7,139.9**	**8,356.0**	**7,319.7**	**6,012.0**
U.S. Longline Landings as a Percent of Total Longline Landings	**6.5**	**5.3**	**5.6**	**5.2**	**5.0**

* Landings include those classified by the SCRS as longline landings for all areas
** Note that the United States has not reported participation in the E. Atl yellowfin tuna fishery since 1983 and has not participated in the E. Atl bluefin tuna fishery since 1982.
***Includes U.S. *dead discards*.
Includes swordfish longline discards and bluefin tuna discards.

The U.S. longline fleet has historically accounted for a small percent of total Atlantic landings of HMS. Even when including U.S. discards for bluefin tuna, swordfish, blue marlin, white marlin, and sailfish, the U.S. percentage still remains around 5 to 6 percent of all longline landings reported to ICCAT. The United States continues to work internationally to encourage other nations to protect overfished HMS.

4.1.4 Bycatch Issues and Data Associated with the Pelagic Longline Fishery

Fish are discarded in pelagic longline fisheries for a variety reasons. As in other HMS fisheries, swordfish, yellowfin tuna, and bigeye tuna may be discarded because they are undersized or unmarketable (e.g., shark bitten). Blue sharks, as well as other species, are discarded because of a limited markets (resulting in low prices) and perishability of the product. Large coastal sharks are discarded during times when the shark season is closed. Bluefin tuna may be discarded because target catch requirements for other species have not been met. Also, all billfish and protected species including mammals, sea turtles, and seabirds are required to be released. In the past, swordfish have been discarded when the swordfish season is closed.

Bycatch mortality of marlins, swordfish, and bluefin tuna from all fishing nations may significantly reduce the ability of these populations to rebuild, and it remains an important management issue. NOAA Fisheries is also concerned about serious injuries to sea turtles and marine mammals as a result of interactions with pelagic longline gear. In order to minimize bycatch and bycatch mortality in the pelagic longline fishery, NOAA Fisheries implemented regulations to close areas to longline fishing (Figure 4.1.1) and has banned the use of live bait by longline vessels in the Gulf of Mexico.

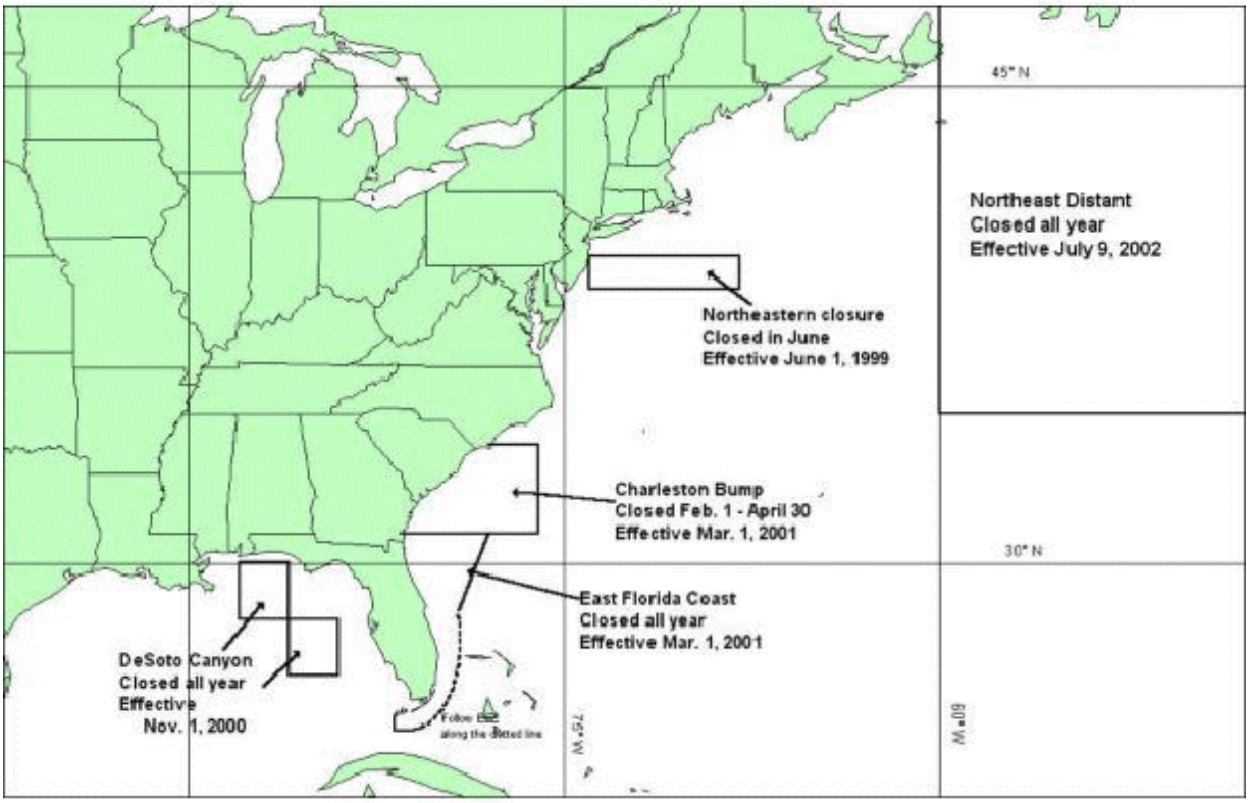


Figure 4.1.1. Areas Closed to Pelagic Longline Fishing by U.S.- Flagged Vessels.

Observer Program

Five hundred ninety-one longline sets were observed and recorded by NOAA Fisheries observers in 2001 (6.3% overall coverage - 100% coverage in the northeast distant statistical sampling area (NED); and 4.2% coverage in remaining areas). Table 4.1.3 compares the amount of observer coverage in past years for this fleet. The HMS BiOp requires that 5 percent of the pelagic longline trips be selected for observer coverage. In addition, ICCAT requires 5 percent observer coverage for all trips targeting yellowfin tuna and/or bigeye tuna. Unfortunately, due to logistical problems, it has not been possible to place observers on all selected trips. NOAA Fisheries is working towards improving compliance with observer requirements and facilitating communication between vessel operators and observer program coordinators. In addition, fishermen are reminded of the safety requirements for the placement of observers specified at 50 CFR 600.746, and the need to have all safety equipment on board required by the U.S. Coast Guard.

Table 4.1.3 Observer Coverage of the Pelagic Longline Fishery. Source: Yeung, 2001 & Lee pers.com..

Year	Number of Sets Observed	Percentage of Total Number of Sets
1995	696	5.2
1996	361	2.5
1997	448	3.1
1998	287	2.9
1999	420	3.8
2000	464	4.2
2001	591	6.3

Marine Mammals

In accordance with the Marine Mammal Protection Act (MMPA), NOAA Fisheries published draft stock assessment reports for Atlantic and Gulf of Mexico marine mammals. These species are sometimes captured on pelagic longline gear and fishermen report takes of mammals to NOAA Fisheries in a marine mammal logbook. The Atlantic pelagic longline fishery is considered a Category I fishery under MMPA. In 2000, there were 14 observed takes of marine mammals by pelagic longlines. This number has been extrapolated out to an estimated 403 mammals fleet-wide (32 common dolphin, 93 Rissa's dolphin, 231 pilot whale, 19 whale, 29 pygmy sperm whale) (Yeung, 2001). In addition to mammals released *dead* from fishing gear, which is uncommon in the pelagic longline fishery, NOAA Fisheries must consider post-release mortality of mammals released *alive*.

Sea Turtles

The Atlantic pelagic longline fishery exceeded the authorized level of takes of loggerhead sea turtles in 1999. A Biological Opinion was completed on June 14, 2001, that found that the actions of the pelagic longline fishery jeopardized the continued existence of loggerhead and leatherback sea turtles. The document reported that the pelagic longline fishery interacted with an estimated 991 loggerhead and 1012 leatherback sea turtles in 1999. The estimated take levels for 2000 are 1256 loggerhead and 769 leatherback sea turtles (Yeung 2001). An emergency rule was published on July 13, 2001, (66 FR 36711) that closed the NED area and modified how pelagic longline gear could be deployed. On December 13, 2001, NOAA Fisheries extended the emergency rule for 180 days (66 FR 64378). On July 9, 2002, NOAA Fisheries published a final rule (67 FR 45393) implementing the NED area closure and required gear modifications.

Seabirds

Gannets, gulls, greater shearwaters, and storm petrels are occasionally hooked by Atlantic pelagic longlines. These species and all other seabirds are protected under the Migratory Bird Treaty Act. Seabird populations are often slow to recover from excess mortality as a consequence of their low reproductive potential (one egg per year and late sexual maturation). According to NOAA Fisheries observer data from 2002, seven gulls, seven unidentified seabirds, four greater shearwaters, two shearwaters, and one northern gannet were hooked between June and November. The majority of longline interactions with seabirds occur as the gear is being set. The birds eat the bait and become hooked on the line; the line sinks and the birds are subsequently drowned.

The United States has developed a National Plan of Action in response to the FAO International Plan of Action to reduce the incidental take of seabirds (www.nmfs.gov.gov/NPOA-S.html). Although Atlantic pelagic longline interactions will be considered in the plan, NOAA Fisheries has not identified a need to implement gear modifications to reduce seabird takes by Atlantic pelagic longlines. Takes of seabirds have been minimal in the fishery, most likely due to the setting of longlines at night and/or fishing in areas where birds are largely absent.

Finfish

At this time, direct use of observer data with pooling for estimating dead discards in this fishery represents the best scientific information available for use in stock assessments. Direct use of observer data has been employed for a number of years to estimate dead discards in Atlantic and Pacific longline fisheries, including billfish, sharks, undersized swordfish, and sea turtles. Furthermore, the data have been used for scientific analyses by both ICCAT and the Inter-American Tropical Tuna Commission for a number of years.

The estimated aggregate weight of dead discards of swordfish, sailfish, blue marlin, and white marlin decreased in 2000 compared to 1999 levels. The weight of pelagic, blue, night, dusky and silky sharks discarded dead decreased, while the weight of coastal and hammerhead sharks discarded dead increased (Cramer, pers. comm.). The most recent longline bycatch data are available in the 2002 U.S. National Report to ICCAT (NMFS, 2002). Dead discards of swordfish in the pelagic longline fishery in 2001 were estimated at 293 mt ww, a decrease from the 2000 level of 490 mt ww (SCRS, 2002).

Longline bycatch of billfish decreased substantially in every area except in the Caribbean, where it remained fairly constant. in 2001 compared to 2000. Estimated billfish dead discards from commercial longlines were 22.4 mt for blue marlin, 16.5 mt for white marlin, and 10.7 mt for sailfish in 2001. In 2000, 59.6 mt of blue marlin, 40.8 mt of white marlin, and 45.2 mt of sailfish were reported as dead discards. Bluefin tuna dead discards from the pelagic longline fishery were 25 to 113 mt in 2001, depending on the methodology used for estimation, which is a decrease from the 2000 levels of 67 to 173 mt.

4.1.5 Northeast Distant Area Experimental Fishery

The June 14, 2001, Biological Opinion included a recommendation that NOAA Fisheries conduct a three-year experimental fishery in the northeast distant statistical reporting area to attempt to reduce the interactions between pelagic longline gear and sea turtles. In the fall of 2001, NOAA Fisheries conducted the first year of the experimental fishery. The measures that were examined included the use of blue-dyed bait and spacing the gangions lines farther away from the float lines. During the course of the experiment, 184.5 sets were observed with 100 percent observer coverage. The participating vessels captured 111 loggerhead and 76 leatherback sea turtles. All the sea turtles were released alive and 16 loggerheads were tagged with satellite tags. In addition to the sea turtles, the vessels interacted with 4 Rissa's dolphin, 1 northern bottlenose whale, and 1 striped dolphin. Following an examination of the data, NOAA Fisheries discovered that the measures had no significant effect upon the catch of sea turtles.

In the summer and fall of 2002, NOAA Fisheries conducted the second year of the experimental fishery. The use of circle hooks, mackerel bait, and shortened daylight soak time were tested to examine their usefulness in reducing the capture of sea turtles. Based on the preliminary information, there were 495 sets made with 100 percent observer coverage by 14 vessels. During the course of the experiment, 100 loggerhead and 158 leatherback sea turtles were captured and 11 were tagged with satellite tags. In addition to the sea turtles, the vessels interacted with 1 unidentified marine mammal, 1 unidentified dolphin, 1 common dolphin, 1 longfin pilot whale, and 4 Rissa's dolphins; all were released alive. NOAA Fisheries is currently waiting for statistical analyses to be performed to assess the effectiveness of the experimental fishing measures.

4.1.6 Safety Issues Associated with the Fishery

Like all offshore fisheries, pelagic longlining can be dangerous. Trips are often long, the work is arduous, and the nature of setting and hauling the longline may cause injuries due to hooking. Like all other HMS fisheries, longline fishermen are exposed to unpredictable weather. NOAA Fisheries does not wish to exacerbate unsafe conditions through the implementation of regulations. Therefore, NOAA Fisheries considers safety factors when implementing management measures on pelagic longline fishermen. For example, all time/area closures are expected to be closed to fishing, not transiting, in order to allow fishermen to make a direct route to and from fishing grounds. NOAA Fisheries seeks comments from fishermen on any safety concerns they have. Fishermen have pointed out that, due to decreasing profit margins, they may fish with less crew or less experienced crew or may not have the time or money to complete necessary maintenance tasks. NOAA Fisheries encourages fishermen to be responsible in fishing and maintenance activities.

4.2 Fishery Data: PURSE SEINE

4.2.1 Overview of History and Current Management

Domestic aspects of the Atlantic tunas purse seine fisheries are described in Section 2.2.3 of the HMS FMP. Social and economic aspects of the fisheries are described in Section 2.2.4.

Vessels using purse seine nets have participated in the U.S. fishery for bluefin tuna continuously since the 1950s, although a number of purse seine vessels targeted and landed bluefin tuna off the coast of Gloucester, MA as early as the 1930s. A limited entry system with non-transferable individual vessel quotas (IVQs) for purse seine vessels was established in 1982, and effectively excluded any new entrants to the permit category. Under this system, equal quotas are assigned to individual vessels by regulation. The IVQ system is possible largely because of the small pool of ownership in the purse seine fishery. Currently, only five vessels comprise the bluefin tuna purse seine fleet and the quotas were made transferable among the five vessels in 1996.

The HMS FMP and its final implementing regulations established percentage quota shares for bluefin tuna for each of the domestic fishing categories. The total amount of large medium and giant bluefin tuna that may be landed by the purse seine sector is 18.6 percent of the overall U.S. bluefin tuna landings quota. The initial 2002 allocation for the purse seine sector was 258 mt (ww). The initial allocation was adjusted to account for a 59.7 mt underage of the 2001 quota allocation. Accordingly, the adjusted 2002 bluefin tuna quota allocation for the purse seine sector was 317.7 mt (ww).

4.2.2 Most Recent Catch and Landings Data

Table 4.2.1 shows purse seine landings of Atlantic tunas from 1997 through 2001. Purse seine landings make up approximately 20% of the total annual U.S. landings of bluefin tuna on average (about 25% of total commercial landings), but account for only a small percentage, if any, of the landings of other HMS. In the 1980's and early 1990's, however, purse seine landings of yellowfin tuna were often over several hundred metric tons. Over 4,000 mt of yellowfin were recorded landed in 1985.

Table 4.2.1 Domestic Atlantic Tuna Landings for the Purse Seine Fishery: 1997-2001 (mt ww). NW Atlantic Fishing Area.

Species	1997	1998	1999	2000	2001
Bluefin Tuna	249.7	248.6	247.9	275.2	195.9
Yellowfin Tuna	0	0	0	0	0
Skipjack Tuna	0	0	0	0	0

4.2.3 U.S. vs. International Catch

The U.S. purse seine fleet has historically accounted for a small percentage of total

Atlantic landings. Over the past five years, the U.S. purse seine fishery has contributed to less than 0.15% of the total purse seine landings reported to ICCAT.

Table 4.2.2 Estimated International Purse Seine Atlantic Tuna Landings in the Atlantic and Mediterranean: 1997-2001 (mt ww).

Species	1997	1998	1999	2000	2001
Bluefin Tuna	25,256	21,857	15,884	17,616	8,122
Yellowfin Tuna	90,074	87,357	84,104	80,414	101,850
Skipjack Tuna	75,200	74,108	93,395	79,996	71,410
Bigeye Tuna	19,057	16,370	21,437	18,378	22,060
Total	**209,587**	**199,692**	**214,820**	**196,404**	**203,442**
U.S. Total	**249.7**	**248.6**	**247.9**	**275.2**	**195.9**
U.S. Percentage	**0.12%**	**0.13%**	**0.12%**	**0.14%**	**0.10%**

At the 1999 ICCAT meeting, the Commission agreed to continue the implementation of an area in the Gulf of Guinea closed to the use of fish aggregation devices (FADs). The closure (which became mandatory in mid-1999) was in response to concern over catches of juvenile and undersize tunas by purse seiners relying on FADs. At its 2000 meeting, the SCRS evaluated the success of the closure. Although the closure only became mandatory in mid-1999, the SCRS evaluation showed that the regulation appears effective in reducing fishing mortality of juvenile bigeye tuna, at least for the purse seine fishery. For juvenile yellowfin tuna, for which the closure was not designed, the impacts on mortality were not as evident. The closure was designed more to reduce/limit mortality on juvenile bigeye, and was implemented for November through January. Juvenile yellowfin are caught at a different time of year (March-April) relative to bigeye. At its 2000 meeting, ICCAT did not take any further action to modify the time/area closure, which will continue into the future.

The SCRS evaluated the time/area closure at its 2002 meeting, and the results of the evaluation were similar to those of the previous years. The SCRS concluded that the catches of juvenile bigeye tuna would have been higher if the time/area closure were not in place. The SCRS also concluded that the time/area closure would have been more effective at reducing catches of juvenile bigeye if compliance with the closure had been better. No changes to the time/area closure were proposed or adopted at the 2002 ICCAT meeting, and the time/area closure will continue.

4.2.4 Bycatch Issues and Data Associated with the Fishery

The Atlantic bluefin tuna purse seine category fishery is currently listed as a Category III fishery under the Marine Mammal Protection Act. After a school of fish is located, a purse seine net is set by paying out the net in a circle around the school. This affords considerable control over what is encircled by the net and the net does not remain in the water for any considerable amount of time. Therefore, this gear-type is not likely to result in mortality or serious injury of marine mammals or sea turtles. As a result, it is NOAA Fisheries' biological opinion that the continued operation of the purse seine fishery may adversely affect, but is not likely to jeopardize, the continued existence of any endangered or threatened species under NOAA Fisheries jurisdiction.

This fishery was observed in 1996, with near-100% coverage. Six pilot whales, one humpback whale, and one minke whale were observed as encircled by the nets during the fishery. All were released alive or dove under the nets and escaped before being pursed.

About mid-way through the 2000 bluefin tuna purse seine fishing season, large concentrations of bluefin tuna were located in one of the areas of Georges Bank that has been closed to all fishing gears in order to provide protection and rebuilding of northeast multispecies stocks, particularly for cod, haddock, and yellowtail flounder.[1] As tuna purse seine gear was not permitted to be used in the closed areas, the purse seine fleet could not access these fish, which were behaving in a manner conducive to purse seine operations (spending time very close to the surface). Purse seine vessels have traditionally fished in or near the closed area, most often to the west, near the "BB" buoy. The 1996 observer data showed minimal interaction with demersal species, and in an effort to gather information on the interaction of tuna purse seine gear with demersal species, and to allow the purse seine fleet to utilize their allocated quota of bluefin tuna and avoid conflicts with other gear types, NOAA Fisheries issued Experimental Fishing Permits (EFPs) to the purse seine fleet, and placed observers on the vessels. This allowed the purse seine vessels to fish in the closed area and successfully prosecute the tuna fishery, and provided NOAA Fisheries with additional data on purse seine operations and gear interactions.

Only four observed purse seine sets were made in the closed areas during the 2001 fishing season, and there was no bycatch of groundfish reported on these sets. In order to gather additional information on the impacts of this fishery in the closed areas, and to allow the purse seine fleet to utilize their allocated quota of bluefin tuna for 2002 and avoid conflicts with other gear types, NOAA Fisheries issued EFPs to the purse seine fleet again in 2002. The New England Fisheries Management Council is investigating revising the list of exempted gear to allow the tuna purse seiners access to the closed areas without EFPs. The Council will utilize the data collected during the 2000, 2001, and 2002 experimental fisheries, and should have a final decision before the 2003 purse seine season.

[1]Since the implementation of the closed areas in 1994, only lobster and hagfish pot gear, ocean quahog and surf clam dredge gear, pelagic longline, hook and line, midwater trawls and recently scallop dredge gear on a limited basis, have been allowed in the closed areas.

4.3 Fishery Data: COMMERCIAL HANDGEAR

Handgear are used for Atlantic HMS by fishermen on private vessels, charter vessels, and headboat vessels. Operations, frequency, target species, duration of trips, and distance ventured offshore vary widely. An overview of the history of the HMS handgear fishery (commercial and recreational) can be found in Section 2.5.8 of the HMS FMP.

The proportion of domestic HMS landings harvested with handgear varies by species, with Atlantic tunas (particularly bluefin tuna) comprising the majority of commercial landings. There is no commercial sale of Atlantic billfish. Commercial handgear landings of all Atlantic HMS (other than sharks) in the United States are shown in Table 4.3.1. The fishery is most active during the summer and fall months, although in the South Atlantic and the Gulf of Mexico fishing also occurs during the winter months. For bluefin tuna, 2001 commercial handgear landings accounted for approximately 63 percent of total U.S. landings, and almost 83 percent of commercial bluefin landings. The commercial handgear fishery for bluefin tuna occurs mainly in New England, with vessels targeting large-medium and giant bluefin tuna using rod and reel, handline, harpoon, and bandit gear. Beyond these general patterns, the availability of bluefin tuna at a specific time and location is highly dependent upon environmental variables that fluctuate from year to year. Fishing usually takes place between eight and 200 km from shore using bait including mackerel, whiting, mullet, ballyhoo, herring, and squid.

The majority of U.S. commercial handgear (rod and reel, handline, and bandit gear) fishing for bigeye, albacore, yellowfin, and skipjack tunas takes place in the northwest Atlantic Ocean. Rod and reel gear is also used by recreational fishermen, which is addressed in Section 4.4 of this report. In 2001, four percent of the total yellowfin catch, or 12 percent of the commercial yellowfin catch, was attributable to commercial handgear. The majority of these landings occurred in the northwest Atlantic Ocean. Commercial handgear landings of skipjack tuna accounted for approximately 15 percent of total skipjack landings, or about 51 percent of commercial skipjack landings. For albacore, commercial handgear landings accounted for less than two percent of total albacore landings, and approximately two percent of commercial albacore landings. Commercial handgear landings of bigeye tuna accounted for approximately three percent of total bigeye landings, and approximately five percent of commercial bigeye landings.

Swordfish are landed using harpoons and/or handlines. While commercial handgear is periodically used by New England fishermen, fishermen in the southeast may increase their handgear landings as the swordfish stock increases. Commercial handgear landings of swordfish are shown in Table 4.3.1, and account for a very small percentage of the total U.S. swordfish catch (less than 0.7 percent). However, in 2001 U.S. commercial handgear landings of swordfish increased by 72 percent over 2000 landings.

The HMS FMP established a limited access program for the commercial swordfish and shark fisheries (all gears), as well as for tunas (longline only). See Chapter 9 of this document

for further information on permitting, including limited access permits.

A number of sharks are landed by fishermen using commercial handgear. However, the nature of the data collected and assessed for Atlantic sharks does not readily allow a breakdown into various commercial gear types. Anecdotal evidence suggests that many charter and headboat captains target sharks as an alternative when other species are unavailable. The Sutton and Ditton study on the Gulf charter/party boat industry (discussed further in Section 5.2.4) indicates that 65 percent of party boat operators targeted sharks at least once during the study period. Further information on Atlantic sharks catch and landings is found in Section 4.5.

4.3.1 Overview of History and Current Management

A thorough description of the commercial handgear fisheries for Atlantic tunas can be found in Section 2.2.3 of the HMS FMP. Social and economic aspects of the domestic handgear fisheries are described in section 2.2.4 of the HMS FMP and later in this document (Section 5). For bluefin tuna, information regarding prices and markets, costs and expenses in the commercial fishery, exports and imports, processing and trade, charter/headboat fishing, and recreational fishing can be found in Section 2.2.4.1 of the HMS FMP. Section 2.2.4.2 of the HMS FMP details Commercial Fishing, Charter/Headboat Fishing, and Recreational Fishing for BAYS tunas.

The domestic swordfish fisheries are discussed in Section 2.3.3 of the FMP. Social and economic aspects of the domestic swordfish fishery are described in Section 2.3.4 of the HMS FMP, and later in this document in Sections 5 and 6.

The domestic shark fisheries are discussed in Section 2.4.3 of the FMP. Directed fisheries for Atlantic sharks are conducted by vessels using bottom longline, gillnet, and rod and reel gear and are discussed more fully in Section 4.5 of this report. Social and economic aspects of the domestic handgear shark fisheries are described in Section 2.4.4 of the FMP, as well as in Sections 5 and 6 of this document.

4.3.2 Most Recent Catch and Landings Data

Updated tables of landings for the commercial handgear fisheries by gear and by area for 1997 - 2001 are presented in Tables 4.3.1 and 4.3.2 of this document. As commercial shark landings are not recorded/disaggregated by gear type, commercial handgear landings are not provided in this section. A complete discussion of the Atlantic shark fishery is found in Section 4.5 of this document. In the HMS FMP, domestic landings of Atlantic bluefin tuna (1983 through 1997) and BAYS tunas (1995 through 1997) are presented in Section 2.2.3, and domestic swordfish catches (landings and discards) are presented in Section 2.3.3. A summary of the historic domestic recreational and commercial yellowfin landings (1981-1998) was presented in section 4.3.2 of the 2000 HMS SAFE Report.

Table 4.3.1 **Domestic Landings for the Commercial Handgear Fishery, by Species and Gear, for 1997-2001 (mt ww)**. Source: U.S. National Report to ICCAT: 2002.

Species	Gear	1997	1998	1999	2000	2001
Bluefin Tuna	Rod and Reel	617.8	603.4	643.6	579.3	889.7
	Handline	17.4	29.2	15.5	3.2	9.0
	Harpoon	97.5	133.4	115.8	184.2	101.9
	TOTAL	**732.7**	**766.0**	**774.9**	**766.7**	**1,000.6**
Bigeye Tuna	Troll	3.9	4.0	0	0	0
	Handline	2.7	0.1	12.3	5.7	33.7
	TOTAL	**6.6**	**4.1**	**12.3**	**5.7**	**33.7**
Albacore Tuna	Troll	5.2	5.8	0	0	0
	Handline	4.8	0	4.4	7.9	3.9
	TOTAL	**10.0**	**5.8**	**4.4**	**7.9**	**3.9**
Yellowfin Tuna	Troll	237.6	177.5	0	0	0
	Handline	90.6	64.7	219.2	283.7	300.2
	TOTAL	**328.2**	**242.2**	**219.2**	**283.7**	**300.2**
Skipjack Tuna	Troll	7.9	0.4	0	0	0
	Handline	0.1	0	6.4	9.7	10.5
	TOTAL	**8.0**	**0.4**	**6.4**	**9.7**	**10.5**
Swordfish	Troll	0.4	0.7	0	0	0
	Handline	1.3	0	5.0	8.9	8.9
	Harpoon	0.7	1.5	0	0.6	7.4
	TOTAL	**2.4**	**2.2**	**5.0**	**9.5**	**16.3**

Table 4.3.2 **Domestic Landings for the Commercial Handgear Fishery by Species and Region for 1997-2001 (mt ww)**. Source: U.S. National Report to ICCAT: 2002.

Species	Region	1997	1998	1999	2000	2001
Bluefin Tuna	NW Atl	732.7	766.0	774.4	766.7	1,000.6
Bigeye Tuna	NW Atl	6.6	4.0	11.9	4.1	33.2
	GOM	0	0.1	0.2	0.1	0.5
	Caribbean	0	0	0.2	1.5	0
Albacore Tuna	NW Atl	6.4	5.8	0.6	2.9	1.7
	GOM	0	0	$\leq$ .05	0	0
	Caribbean	3.6	0	3.8	5.0	2.2
Yellowfin Tuna	NW Atl	252.3	177.5	192.0	235.7	242.5
	GOM	55.6	60.8	12.7	28.6	43.4
	Caribbean	20.3	3.9	14.5	19.4	14.3
Skipjack Tuna	NW Atl	0.7	0.4	0.2	0.2	0.2
	GOM	0	0	0.4	0.7	0
	Caribbean	7.3	0	5.8	8.8	10.3
Swordfish	NW Atl	2.4	2.2	5.0	8.3	16.0
	GOM	0	0	$\leq$ .05	1.2	0.3

Handgear Trip Estimates

Tables 4.3.3a and 4.3.3.b display the estimated number of rod & reel and handline trips targeting large pelagic species in 2000 and 2001. The trips include both commercial and recreational trips, and are not specific to any particular species. One can assume that most trips in MA, NH, and ME targeted bluefin tuna, and that most of these trips were commercial, as over 90 percent of Atlantic tuna vessel permit holders in these states have commercial general category tuna permits. For the other states, the majority of the trips are presumed to be recreational (in that the fish are not sold), with the predominant targeted species consisting of yellowfin and bluefin tunas, and sharks. It should be noted that these estimates remain preliminary and may be subject to change.

Table 4.3.3a **Estimated total trips targeting large pelagic species from June 5 through November 5, 2000**
Source: LPS telephone and dockside interviews.

State/Area	Private Vessel Trips	Charter Trips	Total
VA	930	198	1,128
MD/DE	1,008	915	1,923
NJ	2,934	1,279	4,213
NY	1,093	468	1,561
CT/RI	1,096	372	1,468
MA	6,390	1,108	7,498
NH/ME	1,221	233	1,454
Total	**14,672**	**4,573**	**19,245**

Table 4.3.3b Estimated total trips targeting large pelagic species from June 4 through November 4, 2001. Source: LPS telephone and dockside interviews.

State/Area	Private Vessel Trips	Charter Trips	Total
VA	910	307	1,217
MD/DE and Cape May County, NJ	2,675	655	3,330
NJ (not including Cape May County)	3,040	660	3,700
NY	2,039	280	2,319
CT/RI	497	203	700
MA	3,641	567	4,208
NH/ME	1,944	133	2,077
Total	**14,746**	**2,805**	**17,551**

4.3.3 U.S. vs. International Catch

SCRS data do not break down international landings into a commercial handgear category. While some countries report rod and reel landings, these numbers may include both commercial and recreational landings. However, international catches of all Atlantic HMS for 2001 are summarized in Table 4.1.

4.3.4 Bycatch Issues and Data Associated with the Fishery

Compared to other commercial gear types, commercial handgear produces relatively low

levels of bycatch. However, bycatch in the yellowfin tuna commercial handgear fishery is unmonitored in those areas where commercial activities occur after the Large Pelagic Survey (LPS) sampling season. Rod and reel discards of HMS as assessed from LPS data are discussed in the recreational hand gear section (4.4.4), as are new efforts to document catch and release survival rates. At this time, however, there is little information regarding important interactions and new data relating to commercial handgear bycatch. Anecdotal information suggests that there may be small amounts of bluefin, yellowfin, and bigeye tuna discards, but there is no supporting documentation at this point. Some regulatory discards likely occur because fishermen must comply with minimum size restrictions.

4.3.5 Safety Issues Associated with the Fishery

Section 3.9 of the HMS FMP describes the safety of human life at sea, as it pertains to Atlantic HMS fisheries. Additional safety information regarding the commercial handgear fisheries for Atlantic HMS is presented below.

The U.S. Coast Guard (USCG) conducts routine vessel safety inspections at sea on a variety of vessels throughout the year. During the busy fall general category bluefin tuna season the USCG oftentimes concentrates patrol activities on General category bluefin tuna boats and follows the fleet south of Cape Cod. Boarding officers indicate that the majority of General category vessels have the necessary safety equipment. However, many part-time fishermen operating smaller vessels do not meet the necessary safety standards. Over the last several years, there has been a significant General category BFT fishery from late September through October (and even into the early November) occurring off southeastern New England. The fishery is prosecuted approximately 60 - 70 miles from shore, in weather conditions that are often marginal. There have been several cases of vessels participating in this fishery that have capsized due to weight while attempting to boat commercial-sized bluefin tuna (measuring 73 inches or greater and weighing several hundred pounds).

Currently, NOAA Fisheries does not require proof of proper safety equipment as a condition to obtain an Atlantic tunas permit. Instead, NOAA Fisheries informs permit applicants that commercial vessels are subject to the Fishing Vessel Safety Act of 1988 and advises them to contact their local USCG office for further information. The USCG District Boston office reports receiving 50 to 75 calls a week during the peak fishing season. Officers speak with all callers to answer vessel questions.

Since NOAA Fisheries regulations do not require USCG inspection or safety equipment in order to obtain an Atlantic Tunas General category permit, NOAA Fisheries cannot be certain that all participants in the commercial bluefin fishery are adequately prepared for the conditions they may encounter. NOAA Fisheries is concerned about the safety of all vessels participating in the General category and is working with the USCG to improve communication of vessel safety requirements to general category vessel operators.

It is unlawful for Atlantic tuna vessels to engage in fishing unless the vessel travels to and from the area where it will be fishing under its own power and the person operating that vessel brings any bluefin tuna under control (secured to the catching vessel or on board) without assistance from another vessel, except when shown by the operator that the safety of the vessel or its crew is jeopardized or when other circumstances exist that are beyond the control of the operator. NOAA Fisheries Enforcement and USCG boarding officers have encountered vessels participating in the bluefin tuna fishery that are unable to transit to and from the fishing grounds due to their limited fuel capacity. Occasionally these smaller vessels will work in cooperation with a larger documented vessel to catch a bluefin; others have been observed to leave lifesaving equipment at the dock to make room for extra fuel, bait, and staples. NOAA Fisheries is concerned that inadequately-equipped vessels may jeopardize the crew in that such vessels may not be able to return safely to shore due to insufficient fuel or due to adverse weather conditions without assistance from larger vessels.

If a vessel is boarded at sea and found to be without major survival equipment, the USCG will terminate the trip and escort the vessel back to the dock. Over the last few years, the USCG has focused their boardings on small vessels, especially those owned by "part-time" commercial bluefin fishermen, and has terminated several dozen trips due to a lack of safety equipment on board.

NOAA Fisheries has received comments from some General category participants that effort controls, particularly restricted-fishing days (RFDs), allow fishermen to rest and to make needed vessel repairs, thereby improving vessel safety. However, there is also a perception by many General category participants that every open day must be fished, regardless of conditions. The issue of effort controls alleviating fatigue problems was discussed in the FMP, but vessel repairs were not. NOAA Fisheries continues to receive comments, as discussed in the FMP, indicating that RFDs may encourage fishermen to fish during conditions in which they would otherwise not fish because the day is open, and that a season without RFDs would allow fishermen to choose their own schedule of fishing days, thereby alleviating safety concerns and derby-style fisheries.

NOAA Fisheries will consider all safety-related comments and information, including those from the USCG and NOAA Fisheries Enforcement, when planning future General category effort controls and will discuss these issues in future meetings with the Advisory Panel.

4.4 Fishery Data: RECREATIONAL HANDGEAR

This section of the SAFE report describes the recreational portion of the handgear fishery, and is primarily focused upon rod and reel fishing. The HMS Handgear (rod and reel, handline, and harpoon) fishery includes both commercial and recreational fisheries and is described fully in Section 2.5.8 of the HMS FMP. The recreational billfish fishery is described fully in Section 2.1.3 of the Billfish Amendment. In summary, the commercial sale, barter or trade of Atlantic billfish by U.S. commercial interests is prohibited, so only recreational landings

are authorized.

4.4.1 Overview of History and Current Management

Atlantic tunas, swordfish, and sharks are managed under the HMS FMP, while Atlantic billfish are managed separately under the Billfish FMP, as amended. Summaries of the domestic aspects of the Atlantic tuna fishery, the Atlantic swordfish fishery, and the Atlantic shark fishery are found in Sections 2.2.3, 2.3.3, and 2.4.3, respectively, of the HMS FMP. A history of Atlantic billfish management is provided in Section 1.1.1 of the Billfish Amendment.

Atlantic tunas, sharks, swordfish, and billfish are all targeted by domestic recreational fishermen using rod and reel gear. The recreational swordfish fishery had declined dramatically over the past twenty years, but recent information indicates that the recreational swordfish fishery is rebuilding in the Mid-Atlantic Bight, and off the east coast of Florida. Effective March 1, 2003, an HMS Angling category permit will be required to fish recreationally for any HMS-managed species (Atlantic tunas, sharks, swordfish, and billfish) (67 FR 77434, December 18, 2002). Prior to March 1, 2003, the regulations only required vessels fishing recreationally for Atlantic tunas to possess an Atlantic Tunas Angling category permit.

Recreational fishing for Atlantic HMS is managed primarily through the use of minimum size limits and bag limits. Recreational tuna fishing regulations are the most complex and include a combination of minimum sizes, bag limits, limited season-based quota allotment for bluefin tuna, and reporting requirements (depending upon the particular species and vessel type). Bluefin tuna are the only HMS species managed using a recreational quota for which the fishing season closes after achieving the quota.

The recreational swordfish fishery has been managed through the use of a minimum size requirement. However, regulations published on January 7, 2003 (68 FR 711) established a recreational retention limit of one swordfish per person up to three per vessel per day, to be effective March 2003. Regardless of the length of a trip, no more than the daily limit of North Atlantic swordfish will be allowed to be possessed on board a vessel.

The recreational shark fishery is managed using bag limits, minimum size requirements, and landing requirements (sharks must be landed with heads and fins attached). Additionally, the possession of 19 species of sharks is prohibited.

Atlantic blue and white marlin have a combined landings cap (*i.e.*, a maximum amount of fish (250) that can be landed per year); however, the overall management strategy for the recreational billfish fishery is through the use of minimum size limits. There are no recreational retention limits for Atlantic sailfish, blue marlin, and white marlin. In contrast, recreational anglers may not land longbill spearfish.

ICCAT has made several recommendations to recover billfish resources throughout the

Atlantic Ocean that are discussed in detail in Section 2.4 of this report.

4.4.2 Most Recent Catch and Landings Data

The recreational landings database for HMS consists of information obtained through surveys including the Marine Recreational Fishery Statistics Survey (MRFSS), Large Pelagic Survey (LPS), Southeast Headboat Survey (HBS), Texas Headboat Survey, and Recreational Billfish Survey Tournament Data (RBS). Descriptions of these surveys, the geographic areas they include, and their limitations, are discussed in both the HMS FMP and the Billfish Amendment in Sections 2.6.2 and 2.3.2, respectively.

Reported domestic landings of Atlantic bluefin tuna (1983 through 1998) and BAYS tuna (1995 through 1997) are presented in Section 2.2.3 of the HMS FMP. As landings figures for 1997 and 1998 were preliminary in the HMS FMP, updated tables of landings for these recreational rod and reel fisheries in 1996-2001 are presented below with updates of other HMS species. Recreational landings of swordfish are monitored by the LPS and the MRFSS. However, because swordfish landings are considered rare events, it is difficult to extrapolate the total recreational landings from dockside intercepts.

Table 4.4.1 **Updated Domestic Landings for the Atlantic Tunas, Swordfish and Billfish Recreational Rod and Reel Fishery: Calendar years 1996-2001 (mt ww)*.** Sources: NOAA Fisheries, 2000 and 2001a, Large Pelagic Survey, SEFSC Recreational Billfish Survey. (Recreational shark landings are provided in Tables 4.2.2 and 4.2.3).

Species	Region	1996	1997	1998	1999	2000	2001
Bluefin tuna**	NW Atlantic	362	299	184	99.9	49.5	249.3
	GOM	0	0	0	0.4	0.9	1.7
	Total	**362**	**299**	**184**	**100.3**	**50.4**	**251**
Bigeye tuna	NW Atlantic	108.2	333.5	228.0	316.1	34.4	366.2
	GOM	0	0	0	1.8	0	0
	Total	**108.2**	**333.5**	**228.0**	**317.9**	**34.4**	**366.2**
Albacore	NW Atlantic	277.8	269.5	601.1	90.1	250.75	122.3
	GOM	61.7	65.2	0	0	0	0
	Total	**339.5**	**334.7**	**601.1**	**90.1**	**250.75**	**122.3**
Yellowfin tuna	NW Atlantic	4,484.8	3,560.9	2,845.7	3,818.2	3,809.5	3690.5
	GOM	13.2	7.7	80.9	149.4	52.3	494.2
	Total	**4,498**	**3,569**	**2,927**	**3,967.6**	**3,861.8**	**4184.7**
Skipjack tuna	NW Atlantic	48.1	42.0	49.5	63.6	13.1	32.9

Species	Region	1996	1997	1998	1999	2000	2001
	GOM	36.4	21.7	37.0	34.8	16.7	16.1
	Total	**84.5**	**63.7**	**86.5**	**98.4**	**29.8**	**49.0**
Blue marlin***	NW Atlantic	17.0	25.0	34.1	24.8	13.8	9.0
	GOM	8.3	11.5	4.5	7.5	4.7	5.1
	Caribbean	9.6	8.6	10.6	4.6	5.7	2.3
	Total	**34.9**	**45.1**	**49.2**	**36.9**	**24.2**	**16.4**
White marlin ***	NW Atlantic	2.7	0.9	2.4	1.5	0.23	2.8
	GOM	0.6	0.9	0.2	0.1	0	0.3
	Caribbean	0.0	0.0	0.02	0	0	0
	Total	**3.3**	**1.8**	**2.6**	**1.6**	**0.23**	**3.1**
Sailfish***	NW Atlantic	0.2	0	0.1	0.07	1.75	61.2
	GOM	0.8	0.4	1.0	0.6	0.24	0.6
	Caribbean	0.2	0.2	0.05	0	0.06	0
	Total	**1.2**	**0.6**	**1.5**	**0.67**	**2.05**	**61.8**
Swordfish	**Total**	**5.9**	**10.9**	**4.7**	**21.3**	**15.6**	**15.6**

* Rod and reel catches and landings for Atlantic tunas represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.
** Rod and reel catch estimates for bluefin tuna in the U.S. National Report to ICCAT include both recreational and commercial landings. Rod and reel catch of bluefin less than 73" curved fork length (CFL) are recreational, and rod and reel catch of bluefin 73 inches CFL or greater are commercial. Rod and reel catch of bluefin > 73" CFL also includes a few metric tons of "trophy" bluefin (recreational bluefin 73").
*** Blue marlin, white marlin, and sailfish landings are based on the U.S. National Report to ICCAT and consist primarily of reported tournament landings.

Atlantic Billfish Recreational Fishery

Due to the rare nature of billfish encounters and the difficulty of monitoring landings outside of tournament events, reports of recreational billfish landings are sparse. However, the Recreational Billfish Survey (RBS) provides a preliminary source for analyzing recreational billfish landings. Table 4.4.2 documents the number of billfish landed in 2000 and 2001, as documented by the RBS.

Table 4.4.2 **Preliminary RBS Recreational Billfish Landings (calendar year).** Source: NOAA Fisheries Recreational Billfish Survey.

Species	2000	2001
Blue Marlin	119	75
White Marlin	8	22
Sailfish	16	11

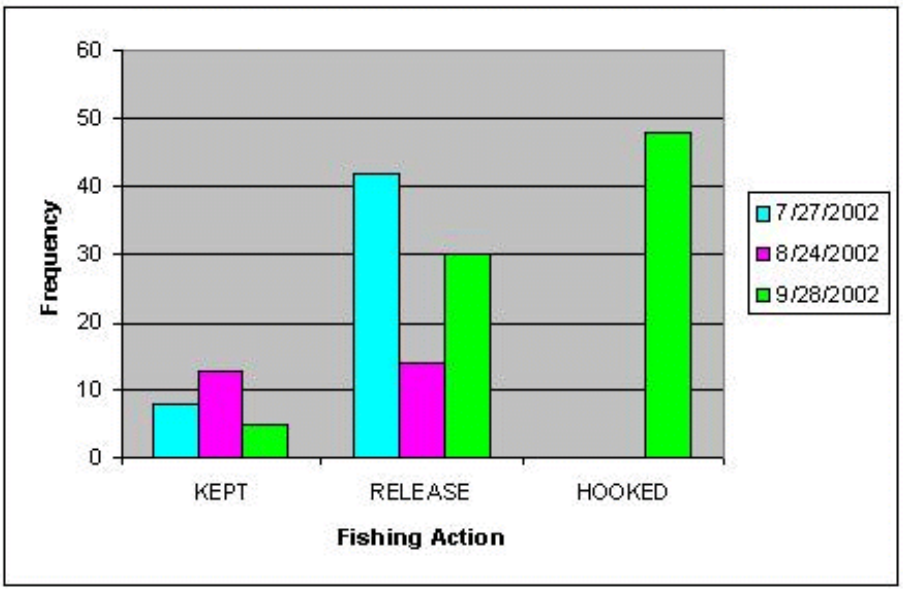
In support of the sailfish assessment conducted at the 2001 SCRS billfish species group meeting, document SCRS/01/106 developed indices of abundance of sailfish from the United States recreational billfish tournament fishery for the period 1973 - 2000. The index of weight per 100 hours fishing was estimated from numbers of sailfish caught and reported in the logbooks submitted by tournament coordinators and NOAA Fisheries observers under the Recreational Billfish Survey Program, as well as available size information. Document SCRS/01/138 estimated United States sailfish catch estimates from various recreational fishery surveys.

Swordfish Recreational Fishery

The recreational swordfish fishery in the North Atlantic Ocean has been steadily expanding in recent years, probably due to increased availability of small swordfish and increased interest in the sport. Fishermen typically fish off the east coast of Florida and off the coasts of New Jersey and New York. Fish have also been occasionally encountered on trips off Maryland and Virginia. In the past, the New York swordfish fishery occurred incidental to overnight yellowfin tuna trips. During the day, fishermen targeted tunas, while at night they fished deeper for swordfish. This appears to have evolved into a year-round directed fishery off Florida and a summer fishery off New Jersey. The Florida fishery occurs at night with fishermen targeting swordfish using live or dead bait and additional attractants such as lightsticks, LED lights, and light bars suspended under the boat.

Historically, fishery survey strategies have not captured all landings of recreational handgear-caught swordfish. Although some handgear swordfish fishermen have commercial permits[2], many others land swordfish strictly for personal consumption. Therefore, NOAA Fisheries recently published regulations to improve recreational swordfish monitoring and conservation. A final rule was published on January 7, 2003, (68 FR 711) that included a trip limit of one swordfish per person, up to three per vessel, and mandatory reporting of all recreationally-landed swordfish and billfish via a toll-free call-in system. These regulations will become effective on March 2, 2003. Accordingly, all reported recreational swordfish landings will be counted against the Incidental swordfish quota.

[2]Access to the commercial swordfish fishery is limited; hand gear fishermen however may purchase permits from other permitted fishermen because the permits are transferable.



Recreational fishing tournaments allow for the collection of a large volume of fishery-dependent data in a relatively short time period. Tournaments also provide a "snapshot" of the recreational fishery at a particular time and location. Analysis of tournament data collected over a period of years could provide valuable information regarding trends in the recreational swordfish fishery. A recent study in process has documented recreational handgear-caught swordfish in three south Florida tournaments (J. Levesque, pers. comm. 2003). The tournaments occurred from July though September 2002, two in Lighthouse Point and the other in Ft. Lauderdale. Data was obtained through direct at-sea observation, dockside interviews with anglers landing swordfish, and a telephone interview with a tournament organizer. A total of 156 vessels and between 468 - 624 individuals participated in the three tournaments.

Figure 4.4.1 indicates that 112 swordfish were caught during the three monitored tournaments. Of these, 26 swordfish were retained and 86 swordfish were released alive. Additional data from the September 28, 2002, tournament indicated that, in that tournament, 48 swordfish were hooked, 30 were released, and four were kept. The definition of hooked, for these purposes, was a swordfish that was on the line for any given amount of time. All hooked fish were assumed to be swordfish. The three fishing tournaments implemented a 55-inch, or 140 cm LJFL minimum size requirement for landed swordfish, although current federal regulations are 119 cm LJFL.

Figure 4.4.1. Total Number of Swordfish Caught, Kept and Released in Three Sampled Recreational Swordfish Tournaments off Southeast Florida during 2002 (J. Levesque, pers. comm. 2003).

Sizes for landed swordfish ranged from 130 - 230 cm fork length. The mean size for landed swordfish was 160 cm fork length. Weights for landed swordfish ranged from 36 - 144 kg. The mean weight for the landed swordfish was 62.6 kg. Estimated weights for the released swordfish ranged from 13 - 32 kg. The mean estimated weight for released swordfish was 19.5 kg.

The overall number of swordfish hooked per-unit-effort was .0615-swordfish/hr. or 6.15 swordfish per 100-hrs.-drifting. The catch per-unit-effort was .0143-swordfish landed/hr. or 1.43 fish per 100-hrs.-drifting.

Shark Recreational Fishery

Recreational landings of sharks are an important component of HMS fisheries. Recreational shark fishing with rod and reel is a popular sport at all social and economic levels, largely because the resource is accessible. Sharks can be caught virtually anywhere in salt water, depending upon the species. Recreational shark fisheries are oftentimes exploited in nearshore waters by private vessels and charter/headboats. However, there is also some shore-based fishing and some offshore fishing. The following tables provide a summary of landings for each of the three species groups.

Table 4.4.3 **Estimates of Total Recreational Harvest of Atlantic Sharks: 1998-2001 (numbers of fish in thousands)**. 2000-2001 data are preliminary. Source: Cortés and Neer 2002, and E. Cortés, 2002, pers. comm.

Species Group	1998	1999	2000	2001
LCS	165.5	91.0	137.4	134.2
Pelagic	11.8	11.1	13.3	3.8
SCS	169.6	115.8	184.7	189.5

Table 4.4.4 **Recreational Harvest of Atlantic LCS by Species, in number of fish: 1998-2001.** Source: Cortés and Neer 2002, and E. Cortés, 2002, pers. comm. Species-specific data for 2000-2001 are preliminary.

LCS Species	1998	1999	2000	2001
Basking**	none reported	none reported	none	none reported
Bignose*	none reported	none reported	none	none reported
Bigeye sand tiger**	none reported	none reported	none	none reported
Blacktip	82,288	34,962	74,055	48,848
Bull	1,850	3,107	6,045	3,751
Caribbean Reef*	74	3	182	none reported
Dusky*	4,499	5,570	2,397	5,703
Galapagos*	none reported	none reported	none	none reported
Hammerhead, Great	467	352	921	3,367
Hammerhead, Scalloped	1,920	1,349	3,517	1,108
Hammerhead, Smooth	375	1	none	703
Hammerhead, Unclassified	390	75	3,693	none reported
Lemon	2,120	146	2,801	5,946
Night*	133	50	none	none reported
Nurse	2,455	1,503	2,138	4,280
Sandbar	35,766	20,553	10,743	35,880
Sand tiger**	none reported	none reported	none	604
Silky	5,376	3,863	5,109	4,070
Spinner	7,522	6,391	6,355	2,896
Tiger	1,380	153	1,479	784
Whale**	none reported	none reported	none	none reported
White**	none reported	none reported	none	none reported
Large Coastal Unclassified	18,925	12,953	17,949	16,284
Total:	165,540	91,031	137,384	134,224

*indicates species that were prohibited in the recreational fishery as of July 1, 1999.
** indicates species that were prohibited as of April 1997.

Table 4.4.5 **Recreational Harvest of Atlantic Pelagic sharks by Species, in number of fish: 1998-2001.** Cortés and Neer 2002, and E. Cortés, 2002, pers. comm. Species-specific data for 2000-2001 are preliminary.

Pelagic Shark Species	1998	1999	2000	2001
Bigeye thresher*	none reported	none reported	none reported	none reported
Bigeye sixgill*	none reported	none reported	none reported	none reported
Blue	6,085	5,218	7,010	950
Mako, Longfin*	none reported	none reported	none reported	none reported
Mako, Shortfin	5,633	1,383	5,808	2,882
Mako, Unclassified	8	9	none reported	none reported
Oceanic whitetip	none reported	none reported	none reported	none reported
Porbeagle	none reported	none reported	none reported	none reported
Sevengill*	none reported	none reported	none reported	none reported
Sixgill*	none reported	none reported	none reported	none reported
Thresher	36	4,512	528	none reported
Total:	11,762	11,122	13,346	3,832

* indicates species that were prohibited in the recreational fishery as of July 1, 1999.

Table 4.4.6 **Recreational Harvest of Atlantic SCS by Species, in number of fish: 1998-2001.** Source: Cortés and Neer 2002, and E. Cortés, 2002, pers. comm. Species-specific data for 2000-2001 are preliminary.

SCS Species	1998	1999	2000	2001
Atlantic Angel*	110	none reported	none reported	none reported
Blacknose	10,523	6,019	10,463	15,059
Bonnethead	29,606	41,128	57,405	58,600
Finetooth	1,124	78	1,786	6,729
Sharpnose, Atlantic	128,254	68,621	114,973	109,114
Sharpnose, Caribbean*	none reported	none reported	none reported	none reported
Smalltail*	none reported	4	29	none reported
Total:	169,617	115,850	184,656	189,502

* indicates species that were prohibited in the recreational fishery as of July 1, 1999.

4.4.3 U.S. vs. International Catch

Important directed recreational fisheries for HMS occur in the United States, Venezuela, the Bahamas, and Brazil. Many other countries and entities in the Caribbean and the west coast of Africa are also responsible for significant HMS recreational landings. Directed recreational fisheries for sailfish occur in the Western Atlantic and include the United States, Venezuela, the Bahamas, Brazil, Dominican Republic, Mexico, and other Caribbean nations. However, of these countries, the United States is the only country that currently reports recreational landings to ICCAT. Therefore, a comparison of the percentage of U.S. landings relative to recreational fisheries in other countries is not possible. Further, total landings data are incomplete because many countries that reported landings in 1996 failed to report their 1998 and 1999 landings, which hampered the 2000 Atlantic marlin stock assessments, as well.

As part of a 1997 SCRS survey, 12 ICCAT member countries as well as Chinese Taipei and Senegal provided information on the existence of, and level of data collection for, recreational and artisanal fisheries. The survey results indicated that Brazil, Canada, France, Italy, Morocco, UK, Bermuda, and the United States have recreational fisheries in the ICCAT area of concern. Levels of data collection varied widely from country to country, making any comparison of catch levels difficult and potentially inaccurate. The wide range of recreational catches across nations and species warrants further exploration of potential data sources and the feasibility of increased recreational monitoring.

At the 1999 ICCAT meeting in Rio de Janeiro, Brazil, the Commission adopted a resolution to improve the quantity and quality of recreational data collection. Recreational fisheries were to be discussed and assesed in each country's National Report beginning in the year 2000. In addition, the SCRS was called upon to examine the impact of recreational fishing on tuna and tuna-like species. At the time this 2003 SAFE report was prepared, additional information was not available regarding international HMS recreational catches.

4.4.4 Bycatch Issues and Data Associated with the Fishery

Bycatch in the recreational rod and reel fishery is difficult to quantify because many fishermen value the experience of fishing and may not be targeting a particular pelagic species. Recreational "marlin" or "tuna" trips may yield dolphin, tunas, wahoo, and other species, both undersized and legally sized. Bluefin tuna trips may yield undersized bluefin, or a seasonal closure may prevent landing of a bluefin tuna above the minimum size. In some cases, therefore, rod and reel catch may be discarded.

The Billfish Amendment established a catch-and-release fishery management program for the recreational Atlantic billfish fishery. As a result of this program, all Atlantic billfish that are released alive, regardless of size, are not considered bycatch. NOAA Fisheries believes that

establishing a catch and release fishery in this situation will further solidify the existing catch-and-release ethic of recreational billfish fishermen, and thereby increase release rates of billfish caught in this fishery. The recreational white shark fishery is by regulation a catch-and-release fishery only and white sharks are not considered bycatch.

Bycatch can result in death or injury to discarded fish. Therefore, bycatch mortality should be incorporated into fish stock assessments, and into the evaluation of management measures. Rod and reel discard estimates from Virginia to Maine during June - October could be monitored through the expansion of survey data derived from the Large Pelagic Survey (dockside and telephone surveys). However, the actual numbers of fish discarded for many species are so low that presenting the data by area could be misleading, particularly if the estimates are expanded for unreported effort in the future. The HMS FMP presented the "raw" data for bycatch species in the rod and reel fishery from the 1997 LPS database in summary format (for all areas) in Table 3.38. The table below presents preliminary 2001 data that was included in the 2002 SAFE Report.

Table 4.4.6 Reported Catch* of HMS in the Rod and Reel Fishery. Source: Large Pelagic Survey (LPS) Preliminary Data.

Species	Number of Fish Kept					Number of Fish Released Alive				
	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
White Marlin**	7	11	6	4	21	203	465	156	705	285
Blue Marlin**	2	3	3	0	0	30	27	28	1,886	68
Sailfish**	0	1	0	-	-	2	2	3	-	-
Swordfish	5	1	3	0	15	6	5	1	0	57
Bluefin Tuna	749	653	396	-	-	1,181	1,105	327	1,789	-
Bigeye Tuna***	17	17	27	2,116	39	6	9	0	0	8
Yellowfin Tuna***	1,632	2,646	2,501	26,727	11,833	224	645	682	1,436	546
Skipjack Tuna	285	261	146	-	0	468	267	88	0	0
Albacore Tuna	189	558	133	0	3,406	43	92	52	0	122
Thresher Shark	3	7	3	11	35	2	2	2	36	0

	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
Mako Shark	51	78	49	0	120	86	92	49	0	486
Sandbar Shark	5	2	2	89	39	30	56	6	2	51
Dusky Shark	16	6	1	0	0	50	54	7	42	17
Tiger Shark	0	2	0	-	0	5	5	0	0	0
Blue Shark***	68	26	11	473	6	1,897	780	572	13,769	2,019
Hammerhead Shark	1	1	1	3	4	4	4	5	0	2
Wahoo	6	71	45	803	125	1	2	0	0	14
Dolphinfish	920	7,263	2,139	7,753	8,364	61	194	73	4,878	345
King Mackerel***	174	198	141	1,352	100	1	10	8	83	62
Atlantic Bonito***	336	328	254	5,258	180	203	300	166	1,067	127
Little Tunny	587	1,231	97	403	216	1,015	1,507	133	783	204
Amberjack ***	3	6	9	3,154	55	18	40	24	463	0
Spanish Mackerel	-	-	-	190	23	-	-	-	0	0

*NOAA Fisheries typically expands these "raw" data to report discards of bluefin tuna by the rod and reel fishery to ICCAT. If sample sizes are large enough to make reasonable discard estimates for other species, NOAA Fisheries may estimate discard estimates of other bycatch species in future SAFE reports.
**Amendment One to the Atlantic Billfish FMP established billfish released in the recreational fishery as a "catch and release" program, thereby exempting these fish from bycatch considerations.
***2000 estimates for these species have likely been "expanded."

Outreach programs to address bycatch were included in the HMS FMP and the Billfish Amendment. These programs have not yet been implemented, but the preparation of program designs are currently in progress. One of the key elements in the outreach program will be to provide information that leads to an improvement in post-release survival from both commercial and recreational gear. Additionally, an outreach program to encourage the use of circle hooks to increase post-release survival within HMS fisheries was introduced in a proposed rule published in 2001 (66 FR 66386, December 26, 2001). The final rule to promote the voluntary use of

circle hooks published in 2003 (68 FR 711, January 7, 2003). Initial implementation of the outreach program is expected to occur in 2003.

A recent study by Graves *et al.,* investigated short-term (5 days) post-release mortality of Atlantic blue marlin using pop-up satellite tag technology. A total of nine recreationally-caught blue marlin were tagged and released during July and August of 1999. All hooks employed in the study were "J" hooks. The attached tags were programmed to detach from the fish after five days and to record direct temperature and inclination of the buoyant tag to determine if the fish were actively swimming after being released. After detachment, the tags floated to the surface and began transmitting recorded position, temperature and inclination data to satellites of the Argos™ system. Three different lines of evidence provided by the tags (movement, water temperature, and tag inclination) suggested that at least eight of the nine blue marlin survived for five days after being tagged and released. One of the tags did not transmit any data which precluded the derivation of a conclusion regarding the tagged marlin's survival.

4.4.5 Safety Issues Associated with the Fishery

The USCG does not maintain statistics on boating accidents, rescue, or casualty data specifically pertaining to recreational fishing as it does for the commercial industry. As a result, the HMS FMP and the Billfish Amendment contain only minimal safety information regarding recreational HMS fisheries. Safety issues associated with handline fisheries for tunas is discussed in Section 4.3.5. The USCG does compile statistics on recreational boating accidents and casualties, independent of the activity in which they are engaged. Two common situations often place recreational boaters in potential danger. Individuals in small vessels often venture out farther than their vessels are designed to travel without proper navigational equipment, and may encounter rougher water than their boats are designed to withstand. Since fishermen targeting HMS species, particularly marlin, often travel at least 75 to 100 miles offshore, having a properly equipped vessel of adequate size is very important for the safety of recreational HMS constituents. Additionally, as the recreational swordfish fishery off the southeastern coast of Florida occurs at night and usually in small boats ranging from 23 to 40 feet in length, it presents other unique risks. Shipping traffic regularly runs through the recreational swordfish fleet, which could lead to incidents if someone is not on watch at all times. Another frequent safety concern of the Coast Guard is when someone is up in the flybridge. Both of these situations can lead to people falling overboard. In 2001, approximately 73 percent of all boating casualties were due to drowning and in approximately 84 percent of all the drowning deaths, the victim was not wearing a personal floatation device (PFD).

Table 4.4.7 2001 Reported Boating Accident Types (USCG Lt. Bruce Schmidt, pers. comm.).

Accident Type	# Accidents	# of Injuries	# of Fatalities	Total Property Damage
Capsizing	466	280	210	$1,554,496

Carbon Monoxide	14	29	4	$0
Collision with Fixed Object	643	467	49	$3,762,104
Collision with Floating Object	109	52	2	$322,023
Collision with Submerged Object	3	1	0	$8,500
Vessel Collision	2,062	1,366	68	$8,997,570
Departed Vessel	16	2	15	$0
Ejected from Vessel	18	3	17	$4,700
Electrocution	4	4	4	$0
Fall in Boat	284	307	7	$48,685
Fall Overboard	514	367	176	$313,789
Fire/Explosion (fuel)	153	73	2	$313,789
Fire/Explosion (other than fuel)	112	18	1	$3,179,323
Flooding or Swamping	339	74	47	$3,001,106
Grounding	412	255	10	$2,138,094
Other	253	175	18	$3,792,817
Sinking	150	25	15	$1,855,357
Skier Mishap	439	454	9	$2,200
Struck by Boat	166	153	6	$827,502
Struck by Motor	100	100	5	$15,701
Struck fixed Object	1	1	0	$0
Struck Submerged Object	125	35	10	$793,466
Unknown	36	33	6	$107,566
Total	**6,419**	**4,274**	**681**	**$31,307,488**

Table 4.4.6 2001 Reported Boating Accident Cause- of-Death Statistics (USCG Lt. Bruce Schmidt, personal communication).

Cause of Death	# Fatalities	PFD Worn	
		Yes	No
Carbon Monoxide Poisoning	4	0	4
Drowning	498	78	420
Hypothermia	28	16	12
Other	28	7	21
Trauma	109	44	65
Unknown	14	4	10
Total	**681**	**149**	**532**

4.5 Fishery Data: ATLANTIC SHARKS

4.5.1 Overview of History and Current Management

Atlantic sharks are targeted primarily through bottom longline, drift gillnet, and rod and reel (commercial, recreational, and charter/headboats) gear types. Although discussions on other fisheries have been broken down by gear type, the nature of the shark catch and the method of data collection lend themselves to a stock-based analysis. As a result, some of the information overlaps with that found in other sections of the report.

The HMS FMP contained numerous new management measures for Atlantic sharks, including rebuilding programs for ridgeback and non-ridgeback large coastal sharks (LCS) and precautionary measures for pelagic and small coastal sharks (SCS). The HMS FMP:

- reduced commercial LCS and SCS quotas,
- established ridgeback and non-ridgeback subgroups of LCS,
- implemented a minimum size for ridgeback LCS,
- reduced the non-ridgeback LCS commercial quota,
- established a commercial quota for blue sharks,
- established a species-specific quota for porbeagle sharks and reduced the pelagic shark commercial quota accordingly,
- reduced recreational retention limits for all sharks,
- expanded the list of prohibited shark species,
- implemented limited access in commercial fisheries,
- established new procedures for counting dead discards and state landings of sharks after federal fishing season closures against federal quotas, and
- established season-specific overharvest/underharvest adjustment procedures.

The implementing regulations were published on May 28, 1999 (64 FR 29090).

While the HMS FMP measures for the recreational fishery went into effect on July 1, 1999, many of the measures for the commercial fishery were not effective due to a court order. The commercial measures that did go into effect onto July 1, 1999, included limited access (including incidental catch limits), trip limits (4,000 lb LCS), and shark gillnet observer coverage. The commercial quotas for LCS, pelagic sharks, and SCS in 1999 and 2000 were the same as the 1997 quotas (1,285 mt dw, 580 mt dw, and 1,760 mt dw, respectively) due to the court order. Additionally, the prohibited species provisions did not go into effect for the commercial fishery until June 2000, and the minimum size on ridgeback LCS have not been implemented in the commercial fishery.

On November 21, 2000, SOFA *et al*. and NOAA Fisheries reached a settlement agreement for both lawsuits. On December 7, 2000, Judge Merryday entered an order approving the settlement agreement. The settlement agreement required, among other things, an independent (i.e., non-NOAA Fisheries) review of the 1998 LCS stock assessment. NOAA Fisheries received the results of the complete peer reviews in October 2001. The settlement agreement did not address any regulations affecting the pelagic shark, prohibited species, or recreational shark fisheries. On March 6, 2001, NOAA Fisheries published an emergency rule implementing the settlement agreement (66 FR 13441).

Taking into consideration the settlement agreement, the peer reviews, current catch rates, and the best available scientific information (not including the 1998 stock assessment projections), NOAA Fisheries implemented another emergency rule, suspending certain measures under the 1999 regulations pending completion of new LCS and SCS stock assessments and a peer review of the new LCS stock assessment (66 FR 67118, December 28, 2001; extended 67 FR 37354, May 29, 2002). Specifically, NOAA Fisheries maintained the 1997 LCS commercial quota (1,285 mt dw), maintained the 1997 SCS commercial quota (1,760 mt dw), suspended the commercial ridgeback LCS minimum size, suspended counting dead discards and state landings after a Federal closure against the quota, and replaced season-specific quota accounting methods with subsequent-season quota accounting methods. This emergency rule expires on December 30, 2002.

On May 8, 2002, NOAA Fisheries announced the availability of the first SCS stock assessment since 1992 (67 FR 30879). The Mote Marine Laboratory and the University of Florida provided NOAA Fisheries with another SCS assessment in August 2002. Both of these stock assessments indicate that overfishing is occurring on finetooth sharks. The three other species in the SCS complex (Atlantic sharpnose, bonnethead, and blacknose) are not overfished and overfishing is not occurring. NOAA Fisheries announced the availability of the LCS stock assessment on October 17, 2002 (67 FR 64098). The results of this stock assessment indicate that the LCS complex is still overfished and overfishing is occurring, that sandbar sharks are no longer overfished and that overfishing is still occurring, and that blacktip sharks are rebuilt and overfishing is not occurring. The peer review for the 2002 LCS stock assessment is expected to be complete in mid-December. At the time of the preparation of this document, the peer review

was not available for summary.

On November 15, 2002, NOAA Fisheries announced the intent to prepare an Environmental Impact Statement (EIS) regarding Atlantic shark management measures during 2003 to address management concerns resulting from the 2002 LCS and SCS stock assessments. The amendment will examine management alternatives available to rebuild or prevent overfishing of Atlantic sharks.

NOAA Fisheries finalized an emergency rule on December 27, 2002, effective for 180 days until June 30, 2003. that implements annual quotas of 783 metric tons (mt) dressed weight (dw) and 931 mt dw for the commercial ridgeback and non-ridgeback large coastal shark fisheries, respectively, and implement an annual quota of 326 mt dw for the commercial small coastal shark fishery. The emergency rule also addresses suspension of the regulation regarding the commercial ridgeback large coastal shark minimum size, season-specific quota adjustments, and accounting procedures for dead discards and state landings after a federal closure against the commercial quota.

Modifications to Observer Coverage Requirements

In the southeast shark gillnet fishery, NOAA Fisheries modified the requirement to have 100 percent observer coverage at all times on March 30, 2001 (66 FR 17370), by reducing the level required to a statistically significant level outside of right whale calving season (100 percent observer coverage is still required during the right whale calving season from November 15 through April 1). This modification of observer coverage reduced administrative costs while maintaining statistically significant and adequate levels of coverage to provide reasonable estimates of sea turtle and marine mammal takes outside the right whale calving season. The level of observer coverage necessary to maintain statistical significance will be reevaluated annually and adjusted accordingly.

As of January 2002, the observer coverage requirements in the bottom longline fishery for sharks changed from voluntary participation in the observer program to mandatory participation if selected. NOAA Fisheries has selected approximately 41 vessels, operating out of three major winter shark fishing areas in the North Carolina/South Atlantic Bight, Florida East Coast, and Florida Gulf Coast areas, for mandatory participation in the observer program during 2003.

Alabama Shark Gillnet Fishery

Previous reports to NOAA Fisheries indicated that a group of about six fishermen in Alabama were beginning a directed fishery for sharks using gillnets with 8-12 inch mesh and more than 2,000 yards of net. The information available to NOAA Fisheries was that the fishery would operate solely in state waters. As of December 2002, the fishery does not appear to be operating due to lack of profitable markets (J. Carlson, pers. comm.).
Directed Shark Observer Programs

The University of Florida and Florida Museum of Natural History are continuing an observer program of the directed bottom longline commercial shark fishery in the Atlantic and Gulf of Mexico to enhance the reliability of management strategies for the shark fishery. Observers provide baseline characterization information, by region, on the species composition, relative abundance, and size composition within species for the large coastal and small coastal bottom longline shark fisheries.

During 2002, three observers were placed on 10 vessels with a total fleet coverage of 2 percent during the first season and six observers on 19 vessels with a total fleet coverage of 4 percent during the second fishing season. Coverage spanned from New Jersey to Louisiana and a total of 60 trips, 133 sets and 214 sea days were observed during the whole year (G. Burgess, pers. comm. 2002).

The 2002 observed catches of sharks in the directed bottom longline fishery are dominated by large coastal sharks (72 percent), with small coastal sharks comprising 28 percent and pelagic sharks comprising 0.3 percent (Table 4.5.1; G. Burgess, pers. comm. 2002). Sandbar sharks dominate the large coastal catch and landings (34.7 and 47.0 percent, respectively), followed by blacktip sharks (23.1 and 30.5 percent, respectively), tiger sharks (19.5 and 6.5 percent, respectively), and nurse sharks (7.4 and 0 percent, respectively). Tiger sharks represent 62.6 percent of large coastal sharks tagged and released (Table 4.5.1).

Atlantic sharpnose sharks dominate the catches of small coastal sharks at 73.6 percent (Table 4.5.1). Approximately 76.3 percent of small coastal sharks are used for bait in this fishery (371 out of 1,562 individuals were landed). Only 18 pelagic sharks were caught, 17 of which were landed and all of which were shortfin mako (Table 4.5.1).

Table 4.5.1 Directed bottom longline shark observed catch and disposition for 2002. Source: G. Burgess, pers. comm. 2002.

	FLORID EAST COAST				FLORIDA GULF COAST				Carolinas and Georgia				TOTAL			
Species	**Caught**	**Kept**	**Other Kill**	**Tagged/ Released**	**Caught**	**Kept**	**Other Kill**	**Tagged/ Released**	**Caught**	**Kept**	**Other Kill**	**Tagged/ Released**	**Caught**	**Kept**	**Other Kill**	**Tagged/ Released**
Sandbar	291	287			582	573	4	1	536	525	3	2	1409	1385	7	3
Blacktip	215	208	7		571	542	24	1	151	148	2		937	898	33	1
Dusky	2		1	1	6		3	3	17		14	3	25		18	7
Silky	8	8			69	48	13	8	13	5	8		90	61	21	8
Bull	16	14			53	48			4	3			72	65		
Bignose					1			1					1			1
Spinner	6	4	2		46	39	4	1	4	3	1		56	46	7	1
Night					17	2	15		1			1	18	2	15	1
Lemon	18	17			130	123			4	4			152	144		
Scalloped HH	59	41	18		66	49	16		11	8	2	1	136	98	36	
Great HH	4	1	3		56	50	6		7	4	3		67	55	12	
Nurse	29			28	267			264	5			5	301			297
Tiger	139	34	5	97	137	37	10	92	515	127	43	345	791	193	58	534
Sand tiger	1			1									1			1
White																
Unidentified																
Atlantic sharpnose	315	3	312		321	68	251	2	513	111	402		1149	182	965	2
Bonnethead	1		1										1		1	
Blacknose	22	13	9		355	155	197	4	33	20	13		411	188	219	4

	FLORID EAST COAST				FLORIDA GULF COAST				Carolinas and Georgia				TOTAL			
Species	**Caught**	**Kept**	**Other Kill**	**Tagged/ Released**	**Caught**	**Kept**	**Other Kill**	**Tagged/ Released**	**Caught**	**Kept**	**Other Kill**	**Tagged/ Released**	**Caught**	**Kept**	**Other Kill**	**Tagged/ Released**
Finetooth									1	1			1	1		
Thresher																
Shortfin mako									18	17			18	17		
LCS	788	614	36	125	2001	1506	95	371	1268	827	76	357	4057	2947	207	853
SCS	338	16	322	0	676	223	448	6	547	132	415	0	1562	371	1185	6
Pelagic									18	17			18	17		
Total	**1126**	**630**	**358**	**125**	**2677**	**1729**	**543**	**377**	**1833**	**976**	**491**	**357**	**5637**	**3335**	**1392**	**859**

As previously mentioned, NOAA Fisheries conducts an observer program in the southeast shark drift gillnet fishery. Gillnet sets are generally made via drifting and strikenetting. Drift gillnet sets are made with one vessel and the gillnet is set in a straight line and allowed to fish passively. Strikenets are either set rapidly in a circle around a school of sharks with more than one vessel (a smaller strike vessel working with a larger driftnet vessel) or set directly behind the wake of a shrimp vessel when it begins haulback. In the latter case, only the driftnet vessel is required (Carlson, 2001).

During the 2002 right whale calving season, a total of 41 drift gillnet sets and 24 strikenet sets were observed. Approximately 61 additional strikenet trips were made when the observer was on board but no strike was made due to inability to locate schooling sharks, sharks being located in state waters, and poor weather conditions. Observed catches on drift gillnet sets were comprised of 10 species of sharks (90.7 percent of numbers caught), 26 species of teleosts and rays (9.2 percent were teleosts and rays), two species of sea turtle (0.05 percent; Tables 4.5.2, 4.5.10, and 4.5.11) (Carlson, 2002). By number, three species of sharks made up 86.9 percent of the sharks caught (Carlson, 2002). By weight, the shark catch was made up primarily of blacktip (42.1 percent), blacknose (17.6 percent), and Atlantic sharpnose (15.4 percent).

Observed catches on strikenet sets during the 2002 right whale calving season were comprised of four species of sharks (99.3 percent of numbers caught) and three species of teleosts and rays (0.7 percent; Tables 4.5.3 and 4.5.12) (Carlson, 2002). No marine mammals or sea turtles were caught while strikenetting. Blacktip sharks made up 99.3 percent of the shark catch when strikenetting. Bycatch included great barracuda, cownose ray, and houndfish (Carlson 2002).

Table 4.5.2 Total Shark Catch in NOAA Fisheries Observed Drift Gillnet Sets During 2002 Critical Right Whale Season: Source: Carlson, 2002.

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	Discarded Dead (%)
Blacktip	1,777	98.4	0.0	1.6
Bonnethead	402	97.5	0.2	2.3
Atlantic sharpnose	1,885	97.9	0.5	1.6
Finetooth	125	100.0	0.0	0.0
Blacknose	1531	99.9	0.1	0.0
Scalloped hammerhead	38	97.3	0.0	2.7
Spinner	132	100.0	0.0	0.0
Great hammerhead	75	61.4	0.0	38.6
Tiger	3	66.6	0.0	33.4
Common thresher	1	100.0	0.0	0.0

Table 4.5.3 Total Shark Catch in NOAA Fisheries Observed Strikenet Sets During 2002 Critical Right Whale Season: Source: Carlson, 2002.

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	Discarded Dead (%)
Blacktip	4,179	99.8	0.2	0.0
Great Hammerhead	1	0.0	0.0	100.0
Spinner	13	100.0	0.0	0.0
Blacknose	13	100.0	0.0	0.0

Outside the right whale calving season (April 1 through November 14), a total of 28 drift gillnet sets were observed from April through October and a total of 14 strikenet sets were observed from August to October (Carlson and Baremore, 2002). The observed drift gillnet catch consisted of 12 species of sharks, 26 species of teleosts and rays, and 1 species of marine mammals (Tables 4.5.4 and 4.5.13). Total observed catch composition (percent of numbers caught) were 84.9 percent sharks, 15.0 percent teleosts, 0.1 percent rays, and 0.01 percent marine mammals. Four species of sharks made up 96.5 percent by number of the shark catch: Atlantic sharpnose (67.4 percent), finetooth (13.7 percent), blacknose (7.9 percent), and blacktip sharks (5.4 percent). By weight, Atlantic sharpnose sharks made up 39.3 percent, finetooth 23.2 percent, blacknose sharks 10.7 percent, and blacktip sharks 15.0 percent.

Observed catch in strikenet sets outside of right whale calving season consisted of three species of sharks (100.0 percent of the total number caught) (Table 4.5.5) (Carlson and Baremore, 2002). No teleosts, sea turtles, or marine mammals were observed caught. The blacknose shark made up 53.1 percent of the total number of sharks caught.

Table 4.5.4 Total drift gillnet shark catch by species during all observer trips, 2002, outside of right whale calving season. Source: Carlson and Baremore, 2002.

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	Discarded Dead (%)
Atlantic sharpnose	7,332	98.9	0.4	0.7
Blacknose	859	100.0	0.0	0.0
Blacktip	572	1.2	30.9	67.8
Finetooth	1490	100.0	0.0	0.0
Bonnethead	305	100.0	0.0	0.0
Scalloped hammerhead	37	2.7	5.4	91.9
Tiger	2	50.0	50.0	0.0
Spinner	17	23.6	5.8	70.6
Sandbar shark	2	0.0	0.0	100.0
Lemon shark	1	0.0	0.0	100.0
Great hammerhead	18	0.0	0.0	100.0

Table 4.5.5 Total strikenet shark catch by species during all observer trips, 2002, outside of right whale calving season. Source: Carlson and Baremore, 2002.

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	Discarded Dead (%)
Blacknose	620	100.0	0.0	0.0
Blacktip	547	99.8	0.2	0.0
Bonnethead	1	100.0	0.0	100.0

National Plan of Action for the Conservation and Management Of Sharks

On February 15, 2001, NOAA Fisheries released the final National Plan of Action (NPOA) for the Conservation and Management of Sharks (66 FR 10484). The NPOA was developed pursuant to the endorsement of the International Plan of Action (IPOA) by the United Nations' Food and Agriculture Organization Committee on Fisheries Ministerial Meeting in February 1999. The overall objective of the IPOA is to ensure conservation and management of sharks and their long-term sustainable use. The final NPOA, consistent with the Magnuson-Stevens Act, requires NOAA Fisheries and the Regional Fishery Management Councils to undertake extensive data collection, analysis, and management measures in order to ensure the long-term sustainability of U.S. shark fisheries. The NPOA also encourages Interstate Marine Fisheries Commissions and State agencies to initiate or expand current data collection, analysis,

and management measures and to implement regulations consistent with federal regulations, as needed. For additional information on the U.S. NPOA and its implementation, see Appendix A.

Shark Finning Prohibition Act

On December 21, 2000, President Clinton signed the Shark Finning Prohibition Act into law (Public Law 106-557). This amended the Magnuson-Stevens Fishery Conservation and Management Act to prohibit any person under U.S. jurisdiction from (i) engaging in the finning of sharks; (ii) possessing shark fins aboard a fishing vessel without the corresponding carcass; and (iii) landing shark fins without the corresponding carcass. NOAA Fisheries published final regulations on February 11, 2002 (67 FR 6194). No changes were made to regulations affecting Atlantic federal commercial shark permit holders.

4.5.2 Most Recent Catch and Landings Data

Landings estimates for 2001 indicate that, compared to landings in 2000, commercial landings for LCS decreased slightly by approximately 12,000 fish (Table 4.5.6). Landings estimates for pelagic sharks for 2001 increased by six mt dw (Table 4.5.8). Species-specific landings estimates for LCS during 2001 indicate that sandbar sharks are the most abundant species landed in the LCS complex (39.4 percent), as compared to landings estimates in 2000 where blacktip sharks dominated with 44.0 percent (Table 4.5.7). Finetooth sharks (42.0 percent) continue to prevail as the most abundant species landed in the SCS complex during 2001 (Table 4.5.9).

Table 4.5.6 Estimates of Total Landings and Dead Discards for Large Coastal Sharks: 1981-2001 (numbers of fish in thousands). Source: Cortes, 2002.

Year	Commercial Landings	Pelagic Longline Discards	Recreational Catches	Unreported	Bottom Longline Discards	Mexican Catches	Menhaden Fishery Bycatch	Total
1981	16.2	0.9	265.0	N/A	0.9	119.971	25.1	428.1
1982	16.2	0.9	413.9	N/A	0.9	81.913	25.1	538.9
1983	17.5	0.9	746.6	N/A	1.0	85.437	25.1	876.5
1984	23.9	1.3	254.6	N/A	1.4	120.684	25.1	426.9
1985	22.2	1.2	365.6	N/A	1.3	87.748	25.1	503.1
1986	54.0	2.9	426.1	24.9	3.1	81.835	25.1	617.9
1987	104.7	9.7	314.4	70.3	5.9	80.160	25.1	610.3
1988	274.6	11.4	300.6	113.3	15.5	89.290	25.1	829.8
1989	351.0	10.5	221.1	96.3	19.9	105.562	25.1	829.4
1990	267.5	8.0	213.2	52.1	15.1	122.220	25.1	703.3
1991	200.2	7.5	293.4	11.3	11.3	95.695	25.1	644.5
1992	215.2	20.9	304.9	N/A	12.2	103.366	25.1	681.6
1993	169.4	7.3	249.0	N/A	11.3	119.820	25.1	581.9
1994	228.0	8.8	160.9	N/A	16.3	110.734	26.2	550.9
1995	222.4	5.2	176.3	N/A	13.9	95.996	24.0	537.8

1996	160.6	5.7	188.5	N/A	7.6	106.057	25.1	493.6
1997	130.6	5.6	165.1	N/A	8.3	83.051	25.1	417.8
1998	174.9	4.3	169.8	N/A	9.9	74.136	25.1	458.1
1999	111.5	9.0	90.1	N/A	3.8	57.061	25.1	297.5
2000	111.2	9.4	140.4	N/A	4.8	52.057	25.1	343.0
2001	99.2	9.4	142.0	N/A	6.3	52.057	25.1	334.1

Table 4.5.7 Commercial landings of Large Coastal Sharks in lb dw: 1997-2001. Source: Cortes, 2002.

Large Coastal Sharks	1997	1998	1999	2000	2001
Basking**	none reported	none reported	none reported	none reported	none reported
Bignose*	2,132	50	9,035	672	1442
Bigeye sand tiger**	none reported	none reported	none reported	none reported	none reported
Blacktip	1,506,182	1,893,805	1,286,979	1,633,919	1,135,199
Bull	40,247	27,389	25,426	24,980	27,037
Caribbean Reef*	3,548	100	none reported	none reported	none reported
Dusky*	80,930	81,124	110,950	205,746	871
Dusky, fins*	none reported	none reported	none reported	none reported	89
Galapagos*	none reported	none reported	none reported	none reported	none reported
Hammerhead, Great	none reported	none reported	none reported	none reported	none reported
Hammerhead, Scalloped	none reported	none reported	none reported	none reported	none reported
Hammerhead, Smooth	none reported	none reported	none reported	none reported	none reported
Hammerhead, Unclassified	79,685	59,802	53,394	35,060	69,355
Large Coastal					172,494
Lemon	20,595	23,232	23,604	45,269	24,453
Narrowtooth*	none reported	none reported	none reported	none reported	none reported
Night*	33	3,289	4,287	none reported	none reported
Nurse	8,864	2,846	1,168	429	387
Sandbar	890,881	1,077,161	1,299,987	1,491,908	1,404,360
Sandbar, fins				996	2364
Sand tiger**	8,425	38,791	6,401	6,554	1,248
Silky	13,920	13,615	8,649	31,959	14,197
Spinner	6,039	16,900	629	14,473	6,970
Tiger	6,603	12,174	30,274	24,443	26,973
Whale**	none reported	none reported	none reported	none reported	none reported
White**	1,315	none reported	82	1,201	26
Large Coastal Unclassified	1,177,539	1,258,027	978,312	108,692	569,605
Unclassified fins	140,638	76,588	80,393	86,824	105,475
Total	3,987,576 (1,809 mt dw)	4,584,893 (2,080 mt dw)	3,919,570 (1,778 mt dw)	3,713,125 (1,684 mt dw)	3,562,546 (1,616 mt dw)

* indicates species that were prohibited in the commercial fishery as of June 21, 2000.

** indicates species that were prohibited as of April 1997.

Table 4.5.8 Commercial landings of Pelagic Sharks in lb dw: 1997-2001. Source: Cortes, 2002, Cortes, 2001, and Cortes, 2000.

Pelagic Sharks	1997	1998	1999	2000	2001
Bigeye thresher*	5,308	1,403	17,759	4,376	330
Bigeye sixgill*	none reported	none reported	none reported	none reported	none reported
Blue	904	706	1,111	3,508	65
Mako, Longfin*	7,867	4,971	4,619	6,560	12,930
Mako, Shortfin	224,362	224,421	170,860	129,088	173,143
Mako, Unclassified	71,371	79,773	58,344	74,690	73,556
Oceanic whitetip	2,764	22,049	698	657	922
Porbeagle	4,222	19,795	5,362	5,272	1,208
Probeagle, fins	none reported	none reported	none reported	none reported	12
Sevengill*	none reported	none reported	none reported	none reported	none reported
Sixgill*	none reported	none reported	none reported	none reported	none reported
Thresher	145,253	102,531	96,012	81,624	56,893
Thresher, fins	none reported	none reported	none reported	none reported	201
Unclassified pelagic	75,543	49,626	46,056	41,184	31,639
Unclassified pelagic, fins	none reported	none reported	none reported	3,746	12,026
Total:	537,594 (244 mt dw)	505,275 (229 mt dw)	400,821 (182 mt dw)	350,705 (159 mt dw)	362,925 (165 mt dw)

* indicates species that were prohibited in the commercial fishery as of June 21, 2000.

** in metric tons dressed weight.

Table 4.5.9 Commercial Landings of Small Coastal Sharks in lb dw: 1997-2001. Source: Cortes, 2002 and

Cortes, 2000.

Small coastal sharks	1997	1998	1999	2000	2001
Atlantic Angel*	none reported	none reported	none reported	86	none reported
Blacknose	202,781	119,689	130,317	178,083	160,990
Bonnethead	75,787	13,949	53,702	69,411	62,980
Finetooth	169,733	267,224	246,404	202,572	299,788
Sharpnose, Atlantic	256,562	230,920	239,647	142,511	195,257
Sharpnose, Atlantic, fins	none reported	none reported	none reported	none reported	209
Sharpnose, Caribbean*	none reported	none reported	2,039	353	205
Unclassified Small Coastal	51	82	136	11	55
Total:	704,914 (320 mt dw)	631,864 (287 mt dw)	672,245 (305 mt dw)	593,027 (269 mt dw)	719,484 (326 mt dw)

* indicates species that were prohibited in the commercial fishery as of June 21, 2000.

4.5.3 U.S. vs. International Breakdown of Landings

As previously stated, there is no comprehensive international reporting system for Atlantic shark catches and landings. While there are some international data, not all countries report shark catches and landings and those that do use varying reporting methods. In 2001 ICCAT passed a resolution on Atlantic sharks to determine needed improvements in data collection for Atlantic shortfin mako and blue sharks, and to conduct an interim meeting in 2003 to discuss the issue. In addition, the resolution called upon contracting parties and non-contracting parties to: (1) submit catch and effort data on Atlantic shortfin mako, porbeagle, and blue sharks; (2) encourage the release of live sharks that are caught incidentally; (3) minimize waste and discards from shark catches; and (4) voluntarily agree not to increase fishing effort targeting Atlantic porbeagle, shortfin mako and blue sharks until sustainable levels of harvest can be determined through stock assessments.

4.5.4 Bycatch Issues and Data Associated with the Fishery

General

Bycatch of sharks occurs in many fisheries, including trawl, set-net, and hook and line fisheries. Estimates of shark dead discards from the pelagic longline fishery range from 4,300 to 9,000 fish in 1998 and 1999 (Cramer, 1999; Cramer and Adams, 2000; Cortes, 2002). Observer data collected from the directed bottom longline shark fishery indicate that LCS discarded dead represent approximately 5.7 percent of the total mortality of these species in that fishery from 1994 through 2001 (Cortes, 2002). Pelagic longline and coastal dead discards combined

represented about 2.8 percent of total mortality of LCS in 2001 (Cortes, 2002) (Table 4.5.6). Observer data in the Gulf of Mexico menhaden fishery for the period 1994-1995 indicate that 75 percent of the sharks encountered died (Cortes, 2000). In 2002, the Gulf of Mexico menhaden fishery accounted for approximately 7.5 percent of the total mortality of LCS (Table 4.5.6).

Shark Bottom Longline Fisheries

Bottom longlining for sharks has relatively low observed bycatch rates. In 1998, observer data indicate that approximately 6,277 sharks were caught compared to 594 other fish, 12 invertebrates, and three sea turtles (Burgess and Johns, 1999). In terms of bycatch rates, observed shark catches constitute 91.1 percent of the 6,886 total animals caught, with other fish comprising 8.6 percent, invertebrates 0.17 percent, and sea turtles 0.04 percent. One delphinid was observed caught and released alive between 1994 and 1999 (G. Burgess, pers. comm. 2000). One pelican was observed caught and killed off the Florida Gulf Coast in January 1995 (G. Burgess, pers. comm. 2001).

NOAA Fisheries (NOAA Fisheries, 2002) anticipates that the continued operation of the shark bottom longline fishery will result in the annual capture of the following numbers of sea turtles: Leatherback - 2; loggerhead - 12; green - 2; hawksbill - 2; Kemp's ridley - 2.

Shark Drift Gillnet and Strikenet Fisheries

During the 2002 right whale calving season, observed drift gillnets sets caught 26 species of teleosts and rays (9.2 percent of the total number of animals caught were teleosts and rays), and two species of sea turtle (0.05 percent; Tables 4.5.10) (Carlson, 2002).

Three teleost and ray species made up 56.2 percent by number of the overall non-shark catch: little tunny (29.2 percent), king mackerel (15.2 percent), and great barracuda (11.8 percent). The highest proportion of species discarded dead (for those species with observed catch greater than 10 individuals) was for Atlantic sailfish (97.7 percent), and cobia (25.7 percent). Note that retention of billfish caught by gear other than rod and reel is prohibited. Remoras had the highest live discard proportion (72.2 percent) (Carlson, 2002).

Table 4.5.10 Total Teleost and Ray Bycatch in NOAA Fisheries Observed Drift Gillnet Sets During 2002 Right Whale Season. Source: Carlson 2002

Species	Total Number Caught	Kept (%)	Discard Alive (%)	Discard Dead (%)
King mackerel	93	75.3	0.0	24.7
Cownose ray	6	33.3	66.6	0.0
Cobia	66	68.2	6.1	25.7
Great barracuda	72	100.0	0.0	0.0
Bluefish	9	44.4	0.0	55.5
Spanish mackerel	16	87.5	0.0	12.5
Little tunny	178	96.1	0.0	3.9
Spotted eagle ray	9	0.0	100.0	0.0
Crevalle jack	41	97.5	2.5	0.0
Remora	11	0.0	72.7	27.3
Atlantic manta ray	2	0.0	100.0	0.0
Tripletail	3	100.0	0.0	0.0
Atlantic sailfish	43	0.0	2.3	97.7
Wahoo	2	100.0	0.0	0.0
Atlantic thread herring	3	0.0	33.3	66.7
Blackfin tuna	4	100.0	0.0	0.0
Blue runner	2	100.0	0.0	0.0
Tarpon	3	0.0	33.3	66.7
Gag grouper	1	100.0	0.0	0.0
Atlantic bumper	2	0.0	50.0	50.0
Dolphin	3	100.0	0.0	0.0
Atlantic bonito	20	100.0	0.0	0.0
Atlantic moonfish	3	66.7	0.0	33.3
Devil ray	6	0.0	33.3	66.7
Permit	2	100.0	0.0	0.0
Sea basses	2	0.0	0.0	100.0
Silver perch	1	100.0	0.0	0.0
Jacks	1	100.0	0.0	0.0

Interactions with three sea turtles and zero marine mammals occurred in 41 separate drift gillnet sets (Carlson, 2002). Two leatherback turtles and one loggerhead turtle were encountered (Table 4.5.11). All three sea turtles were released alive (Carlson, 2002).

Table 4.5.11 Protected Species Interactions in Drift Gillnet Sets During Right Whale Calving Season, 2002. Source: Carlson, 2002.

Species	Total Number Caught	Released Alive	Discarded Dead	Released Condition Unknown or Comatose
Leatherback turtle	2	2	0.0	0.0
Loggerhead turtle	1	1	0.0	0.0

During the 2002 right whale calving season, observed strikenet sets caught three species of teleosts and rays and no sea turtles or marine mammals (Tables 4.5.12) (Carlson, 2002). Only the great barracuda were retained, with all remaining bycatch discarded alive (Carlson, 2002).

Table 4.5.12 Total Bycatch in NOAA Fisheries Observed Strikenet Sets During 2002 Right Whale Season. Source: Carlson 2002

Species	Total Number Caught	Kept (%)	Discard Alive (%)	Discard Dead (%)
Great barracuda	26	84.6	11.6	3.8
Cownose ray	1	0.0	100.0	0.0
Houndfish	1	0.0	100.0	0.0

Outside of right whale calving season, observed drift gillnet catch consisted of 26 species of teleosts and rays and one species of marine mammal, which was discarded dead (Tables 4.5.13). Five species of teleosts and one species of ray made up 90.6 percent by number of the overall non-shark catch. Little tunny (44.1 percent), king mackerel (20.8 percent), great barracuda (12.5 percent), Atlantic moonfish (9.4 percent), and cobia (3.8 percent) dominated the bycatch (Table 4.5.13) (Carlson and Baremore, 2002). During drift gillnet fishing, the highest proportion of species discarded dead (for species with greater than 10 individuals) was for tarpon, crevalle jack, king mackerel, and red drum. Cownose rays and red drum had the highest proportion of discarded alive with 78.1 percent and 50.0 percent, respectively (Table 4.5.13) (Carlson and Baremore, 2002).

Table 4.5.13 Total Bycatch in NOAA Fisheries Observed Drift Gillnet Sets Outside of 2002 Right Whale Calving Seasons. Source: Carlson 2002

Species	Total Number Caught	Kept (%)	Discard Alive (%)	Discard Dead (%)
Little tunny	817	94.5	0.0	5.5
King mackerel	386	41.7	1.0	57.3
Barracuda	231	100.0	0.0	0.0
Blue runner	21	100.0	0.0	0.0
Cownose ray	32	0.0	78.1	21.9
Cobia	72	80.5	7.0	12.5
Remora	21	0.0	90.5	9.5
Atlantic moonfish	174	72.4	22.4	5.2
Crevalle jack	29	3.5	24.1	72.4
Atlantic sailfish	4	0.0	0.0	100.0
Blackfin tuna	1	100.0	0.0	0.0
Spotted eagle ray	1	0.0	100.0	0.0
Manta ray	3	0.0	100.0	0.0
African pompano	2	100.0	0.0	0.0
Tarpon	22	0.0	22.7	77.3
Spanish mackerel	3	100.0	0.0	0.0
Red Drum	28	0.0	50.0	50.0
Bullet	21	100.0	0.0	0.0
Permit	6	0.0	16.6	83.4
Dolphin	2	100.0	0.0	0.0
Atlantic Sturgeon	1	0.0	100.0	0.0
Balloonfish	1	100.0	0.0	0.0
Skipjack tuna	1	100.0	0.0	0.0
Atlantic manta ray	1	0.0	0.0	100.0
Devil ray	1	100.0	0.0	0.0
Bottlenose dolphin	1	0.0	0.0	100.0

Observed catch in strikenet sets outside of right whale calving season consisted of three species of sharks (Table 4.5.5) (Carlson and Baremore, 2002). No teleosts, sea turtles, or marine

mammals were observed caught.

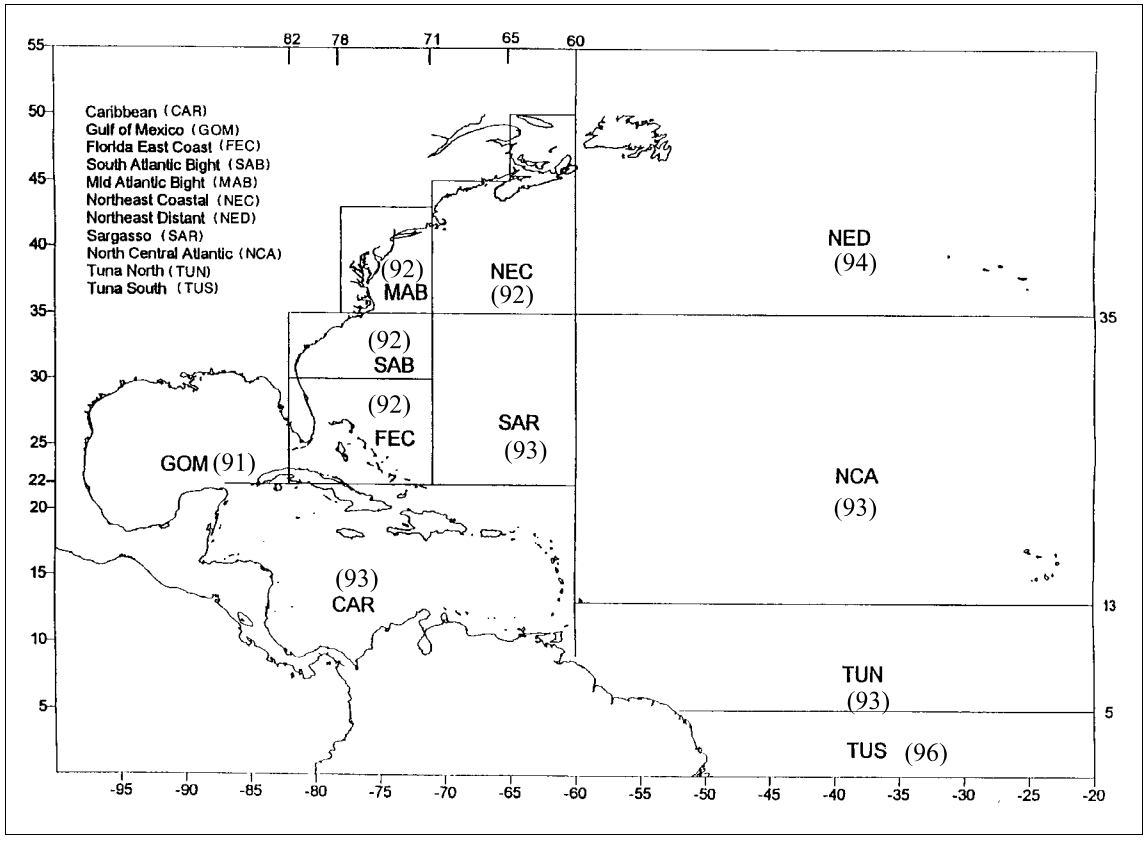
4.6 Fishery Data: LANDINGS BY SPECIES

The following tables are taken from the 2002 National Report of the United States to ICCAT (NAT/02/06). The purpose of this section is to provide a summary of recent landings of HMS on a species by species basis for comparison to Sections 4.1 through 4.5 of the 2001 HMS SAFE report.

Figure 4.6.1. Geographic areas used in summaries of pelagic logbook data from 1992 - 1998; ICCAT areas (91 to 96) are also shown (Cramer and Adams, 2000).

Table 4.6.1. U.S. Landings (mt) of Bluefin Tuna by Gear and Area for 1997 to 2001.

Area	Gear	1997	1998	1999	2000	2001
NW Atlantic	Longline	26.0	30.5	25.1	22.8	17.7
	Handline	17.4	29.2	15.5	3.2	9.0
	Purse Seine	249.7	248.6	247.9	275.2	195.9



	Harpoon	97.5	133.1	115.8	184.2	101.9
	*Rod and reel (>145 cm LJFL)	752.6	610.4	657.5	632.8	993.4
	*Rod and reel (<145 cm LJFL)	178.9	166.3	103.0	49.5	249.3
	Unclassified	2.2	0.6	0.1	0.2	0.5
Gulf of Mexico	Longline	23.8	18.3	48.4	43.3	19.8
	*Rod and reel	0.0	0.0	0.4	0.9	1.7
	All Gears	1348.1	1237	1213.7	1212.1	1589.2

* 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.

Table 4.6.2. U.S. Landings (mt) of Yellowfin Tuna by Gear and Area from 1997 to 2001.

Area	Gear	1997	1998	1999	2000	2001
NW Atlantic	Longline	838.9	464.9	581.3	734.45	631.8
	Rod and reel*	3560.9	2845.7	3818.2	3809.47	3690.5
	Troll	218	177.5	0.0	0.0	0.0
	Purse seine	0.0	0.0	0.0	0.0	0.0
	Gillnet	1.3	1.7	0.2	0.21	7.6
	Trawl	1.9	0.7	4.1	1.76	2.7
	Harpoon	0.0	0.0	0.0	0.0	0.0
	Handline	34.3	0.0	192	235.7	242.5
	Trap	**	0.1	0.8	0.53	0.1
	Unclassified	0.0	0.0	2.1	1.31	6.8
Gulf of Mexico	Longline	2571.3	1864.5	2736.6	2133	1505.5
	Rod and reel*	7.7	80.9	149.4	52.26	494.2
	Handline	55.6	60.8	12.7	28.57	43.4
	Gillnet	0.0	0.0	**	0.0	0.0
	Uncl	0.0	0.0	0.0	0.0	0.0
Caribbean	Longline	135.4	58.6	24.4	11.77	23.1
	Troll	19.6	0.0	0.0	0.0	0.0
	Handline	0.7	3.9	14.5	19.41	14.3
	Gillnet	**	0.0	0.0	0.09	0.3
	Trap	0.1	0.0	0.1	0.28	0.3
NC Area 94a	Longline	6.1	4.6	0.2	2.11	3.5
SW Atlantic	Longline	221.9	55.3	32.4	19.76	36.2
All Gears		7673.7	5619.2	7569	7050.68	6702.8

** $\leq$ 0.05 mt

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

Table 4.6.3. U.S. Landings (mt) of Skipjack Tuna by Gear and Area from 1997 to 2001.

Area	Gear	1997	1998	1999	2000	2001
NW Atlantic	Longline	1.0	0.7	0.3	0.0	0.1
	Rod and reel*	42.0	49.5	63.6	13.12	32.9
	Troll	0.6	0.4	0.0	0.0	0.0
	Purse seine	0.0	0.0	0.0	0.0	0.0
	Gillnet	8.9	16.9	26.5	1.86	3.6
	Trawl	0.0	0.2	1.0	0.04	0.2
	Handline	0.1	0.0	0.2	0.23	0.2
	Trap	0.0	0.0	17.5	0.0	0.0
	Pound	0.0	0.0	0.0	0.0	0.0
	uncl	0.0	0.0	0.0	0.0	0.0
Gulf of Mexico	Longline	1.3	0.6	0.4	0.23	0.2
	Rod and reel*	21.7	37.0	34.8	16.67	16.1
	Handline	0.0	0.0	0.4	0.65	0.0
	Trap	0.0	0.0	0.0	0.0	0.0
	Uncl	0.0	0.0	0.0	0.04	0.0
Caribbean	Longline	1.2	0.0	1.3	1.62	4.0
	Gillnet	0.2	0.0	0.4	0.59	1.6
	Harpoon	0.0	0.0	0.0	0.0	0.0
	Handline	0.0	0.0	5.8	8.8	10.3
	Trap	**	0.0	0.1	0.28	0.4
	Troll	7.3	0.0	0.0	0.0	0.0
	uncl	0.0	0.0	0.0	0.0	0.0
SW Atlantic	Longline	**	0.0	0.0	0.0	0.0
All Gears		84.3	105.3	152.3	44.1	69.6

** <= 0.05 mt

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

Table 4.6.4. U.S. Landings (mt) of Bigeye Tuna by Area and Gear for 1996-2000.

Area	Gear	1997	1998	1999	2000	2001
NW Atlantic	Longline	476.3	544.3	737.8	333.2	506.1
	Rod and reel*	333.5	228.0	316.1	34.4	366.2
	Troll	3.9	4.0	0.0	0.0	0.0
	Gillnet	**	0.4	0.2	0.0	0.2
	Handline	2.7	0.0	11.9	4.1	33.2
	Pairtrawl	0.0	0.0	0.0	0.0	0.0
	Trawl	1.0	0.5	1.2	1.7	0.4
	Harpoon	0.0	0.0	0.0	0.0	0.0
	Haul Seine	0.0	0.0	0.0	0.0	0.0
	Uncl	0.5	0.0	0.9	0.0	1.8
Gulf of Mexico	Longline	33.9	25.6	54.6	44.5	15.3
	Rod and reel*	0.0	0.0	1.8	0.0	0.0
	Handline	**	0.1	0.2	0.1	0.5
Caribbean	Longline	50.0	48.5	23.2	13.7	31.9
	Handline	0.0	0.0	0.2	1.5	0.0
NC Area 94a	Longline	91.8	48.4	35.3	63.1	61.0
SW Atlantic	Longline	142.8	28.5	78.2	77.4	68.2
All Gears		1136.4	928.3	1261.6	573.7	1084.8

** $\leq$= 0.05

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

Table 4.6.5. U.S. Landings (mt) of Albacore Tuna by Gear and Area for 1997 to 2001.

Area	Gear	1997	1998	1999	2000	2001
NW Atlantic	Longline	140.0	155.4	179.5	130.52	171.7
	Gillnet	42.8	40.1	27.0	0.78	3.3
	Handline	4.8	0.0	0.6	2.93	1.7
	Trawl	2.6	2.4	0.4	0.03	0.0
	Troll	1.6	5.8	0.0	0.0	0.0
	Rod and reel*	220.2	601.1	90.1	250.75	122.3
	Pair Trawl	0.0	0.0	0.0	0.0	0.0
	Pound	1.3	0.9	0.4	0.0	0.0
	Uncl	0.2	0.0	0.0	0.12	0.1
Gulf of Mexico	Longline	16.9	3.9	3.8	4.13	4.9
	Rod and reel*	49.3	0.0	0.0	0.0	0.0
	Handline	0.0	0.0	**	0.0	0.0
Caribbean	Longline	16.1	17.8	8.3	9.24	8.7
	Troll	3.6	0.0	0.0	0.0	0.0
	Gillnet	**	0.0	0.2	0.13	0.5
	Trap	**	0.0	**	0.22	0.3
	Handline	0.0	0.0	3.8	5.01	2.2
NC Area 94a	Longline	11.4	1.6	1.5	2.6	6.1
SW Atlantic	Longline	4.7	1.4	1.4	0.89	2.4
All Gears		515.5	830.4	317	407.35	324.2

** $\leq$= 0.05 mt

* Rod and Reel landings are estimates of landings and dead discards, when available.

Table 4.6.6. U.S. Catches and Landings (mt) of Swordfish by Gear and Area for 1997 to 2001.

Area	Gear	1997	1998	1999	2000	2001
NW Atlantic	* Longline	1262.2	1624.1	1872.3	1547.6	1220.8
	Gillnet	0.4	36.3	0.0	0.0	0.0
	Pair Trawl	0.0	0.0	0.0	0.0	0.0
	Handline	1.3	0.0	5.0	7.7	8.6
	Trawl	8.0	5.9	7.5	10.9	2.5
	Troll	0.4	0.7	0.0	0.0	0.0
	* unclassified	11.9	9.1	3.8	1.4	1.8
	Harpoon	0.7	1.5	0.0	0.6	7.4
	** Rod and Reel	10.91	4.71	21.32	15.6	1.5
	Trap	0.0	0.1	**	0.0	0.0
Gulf of Mexico	* Longline	759.9	633.1	579.6	631.7	494.6
	Handline	0.0	0.0	**	1.2	0.3
Caribbean	* Longline	688.9	516.0	260.5	331.9	347.0
	Trap				0.3	0.0
NC Atlantic	* Longline	688.2	658.6	650.0	804.6	420.6
SW Atlantic	* Longline	417.9	170.1	185.2	143.8	43.2
All Gears		3850.71	3660.21	3585	3497.1	2548.3

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

** $\leq$ = 0.5 mt

Table 4.6.7. U.S. Landings (mt) and dead discards of Blue Marlin, White Marlin and Sailfish by Gear and Area for 1998-2001.

		Blue Marlin				White Marlin				Sailfish			
Area	**Gear**	**1998**	**1999**	**2000**	**2001**	**1998**	**1999**	**2000**	**2001**	**1998**	**1999**	**2000**	**2001**
NW Atlantic	Longline*	23.3	22.0	28.8	10.9	15.3	18.6	10.3	5.1	6.4	13.7	11.2	2.2
	Unclassified*	0.62	0.0	0.1	0.0	0.7	0.06	0.0	0.0	0.06		0.0	0.0
	Rod and reel**	34.1	24.8	13.75	9.0	2.4	1.5	0.23	2.8	0.1	0.07	1.75	61.2
Gulf of Mexico	Longline*	18.5	55.2	29.6	9.4	11.8	31.5	29.9	10.1	17.0	57.4	33.9	8.2
	Rod and reel**	4.5	7.5	4.7	5.1	0.2	0.1	0.0	0.3	1.0	0.6	0.24	0.6
Caribbean	Longline*	2.3	1.6	0.5	1.2	1.3	5.04	0.5	0.7	0.2	0.46	0.1	0.0
	Rod and reel**	10.6	4.6	5.7	2.3	0.02	0.0	0.0	0.0	0.05	0.0	0.06	0.0
	Other	0.0	0.0	0.0	0.0	0.0	0.0	n/a	0.0	0.0	0.0	0.0	0.0
Unknown & NC Area 94a	Longline*	6.1	1.6	0.7	0.9	2.8	1.08	0.1	0.6	0.8	0.02	0.1	0.3
SW Atlantic	Longline*	1.6	1.7	0.0	0.0	0.9	0.45	0.0	0.0	2.7	0.02	0.1	0.0
All Gears		101.6	119.0	83.7	38.8	35.4	58.3	41.0	19.6	28.3	72.3	47.3	72.5

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

** Recreational billfish landings estimates are based on tournament reports and the Large Pelagic Survey (see Section 2.3 of the Billfish Amendment).

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