
4. FISHERY DATA UPDATE

In this section of the 2002 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 most HMS fishermen target particular species, the non-selective nature of most fishing gear promotes 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 by species can be found in the National Report of the United States: 2001 (NMFS, 2001b), as well as in Section 4.6 of this report.

The revised list of authorized fisheries (LOF) and fishing gear used in those fisheries became effective August 15, 2001 (66 FR 42780). On January 17, 2002, NMFS published a notice that the 2001 LOF remains in effect for 2002 (67 FR 2410). 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 catch-all categories.

Due to the nature of SCRS data collection, Table 4.1 depicts a summary of the U.S. portion of HMS catch and landings by species rather than gear type. International catch levels as well as U.S. reported catches, other than sharks, are taken from the 2001 SCRS Report which

reflects catch data on a calendar year basis through 2000. The U.S. percentages of regional and total catch for HMS species are presented (Table 4.1) to provide a basis for comparison of 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 2000 U.S. vs International Catch of HMS (mt ww) other than sharks.
Source: SCRS, 2001; NMFS, 2001b).

Species	Total International Reported Catch	Region of U.S. Involvement	Total Regional Catch	U.S. Catch	U.S. Percentage of Regional Catch	
Atlantic Swordfish	40,959.98 (Atlantic and Mediterranean)	North Atlantic (NA) and South Atlantic (SA)	25,550 (11,210 NA, 14,340 SA)	2,915.3 (488.9 mt discards) (2,864.3 + 488.9 mt discards NA, 51 mt SA)	11.4% (25.55% NA, 0.36% SA)	7.12% (includes Med catches)
Atlantic Bluefin Tuna	36,022.97	West Atlantic	2,395	1,212 (173 mt discards)	50.61%	3.36%
Atlantic Bigeye Tuna	99,981.93	Total Atlantic	99,981.93	574	0.57%	0.57%
Atlantic Yellowfin Tuna	135,231.2	West Atlantic	28,129	7,051	25.07%	5.21%
Atlantic Albacore Tuna	69,262.19	North Atlantic	33,134	406	1.23%	0.59%
Atlantic Skipjack Tuna	139,301.7	West Atlantic	26,406	44	0.17%	0.03%
Atlantic Blue Marlin	3,154.717	North Atlantic	818	83.7 (59.7 mt discards)	10.23%	2.65%

Species	Total International Reported Catch	Region of U.S. Involvement	Total Regional Catch	U.S. Catch	U.S. Percentage of Regional Catch	
Atlantic White Marlin	839.449	North Atlantic	317	41 (40.8 mt discards)	12.93%	4.88%
Atlantic Sailfish	1,901.255	West Atlantic	506	47.3 (mt discards)	9.35%	2.49%

4.1 Fishery Data: PELAGIC LONGLINE

4.1.1 Overview of History and Current Management

U.S. pelagic longline fishermen began targeting highly migratory species in the Atlantic Ocean in the early 1960s. However, U.S. landings of swordfish did not exceed 1500 mt until the mid-1970s. Since that time, the gear deployed has evolved several times. The majority of fishermen use monofilament mainline that is rigged depending on whether the line is “targeting” tunas or “targeting” 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, yellowfin tuna fishing tends to occur during the day while most swordfish fishing takes place at night. However, use of pelagic longline gear also results in incidental catch of other pelagic species. The incidental catch includes species which are retained or discarded for economic and regulatory reasons. A complete discussion of the pelagic longline fishery can be found in the final environmental impact statement to reduce bycatch in the Atlantic pelagic longline fishery (NMFS 2000). 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 this fishery is discussed in Section 4.1.4 and 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 in order to reduce the mortality of small fish. Pelagic longline fishermen are also subject to target catch limits 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, NMFS 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, NMFS would like to require all pelagic longline vessels to report positions on an approved vessel monitoring system (VMS). Implementation of the VMS program is delayed pending the outcome of ongoing litigation.

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, NMFS 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. NMFS is re-evaluating the limited access program and may

consider gear-specific permits in the future. Refer to Section 9 for a discussion of limited access options.

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 1996-2000 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 1996-2000 (mt ww)*.
Source: NMFS 2001b and NMFS 2001a.

	1996	1997	1998	1999	2000
Swordfish <i>landings</i>	3,599.8	3,350.1	3,158.9	3,047.6	2,968.6
Swordfish <i>dead discards</i> **	589	467	443	500	491
Yellowfin Tuna	3,285	3,773.6	2,447.9	3,374.9	2,901.1
Bigeye Tuna	660.5	794.8	695.3	929.1	531.9
Bluefin Tuna <i>landings</i>	67.9	49.8	48.8	73.5	66.1
Bluefin Tuna <i>dead discards</i> ***	73.5-168	37.1-148	64-102	30-151	67 - 173
Albacore Tuna	109.4	189.1	180.1	194.5	147.4
Skipjack Tuna	0.3	3.5	1.3	2.0	1.8
Blue Marlin****	196.5	138.1	51.8	82.1	59.6
White Marlin****	67.6	70.8	32.1	56.7	40.8
Sailfish****	71.6	57.7	27.1	71.6	45.4
Total	8,721.1 - 8,815.6	8,931.6 - 9,042.5	7,150.3 - 7,188.3	8,362.0 - 8,483.0	7,320.7 - 7,426.7

*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 NMFS at this time. Source: SCRS 2001.

***Estimates of bluefin tuna discards vary depending on method used to calculate discards.

****Indicates longline *dead discards* of these species.

4.1.3 U.S. vs. International Catch

For 2000, the provisional estimate of U.S. vessel landings and dead discards of swordfish (North and South Atlantic) was 3,497 mt (99 percent of these are longline landings and discards). This estimate is 2 percent lower than the estimate of 3,585 mt for 1999. Decline in U.S. landings of swordfish from the 1990 level (5,519 mt, North Atlantic only) was at least in part due to U.S. implementation of quotas. The 1999 stock assessment shows a potential reward for these fishermen who have been subject to increasingly restrictive management measures. With a rebuilding plan in place, it is hoped that the strong year classes of young swordfish will be protected throughout their lives and stock size will begin to increase. Anecdotal evidence indicates more small swordfish are being encountered by pelagic longline fishermen throughout the Atlantic Ocean. The following table indicates the proportion of the harvest that is caught by the United States.

Table 4.1.2 Estimated International Longline Landings of HMS, Other than Sharks, for All Countries in the Atlantic: 1996-2000 (mt ww)*. Source: SCRS 2001

	1996	1997	1998	1999	2000
Swordfish (N.Atl + S. Atl)	31,331	30,302	24,376	25,308	23,796
Yellowfin Tuna (W. Atl)**	8,631	8,724	8,716	11,981	9,842
Bigeye Tuna	74,876	68,227	71,811	78,886	70,049
Bluefin Tuna (W. Atl.)**	528	382	764	914	589
Albacore Tuna (N. Atl + S. Atl)	25,092	23,490	23,573	27,203	28,221
Skipjack Tuna	26	65	99	49	28
Blue Marlin (N. Atl. + S. Atl.)***	3,444	3,612	2,483	2,442	1,934
White Marlin (N. Atl. + S. Atl.)***	1,237	974	884	954	798
Sailfish (W. Atl.)***	252	188	251	191	219
Total	145,417	135,964	132,957	147,928	135,476
U.S. Longline Landings (from U.S. Natl. Report, 2000)#	8721.1	8931.6	7150.3	8362.0	7320.7
U.S. Longline as Percentage of Longline Total	6.0	6.6	5.4	5.6	5.4

* 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

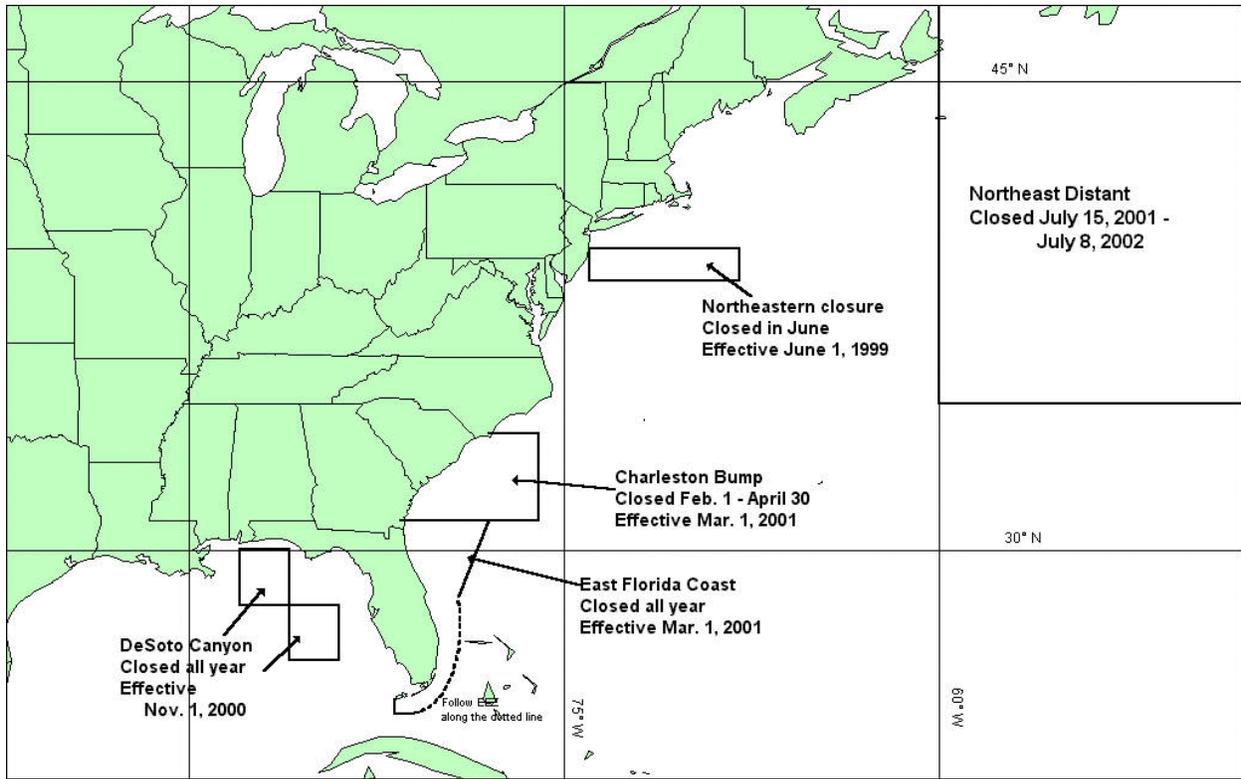
The U.S. longline fleet has historically accounted for a small percentage of total Atlantic landings of HMS. Even when including U.S. discards for bluefin tuna, swordfish, blue marlin, white marlin, and sailfish, the U.S. percentage still remains around 5 to 6 percent of all longline landings reported 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 from the pelagic longline fishery 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 some other finfish species, are discarded as a result of a limited market (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 have not been met. All billfish and protected species including mammals, sea turtles, and birds are required to be released. In the past, swordfish have been discarded during times 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 remains an important management issue. NMFS is also concerned about serious injuries to 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, NMFS published regulations to close areas to longline fishing (Figure 4.1.1) and 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

Four hundred and sixty-four longline sets were observed and recorded by NMFS observers in 2000 (4.2% coverage of a total of 11,065 sets reported). Table 4.1.3 compares 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 was not possible to place observers on all selected trips. NMFS is working towards improving compliance with observer requirements and facilitating communication between vessel operators and observer program coordinators. In addition, fishermen will be reminded of safety requirements for placement of observers, including the need to have all safety equipment on board that is required by the U.S. Coast Guard.

Table 4.1.3 Observer Coverage of the Pelagic Longline Fishery. Source: Yeung, 2001.

Year	Number of Sets Observed	
1995	696	5.2

1996	361	2.5
1997	448	3.1
1998	287	2.9
1999	420	3.8
2000	464	4.2

Marine Mammals

In accordance with the Marine Mammal Protection Act (MMPA), NMFS published draft stock assessment reports for Atlantic and Gulf of Mexico marine mammals. These species are sometimes hooked on pelagic longline gear and fishermen report takes of mammals to NMFS 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 Risso’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, NMFS 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. As a result, NMFS re-initiated consultation under Section 7 of ESA and published a BiOp on June 30, 2000. NMFS subsequently re-initiated consultation under the ESA to consider new information and analyses concerning turtle interactions with Atlantic pelagic longline gear. Nevertheless, an emergency rule to reduce bycatch was published October 13, 2000, (65 FR 60889) to avoid fishing in an “L-shaped” area of the Grand Banks to minimize the number of turtle takes. In addition, all U.S.-flagged vessel with pelagic longline fishing gear onboard are required to have line clippers and a dip net that meet standards set forth in the emergency rule. The line clipper and dipnet requirements were implemented on a long-term basis by an interim final rule that became effective on April 10, 2001 (66 FR 17370). A new Biological Opinion was completed on June 14, 2001, that found that the actions of the pelagic longline fishery jeopardized the continued existence of the loggerhead and leatherback sea turtles. This 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 northeast distant statistical reporting area and modified how pelagic longline gear would be deployed. On December 13, 2001, NMFS extended the emergency rule for 180 days (66 FR 64378). NMFS is currently working on developing a proposed and final rule to implement these measures.

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 NMFS observer data from 2001, 8 greater shearwaters were hooked in June and July. 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 incidental seabird takes (www.nmfs.gov.gov/NPOA-S.html). Although Atlantic pelagic longline interactions will be considered in the plan, NMFS has not identified a need to implement gear modifications aimed at reducing seabird takes by Atlantic pelagic longlines. Takes of seabirds have been minimal in this 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 used for a number of years to estimate dead discards of a variety of species in longline fisheries, including billfish, sharks, undersized swordfish, and turtles, and has been applied in both Atlantic and Pacific fisheries. Further, the data have been used for scientific analyses by both ICCAT and the Inter-American Tropical Tuna Commission for a number of years.

The total estimated metric tons of dead discards of swordfish, sailfish, blue marlin, and white marlin decreased in 2000 compared to 1999 levels. The weight of pelagic, blue, dusky and hammerhead sharks discarded dead decreased while the weight of coastal and silky sharks increased (Cramer, pers. comm.). The most recent longline bycatch data are available from the 2001 U.S. National Report to ICCAT (NMFS 2001b). Longline dead discards of swordfish in 2000 were estimated to be 491 mt ww, a small decrease from the 1999 level of 500 mt ww (SCRS 2001).

Longline bycatch of billfish in 2000 decreased in many geographic areas from 1999 levels. Estimated billfish dead discards from commercial longlines were 59.6 mt for blue marlin, 40.8 mt for white marlin, and 45.2 mt for sailfish in 2000. In 1999, 82.1 mt blue marlin, 56.7 mt white marlin, and 71.6 mt sailfish were reported as dead discards. Blue marlin bycatch decreased substantially in every area except in the northwest Atlantic Ocean. The largest decrease was in the Gulf of Mexico, where it declined by almost 50 percent. The bycatch of white marlin decreased in all areas compared to 1999, most drastically in the northwest Atlantic Ocean and the

Caribbean Sea. Sailfish bycatch also decreased in general from 1999 to 2000. The decline was most noticeable in the Gulf of Mexico and the Caribbean Sea. Bluefin tuna dead discards from the pelagic longline fishery were 67 to 173 mt in 2000, depending on the methodology used for estimation, which is an increase for the 1999 levels of 30 to 151 mt.

4.1.5 Northeast Distant Area Experimental Fishery

In the fall of 2001, NMFS conducted the first year of an experimental fishery in the northeast distant statistical reporting area. The goal of the research is to examine gear modifications that will reduce the incidental catch of sea turtles without significantly decreasing the catch of target species. The measures that were examined in 2001 were the use of blue-dyed bait and spacing the gangion 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 Risso's dolphin, 1 northern bottlenose whale, and 1 striped dolphin. NMFS is currently analyzing the data to determine the effectiveness of the experimental measures.

4.1.6 Safety Issues Associated with the Fishery

Like all offshore fisheries, pelagic longlining can be dangerous. Trips can be long, the work can be arduous, and the nature of setting and hauling the line may cause injuries due to hooking. Like all other HMS fisheries, longline fishermen are exposed to unpredictable weather. NMFS does not wish to exacerbate unsafe conditions through implementation of regulations. Therefore, NMFS 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. NMFS seeks comments from fishermen on any safety concerns they may 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. NMFS 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 did target and land bluefin tuna off the coast of Gloucester, MA as early as the 1930s. The limited entry system with

non-transferable individual vessel quotas (IVQs) for purse seining was established in 1982, effectively excluding any new entrants to this category. Equal quotas are assigned to individual vessels by regulation; the IVQ system is possible given the small pool of ownership in this sector of the 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. For the Purse Seine category, NMFS adopted a cap on the amount of quota the category could be allocated. The HMS AP met in Silver Spring, MD on June 10 and June 11, 1999, and discussed, among other issues, the Purse Seine category cap. The AP provided information and advice to NMFS on the issue of fairness in the context of allocation to the Purse Seine category.

On August 18, 1999 (64 FR 44885), NMFS published a proposed rule to remove the 250 mt cap on the Purse Seine category bluefin tuna allocation. NMFS held two public hearings on the proposed rule and the comment period closed on September 27, 1999. Numerous comments were received, both in favor of the proposed rule and against it. On October 27, 1999, NMFS filed a final rule with the Federal Register (64 FR 58793, November 1, 1999) removing the cap on the Purse Seine category.

4.2.2 Most Recent Catch and Landings Data

Table 4.2.1 shows purse seine landings of Atlantic tunas from 1996 through 2000. Purse Seine landings make up about 20% of the total annual U.S. landings of bluefin tuna (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: 1996-2000 (mt ww). NW Atlantic Fishing Area.

Species	1996	1997	1998	1999	2000
Bluefin Tuna	245.0	249.7	248.6	247.9	275.2
Yellowfin Tuna	6.8	0	0	0	0
Skipjack Tuna	0.7	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: 1996-2000 (mt ww).

Species	1996	1997	1998	1999	2000
Bluefin Tuna	26,589	25,256	21,857	16,091	14,841
Yellowfin Tuna	89,156	78,370	83,659	77,581	75,057
Skipjack Tuna	91,520	76,171	77,594	97,794	82,779
Bigeye Tuna	26,919	19,057	16,370	21,437	18,378
Total	234,184	198,858	199,480	212,903	191,055
U.S. Total	252.5	249.7	248.6	247.9	275.2
U.S. Percentage	0.11%	0.13%	0.12%	0.12%	0.14%

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 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 2001 meeting, and the results of the evaluation were similar to those of the previous year. 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 2001 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 NMFS' 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 NMFS 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, NMFS issued Experimental Fishing Permits 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 NMFS with additional data on purse seine operations and gear interactions.

Only five observed purse seine sets were made in the closed areas during the 2000 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 2001 and avoid conflicts with other gear types, NMFS issued EFPs to the purse seine fleet again in 2001, and placed observers on the vessels. 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 Experimental Fishing Permits. The Council will utilize the data collected during the 2000 and 2001 experimental fisheries, and should have a final decision before the 2002 purse seine season.

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

4.2.5 Safety Issues Associated with the Fishery

There are no new safety issues associated with the U.S. Atlantic tunas purse seine fishery. Section 3.9 of the HMS FMP describes safety of human life at sea as it pertains to the fisheries for Atlantic HMS.

4.3 Fishery Data: COMMERCIAL HANDGEAR

Handgear are used for Atlantic HMS by fishermen on private vessels, charter vessels, and headboat vessels. Operations, frequency and 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 comprising the majority of commercial landings. 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, although in the South Atlantic and Gulf of Mexico fishing occurs during the winter months. For bluefin tuna, commercial handgear landings accounted for approximately 63 percent of total U.S. landings, and almost 70 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 using rod and reel, handline, harpoon, and bandit gear. Beyond these general patterns, the availability of bluefin tuna at a specific location and time is highly dependent on 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 activities for bigeye, albacore, yellowfin, and skipjack tunas take place in the northwest Atlantic. Rod and reel gear is also used by recreational fishermen, which is addressed in Section 4.4. In 2000, four percent of the total yellowfin catch, or nine 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 22 percent of total skipjack landings, or about 67 percent of commercial skipjack landings. For albacore, commercial handgear landings accounted for less than two percent of total albacore landings, or about five percent of commercial albacore landings. Commercial handgear landings of bigeye tuna accounted for less than one percent of total and 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. Handgear landings of swordfish are shown in

Table 4.3.1 and account for a very small percentage of total U.S. swordfish catch (less than 0.3 percent).

The HMS FMP established a limited access program for the commercial swordfish and shark fisheries (all gears), as well as for tunas (longline only). Fishermen who submitted an application by December 1, 1999, with documentation of a swordfish permit for use with harpoon gear or landings of swordfish with handgear as evidenced by logbook records, verifiable sales slips or receipts from registered dealers, or state landings records were eligible for a swordfish handgear permit. NMFS also issued handgear permits to those applicants who met the earned income requirement, i.e., those who had derived more than 50% of their earned income from commercial fishing through the harvest and first sale of fish or from charter/headboat fishing, or those who had gross sales of fish greater than \$20,000 harvested from their vessel, during one of the three calendar years preceding the application. Chapter 4 of the HMS FMP includes a complete description of the handgear permit for swordfish under the limited access system. See Chapter 9 of this document for further information on permitting, including limited access permits.

There are a significant number of sharks 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 4.3.5) indicate that 65 percent of party boat operators targeted sharks at least once during the study period. Further information on Atlantic sharks catch and landings data 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. Section 2.2.4.2 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 handgear fisheries are described in Section 2.3.4, and later in this document.

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 discussed in Section 4.5 of this report. Social and economic aspects of the domestic handgear fisheries are described in Section 2.4.4 of the FMP, as well as in Section 5 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 1997-2000 are presented in Tables 4.3.1 and 4.3.2. As commercial shark landings are not recorded/disaggregated by gear type, no commercial handgear data is provided in this section. A complete discussion of Atlantic sharks is found in Section 4.5. 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.

In October 1999, NMFS published revised statistics on the level of U.S. recreational and commercial landings of Atlantic yellowfin tuna since 1981 (64 FR 58035, October 28, 1999). Preliminary statistics were published in March 1996 (61 FR 10319, March 13, 1996), and NMFS received considerable public comment. NMFS published these final statistics to inform the public of updated data on landings trends in the yellowfin tuna recreational and commercial fisheries. A summary of these historical domestic recreational and commercial yellowfin landings (1981-1998) is 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 1997-2000 (mt ww). Source: U.S. National Report to ICCAT: 2001.

Species	Gear	1997	1998	1999	
Bluefin Tuna	Rod and Reel	617.8	603.4	643.6	579.3
	Handline	17.4	29.2	16.4	3.2
	Harpoon	97.5	133.4	114.4	184.2
	TOTAL	732.7	766.0	774.4	766.7
Bigeye Tuna	Troll	3.9	4.0	0	0
	Handline	2.7	0.1	12.3	5.7
	TOTAL	6.6	4.1	12.3	5.7
Albacore Tuna	Troll	5.2	5.8	0	0
	Handline	4.8	0	4.4	7.9
	TOTAL	10.0	5.8	4.4	7.9
Yellowfin Tuna	Troll	237.6	177.5	0	0

Species	Gear	1997	1998	1999	2000
	Handline	90.6	64.7	219.2	283.7
	TOTAL	328.2	242.2	219.2	283.7
Skipjack Tuna	Troll	7.9	0.4	0	0
	Handline	0.1	0	6.6	9.7
	TOTAL	8.0	0.4	6.6	9.7
Swordfish	Troll	0.4	0.7	0	0
	Handline	1.3	0	5.0	8.9
	Harpoon	0.7	1.5	0	0.6
	TOTAL	2.4	2.2	5.0	9.5

Table 4.3.2 Domestic Landings for the Commercial Handgear Fishery by Species and Region for 1996-2000 (mt ww). Source: U.S. National Report to ICCAT: 2001.

Species	Region	1997	1998	1999	
Bluefin Tuna	NW Atl	732.7	766.0	774.4	766.7
Bigeye Tuna	NW Atl	6.6	4.0	11.9	4.1
	GOM	0	0.1	0.2	0.1
	Carib	0	0	0.2	1.5
Albacore Tuna	NW Atl	6.4	5.8	0.6	2.9
	GOM	0	0	≤ .05	0
	Carib	3.6	0	3.8	5.0
Yellowfin Tuna	NW Atl	252.3	177.5	192.0	235.7
	GOM	55.6	60.8	12.7	28.6
	Carib	20.3	3.9	14.5	19.4
Skipjack Tuna	NW Atl	0.7	0.4	0.2	0.2
	GOM	0	0	0.4	0.6
	Carib	7.3	0	5.8	8.8
Swordfish	NW Atl	2.4	2.2	5.0	8.3

Species	Region	1997	1998	1999	2000
	GOM	0	0	≤ .05	1.2

Handgear Trip Estimates

Tables 4.3.3a and 4.3.3.b displays the estimated number of rod and reel and handline trips targeting large pelagic species in 2000 and 2001. The trips include commercial and recreational trips, and are not specific to any particular species. One can assume that most trips in MA, NH, and ME were targeting bluefin tuna, and that most of these trips were commercial, as over 90 percent of Atlantic tunas vessel permit holders in these states have commercial General category tuna permits. For the other states, the majority of the trips are recreational (in that fish are not sold), with the predominant targeted species consisting of yellowfin and bluefin tunas, and sharks. It should be noted that these estimates are still preliminary and 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 lend themselves to organize international landings into a commercial handgear category. While some countries report rod and reel landings, these numbers may include both commercial and recreational landings. International catches of all Atlantic HMS for 2000 are summarized in Table 4.1.

4.3.4 Bycatch Issues and Data Associated with the Fishery

As compared with other commercial gear types, commercial handgear produces relatively lower 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 Section (4.4.4) as are new efforts in documenting 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 reports suggest that there may be small bluefin, yellowfin, and bigeye tuna discards, but there is no supporting documentation at this point. Some regulatory discards 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 safety of human life at sea as it pertains to the fisheries for Atlantic HMS. 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, and during the busy fall General category bluefin tuna season the USCG concentrated patrol activities on General category bluefin tuna boats and followed 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 in late September and October (and even the early part of 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, NMFS does not require proof of proper safety equipment as a condition to obtain an Atlantic tunas permit. Instead, NMFS 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 NMFS regulations do not require USCG inspection or safety equipment in order to obtain a General category permit, NMFS cannot be certain that all participants in the commercial bluefin fishery are adequately prepared for the conditions they may encounter. NMFS 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 tunas 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) with no assistance from another vessel, except when shown by the operator that the safety of the vessel or its crew was jeopardized or other circumstances existed that were beyond the control of the operator. NMFS Enforcement and USCG boarding officers have recently 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. NMFS is concerned that use of such inadequately-equipped vessels jeopardizes crew in that the vessel may not be able to safely return to shore without assistance of the larger vessel due to insufficient fuel or to adverse weather conditions.

Over the last few years, the USCG focused boardings on small vessels, especially those owned by “part-time” commercial bluefin fishermen, and terminated several dozen trips due to the lack of safety equipment on board. If a vessel is boarded at sea and found to be lacking major survival equipment, the USCG will terminate the trip and escort the vessels back to the dock.

NMFS 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, and therefore improve safety. There is a perception by many General category participants that every open day must be fished. The issue of effort controls alleviating fatigue problems was discussed in the FMP, but vessel repairs were not. NMFS also continues to receive comments, as discussed in the FMP, that indicate that RFDs may encourage fishermen to fish in conditions which they generally would avoid on open days, and that a season without RFDs would allow fishermen to choose their own schedule of fishing days, thus alleviating derby conditions and safety concerns.

NMFS will consider all safety comments and information, including those from the USCG and NMFS Enforcement, when planning future General category effort control schedules and will discuss these issues in future meetings with the AP.

4.4 Fishery Data: RECREATIONAL HANDGEAR

The HMS Handgear (rod and reel, handline, and harpoon) fishery includes both commercial and recreational fishermen and is described in Section 2.5.8 of the HMS FMP. The recreational billfish fishery is described in section 2.1.3 the Billfish Amendment; commercial sale, barter or trade of Atlantic billfish by U.S. commercial interests is prohibited. This section of the SAFE report describes the recreational portion of the handgear fishery, primarily as related to rod and reel fishing. Commercial handgear fisheries for HMS are discussed separately in Section 4.3 of this report.

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 Amendment. The history of Atlantic billfish management is reviewed in Section 1.1.1 of the Billfish Amendment. 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.

Atlantic tunas, sharks, and billfish are all targeted by recreational fishermen using rod and reel gear. Atlantic swordfish are also targeted and, although this fishery had declined dramatically over the past twenty years, recent information indicates that a recreational swordfish fishery is rebuilding in the Mid-Atlantic Bight, as well as off the East Coast of Florida. Recreational fishing for Atlantic HMS is managed primarily through the use of minimum sizes and bag limits. Recreational tuna fishing regulations are the most complex and include a combination of minimum sizes, bag limits, limited seasons based quota allotment for bluefin tuna, and reporting requirements depending on the particular species and vessel type. Atlantic tunas are the only HMS species group that require a permit for recreational fishing at this time. Bluefin tuna are the only HMS species managed under a recreational quota for which the fishing season closes after the quota has been met. While Atlantic marlin have associated landing caps (a maximum amount of fish that can be landed), the overall strategy for management of recreational billfish fisheries is

based on use of minimum size limits. The recreational fishery for swordfish is also managed through a minimum size requirement. However, a proposed rule was published (December 26, 2001; 66 FR 66386) that would implement a recreational possession limit within the swordfish fishery. The recreational shark fishery is managed through 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.

In 1997, ICCAT made several recommendations to recover billfish resources throughout the Atlantic Ocean, including reduction of Atlantic BUM and WHM landings by at least 25 percent from 1996 levels, starting in 1998, to be accomplished by 1999; promote the voluntary release of live Atlantic BUM and WHM; and work to improve current monitoring, data collection and reporting in all Atlantic billfish fisheries. A 1998 ICCAT recommendation continued the requirement for a reduced level of marlin landings through 2000. Because commercial landings of Atlantic billfish by U.S.-flagged vessels were prohibited by the 1988 Atlantic Billfish FMP, the 25 percent reduction in blue and white marlin landings affects only recreational anglers in the United States. In November, 2000, ICCAT made a third recommendation for BUM and WHM by developing a two-phase rebuilding program. Phase One of the ICCAT Atlantic marlin rebuilding plan requires that countries reduce white marlin landings by 67 percent and blue marlin landings by 50 percent from 1999 levels. The recommendation requires that the United States limit landings by U.S. recreational fishermen to 250 Atlantic BUM and WHM, combined, on an annual basis for 2001 and 2002. The United States also must continue monitoring of billfish tournaments through scientific observer coverage of at least five percent initially, with an objective of 10 percent coverage by 2002. Phase Two of the ICCAT Atlantic marlin rebuilding program will include a reassessment of the status of the BUM and WHM stocks during 2002.

4.4.2 Most Recent Catch and Landings Data

The recreational landings databases for HMS consists of data obtained through surveys including the Marine Recreational Fishery Statistics Survey (MRFSS), Large Pelagic Survey (LPS), Southeast Headboat survey (HBS), Texas Headboat survey, and the 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 1996-2000 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 1996-2000 (mt ww)*. Sources: NMFS, 1999 and 2000a, 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	
Bluefin tuna**	NW Atlantic	362	299	184	99.9	49.5
	GOM	0	0	0	0.4	0.9
	Total	362	299	184	100.3	50.4
Bigeye tuna	NW Atlantic	108.2	333.5	228.0	316.1	34.4
	GOM	0	0	0	1.8	0
	Total	108.2	333.5	228.0	317.9	34.4
Albacore	NW Atlantic	277.8	269.5	601.1	90.1	250.75
	GOM	61.7	65.2	0	0	0
	Total	339.5	334.7	601.1	90.1	250.75
Yellowfin tuna	NW Atlantic	4,484.8	3,560.9	2,845.7	3,818.2	3,809.5
	GOM	13.2	7.7	80.9	149.4	52.3
	Total	4,498	3,569	2,927	3,967.6	3,861.8
Skipjack tuna	NW Atlantic	48.1	42.0	49.5	63.6	13.1
	GOM	36.4	21.7	37.0	34.8	16.7
	Total	84.5	63.7	86.5	98.4	29.8
Blue marlin***	NW Atlantic	17.0	25.0	34.1	24.8	
	GOM	8.3	11.5	4.5	7.5	
	Caribbean	9.6	8.6	10.6	4.6	
	Total	34.9	45.1	49.2	36.9	
White marlin***	NW Atlantic	2.7	0.9	2.4	1.5	
	GOM	0.6	0.9	0.2	0.1	
	Caribbean	0.0	0.0	0.02	0	
	Total	3.3	1.8	2.6	1.6	
Sailfish***	NW Atlantic	0.2	0	0.1	0.07	

Species	Region	1996	1997	1998	1999	2000
	GOM	0.8	0.4	1.0	0.6	
	Caribbean	0.2	0.2	0.05	0	
	Total	1.2	0.6	1.15	0.67	
Swordfish	Total	5.9	10.9	4.7	21.3	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 estimated based on the SEFSC Recreational Billfish Survey and the Large Pelagic Survey.

Atlantic Billfish Recreational Fishing

Due to the rare nature of billfish encounters and the difficulty of monitoring landings outside of tournament events, reporting of recreational billfish landings are sparse. However, in 2000, the Recreational Billfish Survey Program documented 119 blue marlin, 8 white marlin, and 16 sailfish landings.

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 NMFS 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 expanding in recent years probably due to increased availability of small swordfish and increased interest in this sport. Fishermen typically fish off the east coast of Florida and off the coasts of New Jersey and New York. Occasional fish have also been encountered during trips off Maryland and Virginia. In the past, the New York fishery for swordfish has 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 directed fishery off Florida year-round and New Jersey in the summer months. The Florida fishery occurs at night when fishermen target swordfish using live or dead bait and additional attractants such as lightsticks, LED lights, and light bars suspended under the boat.

Existing survey strategies do not pick up landings of these fish which anecdotally appear to be frequent. Some hand gear swordfish fishermen have commercial permits², others land swordfish for personal consumption. NMFS is developing a strategy for sampling this fishery in order to accurately report recreational handgear-caught swordfish to ICCAT. A proposed rule was published (December 26, 2001; 66 FR 66386) that includes the mandatory reporting of recreationally-landed swordfish via a toll-free call-in system. Recreational swordfish landings are counted against the Incidental quota.

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 of accessibility to the resource. Sharks can be caught virtually anywhere in salt water, with even large specimens available in the nearshore area to surf anglers or small boaters. Recreational shark fisheries are exploited primarily by private vessels and charter/headboats although there are some shore-based fishermen in the Florida Keys as well as offshore tournament fishing. The following tables provides a summary of landing for each of the three species groups.

Table 4.4.2 Final Estimates of Total Recreational Harvest of Atlantic Sharks: 1995-2000 (numbers of fish in thousands). 2000 data are preliminary. Source: Cortes 2000, Cortes 2001, and E. Cortes, 2001, pers. comm.

Species Group	1995	1996	1997	1998	1999	
LCS	176.3	188.5	165.1	169.8	90.1	130.4
Pelagic	32.5	21.6	8.7	11.8	11.1	12.8
SCS	170.7	113.5	98.5	169.8	111.5	158.5

Table 4.4.3 Recreational Harvest of Atlantic LCS by Species, in number of fish: 1997-1999. Source: Cortes 2000. Species-specific data for 2000 are under review at this time.

LCS Species	1997	1998	1999
Basking**	none reported	none reported	none reported
Bignose*	none reported	none reported	none reported
Bigeye sand tiger**	none reported	none reported	none reported

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

LCS Species	1997	1998	1999
Blacktip	70,963	82,310	30,961
Bull	857	1,745	2,832
Caribbean Reef*	none reported	none reported	none reported
Dusky*	13,426	4,499	5,186
Gallapagos*	none reported	none reported	none reported
Hammerhead, Great	381	494	346
Hammerhead, Scalloped	3,313	2,575	1,329
Hammerhead, Smooth	2,227	375	none reported
Hammerhead, Unclassified	473	389	75
Lemon	2,354	2,303	131
Night*	90	133	none reported
Nurse	7,937	2,455	1,489
Sandbar	41,618	35,766	18,882
Sand tiger**	1,474	none reported	none reported
Silky	122	5,376	3,834
Spinner	2,990	10,836	5,738
Tiger	69	1,380	146
Whale**	none reported	none reported	none reported
White**	none reported	none reported	none reported
Large Coastal Unclassified	16,790	19,139	12,953
Total:	165,094	169,776	83,901

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

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

Table 4.4.4 Recreational Harvest of Atlantic Pelagic sharks by Species, in number of fish: 1997-2000.
2000 data are preliminary. Source: Cortes 2000, Cortes 2001.

Pelagic Shark Species	1997	1998	1999	
Bigeye thresher*	none reported	none reported	none reported	none reported
Bigeye sixgill*	none reported	none reported	none reported	none reported
Blue	4,236	6,085	5,218	6,779
Mako, Longfin*	none reported	none reported	none reported	none reported
Mako, Shortfin	3,025	5,633	1,383	5,563
Mako, Unclassified	10	8	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	1,472	36	4,512	505
Total:	8,743	11,762	11,113	12,847

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

Table 4.4.5 Recreational Harvest of Atlantic SCS by Species, in number of fish: 1997-1999. Source: Cortes 2000. Species-specific data for 2000 are under review at this time.

SCS Species	1997	1998	1999
Atlantic Angel*	107	109	none reported
Blacknose	10,705	10,523	5,957
Bonnethead	15,307	29,692	36,664
Finetooth	4,763	139	69
Sharpnose, Atlantic	67,726	129,315	40,291
Sharpnose, Caribbean*	none reported	none reported	none reported
Smalltail*	none reported	none reported	none reported
Total:	98,501	169,779	82,891

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

4.4.3 U.S. vs. International Catch

Important fisheries including directed recreational fisheries of the United States, Venezuela, Bahamas, Brazil, and many other countries and entities in the Caribbean Sea and off of the west coast of Africa are responsible for significant HMS landings. Directed recreational fisheries for sailfish occur in the west Atlantic from the United States, Venezuela, Bahamas, Brazil, Dominican Republic, Mexico, and other countries in the Caribbean Sea. However, of these countries, the United States is the only country that reports recreational landings to ICCAT. Therefore, a comparison of the percentage of U.S. landings relative to recreational fisheries in other countries is not feasible. 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. 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 catch across nations and species does warrant further exploration of potential data sources and the feasibility of increased 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 are to be discussed and assessed 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 report was prepared, no further information was available on 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 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. NMFS believes that establishing a catch and release fishery in this situation will further solidify the existing catch-and-release ethic of recreational billfish fishermen, thereby increasing 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 and bycatch mortality should be incorporated into fish stock assessments and evaluation of management measures. Rod and reel estimates from Virginia to Maine during June through October can be monitored through expanding survey data derived from the Large Pelagic Survey (dockside and telephone surveys). Actual numbers of fish discarded for many species are so low that presenting these data by area may be misleading, particularly if 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. This table is updated below to include preliminary 2001 data.

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

Species	Number of Fish Kept									
	1997	1998	1999	2000	2001	1997	1998	1999	2000	
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
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

	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
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

*NMFS 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, NMFS 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

Outreach programs were included as final actions in the HMS FMP and the Billfish Amendment as part of the management measures to address bycatch. These programs have not yet been implemented, but preparation of program designs is currently in progress. One of the key elements of 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 within HMS fisheries was introduced in a proposed rule published this year (December 26, 2001; 66 FR 66386).

Section 3.5.2.2 in the Billfish Amendment includes a review of available information on post-release mortality. Table 3.5.3 of the Billfish Amendment and Table 3.40 of the HMS FMP list the existing studies, their methods, and conclusions. Approximately 90 percent, or greater, of blue and white marlin taken by U.S. recreational fishermen are released after capture, therefore, studies on post-release mortality are critical.

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. Coast Guard Safety Officer and Recreational Boats Safety Specialist, Lieutenant Keirsten Current cited two common situations that place recreational boaters in potential danger. Individuals in small vessels often venture out farther than the vessels are designed without the proper navigational equipment and may encounter rougher water than their boats can handle. 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 can lead to incidents if someone is not on watch at all times. The other situation that the Lieutenant noted as a 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 1997, approximately 70 percent of all boating casualties were due to drowning and in approximately 90 percent of all the drowning deaths, the victim was not wearing a personal floatation device (PFD).

Table 4.4.7 1997 Reported Boating Casualties (USCG Lt. Current, personal communication).

Age Groups	# of Drowning Fatalities (victim was wearing a PFD)	# of Drowning Fatalities (victim was not wearing a PFD)	Total Number of Drowning Fatalities	
0-12	0	14	14	11
13-19	4	36	40	15
20-29	15	91	106	36
30-39	13	98	11	58
40-49	12	97	109	41
50-59	7	76	83	19
60-69	9	40	49	14
70-79	4	24	28	5
80-97	1	5	6	7
TOTAL	65	521	586	233

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 new 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 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 NMFS reached a settlement agreement that would dismiss both lawsuits brought by those parties. On December 7, 2000, Judge Merryday entered an order approving the settlement agreement. The terms of the settlement agreement specified several actions to be taken by the plaintiffs and by NMFS. NMFS implemented some of the terms of the settlement agreement via an emergency rule (March 6, 2001, 66 FR 13441), which expired on September 4, 2001. The emergency rule established the LCS and SCS commercial quotas at 1,285 and 1,760 mt dw, respectively (1997 levels), and suspended the regulations on splitting the LCS management group into ridgeback and non-ridgeback LCS subgroups, the commercial LCS ridgeback minimum size, and counting dead discards and state landings after Federal closures against Federal quotas.

The settlement agreement also required an independent (i.e., non-NMFS) review of the 1998 LCS stock assessment. The original settlement agreement determined that the Center for Independent Experts (CIE) would conduct the peer review. In May 2001, the CIE transmitted three peer reviews of the 1998 LCS stock assessment to NMFS. Upon examination, NMFS determined that the three peer reviews conducted by the CIE did not conform to the terms of the settlement agreement and therefore were not complete.

Due to these irregularities, in July 2001, NMFS and the plaintiffs revised certain sections of the settlement agreement. The revisions allowed for the Natural Resources Consultants, Inc. (NRC) to conduct a second peer review. While the CIE could complete the reviews following the terms of the original settlement agreement, the NRC reviews were the deciding set of reviews in terms of the settlement agreement. Both sets of reviews can be used for the next stock assessment. The revised settlement agreement also calls for the LCS and SCS stock assessments to be completed by April 1, 2002.

The terms of the revised settlement agreement stipulated that NRC would select independent scientists with expertise in international fisheries on HMS, shark population dynamics/life history, and methods of stock assessment in situations of incomplete data and that each reviewer would make one overall statement as to whether “the scientific conclusions and scientific management recommendations contained in the 1998 SEW Report are based on scientifically reasonable uses of appropriate fisheries stock assessment techniques and the best available biological and fishery information relating to LCS.”

NMFS received the results of the complete peer reviews in October, 2001. Three of the four NRC reviewers found that the scientific conclusions and scientific management recommendations contained in the 1998 SEW report *were not* based on scientifically reasonable uses of appropriate fisheries stock assessment techniques and the best available biological fishery information relating to LCS. The settlement agreement stated that in this case, NMFS would take the appropriate action to maintain the 1997 LCS quota and catch accounting/monitoring procedures, pending a new LCS stock assessment. Accordingly, NMFS published an emergency rule on December 28, 2001 (66 FR 67118), that establishes the commercial LCS quota at 1,285 mt dw, consistent with the terms of the settlement. NMFS also suspended the regulations on splitting the LCS management group into ridgeback and non-ridgeback LCS subgroups, the ridgeback LCS minimum size, counting dead discards and state landings after Federal closures against Federal quotas, and season-specific quota adjustments for LCS and SCS pending the results of the new stock assessments.

The new LCS stock assessment will consider the recommendations of the reviewers and will also be independently peer reviewed. NMFS believes that in this case the independent reviews served as an important quality-control mechanism by which NMFS, plaintiffs, and

members of the public were assured that the best available scientific information and techniques will form the basis for future shark management actions.

The emergency rule also, consistent with the settlement agreement, establishes the 1997 commercial quota level of 1,760 mt dw for SCS pending completion of a new stock assessment. Upon completion of a new stock assessment, NMFS may enter into rulemaking to implement the commercial SCS quota level adopted in the HMS FMP, or take other appropriate action to conserve SCS while maintaining a sustainable fishery in the long-term, as necessary. The settlement agreement did not address any regulations affecting the pelagic shark, prohibited species, or recreational shark fisheries.

Additionally, because the settlement agreement dissolved the court injunction on all commercial quotas and because the pelagic shark quotas were no longer at issue, on January 2, 2001 (66 FR 55), NMFS announced that the pelagic shark quotas adopted in the HMS FMP would be enforced. These annual quotas are: 92 mt dw for porbeagle sharks; 273 mt dw for blue sharks; and 488 mt dw for pelagic sharks other than porbeagle or blue sharks.

On December 5, 2000 (65 FR 75867), NMFS announced that the first semiannual season for LCS would open on January 1, 2001, and close on March 24, 2001; no closure dates were announced for the pelagic and SCS fisheries. The pelagic and SCS fisheries remained open for the entire semiannual season. Approximately 587.5 mt dw of the available commercial LCS quota of 642.5 mt dw was landed during the LCS open season. Dealer reports and state landings as of August 20, 2001, indicate that only 7.2 and 16.4 percent of the SCS (880 mt dw) and pelagic (290 mt dw) semiannual quotas, respectively, were reported landed.

Due to the underharvest of the available LCS quota, NMFS added the unharvested 55 mt dw to the available quota for the second semiannual LCS fishing season for a total of 697 mt dw. On June 26, 2001 (66 Fr 33918), NMFS announced that the second LCS fishing season would open on July 1, 2001, and close on August 31, 2001. Again, no closure dates were announced for the pelagic and SCS fisheries and these fisheries remained open for the entire semiannual season. On September 5, 2001 (66 FR 46401), due to reported landings that only 47 percent of the quota had been reached as of the end of July, NMFS extended the LCS fishing season through September 4, 2001, to ensure that eligible fishery participants had an adequate opportunity to harvest the available quota.

As of October 23, 2001, dealer reports and state landing reports indicate that approximately 603.8 mt dw of LCS or 86.6 percent of the available 697 mt dw had been landed in the second semiannual season. This was 93.2 mt dw (13.4 percent) under the available quota. Only a total of 111.3 mt dw and 30 mt dw of the SCS and pelagic semiannual quotas, respectively, had been reported at that time. No estimates of blue shark dead discards for 2001 are available at this time.

Thus, for 2001, approximately 1,190.6 mt dw (92.6 percent) of the annual LCS quota of 1,285 mt dw, approximately 175.2 mt dw (9.9 percent) of the annual SCS quota of 1,760 mt dw, and approximately 77.5 mt dw (13.3 percent) of the annual pelagic shark quota of 580 mt dw have been reported landed. These numbers are preliminary and are subject to change.

On December 28, 2001 (66 FR 67118), as part of the emergency rule mentioned above, NMFS announced that the LCS first semiannual season would close on April 15, 2002. Closure dates for the pelagic and SCS fisheries will be announced as necessary. NMFS will continue to monitor the fisheries and will close the fisheries if harvest data indicate that the quotas will be reached earlier than projected.

Modifications to Observer Coverage Requirements

In the southeast shark gillnet fishery, NMFS 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; no adjustments to the necessary level of observer coverage are expected in 2002.

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. NMFS has selected approximately 32 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.

Alabama Shark Gillnet Fishery

Previous reports to NMFS 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 NMFS was that the fishery would operate solely in state waters. As of November 2001, the fishery does not appear to be operating due to lack of profitable markets (J. Duffy, Alabama Conservation and Marine Resources, pers. comm to J. Carlson, NMFS Southeast Fisheries Science Center, Panama City, Florida).

Directed Shark Observer Programs

The University of Florida is 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 the 2001 sampling season, a total of 36 shark trips were observed, representing 84 sets yielding 480,476 observed hook hours. Catches, catch rates, and disposition were documented for total of 3,937 LCS and 1,304 SCS. The biological data are being processed to identify catch patterns by species and region.

The 2001 observed catches of sharks in the directed bottom longline fishery are dominated by large coastal sharks (74.6 percent), with small coastal sharks comprising 25.2 percent and pelagic sharks comprising 0.2 percent (Table 4.5.1; G. Burgess, pers. comm. 2001). Sandbar sharks dominate the large coastal catch and landings (74.1 and 90.0 percent, respectively), followed by tiger sharks (10.8 and 2.3 percent, respectively), scalloped hammerheads (3 and 1.7 percent, respectively), and dusky sharks (2.2 and 1.6 percent, respectively; note that dusky sharks are a prohibited species so possession and landing is prohibited). Tiger sharks represent 56 percent of large coastal sharks tagged and released (Table 4.5.1).

Atlantic sharpnose sharks dominate the catches of small coastal sharks at 97.7 percent (Table 4.5.1). Approximately 99 percent of small coastal sharks are used for bait in this fishery (only 10 out of 1,466 individuals were landed). Only 12 pelagic sharks were caught and landed - eleven shortfin mako and one thresher shark (Table 4.5.1).

Table 4.5.1 Directed bottom longline shark observed catch and disposition for 2001. Source: G. Burgess, pers. comm. 2001.

Species	FLORID EAST COAST				FLORIDA GULF COAST				NORTH CAROLINA				TOTAL			
	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	316	297	13	6	850	812	26	12	2052	1993	22	37	3218	3102	61	55
Blacktip	71	62	9		1	1			3	3			75	66	9	
Dusky	7	2	2	3	7	3	3	1	84	49	21	14	98	54	26	17
Silky	9	1	8		57	16	40	1	3	2	1		69	19	49	1
Bull	6	5	1		16	13	3						22	18	4	
Bignose					1		1						1		1	
Spinner	11	4	4	3	14	13	1		2	2			27	19	5	3
Night					12		12						12		12	
Lemon					10	10			1			1	11	10		1
Scalloped HH	4		4		67	27	40		62	32	27	3	133	59	71	3
Great HH	4	1	3		5	3	2		5	1	4		14	5	9	
Nurse	3			3	26		1	25	2			2	31	1		30
Tiger	118	19	35	64	45	15	13	17	310	24	32	254	473	58	80	335
Sand tiger	3			3					148		1	147	151		1	150
White	3		2	1									3		2	1
Unidentified					2		2						2		2	
Atlantic sharpnose	1065	1	1060	4	58		58		310	8	302		1433	9	1420	4
Bonnethead	6		6										6		6	

Species	FLORID EAST COAST				FLORIDA GULF COAST				NORTH CAROLINA				TOTAL			
	Caught	Kept	Other Kill	Tagged/Released	Caught	Kept	Other Kill	Tagged/Released	Caught	Kept	Other Kill	Tagged/Released	Caught	Kept	Other Kill	Tagged/Released
Blacknose	22		22		5	1	4						27	1	26	
Thresher	1	1											1	1		
Shortfin mako									11	11			11	11		
LCS	555	391	81	83	1113	913	144	56	2672	2107	108	457	4340	3411	333	596
SCS	1093	1	1088	4	63	1	62		310	8	302		1466	10	1452	4
Pelagic	1	1							11	11			12	12		
Total	1649	393	1169	87	1176	914	206	56	2993	2126	410	457	5818	3433	1785	600

NMFS conducts an observer program in the southeast shark drift gillnet fishery. During right whale calving season (November 15 through March 31), 100 percent observer coverage of all shark trips is required. Outside of right whale calving season, a statistically significant level of observer coverage is required (currently approximately 53 percent of all shark trips). 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 2001 right whale calving season, a total of 70 drift gillnet sets and 12 strikenet sets were observed. Approximately 20 additional strikenet trips were made when the observer was on board but no strike was made due to inability to locate the school, sharks being located in state waters, and poor weather conditions. Observed catches on drift gillnet sets were comprised of 12 species of sharks (92.6 percent of numbers caught), 34 species of teleosts and rays (5.65 percent percent were teleosts, 1.58 percent were rays), three species of sea turtle (0.10 percent), and two species of marine mammals (0.04 percent; Tables 4.5.2, 4.5.10, and 4.5.11) (Carlson, 2001). By number, four species of sharks made up 94.3 percent of the sharks caught: blacktip (32.3 percent), bonnethead (31.2 percent), Atlantic sharpnose (22 percent), and finetooth sharks (8.8 percent; Carlson, 2001). By weight, the shark catch was made up primarily of blacktip (40.1 percent), bonnethead (17.5 percent), Atlantic sharpnose (14.4 percent), scalloped hammerhead (9.4 percent), and great hammerhead sharks (8.9 percent).

Observed catches on strikenet sets during the 2001 right whale calving season were comprised four species of sharks (99.9 percent of numbers caught) and three species of teleosts and rays (0.1 percent; Tables 4.5.3 and 4.5.12) (Carlson, 2001). No marine mammals or sea turtles were caught while strikenetting. Blacktip sharks made up 99.9 percent of the shark catch when strikenetting. Bycatch included great barracuda, Atlantic guitar fish, and gray triggerfish (Carlson 2001).

Table 4.5.2 Total Shark Catch in NMFS Observed Drift Gillnet Sets During 2001 Critical Right Whale Season: Source: Carlson, 2001.

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	
Blacktip	4,774	99.9	0.1	0.0
Bonnethead	4,617	99.8	0.1	0.1
Atlantic sharpnose	3,259	100.0	0.0	0.0
Finetooth	1,320	100.0	0.0	0.0

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	
Blacknose	374	100.0	0.0	0.0
Scalloped hammerhead	168	98.2	0.0	1.8
Spinner	141	100.0	0.0	0.0
Great hammerhead	129	100.0	0.0	0.0
Bull	12	75.0	0.0	25.0
Tiger	5	100.0	0.0	0.0
Common thresher	4	100.0	0.0	0.0
Mackerel	3	100.0	0.0	0.0
Sandbar	2	100.0	0.0	0.0
Unknown requiem	1	100.0	0.0	0.0

Table 4.5.3 Total Shark Catch in NMFS Observed Strikenet Sets During 2001 Critical Right Whale Season: Source: Carlson, 2001.

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	Discarded Dead (%)
Blacktip	3,037	100.0	0.0	0.0
Nurse	1	0.0	100.0	0.0
Bull	1	100.0	0.0	0.0
Blacknose	1	100.0	0.0	0.0

Outside the right whale calving season (April 1 through November 14), a total of 37 drift gillnet sets were observed from April through October (15 in 2000 and 22 in 2001) and a total of eight strikenet sets were observed from August to September (three in 2000 and five in 2001) (Carlson and Baremore, 2001). The observed drift gillnet catch consisted of 10 species of sharks, 25 species of teleosts and rays, and 1 species of sea turtle (Tables 4.5.4 and 4.5.13). Total observed catch composition (percent of numbers caught) were 70.5 percent sharks, 27.8 percent teleosts, 1.6 percent rays, 0.01 percent sea turtle, and no marine mammals. Three species of sharks made up 96.9 percent by number of the shark catch: Atlantic sharpnose (85.6 percent), blacknose (7.2 percent), and blacktip sharks (4.1 percent). By weight, Atlantic sharpnose sharks made up 58.3 percent, blacknose sharks 21.9 percent, and blacktip sharks 12.5 percent.

Observed catch in strikenet sets outside of right whale calving season consisted of four species of sharks (99.9 percent of the total number caught) and one species of ray (0.01 percent) (Table 4.5.5) (Carlson and Baremore, 2001). No sea turtles or marine mammals were observed caught. The blacknose shark made up 61.3 percent of the total number of sharks caught. Bycatch included only the cownose ray.

Table 4.5.4 Total drift gillnet shark catch by species during all observer trips, 2000 and 2001, outside of right whale calving season. Source: Carlson and Baremore, 2001.

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	
Atlantic sharpnose	8,688	99.9	0.01	0.01
Blacknose	726	99.4	0.0	0.6
Blacktip	422	74.7	15.8	9.5
Finetooth	164	100.0	0.0	0.0
Bonnethead	123	100.0	0.0	0.0
Scalloped hammerhead	14	28.6	0.0	71.4
Tiger	3	0.0	66.7	33.3
Bull	2	100.0	0.0	0.0
Spinner	2	50.0	0.0	50.0
Great hammerhead	1	100.0	0.0	0.0

Table 4.5.5 Total strikenet shark catch by species during all observer trips, 2000 and 2001, outside of right whale calving season. Source: Carlson and Baremore, 2001.

Species	Total Number Caught	Kept (%)	Discarded Alive (%)	Discarded Dead (%)
Blacknose	111	100.0	0.0	0.0
Blacktip	54	11.9	25.9	62.9
Spinner	10	0.0	0.0	100.0
Finetooth	4	100.0	0.0	0.0

National Plan of Action for the Conservation and Management Of Sharks

On February 15, 2001, NMFS 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 NMFS 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

Shark conservation is a serious concern, both domestically and internationally. The United States is of the view that all nations and relevant international fishery organizations should take action to ensure that shark populations are monitored and fishery conservation measures are implemented to ensure that shark stocks are protected from overexploitation. The strong international market for shark fins has increased the potential for harvesting shark stocks at unsustainable levels. In the Shark Finning Prohibition Act (Act), Congress found the practice of shark finning to be unacceptable in the United States (finning is the practice of removing the fin or fins from a shark (whether or not including the tail) and returning the remainder of the shark to the sea). Uncontrolled finning can be a factor leading to unsustainable shark harvests, and because the species of shark cannot be determined from the fins alone in most instances, the effects of the fisheries on specific shark species when finning is practiced cannot be determined. That is, the mortality cannot always be assigned to individual species, so the mortality statistics may not be reliably used in stock assessments. It is the intent of the Act to support sustainable use of shark stocks with a minimum of waste.

On December 21, 2000, President Clinton signed the 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. The Act also requires NMFS to promulgate regulations to implement the prohibitions of the statute. On June 28, 2001 (66 FR 34401), NMFS published a proposed rule that would implement the provisions of the Act. Final regulations were published 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 2000 indicate that, compared to landings in 1999, commercial landings for LCS increased slightly by approximately 1,000 fish (Table 4.5.6). Landings estimates

for pelagic sharks for 2000 declined by 84.5 mt dw (Table 4.5.8). Species-specific landings estimates for LCS and SCS for 2000 are under review; Tables 4.5.7 and 4.5.9 provide those estimates for the years 1997-1999.

Table 4.5.6 Estimates of Total Landings and Dead Discards for Large Coastal Sharks: 1981-2000 (numbers of fish in thousands). 2000 data are preliminary. Source: Cortes, 2000; E.Cortes, pers. comm., 2001.

Year	Commercial Landings	Longline Discards	Recreational Catches	Unreported	Coastal Discards	Menhaden Fishery bycatch	
1981	16.2	0.9	265.0	N/A	N/A	N/A	282.1
1982	16.2	0.9	413.9	N/A	N/A	N/A	431.0
1983	17.5	0.9	746.6	N/A	N/A	N/A	765.0
1984	23.9	1.3	254.6	N/A	N/A	N/A	279.8
1985	22.2	1.2	365.6	N/A	N/A	N/A	389.0
1986	54.0	2.9	426.1	24.9	N/A	N/A	507.9
1987	104.7	9.7	314.4	70.3	N/A	N/A	499.0
1988	274.6	11.4	300.6	113.3	N/A	N/A	699.9
1989	351.0	10.5	221.1	96.3	N/A	N/A	678.8
1990	267.5	8.0	213.2	52.1	N/A	N/A	540.8
1991	200.2	7.5	293.4	11.3	N/A	N/A	512.4
1992	215.2	20.9	304.9	N/A	N/A	N/A	541.1
1993	169.4	7.3	249.0	N/A	17.6	N/A	443.3
1994	228.0	8.8	160.9	N/A	22.8	26.2	446.7
1995	222.4	5.2	176.3	N/A	22.2	24.0	450.1
1996	160.6	5.7	188.5	N/A	16.1	25.1	396.0
1997	130.6	5.6	165.1	N/A	13.2	25.1	339.6
1998	174.9	4.3	169.8	N/A	11.2	25.1	385.3
1999	111.5	9.0	90.1	N/A	3.0	25.1	238.7

2000	112.7	9.4	130.4	N/A	4.3	25.1	281.9
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Table 4.5.7 Commercial landings of Large Coastal Sharks in lb dw: 1997-1999. Source: Cortes, 2000. Species-specific landings data for 2000 are under review at this time.

Large Coastal Sharks	1997	1998	1999
Basking**	none reported	none reported	none reported
Bignose*	2,132	50	9,035
Bigeeye sand tiger**	none reported	none reported	none reported
Blacktip	1,506,182	1,893,805	1,286,979
Bull	40,247	27,389	25,426
Caribbean Reef*	3,548	100	none reported
Dusky*	80,930	81,124	110,950
Galapagos*	none reported	none reported	none reported
Hammerhead, Great	none reported	none reported	none reported
Hammerhead, Scalloped	none reported	none reported	none reported
Hammerhead, Smooth	none reported	none reported	none reported
Hammerhead, Unclassified	79,685	59,802	53,394
Lemon	20,595	23,232	23,604
Narrowtooth*	none reported	none reported	none reported
Night*	33	3,289	4,287
Nurse	8,864	2,846	1,168
Sandbar	890,881	1,077,161	1,299,987
Sand tiger**	8,425	38,791	6,401
Silky	13,920	13,615	8,649
Spinner	6,039	16,900	629
Tiger	6,603	12,174	30,274
Whale**	none reported	none reported	none reported
White**	1,315	none reported	82
Large Coastal Unclassified	1,177,539	1,258,027	978,312
Unclassified fins	140,638	76,588	80,393
Total	3,987,576 (1,809 mt dw)	4,584,893 (2,080 mt dw)	3,919,570 (1,778 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: 1997-2000. 2000 data are preliminary.
Source: Cortes, 2000 and Cortes, 2001.

Pelagic Sharks	1997	1998	1999	2000**
Bigeye thresher*	5,308	1,403	17,759	none reported
Bigeye sixgill*	none reported	none reported	none reported	none reported
Blue	904	706	1,111	0.31
Mako, Longfin*	7,867	4,971	4,619	0.03
Mako, Shortfin	224,362	224,421	170,860	85.07
Mako, Unclassified	71,371	79,773	58,344	none reported
Oceanic whitetip	2,764	22,049	698	0.79
Porbeagle	4,222	19,795	5,362	0.54
Sevengill*	none reported	none reported	none reported	none reported
Sixgill*	none reported	none reported	none reported	none reported
Thresher	145,253	102,531	96,012	10.78
Unclassified pelagic	75,543	49,626	46,056	none reported
Total:	537,594 (244 mt dw)	505,275 (229 mt dw)	400,821 (182 mt dw)	(97.5 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: 1997-1999. Source: Cortes, 2000.
Species-specific landings data for 2000 are under review at this time.

Small coastal sharks	1997	1998	
Atlantic Angel*	none reported	none reported	none reported
Blacknose	202,781	119,689	130,317
Bonnethead	75,787	13,949	53,702
Finetooth	169,733	267,224	246,404
Sharpnose, Atlantic	256,562	230,920	239,647
Sharpnose, Caribbean*	none reported	none reported	2,039

Unclassified Small Coastal	51	82	136
Total:	704,914 (320 mt dw)	631,864 (287 mt dw)	672,245 (305 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.

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). Observer data collected from the directed bottom longline shark fishery indicate that LCS discarded dead represent approximately 2.7 and 3.8 percent of the mortality of these species in that fishery in 1999 and 2000, respectively (Cortes, 2000; E. Cortes, pers. comm. 2001). Pelagic longline and coastal dead discards combined represented about five percent of total mortality of LCS in 1999 and 2000 (Cortes, 2000; E. Cortes, pers. comm. 2001) (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).

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 3 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).

A total of 37 sea turtles have been observed from 1994 through 2001 (G. Burgess, pers. comm. 2001). A total of 26 loggerhead turtles have been observed caught, with 18 released alive, 6 released dead, and 2 released condition unknown. A total of 4 leatherback turtles have been observed caught, with one released alive, one released dead, and 2 released condition unknown. An additional 7 unidentified species of sea turtle have been observed caught, with one released alive, one released dead, and five released condition unknown (G. Burgess, pers. comm. 2001).

Shark Drift Gillnet and Strikenet Fisheries

During the 2001 right whale calving season, observed drift gillnets sets caught 34 species of teleosts and rays (5.65 percent percent of the total number of animals caught were teleosts and 1.58 percent were rays), 3 species of sea turtle (0.10 percent), and 2 species of marine mammals (0.04 percent; Tables 4.5.10) (Carlson, 2001). Some bonnethead, scalloped hammerhead, and bull sharks were discarded dead in the drift gillnet fishery. Twelve sailfish and one longbill spearfish were also observed caught with five of the sailfish retained, two released alive, and five released dead. The longbill spearfish was released dead. Note that retention of billfish caught by gear other than rod and reel is prohibited.

Three teleost and one ray species made up 70.4 percent by number of the overall non-shark catch: king mackerel (29.7 percent), cownose ray (18.4 percent), cobia (13.7 percent), and red drum (8.6 percent). The highest proportion of species discarded dead (for those species with observed catch greater than 10 individuals) was for king mackerel (71.7 percent), red drum (55.6 percent), little tunny (42.9 percent), remora (41.2 percent), Atlantic sailfish (41.6 percent), and bluefish (12.2 percent). Spotted eagle rays, cownose rays, and manta rays had the highest discard alive proportion (100, 94.8, and 93.8 percent, respectively) (Carlson, 2001).

Table 4.5.10 Total Teleost and Ray Bycatch in NMFS Observed Drift Gillnet Sets During 2001 Right Whale Season. Source: Carlson 2001

Species	Total Number Caught	Kept (%)	Discard Alive (%)	
King mackerel	343	28.3	0.0	71.7
Cownose ray	213	3.3	94.8	1.9
Cobia	159	88.1	3.1	8.8
Red drum	99	22.2	22.2	55.6
Great barracuda	63	100.0	0.0	0.0
Bluefish	41	82.9	4.9	12.2

Species	Total Number Caught	Kept (%)	Discard Alive (%)	
Spanish mackerel	30	100.0	0.0	0.0
Little tunny	28	57.1	0.0	42.9
Spotted eagle ray	24	0.0	100.0	0.0
Crevalle jack	21	100.0	0.0	0.0
Remora	17	0.0	58.8	41.2
Atlantic manta ray	16	0.0	93.8	6.2
Tripletail	13	92.3	7.7	0.0
Atlantic sailfish	12	41.6	16.6	41.6
Wahoo	9	100.0	0.0	0.0
Atlantic thread herring	9	0.0	0.0	100.0
Blackfin tuna	6	83.3	0.0	16.4
Blue runner	5	100.0	0.0	0.0
Sheepshead	4	100.0	0.0	0.0
Triggerfish	2	0.0	50.0	50.0
Tarpon	2	0.0	0.0	100.0
Gag grouper	2	100.0	0.0	0.0
Pilot fish	2	0.0	0.0	100.0
Cero	2	100.0	0.0	0.0
Atlantic bumper	1	0.0	0.0	100.0
Dolphin	1	100.0	0.0	0.0
Southern stingray	1	0.0	0.0	100.0
Scrawled cowfish	1	0.0	100.0	0.0
Lesser electric eel	1	0.0	100.0	0.0
Black drum	1	0.0	100.0	0.0
Atlantic bonito	1	100.0	0.0	0.0
Atlantic moonfish	1	0.0	0.0	100.0

Species	Total Number Caught	Kept (%)	Discard Alive (%)	Discard Dead (%)
Atlantic angel shark	1	0.0	100.0	0.0
Longbill spearfish	1	0.0	0.0	100.0
Unidentified teleost	1	0.0	0.0	100.0

Interactions with 23 sea turtles and marine mammals occurred in 13 separate drift gillnet sets (Carlson, 2001). Fourteen leatherback turtles, one loggerhead turtle, and one hawksbill turtle and three Atlantic spotted and four bottlenose dolphins were encountered in 62 drift gillnet sets (Table 4.5.11). Mortalities were observed for four Atlantic bottlenose dolphin, two leatherback turtles, and one Atlantic spotted dolphin; two leatherback turtles were released condition unknown and one hawksbill turtle was released comatose (Carlson, 2001). Observers also noted high densities of jellyfish, a prey source for leatherback turtles, in the area.

Due to the high number of interactions with leatherback sea turtles, NMFS implemented a temporary 30-day rule that prohibited shark gillnet fishing (strickenetting was allowed) between Savannah, Georgia, and West Palm Beach, Florida (66 FR 15045, March 15, 2001). The prohibition was effective from March 9 through April 9, 2001.

Garrison (2001) estimated the mortality of the Atlantic bottlenose dolphin in the directed shark gillnet fishery of Florida and Georgia. Based on observed bycatch rates and effort from logbooks, annual mortality of bottlenose dolphin in the Central Florida management unit is estimated to range from 43 animals (11- 167 95 percent confidence interval) in 1999 to 4 animals (1-21 95 percent confidence interval) in 2000. Because catch rates are relatively low, the total number of trips largely determines the magnitude of annual mortality estimates. This fishery has also been included in the newly formed Bottlenose Dolphin Take Reduction Team because of interactions with bottlenose dolphin.

Table 4.5.11 Protected Species Interactions in Drift Gillnet Sets During Right Whale Calving Season, 2001. Source: Carlson, 2001.

Species	Total Number Caught	Released Alive	Discarded Dead	
Leatherback turtle	14	10	2	2
Loggerhead turtle	1	1	0	0
Hawksbill turtle	1	0	0	1

Bottlenose dolphin	4	4	0	0
Spotted dolphin	3	2	1	0

During the 2001 right whale calving season, observed strikenet sets caught 3 species of teleosts and rays and no sea turtles or marine mammals (Tables 4.5.12) (Carlson 2001). One nurse shark was released alive. Of the non-shark catch, only the great barracuda was retained, with all remaining bycatch discarded alive (Carlson, 2001).

Table 4.5.12 Total Bycatch in NMFS Observed Strikenet Sets During 2001 Right Whale Season. Source: Carlson 2001

Species	Total Number Caught	Kept (%)	Discard Alive (%)	Discard Dead (%)
Great barracuda	2	100.0	0.0	0.0
Atlantic guitarfish	1	0.0	100.0	0.0
Gray triggerfish	1	0.0	100.0	0.0

Outside of right whale calving season, observed drift gillnet catch consisted of 25 species of teleosts and rays and 1 loggerhead turtle, which was released alive (Tables 4.5.13). Five species of teleosts and one species of ray made up 94.7 percent by number of the overall non-shark catch. Little tunny (48.9 percent), king mackerel (25.1 percent), barracuda (10.3 percent), blue runner (5.3 percent), and cownose ray (5.1 percent) dominated the bycatch (Table 4.5.13) (Carlson and Baremore, 2001). During drift gillnet fishing, the highest proportion of species discarded dead (for species with greater than 10 individuals) was for Atlantic moonfish (100 percent), Atlantic sailfish (100 percent), lookdown (100 percent), king mackerel (83.7 percent), and remora (42.9 percent). Cownose rays and remoras had the highest proportion of discarded alive with 78.7 percent and 57.1 percent, respectively (Table 4.5.13) (Carlson and Baremore, 2001).

Table 4.5.13 Total Bycatch in NMFS Observed Drift Gillnet Sets Outside of 2000 and 2001 Right Whale Calving Seasons. Source: Carlson 2001

Species	Total Number Caught	Kept (%)	Discard Alive (%)	
Little tunny	2,066	88.4	0.0	11.6
King mackerel	1,059	16.3	0.0	83.7
Barracuda	436	100.0	0.0	0.0
Blue runner	223	100.0	0.0	0.0
Cownose ray	216	1.4	78.7	19.9
Cobia	61	60.6	6.6	32.8
Remora	35	0.0	57.1	42.9
Atlantic moonfish	24	0.0	0.0	100.0
Crevalle jack	23	60.9	0.0	39.1
Atlantic sailfish	13	0.0	0.0	100.0
Lookdown	12	0.0	0.0	100.0
Snapper	6	100.0	0.0	0.0
Blackfin tuna	6	100.0	0.0	0.0
Spotted eagle ray	5	0.0	100.0	0.0
Manta ray	5	20.0	40.0	40.0
Wahoo	4	100.0	0.0	0.0
African pompano	4	100.0	0.0	0.0
Rays	4	50.0	50.0	0.0
Tarpon	3	0.0	100.0	0.0
Spadefish	2	50.0	0.0	50.0
Weakfish	2	0.0	0.0	100.0
Tripletail	2	100.0	0.0	0.0
Spanish mackerel	2	100.0	0.0	0.0
Bluefish	1	100.0	0.0	0.0
Almaco jack	1	0.0	0.0	100.0
Bigeye tuna	1	100.0	0.0	0.0
Florida pompano	1	100.0	0.0	0.0

Species	Total Number Caught	Kept (%)	Discard Alive (%)	Discard Dead (%)
Loggerhead turtle	1	0.0	100.0	0.0

Observed catch in strikenet sets outside of right whale calving season consisted of two cownose rays (0.01 percent), one of which was kept and the other released alive (Carlson and Baremore, 2001). No sea turtles or marine mammals were observed caught. During strikenet fishing, 36.5 percent of sharks were discarded (Table 4.5.5) because of large coastal shark fishing season closures (Carlson and Baremore, 2001).

4.6 Fishery Data: LANDINGS BY SPECIES

The following tables are taken from the 2001 National Report of the United States to ICCAT (NMFS 2001b). 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).

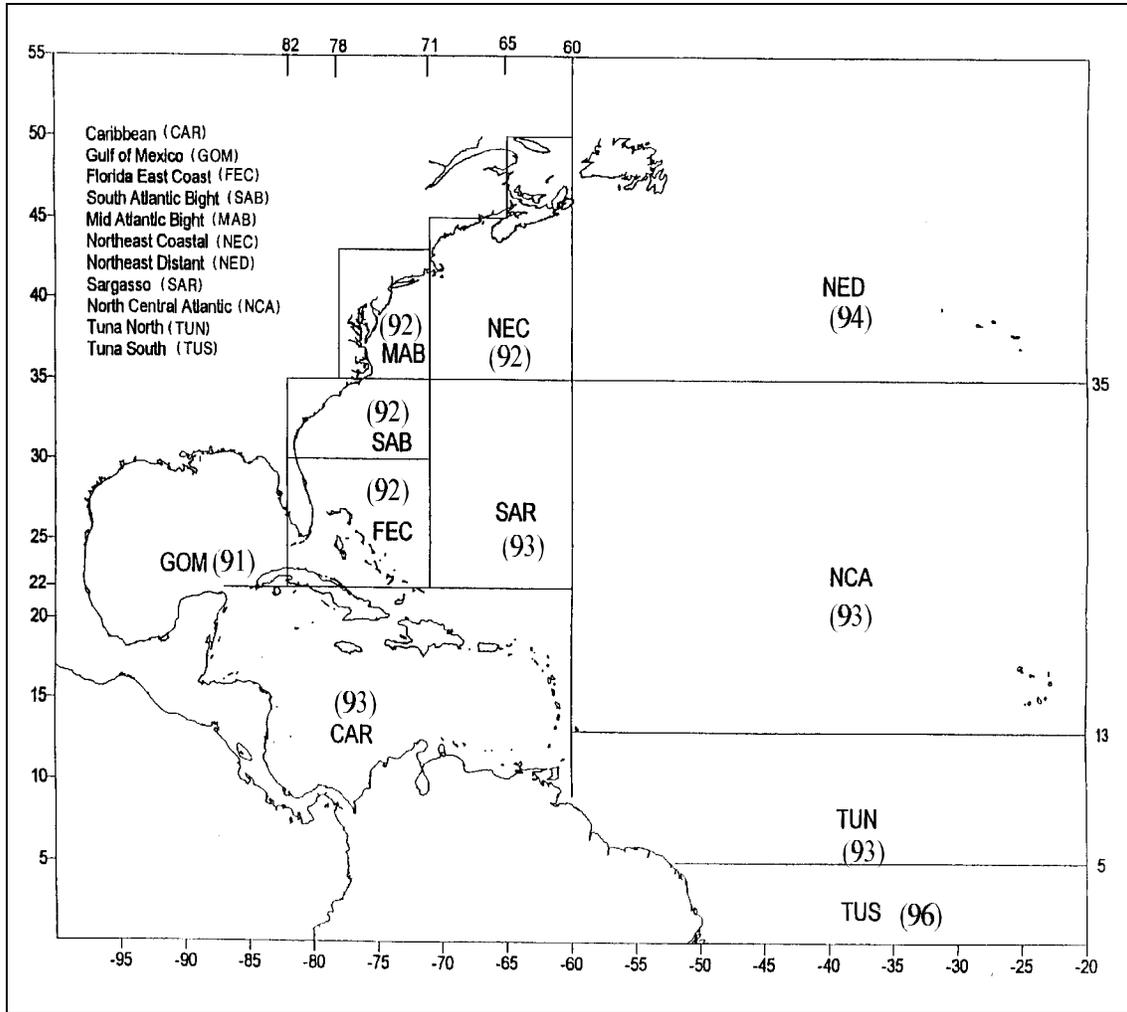


Table 4.6.1. U.S. Landings (mt) of Bluefin Tuna by Gear and Area for 1996 to 2000.

Area	Gear	1996	1997	1998	1999	2000
NW Atlantic	Longline	31.7	26.0	30.5	25.1	22.8
	Handline	32.5	17.4	29.2	15.5	3.2
	Purse Seine	245.0	249.7	248.6	247.9	275.2
	Harpoon	95.7	97.5	133.1	115.8	184.2
	*Rod and reel (>145 cm LJFL)	588.5	752.6	610.4	657.5	632.8
	*Rod and reel (<145 cm LJFL)	251.7	178.9	166.3	103.0	49.5
	Unclassified	2.8	2.2	0.6	0.1	0.2
Gulf of Mexico	Longline	36.2	23.8	18.3	48.4	43.3
	*Rod and reel	0.0	0.0	0.0	0.4	0.9
	All Gears	1284.1	1348.1	1237	1213.7	1212.1

* 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 1996 to 2000.

Area	Gear	1996	1997	1998	1999	2000
NW Atlantic	Longline	728.3	838.9	464.9	581.3	734.45
	Rod and reel*	4484.8	3560.9	2845.7	3818.2	3809.47
	Troll	371.0	218	177.5	0	0
	Purse seine	6.8	0	0	0	0
	Gillnet	13.2	1.3	1.7	0.2	0.21
	Trawl	7.3	1.9	0.7	4.1	1.76
	Harpoon	0	0	0	0	0
	Handline	37.2	34.3	0	192	235.7
	Trap	0	**	0.1	0.8	0.53
	Unclassified	0.4	0	0	2.1	1.31
Gulf of Mexico	Longline	2164.8	2571.3	1864.5	2736.6	2133
	Rod and reel*	13.2	7.7	80.9	149.4	52.26
	Handline	47.0	55.6	60.8	12.7	28.57
	Gillnet	0	0	0	**	0
	Uncl	19.6	0	0	0	0
Caribbean	Longline	34.2	135.4	58.6	24.4	11.77
	Troll	0	19.6	0	0	0
	Handline	0	.7	3.9	14.5	19.41
	Gillnet	0	**	0	0	0.09
	Trap	0	.1	0	0.1	0.28
NC Area 94a	Longline	319.3	6.1	4.6	0.2	2.11
SW Atlantic	Longline	38.4	221.9	55.3	32.4	19.76
All Gears		8285.5	7673.7	5619.2	7569	7050.68

** \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 1996 to 2000.

Area	Gear	1996	1997	1998	1999	2000
NW Atlantic	Longline	.1	1.0	0.7	0.3	0
	Rod and reel*	48.1	42.0	49.5	63.6	13.12
	Troll	.9	.6	0.4	0	0
	Purse seine	.7	0	0	0	0
	Gillnet	18.5	8.9	16.9	26.5	1.86
	Trawl	0	0	0.2	1.0	0.04
	Handline	0.3	.1	0	0.2	0.23
	Trap	15.2	0	0	17.5	0
	Pound	0	0	0	0	0
	uncl	**	0	0	0	0
Gulf of Mexico	Longline	.2	1.3	0.6	0.4	0.23
	Rod and reel*	36.4	21.7	37.0	34.8	16.67
	Handline	0.1	0	0	0.4	0.65
	Trap	0	0	0	0	0
	Uncl					0.04
Caribbean	Longline	0	1.2	0	1.3	1.62
	Gillnet	0	.2	0	0.4	0.59
	Harpoon	0	0	0	0	0
	Handline	0	0	0	5.8	8.8
	Trap	0	**	0	0.1	0.28
	Troll	**	7.3	0	0	0
	uncl	0	0	0	0	0
SW Atlantic	Longline	0	**	0	0	0
All Gears		120.5	84.3	105.3	152	44.13

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

Area	Gear	1996	1997	1998	1999	2000
NW Atlantic	Longline	333.0	476.3	544.3	737.8	333.2
	Rod and reel*	108.2	333.5	228.0	316.1	34.4
	Troll	4.1	3.9	4.0	0	0
	Gillnet	4.2	**	0.4	0.2	0
	Handline	16.4	2.7	0	11.9	4.1
	Pairtrawl	0	0	0	0	0
	Trawl	1.4	1.0	0.5	1.2	1.7
	Harpoon	0	0	0	0	0
	Haul Seine	0	0	0	0	0
	Uncl	0.1	.5	0	0.9	0
Gulf of Mexico	Longline	30.9	33.9	25.6	54.6	44.5
	Rod and reel*	0	0	0	1.8	0
	Handline	0.9	**	0.1	0.2	0.1
Caribbean	Longline	32.8	50.0	48.5	23.2	13.7
	Handline	0	0	0	0.2	1.5
NC Area 94a	Longline	228.9	91.8	48.4	35.3	63.1
SW Atlantic	Longline	34.9	142.8	28.5	78.2	77.4
All Gears		795.8	1136.4	928.3	1261.6	573.6

** ≤ 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 1996 to 2000.

Area	Gear	1996	1997	1998	1999	2000
NW Atlantic	Longline	63.6	140.0	155.4	179.5	130.52
	Gillnet	30.7	42.8	40.1	27.0	0.78
	Handline	3.7	4.8	0	0.6	2.93
	Trawl	1.7	2.6	2.4	0.4	0.03
	Troll	2.7	1.6	5.8	0	0
	Rod and reel*	277.8	220.2	601.1	90.1	250.75
	Pair Trawl	0	0	0	0	0
	Pound	3.5	1.3	0.9	0.4	0
	Uncl	21.1	0.2	0	0	0.12
	Gulf of Mexico	Longline	5.7	16.9	3.9	3.8
Rod and reel*		61.7	49.3	0	0	0
Handline		0.1	0	0	**	0
Caribbean	Longline	6.6	16.1	17.8	8.3	9.24
	Troll	0	3.6	0	0	0
	Gillnet	0	**	0	0.2	0.13
	Trap	0	**	0	**	0.22
	Handline	0	0	0	3.8	5.01
NC Area 94a	Longline	32.4	11.4	1.6	1.5	2.6
SW Atlantic	Longline	1.1	4.7	1.4	1.4	0.89
All Gears		512.4	515.5	830.4	317	407.35

** ≤ 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 1996 to 2000.

Area	Gear	1996	1997	1998	1999	2000
NW Atlantic	* Longline	1310.4	1262.2	1624.1	1872.3	1547.6
	Gillnet	77.8	.4	36.3	0	0
	Pair Trawl	0	0	0	0	0
	Handline	.1	1.3	0	5.0	7.7
	Trawl	19.8	8.0	5.9	7.5	10.9
	Troll	7.3	0.4	0.7	0	0
	* unclassified	25.8	11.9	9.1	3.8	1.4
	Harpoon	.5	.7	1.5	0	0.6
	** Rod and Reel	5.92	10.91	4.71	21.32	15.6
	Trap	0	0	0.1	**	0
Gulf of Mexico	* Longline	896.3	759.9	633.1	579.6	631.7
	Handline	0	0	0	**	1.2
Caribbean	* Longline	1180.0	688.9	516.0	260.5	331.9
	Trap					0.3
NC Atlantic	* Longline	629.4	688.2	658.6	650.0	804.6
SW Atlantic	* Longline	172.6	417.9	170.1	185.2	143.8
All Gears		4325.92	3850.71	3660.21	3585	3497.1

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

** ≤ 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 1997-2000.

		Blue Marlin				White Marlin				Sailfish			
Area	Gear	1997	1998	1999	2000	1997	1998	1999	2000	1997	1998	1999	2000
NW Atlantic	Longline*	18.7	23.3	22.0	28.8	11.2	15.3	18.6	10.3	9.2	6.4	13.7	11.2
	Unclassified*		0.62		0.1		0.7	0.06	0.0		0.06		0.0
	Rod and reel**	25.0	34.1	24.8	13.75	0.9	2.4	1.5	0.23	0.0	0.1	0.07	1.75
Gulf of Mexico	Longline*	51.0	18.5	55.2	29.6	15.4	11.8	31.5	29.9	13.3	17.0	57.4	33.9
	Rod and reel**	11.5	4.5	7.5	4.7	0.9	0.2	0.1	0.0	0.4	1.0	0.6	0.24
Caribbean	Longline*	24.6	2.3	1.6	0.5	6.6	1.3	5.04	0.5	3.3	0.2	0.46	0.1
	Rod and reel**	8.6	10.6	4.6	5.7	0.0	0.02	0.0	0.0	0.2	0.05	0.0	0.06
	Other	0.0	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0
Unknown & NC Area 94a	Longline*	2.3	6.1	1.6	0.7	0.5	2.8	1.08	0.1	0.0	0.8	0.02	0.1
SW Atlantic	Longline*	41.5	1.6	1.7		37.1	0.9	0.45	0.0	31.9	2.7	0.02	0.1
All Gears		183.2	101.6	119.0	83.7	72.6	35.4	58.3	41.0	58.3	28.3	72.3	47.3

* 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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