extensive shelf that extends to the British Virgin Islands. Depth ranges from 18 to 30 m (59 to 99 ft). Much of the bottom is sandy, commonly with algal and sponge communities. The southeast coast has a narrow shelf (eight km wide). About 25 km (15.5 mi) to the southeast is Grappler Bank, a small seamount with its summit at a depth of 70 m (231 ft). The central south coast broadens slightly to 15 km (99 mi) and an extensive sea grass bed extends nine kilometers offshore to Caja de Muertos Island. Further westward, the shelf narrows again to just two km (1.2 mi) before widening at the southwest corner to over 10 km (6 mi). The entirety of the southern shelf is characterized by hard or sand-algal bottoms with emergent coral reefs, grass beds, and shelf edge. Along the southern portion of the west coast the expanse of shelf continues to widen, reaching 25 km (15.5 mi) at its maximum. A broad expanse of the shelf is found between 14 and 27 m (46 and 99 ft), where habitats are similar to those of the south coast. To the north, along the west coast, the shelf rapidly narrows to two to three kilometers.

*Physical Oceanography*

U.S. Caribbean waters are primarily influenced by the westward flowing North Equatorial Current, the predominant hydrological driving force in the Caribbean region. It flows from east to west along the northern boundary of the Caribbean plateau and splits at the Lesser Antilles, flowing westward along the north coasts of the islands.

The north branch of the Caribbean Current flows west into the Caribbean Basin at roughly 0.5 m (1.7 ft) per second. It is located about 100 km (62 mi) south of the islands, but its position varies seasonally. During the winter it is found further to the south than in summer. Flow along the south coast of Puerto Rico is generally westerly, but this is offset by gyres formed between the Caribbean Current and the island. The Antilles Current flows to the west along the northern edge of the Bahamas Bank and links the waters of the Caribbean to those of southeast Florida.

Coastal surface water temperatures remain fairly constant throughout the year and average between 26° and 30°C (79° and 86°F). Salinity of coastal waters is purely oceanic and therefore is usually around 36 ppt. However, in the enclosed or semi-enclosed embayments salinity may vary widely depending on fluvial and evaporational influences.

It is believed that no upwelling occurs in the waters of the U.S. Caribbean (except perhaps during storm events) and, since the waters are relatively stratified, they are severely nutrient-limited. In tropical waters nitrogen is the principal limiting nutrient.

## 3.4 Fishery Data Update

In this section, HMS fishery data, with the exception of some data on Atlantic sharks, are analyzed by gear type; Section 3.4.6 provides a summary of landings by species. While HMS fishermen generally target particular species, the non-selective nature of most fishing gears promotes effective analysis and management on a gear-by-gear basis. In addition, issues such as bycatch, and safety are generally better addressed by gear type. A summary of catch statistics can be found in Section 3.4.6 of this document.

The revised list of authorized fisheries (LOF) and fishing gear used in those fisheries became effective December 1, 1999 (64 FR 67511). The rule applies to all U.S. marine fisheries, including Atlantic HMS. As stated in the rule, "no person or vessel may employ fishing gear or participate in a fishery in the exclusive economic zone (EEZ) not included in this LOF without giving 90 days' advance notice to the appropriate Fishery Management Council (Council) or, with respect to Atlantic 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 recreational fishery – rod and reel, handline; tuna purse seine fishery – purse seine; tuna recreational fishery– rod and reel, handline; and tuna handgear fishery – rod and reel, harpoon, handline, bandit gear. 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 the Secretary or Regional Council management authority, are covered in two broad categories: Recreational Fisheries (Non-FMP) and Commercial Fisheries (Non-FMP). Species that fit this description may be harvested with the gears listed for these catchall categories.

Due to the nature of SCRS data collection,

Table 3.21 depicts a summary of U.S. and international HMS catches by species rather than gear type. International catch levels and U.S. reported catches for HMS, other than sharks, are taken from the 2005 Standing Report of the SCRS (SCRS, 2005). The U.S. percentage of regional and total catches for HMS species is presented (

Table 3.21) to provide a basis for comparison of the U.S.' catches relative to other nations/entities. Catch of billfish includes both recreational landings and dead discards from commercial fisheries; catch for bluefin tuna includes commercial landings and discards and recreational landings; and swordfish include commercial landings and discards. International catch and landings tables are included for the pelagic longline and purse seine fisheries in Sections 3.4.1 and 3.4.2 of this document. 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 3.21 Calendar Year 2004 U.S. vs International Catch of HMS (mt ww) other than sharks.** Source: SCRS, 2005.

| Species | Total International Reported Catch | Region of U.S. Involvement | Total Regional Catch | U.S. Catch | U.S. Percentage of Regional Catch | U.S. Percentage of Total Atlantic Catch |
|---|---|---|---|---|---|---|
| Atlantic Swordfish | 25,173* (includes N. & S. Atlantic) | North Atlantic | 12,283* | 2,600 | 21.17% | 10.39% |
| | | South Atlantic | 12,779* | 16 | 0.13% | |
| Atlantic Bluefin Tuna | 28,889** | West Atlantic | 1,928 | 971 | 50.36% | 3.36% |
| Atlantic Bigeye Tuna | 72,349 | Total Atlantic | 72,349 | 414 | 0.57% | 0.57% |
| Atlantic Yellowfin Tuna | 116,275 | West Atlantic | 29,829 | 6,500 | 21.79% | 5.59% |
| Atlantic Albacore Tuna | 52,775 (includes N. & S. Atlantic and Mediterranean) | North Atlantic | 25,460 | 646 | 2.54% | 1.23% |
| | | South Atlantic | 22,468 | 1 | 0.004% | |
| Atlantic Skipjack Tuna | 161,089 | West Atlantic | 26,910 | 102 | 0.38% | 0.06% |
| Atlantic Blue Marlin | 2,076 | North Atlantic | 596 | 59*** | 9.90% | 2.84% |
| Atlantic White Marlin | 532 | North Atlantic | 190 | 28*** | 14.74% | 5.26% |
| Atlantic Sailfish | 2,167 | West Atlantic | 1,017 | 40 | 3.93% | 1.85% |

* Actual catches are likely higher given significant non-compliance with ICCAT reporting requirements.
** Significant non-compliance with ICCAT reporting requirements affects SCRS from estimating aggregate 2004 eastern Atlantic bluefin tuna catches accurately.
***The U.S. catch of marlins reported in the DEIS was lower as discards were inadvertently omitted.

### 3.4.1 Pelagic Longline Fishery

#### 3.4.1.1 Domestic History and Current Management

The U.S. pelagic longline fishery for Atlantic HMS primarily targets swordfish, yellowfin tuna, and bigeye tuna in various areas and seasons. Secondary target species include dolphin, albacore tuna, pelagic sharks (including mako, thresher, and porbeagle sharks), as well as several species of large coastal sharks. Although this gear can be modified (*e.g.*, depth of set, hook type, etc.) to target swordfish, tunas, or sharks, it is generally a multi-species fishery. These vessel operators are opportunistic, switching gear style and making subtle changes to target the best available economic opportunity of each individual trip. Pelagic longline gear sometimes attracts and hooks non-target finfish with little or no commercial value, as well as species that cannot be retained by commercial fishermen due to regulations, such as billfish. Pelagic longlines may also interact with protected species such as marine mammals, sea turtles, and seabirds. Thus, this gear has been classified as a Category I fishery with respect to the Marine Mammal Protection Act. Any species (or undersized catch of permitted species) that cannot be landed due to fishery regulations is required to be released, whether dead or alive. Pelagic longline gear is composed of several parts (see Figure 3.25[2]) (NMFS, 1999).

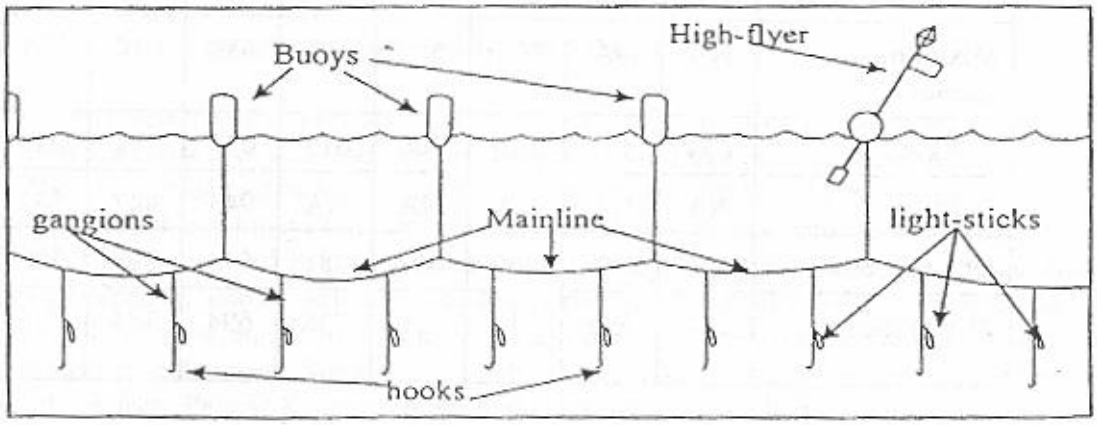



**Figure 3.25 Typical U.S. Pelagic Longline Gear.** Source: Arocha, 1996

The primary fishing line, or mainline of the longline system, can vary from five to 40 miles in length, with approximately 20 to 30 hooks per mile. The depth of the mainline is determined by ocean currents and the length of the floatline, which connects the mainline to several buoys, and periodic markers which can have radar reflectors or radio beacons attached. Each individual hook is connected by a leader, or gangion, to the mainline. Lightsticks, which contain chemicals that emit a glowing light, are often used, particularly when targeting swordfish. When attached to the hook and suspended at a certain depth, lightsticks attract baitfish, which may, in turn, attract pelagic predators (NMFS, 1999).

[2] As of April 1, 2001, (66 FR 17370) a vessel is considered to have pelagic longline gear on board when a power-operated longline hauler, a mainline, floats capable of supporting the mainline, and leaders (gangions) with hooks are on board.

When targeting swordfish, pelagic longline gear is generally deployed at sunset and hauled at sunrise to take advantage of swordfish nocturnal near-surface feeding habits (NMFS, 1999). In general, longlines targeting tunas are set in the morning, deeper in the water column, and hauled in the evening. Except for vessels of the distant water fleet, which undertake extended trips, fishing vessels preferentially target swordfish during periods when the moon is full to take advantage of increased densities of pelagic species near the surface. The number of hooks per set varies with line configuration and target species (Table 3.22) (NMFS, 1999). The pelagic longline gear components may also be deployed as a trolling gear to target surface feeding tunas. Under this configuration, the mainline and gangions are elevated and actively trolled so that the baits fish on or above the water's surface. This style of fishing is often referred to as "green-stick fishing," and reports indicate that it can be extremely efficient compared to conventional fishing techniques. For more information on green-stick fishing gear and the configurations allowed under current regulations, please refer to the discussions of alternative H4 in Chapters 2 and 4 of this document.

**Table 3.22 Average Number of Hooks per Pelagic Longline Set, 1999-2004.** Source: Data reported in pelagic longline logbook.

| Target Species | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Swordfish | 521 | 550 | 625 | 695 | 712 | 701 |
| Bigeye Tuna | 768 | 454 | 671 | 755 | 967 | 400 |
| Yellowfin Tuna | 741 | 772 | 731 | 715 | 723 | 696 |
| Mix of tuna species | NA | 638 | 719 | 767 | 764 | 779 |
| Shark | 613 | 621 | 571 | 640 | 970 | 1,046 |
| Dolphin | NA | 943 | 447 | 542 | 692 | 1,033 |
| Other species | 781 | 504 | 318 | 300 | 865 | 270 |
| Mix of species | 738 | 694 | 754 | 756 | 750 | 777 |

Figure 3.26 illustrates basic differences between swordfish (shallow) sets and tuna (deep) longline sets. Swordfish sets are buoyed to the surface, have few hooks between floats, and are relatively shallow. This same type of gear arrangement is used for mixed target sets. Tuna sets use a different type of float placed much further apart. Compared with swordfish sets, tuna sets have more hooks between the floats and the hooks are set much deeper in the water column. It is believed that because of the difference in fishing depth, tuna sets hook fewer turtles than the swordfish sets. In addition, tuna sets use bait only, while swordfish fishing uses a combination of bait and lightsticks. Compared with vessels targeting swordfish or mixed species, vessels specifically targeting tuna are typically smaller and fish different grounds.

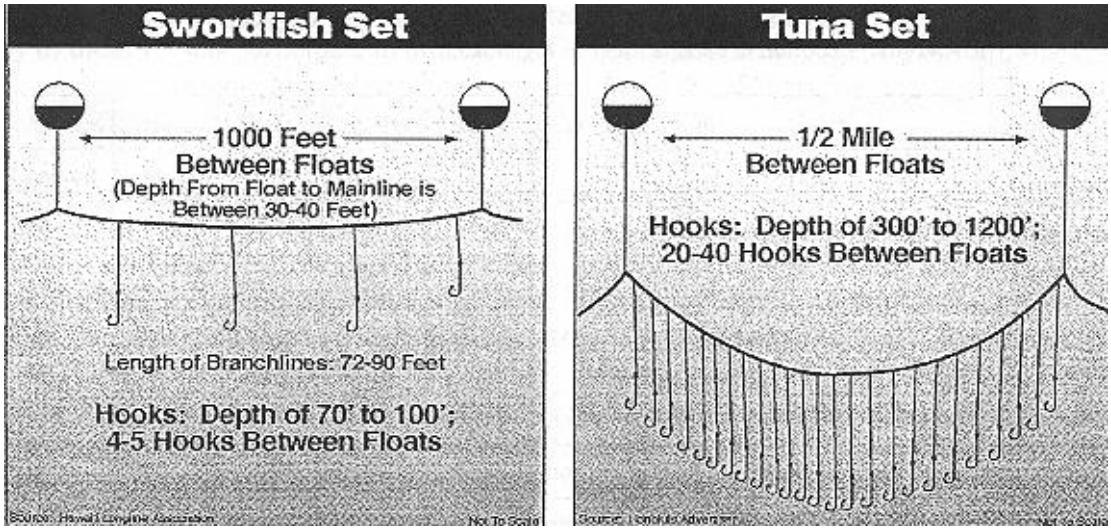



**Figure 3.26 Different Pelagic Longline Gear Deployment Techniques.** Source: Hawaii Longline Association and Honolulu Advertiser.

NOTE: This figure is only included to show basic differences in pelagic longline gear configuration and to illustrate that this gear may be altered to target different species.

*Regional U.S. Pelagic Longline Fisheries Description*

The U.S. pelagic longline fishery sector has historically been comprised of five relatively distinct segments with different fishing practices and strategies, including the Gulf of Mexico yellowfin tuna fishery, the South Atlantic-Florida east coast to Cape Hatteras swordfish fishery, the Mid-Atlantic and New England swordfish and bigeye tuna fishery, the U.S. distant water swordfish fishery, and the Caribbean Islands tuna and swordfish fishery. Each vessel type has different range capabilities due to fuel capacity, hold capacity, size, and construction. In addition to geographical area, these segments have historically differed by percentage of various target and non-target species, gear characteristics, and deployment techniques. Some vessels fish in more than one fishery segment during the course of the year (NMFS, 1999). Due to the many changes in the regulations since 1999 (*e.g.*, time/area closures and gear restrictions), the fishing practices and strategies of these different segments may have changed.

The Gulf of Mexico Yellowfin Tuna Fishery

Gulf of Mexico vessels primarily target yellowfin tuna year-round; however, each port has one to three vessels that directly target swordfish, either seasonally or year-round. Longline fishing vessels that target yellowfin tuna in the Gulf of Mexico also catch and sell dolphin, swordfish, other tunas, and sharks. During yellowfin tuna fishing, few swordfish are captured incidentally. Many of these vessels participate in other Gulf of Mexico fisheries (targeting shrimp, shark, and snapper/grouper) during allowed seasons. Home ports for this fishery include Madiera Beach, Florida; Panama City, Florida; Dulac, Louisiana; and Venice, Louisiana (NMFS, 1999).

For catching tuna, the longline gear is configured similar to swordfish longline gear but is deployed differently. The gear is typically set out at dawn (between two a.m. and noon) and

retrieved at sunset (4 p.m. to midnight). The water temperature varies based on the location of fishing. However, yellowfin tuna are targeted in the western Gulf of Mexico during the summer when water temperatures are high. In the past, fishermen have used live bait, however, NMFS prohibited the use of live bait in an effort to decrease bycatch and bycatch mortality of billfish (65 FR 47214, August 1, 2000). This rule also closed the Desoto Canyon area (year-round closure) to pelagic longline gear. In the Gulf of Mexico, and all other areas, except the NED, specific circle hooks (16/0 or larger non-offset and 18/0 or larger with an offset not to exceed 10 degrees) are currently required, as are whole finfish and squid baits.

The South Atlantic – Florida East Coast to Cape Hatteras Swordfish Fishery

Historically, South Atlantic pelagic longline vessels targeted swordfish year-round, although yellowfin tuna and dolphin fish were other important marketable components of the catch. In 2001 (65 FR 47214, August 1, 2000), the Florida East Coast closed area (year-round closure) and the Charleston Bump closed area (February through April closure) became effective. NMFS analyzed logbook data to determine the effectiveness of these closed areas (Sections 2.1.2 and 4.1.2).

Prior to these closures, smaller vessels used to fish short trips from the Florida Straits north to the bend in the Gulf Stream off Charleston, South Carolina (Charleston Bump). Mid-sized and larger vessels migrate seasonally on longer trips from the Yucatan Peninsula throughout the West Indies and Caribbean Sea, and some trips range as far north as the Mid-Atlantic coast of the United States to target bigeye tuna and swordfish during the late summer and fall. Fishing trips in this fishery average nine sets over 12 days. Home ports (including seasonal ports) for this fishery include Georgetown, South Carolina; Charleston, South Carolina; Fort Pierce, Florida; Pompano Beach, Florida; and Key West, Florida. This sector of the fishery consists of small to mid-size vessels, which typically sell fresh swordfish to local high-quality markets (NMFS, 1999).

The Mid-Atlantic and New England Swordfish and Bigeye Tuna Fishery

Fishing in this area has evolved during recent years to focus almost year-round on directed tuna trips, with substantial numbers of swordfish trips as well. Some vessels participate in directed bigeye/yellowfin tuna fishing during the summer and fall months and then switch to bottom longline and/or shark fishing during the winter when the large coastal shark season is open. In 1999, NMFS closed the Northeastern U.S. area in June to pelagic longline gear to reduce bluefin tuna discards (64 FR 29090, May 28, 1999). Fishing trips in this fishery sector average 12 sets over 18 days. During the season, vessels primarily offload in the ports of New Bedford, Massachusetts; Barnegat Light, New Jersey; Ocean City, Maryland; and Wanchese, North Carolina (NMFS, 1999).

The U.S. Atlantic Distant Water Swordfish Fishery

This fishing ground covers virtually the entire span of the western north Atlantic to as far east as the Azores and the Mid-Atlantic Ridge. Approximately 12 large fishing vessels that fish in the distant water operate out of Mid-Atlantic and New England ports during the summer and fall months targeting swordfish and tunas, and then move to Caribbean ports during the winter

and spring months. Many of the current distant water operations were among the early participants in the U.S. directed Atlantic commercial swordfish fishery. These larger vessels, with greater ranges and capacities than the coastal fishing vessels, enabled the United States to become a significant participant in the north Atlantic fishery. They also fish for swordfish in the south Atlantic. The distant water vessels traditionally have been larger than their southeast counterparts because of the distances required traveling to the fishing grounds. Fishing trips in this fishery tend to be longer than in other fisheries, averaging 30 days and 16 sets. Ports for this fishery range from San Juan, Puerto Rico through Portland, Maine, and include New Bedford, Massachusetts, and Barnegat Light, New Jersey (NMFS, 1999). This segment of the fleet was directly affected by the L-shaped closure in 2000 and the NED closure implemented in 2001. A number of vessels have recently returned to this fishery with the issuance of the July 6, 2004, rule (69 FR 40734) to reduce sea turtle bycatch and bycatch mortality. Unlike in other areas, vessels fishing in the NED are required to use 18/0 or larger circle hooks with an offset not to exceed 10 degrees and whole mackerel or squid baits.

The Caribbean Tuna and Swordfish Fishery

This fleet is similar to the southeast coastal fishing fleet in that both are comprised primarily of smaller vessels that make short trips relatively near-shore, producing high quality fresh product. Both fleets also encounter relatively high numbers of undersized swordfish at certain times of the year. Longline vessels targeting HMS in the Caribbean use fewer hooks per set, on average, fishing deeper in the water column than the distant water fleet off New England, the northeast coastal fleet, and the Gulf of Mexico yellowfin tuna fleet. This fishery is typical of most pelagic fisheries, being truly a multi-species fishery, with swordfish as a substantial portion of the total catch. Yellowfin tuna, dolphin and, to a lesser extent, bigeye tuna, are other important components of the landed catch. Ports for this fishery include St. Croix, U.S. Virgin Islands; and San Juan, Puerto Rico. Many of these high quality fresh fish are sold to local markets to support the tourist trade in the Caribbean (NMFS, 1999).

*Management of the U.S. Pelagic Longline Fishery*

The U.S. Atlantic pelagic longline fishery is restricted by a limited swordfish quota, divided between the North and South Atlantic (separated at 5°N. Lat.). Other regulations include minimum sizes for swordfish, yellowfin, bigeye, and bluefin tuna, limited access permitting, bluefin tuna catch requirements, shark quotas, protected species incidental take limits, reporting requirements (including logbooks), and gear and bait requirements. Current billfish regulations prohibit the retention of billfish by pelagic longline vessels, or the sale of billfish from the Atlantic Ocean. As a result, all billfish hooked on pelagic longlines must be discarded, and are considered bycatch. This is a heavily managed gear type and, as such, is strictly monitored. 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 intent of these closures is to decrease bycatch in the pelagic longline fishery by closing those areas with the highest rates of bycatch. 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 requires all pelagic longline vessels to report positions on an approved vessel monitoring system (VMS).

In June 2004, NMFS conditionally re-opened the NED to pelagic longline fishing. NMFS limited vessels with pelagic longline gear onboard in that area, at all times, to possessing onboard and/or using only 18/0 or larger circle hooks with an offset not to exceed ten degrees. Only whole mackerel and squid baits may be possessed and or utilized with allowable hooks. In August of 2004, NMFS limited vessels with pelagic longline gear onboard, at all times, in all areas open to pelagic longline fishing, excluding the NED, to possessing onboard and/or using only 16/0 or larger non-offset circle hooks and/or 18/0 or larger circle hooks with an offset not to exceed ten degrees. Only whole finfish and squid baits may be possessed and/or utilized with allowable hooks. All pelagic longline vessels must possess and use sea turtle handling and release gear in compliance with NMFS careful release protocols.

Permits

The 1999 FMP established six different limited access permit types: (1) directed swordfish, (2) incidental swordfish, (3) swordfish handgear, (4) directed shark, (5) incidental shark, and (6) tuna longline. To reduce bycatch in the pelagic longline fishery, these permits were designed so that the swordfish directed and incidental permits are valid only if the permit holder also holds both a tuna longline and a shark permit. Similarly, the tuna longline permit is valid only if the permit holder also holds both a swordfish (directed or incidental, not handgear) and a shark permit. This allows limited retention of species that might otherwise have been discarded.

As of February 1, 2006, approximately 214 tuna longline limited access permits had been issued. In addition, approximately 191 directed swordfish limited access permits, 86 incidental swordfish limited access permits, 240 directed shark limited access permits, and 312 incidental shark limited access permits had been issued. Vessels with limited access swordfish and shark permits do not necessarily use pelagic longline gear, but these are the only permits that allow for the use of pelagic longline gear in HMS fisheries.

Monitoring and Reporting

Pelagic longline fishermen and the dealers who purchase HMS from them are subject to reporting requirements. NMFS has extended dealer reporting requirements to all swordfish importers as well as dealers who buy domestic swordfish from the Atlantic. These data are used to evaluate the impacts of harvesting on the stock and the impacts of regulations on affected entities.

Commercial HMS fisheries are monitored through a combination of vessel logbooks, dealer reports, port sampling, cooperative agreements with states, and scientific observer coverage. Logbooks contain information on fishing vessel activity, including dates of trips, number of sets, area fished, number of fish, and other marine species caught, released, and retained. In some cases, social and economic data such as volume and cost of fishing inputs are also required.

Pelagic Longline Observer Program

During 2005, NMFS observers recorded 796 pelagic longline sets for an overall fishery coverage of 10.1 percent. In non-experimental fishing, the overall observer coverage was 7.2 percent. A total of 247 experimental pelagic longline sets were observed in the NEC, GOM, FEC, MAB, and SAB areas, primarily during the second and third quarters. These experimental sets (EXP) had 100 percent observer coverage and are separated from the normal commercial fishery in Table 3.23 (Walsh and Garrison, 2006). In 2004, NMFS observers recorded 702 pelagic longline sets for an overall coverage of 7.3 percent. During the first and second quarters of 2004, 60 experimental sets employing circle hooks were made in the Gulf of Mexico (EXP). These sets had 100 percent observer coverage (Garrison, 2005). One thousand eighty-eight pelagic longline sets were observed and recorded by NMFS observers in 2003 (11.5 percent overall coverage – 100 percent coverage in the NED; and 6.2 percent coverage in remaining areas) (Garrison and Richards, 2004). Table 3.23 details the amount of observer coverage in past years for this fleet. Generally, due to logistical problems, it has not always been 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 are reminded of the safety requirements for the placement of observers specified at 50 CFR 600.746, and the need to have all safety equipment on board required by the U.S. Coast Guard.

**Table 3.23 Observer Coverage of the Pelagic Longline Fishery.** Source: Yeung, 2001; Garrison, 2003; Garrison and Richards, 2004; Garrison, 2005; Walsh and Garrison, 2006.

| **Year** | **Number of Sets Observed** | | | **Percentage of Total Number of Sets** | | |
|---|---|---|---|---|---|---|
| 1999 | 420 | | | 3.8 | | |
| 2000 | 464 | | | 4.2 | | |
| 2001* | Total | Non-NED | NED | Total | Non-NED | NED |
| | 584 | 398 | 186 | 5.4 | 3.7 | 100.0 |
| 2002* | 856 | 353 | 503 | 8.9 | 3.9 | 100.0 |
| 2003* | 1088 | 552 | 536 | 11.5 | 6.2 | 100.0 |
| | Total | Non-EXP | EXP | Total | Non-EXP | EXP |
| 2004** | 702 | 642 | 60 | 7.3 | 6.7 | 100.0 |
| 2005** | 796 | 549 | 247 | 10.1 | 7.2 | 100.0 |

*In 2001, 2002, and 2003, 100 percent observer coverage was required in the NED research experiment.
** In 2004 and 2005 there was 100 percent observer coverage in experimental fishing (EXP).

### 3.4.1.2 Recent Catch and Landings

U.S. pelagic longline catch (including bycatch, incidental catch, and target catch) is largely related to these vessel and gear characteristics, but is summarized for the whole fishery in Table 3.24. U.S. pelagic longline landings of Atlantic tunas and swordfish for 1999 – 2004 are

summarized in Table 3.25. Additional information related to landings can be seen in Section 3.4.6

From May 1992 through December 2000, the Pelagic Observer Program (POP) recorded a total of 4,612 elasmobranchs (15 percent of the total catch) caught off the southeastern U.S. coast in fisheries targeting tunas and swordfish (Beerkircher *et al.*, 2004). Of the 22 elasmobranch species observed, silky sharks were numerically dominant (31.4 percent of the elasmobranch catch), with silky, dusky, night, blue, tiger, scalloped hammerhead, and unidentified sharks making up the majority (84.6 percent) (Beerkircher *et al.*, 2004).

**Table 3.24 Reported Catch of Species Caught by U.S. Atlantic Pelagic Longlines, in Number of Fish, for 1999-2004.** Source: Pelagic Longline Logbook Data.

| Species | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Swordfish Kept | 67,120 | 62,978 | 47,560 | 49,320 | 51,835 | 46,440 |
| Swordfish Discarded | 20,558 | 17,074 | 13,993 | 13,035 | 11,829 | 10,675 |
| Blue Marlin Discarded | 1,253 | 1,443 | 635 | 1,175 | 595 | 712 |
| White Marlin Discarded | 1,969 | 1,261 | 848 | 1,438 | 809 | 1,053 |
| Sailfish Discarded | 1,407 | 1,091 | 356 | 379 | 277 | 424 |
| Spearfish Discarded | 151 | 78 | 137 | 148 | 108 | 172 |
| Bluefin Tuna Kept | 263 | 235 | 177 | 178 | 273 | 475 |
| Bluefin Tuna Discarded | 604 | 737 | 348 | 585 | 881 | 1,031 |
| Bigeye, Albacore, Yellowfin, Skipjack Tunas Kept | 114,438 | 94,136 | 80,466 | 79,917 | 63,321 | 76,962 |
| Pelagic Sharks Kept | 2,894 | 3,065 | 3,460 | 2,987 | 3,037 | 3,440 |
| Pelagic Sharks Discarded | 28,967 | 28,046 | 23,813 | 22,828 | 21,705 | 25,355 |
| Large Coastal Sharks Kept | 6,382 | 7,896 | 6,478 | 4,077 | 5,326 | 2,292 |
| Large Coastal Sharks Discarded | 5,442 | 6,973 | 4,836 | 3,815 | 4,813 | 5,230 |
| Dolphin Kept | 31,536 | 29,125 | 27,586 | 30,384 | 29,372 | 38,769 |
| Wahoo Kept | 5,136 | 4,193 | 3,068 | 4,188 | 3,919 | 4,633 |
| Turtles Discarded | 631 | 271 | 424 | 465 | 399 | 369 |
| *Number of Hooks (X 1,000)* | *7,902* | *7,976* | *7,564* | *7,150* | *7,008* | *7,276* |

**Table 3.25** Reported Landings in the U.S. Atlantic Pelagic Longline Fishery (in mt ww) for 1999-2004. **Source: NMFS, 2004a; NMFS, 2005.**

| Species | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Yellowfin Tuna | 3,374 | 2,901 | 2,201 | 2,573 | 2,154 | 2,489 |
| Skipjack Tuna | 2.0 | 1.8 | 4.3 | 2.5 | 4.2 | 0.7 |
| Bigeye Tuna | 929.1 | 531.9 | 682.4 | 535.8 | 284.9 | 308.7 |
| Bluefin Tuna | 73.5 | 66.1 | 37.5 | 49.9 | 81.4 | 96.1 |
| Albacore Tuna | 194.5 | 147.3 | 193.8 | 155 | 110.9 | 117.4 |
| Swordfish N.* | 3,362.4 | 3,315.8 | 2,483 | 2,598.8 | 2,772.1 | 2,551 |
| Swordfish S.* | 185.2 | 143.8 | 43.2 | 199.9 | 20.9 | 15.7 |

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

*Marine Mammals*

Of the marine mammals that are hooked by U.S. pelagic longline fishermen, many are released alive, although some animals suffer serious injuries and may die after being released. The observed and estimated marine mammal interactions for 1992 – 2005 are summarized in Table 3.26 and Table 3.27. Marine mammals are caught primarily during the third and fourth quarters in the Mid-Atlantic Bight (MAB) and Northeast Coastal (NEC) areas (Figure 3.27). In 2005, the majority of observed interactions were with pilot whales in the MAB area (Walsh and Garrison, 2006).

In 2000, there were 14 observed takes of marine mammals by pelagic longlines. This number has been extrapolated based on reported fishing effort to an estimated 403 mammals fleet-wide (32 common dolphin, 93 Risso's dolphin, 231 pilot whales, 19 whales, 29 pygmy sperm whales) (Yeung, 2001). In 2001 and 2002, there were 16 and 24 observed takes of marine mammals, respectively. The majority of these interactions were observed in the MAB, followed by the NED research experiment. In 2001, there were an estimated total of 84 Risso's dolphin and 93 pilot whale interactions in the pelagic longline fishery. In 2002, there were an estimated 87 Risso's dolphin and 114 pilot whale interactions in the pelagic longline fishery. In the NED research experiment, an additional four Risso's dolphin and one northern bottlenose whale were recorded with serious injuries during 2001, as well as three Risso's dolphin, one unidentified dolphin, and one unidentified marine mammal in 2002. One striped dolphin was recorded as released alive during the NED experiment in 2001, as well as one Risso's dolphin, one common dolphin, one pilot whale, and one unidentified dolphin in 2002 (Garrison, 2003).

In 2003, there were 28 observed takes of marine mammals in the pelagic longline fishery. The majority of these interactions were observed in the MAB, followed by the NED experimental fishery, and the NEC area. This number has been extrapolated based on reported fishing effort to an estimated 300 mammals fleet wide (49 beaked whales, 16 dolphin, 30 Atlantic spotted dolphin, 46 common dolphin, 105 Risso's dolphin, 32 pilot whales, 22 minke

whales). In addition, five Risso's dolphin, one striped dolphin, and one baleen whale were observed captured in the 2003 NED research experiment, with one Risso's dolphin recorded as dead (Garrison and Richards, 2004).

There were a total of 12 observed interactions with marine mammals in the pelagic longline fishery in 2004. The majority of these interactions was with pilot whales and was observed in the MAB area. During 2004, the pelagic longline fishery was estimated to have interacted with 108 pilot whales, 49 Risso's dolphins, and seven common dolphins (Garrison, 2005). In 2005, there were a total of 24 observed interactions with marine mammals in the pelagic longline fishery. The majority of these interactions was with pilot whales and was observed in the MAB area. During 2005, the pelagic longline fishery was estimated to have interacted with 294 pilot whales, 42 Risso's dolphin, six common dolphin, five bottlenose dolphin, four Atlantic spotted dolphin, one beaked whale, 13 unidentified marine mammals, three unidentified whales, and three unidentified dolphin (Walsh and Garrison, 2006). NMFS monitors observed interactions with sea turtles and marine mammals on a quarterly basis and reviews data for appropriate action, if any, as necessary. In June 2005, NMFS convened the Pelagic Longline Take Reduction Team (PLTRT) to assess and reduce marine mammal takes, specifically pilot whales and Risso's dolphins, by the pelagic longline fishery. At the time of writing, the Pelagic Longline Take Reduction Plan (PLTRP) was expected to be finalized soon.

**Table 3.26 Summary of Marine Mammal Interactions in the Pelagic Longline Fishery, 1992-1998.** Source: Yeung, 1999a; Yeung, 1999b.

| Year | Species | Total | | Mortality | | Alive | |
|---|---|---|---|---|---|---|---|
| | | Obs | Est | Obs | Est | Obs | Est |
| 1992 | Risso's Dolphin | 3 | 121 | 2 | 74 | 1 | 47 |
| | Common Dolphin | 1 | 24 | | | 1 | 24 |
| | Dolphin | 1 | 17 | | | 1 | 17 |
| | Pilot Whale | 12 | 420 | 3 | 105 | 9 | 319 |
| 1993 | Risso's Dolphin | 3 | 62 | 1 | 36 | 2 | 26 |
| | Bottlenose Dolphin | 2 | 29 | | | 2 | 29 |
| | Pilot Whale | 16 | 193 | 1 | 15 | 15 | 178 |
| | Spotted Dolphin | 1 | 11 | | | 1 | 11 |
| 1994 | Atlantic Spotted Dolphin | 1 | 17 | 1 | 17 | | |
| | Pantropical Spotted Dolphin | 1 | 20 | | | 1 | 20 |
| | Killer Whale | 1 | 16 | 1 | 16 | | |
| | Pilot Whale | 14 | 161 | 12 | 137 | 2 | 26 |
| | Risso's Dolphin | 7 | 87 | 7 | 87 | | |
| 1995 | Risso's Dolphin | 5 | 101 | 4 | 85 | 1 | 16 |
| | Unidentified Marine Mammal | 1 | 22 | | | 1 | 22 |
| | Pilot Whale | 13 | 252 | 11 | 200 | 2 | 53 |
| | Shortfin Pilot Whale | 2 | 58 | 2 | 58 | | |
| 1996 | Risso's Dolphin | 4 | 99 | 2 | 52 | 2 | 47 |
| | Unidentified Marine Mammal | 1 | 43 | | | 1 | 43 |
| 1997 | Pilot Whale | 1 | 29 | | | 1 | 29 |
| | Short-Beaked Spinner Dolphin | 1 | 16 | | | 1 | 16 |
| 1998 | Beaked Whale | 1 | 88 | | | 1 | 88 |
| | Bottlenose Dolphin | 2 | 46 | 1 | 31 | 1 | 15 |
| | Risso's Dolphin | 2 | 47 | 1 | 23 | 1 | 24 |
| | Pilot Whale | 1 | 24 | | | 1 | 24 |

**Table 3.27 Summary of Marine Mammal Interactions in the Pelagic Longline Fishery, 1999-2005.** Sources: Yeung, 2001; Garrison, 2003; Garrison and Richards, 2004; Garrison, 2005; Walsh and Garrison, 2006.

| Year | Species | Total | | Mortality | | Serious Injury | | Alive | |
|---|---|---|---|---|---|---|---|---|---|
| | | Obs | Est | Obs | Est | Obs | Est | Obs | Est |
| 1999 | Risso's Dolphin | 1 | 23 | | | 1 | 23 | | |
| | Unidentified Marine Mammal | 1 | 14 | | | | | 1 | 14 |
| | Pilot Whale | 5 | 385 | 1 | 94 | 4 | 291 | | |
| 2000 | Common Dolphin | 1 | 32 | | | | | 1 | 32 |
| | Risso's Dolphin | 3 | 93 | 1 | 41 | 1 | 23 | 1 | 29 |
| | Pilot Whale | 8 | 231 | 1 | 24 | 4 | 109 | 3 | 98 |
| | Whale | 1 | 19 | | | 1 | 19 | | |
| | Pygmy Sperm Whale | 1 | 28 | | | 1 | 28 | | |
| 2001 | Risso's Dolphin | 8 | 83.6 | 1 | 24.4 | 6 | 48.9 | 1 | 14.3 |
| | Pilot Whale | 6 | 92.9 | 1 | 19.8 | 4 | 50.2 | 1 | 22.7 |
| | Striped Dolphin | 1 | 1 | | | | | 1 | 1 |
| | Northern Bottlenose Whale | 1 | 1 | | | 1 | 1 | | |
| 2002 | Risso's Dolphin | 10 | 87.2 | | | 4 | 11 | 6 | 59.6 |
| | Pilot Whale | 10 | 113.5 | | | 4 | 49.9 | 6 | 67.8 |
| | Common Dolphin | 1 | 1 | | | | | 1 | 1 |
| | Unidentified Dolphin | 2 | 2 | | | 1 | 1 | 1 | 1 |
| | Unidentified Marine Mammal | 1 | 1 | | | 1 | 1 | | |
| 2003 | Beaked Whale | 2 | 48.8 | | | 1 | 5.3 | 1 | 43.5 |
| | Dolphin | 1 | 16.2 | | | 1 | 16.2 | | |
| | Atlantic Spotted Dolphin | 1 | 29.8 | | | 1 | 29.8 | | |
| | Bottlenose Dolphin | 1 | 2 | | | | | 1 | 2 |
| | Common Dolphin | 2 | 45.6 | | | | | 2 | 45.6 |
| | Risso's Dolphin | 14 | 109.5 | 1 | 1 | 3 | 40.1 | 10 | 68.4 |
| | Striped Dolphin | 1 | 1 | | | | | 1 | 1 |
| | Pilot Whale | 4 | 32.1 | | | 2 | 21.4 | 1 | 11.3 |
| | Baleen Whale | 1 | 1 | | | | | 1 | 1 |
| | Minke Whale | 1 | 22.3 | | | | | 1 | 22.3 |
| 2004 | Pilot Whale | 8 | 107.5 | | | 6 | 74.1 | 2 | 33.8 |
| | Common Dolphin | 1 | 6.8 | | | | | 1 | 6.8 |
| | Risso's Dolphin | 3 | 49.4 | | | 2 | 27.5 | 1 | 21.9 |
| 2005 | Pilot Whale | 18 | 294.4 | | | 9 | 211.5 | 9 | 79.5 |
| | Risso's Dolphin | 2 | 42.1 | | | | 2.9 | 2 | 39.2 |
| | Common Dolphin | | 5.7 | | | | | | 5.7 |
| | Bottlenose Dolphin | 1 | 5.2 | | | | | 1 | 5.2 |
| | Beaked Whale | | 1 | | | | 1 | | |
| | Atlantic Spotted Dolphin | 1 | 4.3 | | | | | 1 | 4.3 |
| | Unidentified Marine Mammal | 1 | 13.2 | | | 1 | 13.2 | | |
| | Unidentified Whale | | 3.4 | | | | 3.4 | | |
| | Unidentified Dolphin | 1 | 2.6 | | | | | 1 | 2.6 |

*Sea Turtles*

Currently, many sea turtles are taken in the GOM and NEC areas (Figure 3.27) and most are released alive. In the past, the bycatch rate was highest in the third and fourth quarters. Loggerhead and leatherback turtles dominate the catch of sea turtles. In general, sea turtle captures are rare, but takes appear to be clustered (Hoey and Moore, 1999).

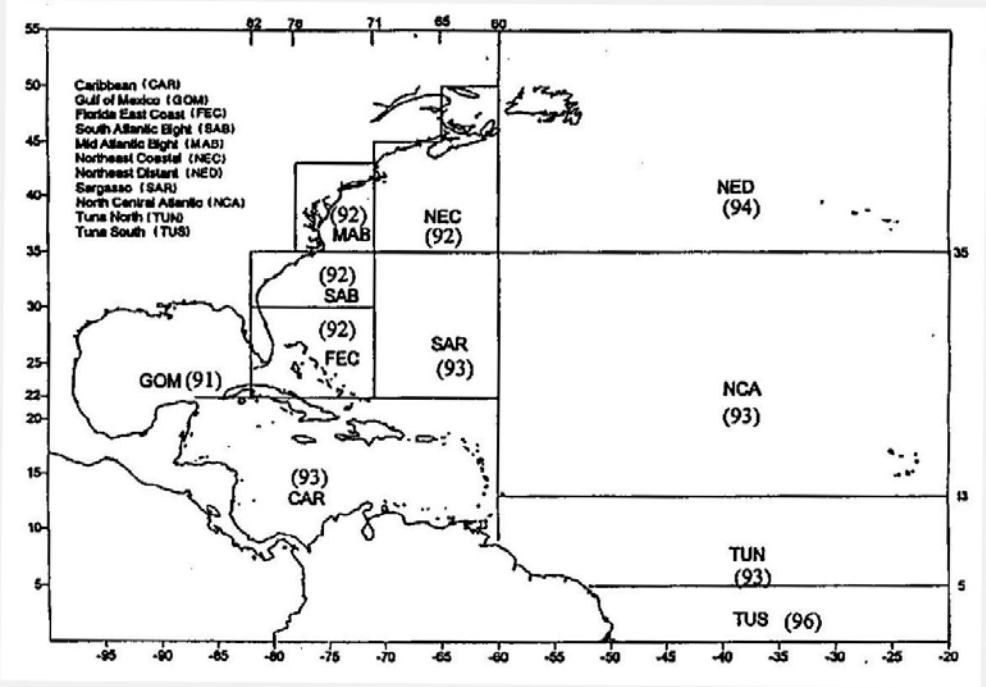



**Figure 3.27 Geographic Areas Used in Summaries of Pelagic Logbook Data.** Source: Cramer and Adams, 2000

The estimated take levels for 2000 were 1,256 loggerhead and 769 leatherback sea turtles (Yeung, 2001). The estimated sea turtle takes for regular fishing and experimental fishing effort for 2001 - 2005 are summarized in Table 3.28. The majority of leatherback interactions have occurred in the Gulf of Mexico. Loggerhead interactions are more widely distributed, however, the NEC, FEC, and Gulf of Mexico appear to be areas with high interaction levels each year.

In 2005, the pelagic longline fishery interacted with an estimated 351 leatherback sea turtles and 275 loggerhead sea turtles outside of experimental fishing operations. During 2005, the interactions with leatherback sea turtles were highest in the Gulf of Mexico (179 animals). The majority of loggerhead sea turtle interactions occurred in the NEC, MAB, CAR, SAR, and SAB areas (Walsh and Garrison, 2006). NMFS monitors observed interactions with sea turtles and marine mammals on a quarterly basis and reviews data for appropriate action, if any, as necessary.

**Table 3.28 Estimated number of leatherback and loggerhead sea turtle interactions in the U.S. Atlantic pelagic longline fishery, 2001-2005 by statistical area.** Sources: Walsh and Garrison, 2006; Garrison, 2005; Garrison and Richards, 2004; Garrison 2003.

| | Leatherback | | | | | Loggerhead | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Area** | **2001** | **2002** | **2003** | **2004** | **2005** | **2001** | **2002** | **2003** | **2004** | **2005** |
| CAR | 61 | 0 | 0 | 17 | 2 | 27 | 43 | 36 | 61 | 40 |
| GOM | 393 | 695 | 838 | 780 | 179 | 0 | 170 | 135 | 45 | 19 |
| FEC | 313 | 100 | 27 | 64 | 62 | 0 | 99 | 137 | 99 | 0 |
| SAB | 241 | 93 | 75 | 164 | 7 | 39 | 22 | 52 | 194 | 34 |
| MAB | 139 | 70 | 94 | 184 | 11 | 43 | 94 | 18 | 92 | 54 |
| NEC | 30 | 5 | 76 | 33 | 6 | 117 | 147 | 241 | 150 | 67 |
| NED | 32 | 0 | 0 | 98 | 63 | 72 | 0 | 0 | 52 | 20 |
| SAR | 0 | 0 | 0 | 18 | 20 | 0 | 0 | 70 | 41 | 38 |
| NCA | 1 | 0 | 2 | 0 | 0 | 13 | 0 | 39 | 0 | 3 |
| TUN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TUS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 1208 | 962 | 1113 | 1359 | 351 | 312 | 575 | 728 | 734 | 275 |
| NED exp'tal fishery (2001-03) | 77 | 158 | 79 | -- | -- | 142 | 100 | 92 | -- | -- |
| Exp'tal fishery (2004-05) | -- | -- | -- | 3 | 17 | -- | -- | -- | 0 | 8 |
| Total | 1285 | 1120 | 1192 | 1362 | 368 | 454 | 675 | 820 | 734 | 283 |

As a result of the increased sea turtle interactions in 2001 and 2002, NMFS reinitiated consultation for the pelagic longline fishery and completed a new BiOp on June 1, 2004. The June 2004 BiOp concluded that long-term continued operation of the Atlantic pelagic longline fishery is not likely to jeopardize the continued existence of loggerhead, green, hawksbill, Kemp's ridley, or olive ridley sea turtles, but is likely to jeopardize the continued existence of leatherback sea turtles. The BiOp included a reasonable and prudent alternative (RPA) and an incidental take statement (ITS) for the combined years 2004 – 2006, and for each subsequent three-year period (NMFS, 2004b).

A final rule published in July 2004 (69 FR 40734) prohibited the possession of "J"-style hooks in the pelagic longline fishery and required the possession and use of specific sea turtle release and disentanglement gears, handling and release protocols, as well as requiring the use of specific circle hooks and baits.

NED Research Experiment

Consistent with the conservation recommendation of an earlier, 2001 BiOp, NMFS initiated a research experiment in the NED area in consultation and cooperation with the domestic pelagic longline fleet. The goal was to develop and evaluate the efficacy of new technologies and changes in fishing practices to reduce sea turtle interactions. In 2001, the experiment attempted to evaluate the effect of gangions placed two gangion lengths from

floatlines, the effect of blue-dyed bait on target catch and sea turtle interactions, and the effectiveness of dipnets, line clippers, and dehooking devices. Eight vessels participated, making 186 sets, between August and November. During the course of the research experiment, 142 loggerhead and 77 leatherback sea turtles were incidentally captured and no turtles were released dead.

The data gathered during the 2001 experiment were analyzed to determine if the tested measures reduced the incidental capture of sea turtles by a statistically significant amount. The blue-dyed bait parameter decreased the catch of loggerheads by 9.5 percent and increased the catch of leatherbacks by 45 percent. Neither value is statistically significant. In examining the gangion placement provision, the treatment sections of the gear (with gangions placed 20 fathoms from floatlines) did not result in a statistically significant reduction in the number of loggerhead and leatherback sea turtle interactions than the control sections of the gear (with a gangion located under a floatline). The treatment section of the gear recorded an insignificant increase in the number of leatherback interactions. Following an examination of the data, NMFS discovered that the measures had no significant effect upon the catch of sea turtles (Watson *et al.*, 2003).

Dipnets and line clippers were examined for general effectiveness. The dipnets were found to be adequate in boating loggerhead sea turtles. Several line clippers were tested, with the La Force line clipper having the best performance. Several types of dehooking devices were tested, with the work on these devices continuing in the 2002 and 2003 NED research experiment.

In the summer and fall of 2002, NMFS conducted the second year of the research experiment. The use of circle and "J"-hooks, whole mackerel bait, squid bait, and shortened daylight soak time were tested to examine their effectiveness in reducing the capture of sea turtles. The data indicate there were 501 sets made by 13 vessels with 100 percent observer coverage. During the course of the experiment, 100 loggerhead and 158 leatherback sea turtles were captured and 11 were tagged with satellite tags. In addition to the sea turtles, the vessels interacted with one unidentified marine mammal, one unidentified dolphin, one common dolphin, one longfin pilot whale, and four Risso's dolphins; all were released alive (Watson *et al.*, 2003).

In 2003, the research experiment tested a number of treatments to verify the results of the 2002 experiment in addition to testing additional treatments. Data indicate that there were 539 sets made by 11 vessels with 100 percent observer coverage. During the course of the experiment, one olive ridley, 92 loggerhead, and 79 leatherback sea turtles were captured; all were released alive (Foster *et al.*, 2004; Watson *et al.*, 2004). In addition to the sea turtles, the vessels interacted with one striped dolphin, one baleen whale, and five Risso's dolphin resulting in one mortality (Garrison and Richards, 2004).

From 2001 through 2003, NMFS worked with the commercial fishing industry to develop new pelagic longline fishing technology to reduce interaction rates and bycatch mortality of threatened and endangered sea turtles. The cooperative gear technology research investigated line configurations, setting and retrieving procedures, hook types, hook sizes, bait types, and release and disentanglement gears. Ultimately, specific hook designs and bait types were found

to be the most effective measures for reducing sea turtle interactions. Large circle hooks and mackerel baits were found to substantially reduce sea turtle interactions over the use of the industry standard "J"-hooks and squid baits. The gears developed to remove hooks and line from hooked and entangled sea turtles are anticipated to reduce post-hooking mortality associated with those interactions not avoided. Since the conclusion of the NED research experiment, NMFS has continued to investigate pelagic longline bycatch mitigation techniques in the Gulf of Mexico, Atlantic Ocean, and the Caribbean Sea. Additionally, NMFS held a series of voluntary workshops for U.S. pelagic longline fishermen providing outreach and training in sea turtle handling and release techniques.

NMFS believes that the transfer of this information to other fishing countries will result in significant reductions in interaction rates and post-release mortalities of threatened and endangered sea turtles throughout their ranges.

*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). The majority of longline interactions with seabirds occur as the gear is being set. The birds eat the bait and become hooked on the line. The line then sinks and the birds are subsequently drowned.

The United States has developed a National Plan of Action in response to the Food and Agriculture Organization of the United Nations (FAO) International Plan of Action to reduce the incidental takes of seabirds (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 to reduce seabird takes by Atlantic pelagic longlines. Takes of seabirds have been minimal in the fishery, most likely due to the setting of longlines at night and/or fishing in areas where birds are largely absent.

Observer data from 1992 through 2005 indicate that seabird bycatch is relatively low in the U.S. Atlantic pelagic longline fishery (Table 3.29). Since 1992, a total of 129 seabird interactions have been observed, with 95 observed killed (73.6 percent). In 2005, a total of four seabirds were observed taken.

Observed bycatch has ranged from one to 18 seabirds observed dead per year and zero to 15 seabirds observed released alive per year from 1992 through 2003. Half of the seabirds observed were not identified to species (n = 59). Of the seabirds identified, gulls represent the largest group (n = 35), followed by greater shearwaters (n = 23), and northern gannets (n = 8) (Table 3.30). Greater shearwaters experienced the highest mortality (96.2 percent), followed by gulls (80 percent), and unidentified seabirds (67.8 percent). Northern gannets had the lowest mortality rate (12.5 percent).

Preliminary estimates of expanded seabird bycatch and bycatch rates from 1995 – 2004, varied by year and species with no apparent pattern (Table 3.31). The estimated number of all

seabirds caught and discarded dead ranged from zero to 468 per year, while live discards ranged from zero to 292 per year. The annual bycatch rate of birds discarded dead ranged from zero to 0.0486 birds per 1,000 hooks, while live discards ranged from zero to 0.0303 birds per 1,000 hooks.

**Table 3.29 Seabird Bycatch in the U.S. Atlantic Pelagic Longline Fishery, 1992-2005.** Source: NMFS, 2004a; NMFS PLL fishery observer program (POP) data.

| Year | Month [1] | Area | Type of Bird | Number observed | Status |
|---|---|---|---|---|---|
| 1992 | 10 | MAB | GULL | 4 | dead |
| 1992 | 10 | MAB | SHEARWATER GREATER | 2 | dead |
| 1993 | 2 | SAB | GANNET NORTHERN | 2 | alive |
| 1993 | 2 | MAB | GANNET NORTHERN | 2 | alive |
| 1993 | 2 | MAB | GULL BLACK BACKED | 1 | alive |
| 1993 | 2 | MAB | GULL BLACK BACKED | 3 | dead |
| 1993 | 11 | MAB | GULL | 1 | alive |
| 1994 | 6 | MAB | SHEARWATER GREATER | 3 | dead |
| 1994 | 8 | MAB | SHEARWATER GREATER | 1 | dead |
| 1994 | 11 | MAB | GULL | 4 | dead |
| 1994 | 12 | MAB | GULL HERRING | 7 | dead |
| 1995 | 7 | MAB | SEA BIRD | 5 | dead |
| 1995 | 8 | GOM | SEA BIRD | 1 | dead |
| 1995 | 10 | MAB | STORM PETREL | 1 | dead |
| 1995 | 11 | NEC | GANNET NORTHERN | 2 | alive |
| 1995 | 11 | NEC | GULL | 1 | alive |
| 1997 | 6 | SAB | SEA BIRD | 11 | dead |
| 1997 | 7 | MAB | SEA BIRD | 1 | dead |
| 1997 | 7 | NEC | SEA BIRD | 15 | alive |
| 1997 | 7 | NEC | SEA BIRD | 6 | dead |
| 1998 | 2 | MAB | SEA BIRD | 7 | dead |
| 1998 | 7 | NEC | SEA BIRD | 1 | dead |
| 1999 | 6 | SAB | SEA BIRD | 1 | dead |
| 2000 | 6 | SAB | GULL LAUGHING | 1 | alive |
| 2000 | 11 | NEC | GANNET NORTHERN | 1 | dead |
| 2001 | 6 | NEC | SHEARWATER GREATER | 7 | dead |
| 2001 | 7 | NEC | SHEARWATER GREATER | 1 | dead |
| 2002 | 7 | NEC | SEABIRD | 1 | dead |
| 2002 | 8 | NED | SHEARWATER GREATER | 1 | dead |
| 2002 | 8 | NED | SEABIRD | 1 | dead |
| 2002 | 9 | NED | SHEARWATER GREATER | 3 | dead |
| 2002 | 9 | NED | SEABIRD | 3 | alive |
| 2002 | 9 | NED | SHEARWATER SPP | 1 | dead |
| 2002 | 10 | NED | GANNET NORTHERN | 1 | alive |

| Year | Month [1] | Area | Type of Bird | Number observed | Status |
|---|---|---|---|---|---|
| 2002 | 10 | NED | SHEARWATER SPP | 1 | dead |
| 2002 | 10 | NED | SEABIRD | 2 | dead |
| 2002 | 10 | MAB | GULL | 3 | alive |
| 2002 | 10 | MAB | GULL | 1 | dead |
| 2002 | 11 | MAB | GULL | 3 | dead |
| 2003 | 1 | GOM | SEABIRD | 1 | alive |
| 2003 | 8 | NED | SEABIRD | 1 | dead |
| 2003 | 9 | MAB | SEABIRD | 1 | dead |
| 2004 | 1 | MAB | GULL | 5 | dead |
| 2004 | 3 | MAB | GREATER SHEARWATER | 1 | alive |
| 2004 | 3 | MAB | GREATER SHEARWATER | 4 | dead |
| 2004 | 4 | NED | SEABIRD | 1 | dead |
| 2005 | 1 | SAB | HERRING GULL | 1 | dead |
| 2005 | 1 | SAB | SHEARWATER | 1 | dead |
| 2005 | 3 [2] | NEC | GREATER SHEARWATER | 1 | alive |
| 2005 | 3 [2] | NEC | GREATER SHEARWATER | 1 | dead |

[1] Beginning in 2004, reports based on Quarters not month.
[2] Experimental fishery takes.

**Table 3.30 Status of Seabird Bycatch in the U.S. Atlantic Pelagic Longline Fishery, 1992-2005.** Source: NMFS PLL fishery observer program (POP) data.

| Species | Release Status | | Total | Percent Dead |
|---|---|---|---|---|
| | Dead | Alive | | |
| GULLS (incl. Blackback, Herring, Laughing, and unid. gulls) | 28 | 7 | 34 | 80% |
| UNIDENTIFIED SEABIRD | 40 | 19 | 59 | 67.8% |
| GREATER SHEARWATER | 22 | 1 | 23 | 95.6% |
| SHEARWATER SPP | 3 | 0 | 3 | 100% |
| NORTHERN GANNET | 1 | 7 | 8 | 12.5% |
| STORM PETREL | 1 | 0 | 1 | 100% |
| TOTAL ALL SEABIRDS | 95 | 34 | 129 | 73.6% |

**Table 3.31 Preliminary Expanded Estimates of Seabird Bycatch (D = discarded dead and A = discarded alive) and bycatch rates (all seabirds per 1,000 hooks) in the U.S. Atlantic pelagic longline fishery, 1997-2004.** Source: NMFS, 2004a; NMFS PLL fishery observer program (POP) data.

| | 1997 | | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species** | **D** | **A** | **D** | **A** | **D** | **A** | **D** | **A** | **D** | **A** | **D** | **A** | **D** | **A** | **D** | **A** |
| Unid. seabirds | 468 | 292 | 155 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 8 | 13 | 4 | 0 |
| Gulls | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 14 | 83 | 0 | 0 | 48 | 0 |
| Shearwaters | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 210 | 0 | 6 | 0 | 0 | 0 | 59 | 15 |
| Northern gannet | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Storm petrel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | |
| All seabirds | 468 | 292 | 155 | 0 | 14 | 0 | 11 | 18 | 210 | 0 | 23 | 87 | 8 | 13 | 111 | 15 |
| | | | | | | | | | | | | | | | | |
| Total hooks set | 9,637,807 | | 8,019,183 | | 7,901,789 | | 7,975,529 | | 7,563,951 | | 7,150,231 | | 7,008,500 | | 7,186,000 | |
| | | | | | | | | | | | | | | | | |
| Bycatch rate | 0.0486 | 0.0303 | 0.0194 | 0 | 0.0017 | 0 | 0.0014 | 0.0023 | 0.0278 | 0 | 0.0032 | 0.0121 | 0.0011 | 0.0019 | 0.015 | 0.002 |

*Finfish*

In the U.S. pelagic longline fishery, fish are discarded for a variety reasons. Swordfish, yellowfin tuna, and bigeye tuna may be discarded because they are undersized or unmarketable (*e.g.*, shark bitten). Blue sharks, as well as other species, are discarded because of a limited markets (resulting in low prices) and perishability of the product. Large coastal sharks are discarded during times when the shark season is closed. Bluefin tuna may be discarded because target catch requirements for other species have not been met. Also, all billfish are required to be released. In the past, swordfish have been discarded when the swordfish season was closed. Reported catch from 1999 – 2004 for the U.S. pelagic longline fishery (including reported bycatch, incidental catch, and target catch) is summarized in Table 3.24. Additional U.S. landings and discard data are available in the 2005 U.S. National Report to ICCAT (NMFS, 2005).

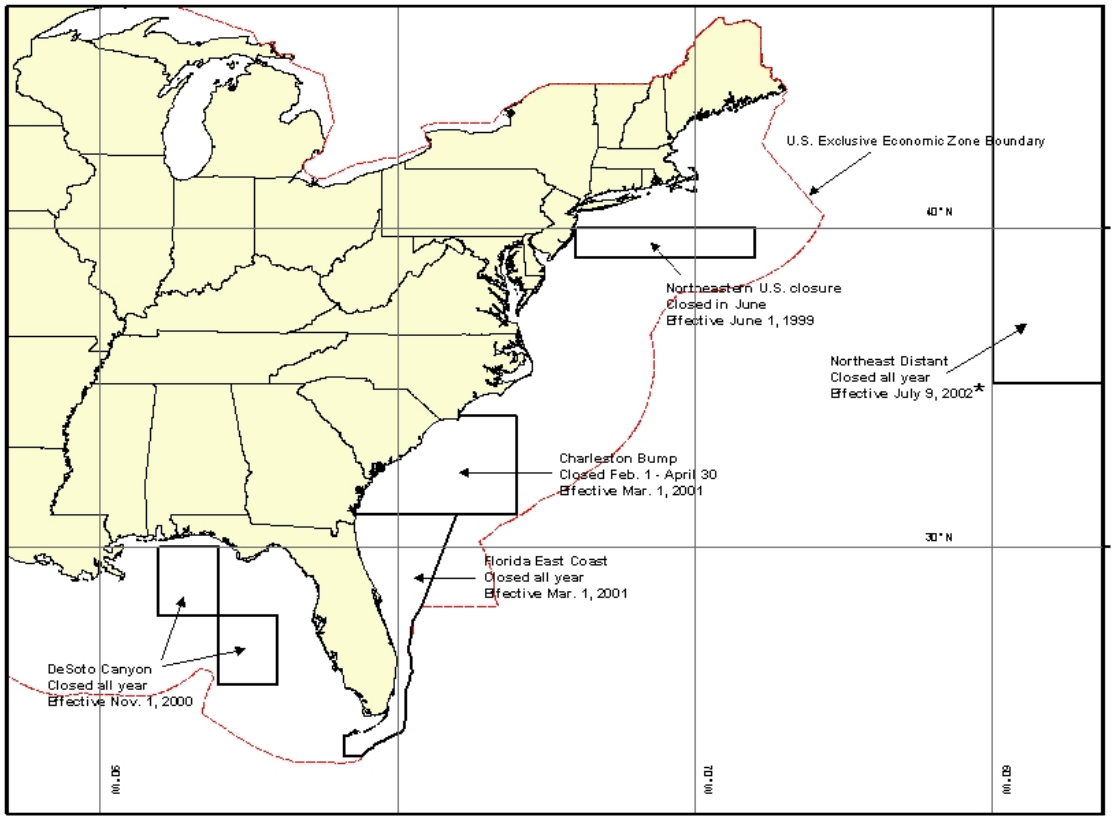
At this time, direct use of observer data with pooling for estimating dead discards in this fishery represents the best scientific information available for use in stock assessments. Direct use of observer data has been employed for a number of years to estimate dead discards in Atlantic and Pacific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

Bycatch mortality of marlins, swordfish, and bluefin tuna from all fishing nations may significantly reduce the ability of these populations to rebuild, and it remains an important management issue. In order to minimize bycatch and bycatch mortality in the domestic pelagic longline fishery, NMFS implemented regulations to close areas to this gear type (Figure 3.28) and has banned the use of live bait by pelagic longline vessels in the Gulf of Mexico.

As part of the bluefin tuna rebuilding program, ICCAT recommends an allowance for dead discards. The U.S. annual dead discard allowance is approximately 68 mt ww. The estimate for the 2004 calendar year was used as a proxy to calculate the amount to be added to, or subtracted from, the U.S. bluefin tuna landings quota for 2005. The 2004 calendar year preliminary estimate of U.S. dead discards, as reported per the longline discards calculated from logbook tallies, adjusted as warranted when observer counts in quarterly/geographic stratum exceeded logbook reports, totaled 72 mt ww. Estimates of dead discards from other gear types and fishing sectors that do not use the pelagic longline vessel logbook are unavailable at this time, and thus, are not included in this calculation. As U.S. fishing activity is estimated to have exceeded the approximate 68 mt ww dead discard allowance by approximately 4.0 mt, the ICCAT recommendation and U.S. regulations state that the United States must account for this excess. Therefore, NMFS shall subtract the amount in excess (approximately 4.0 mt) from the amount of bluefin tuna that can be landed in the subsequent fishing year by those categories accounting for the dead discards.

The 2005 calendar year preliminary dead discard estimate is not yet available. The 2004 calendar year preliminary dead discard estimate, as reported in pelagic longline vessel logbooks and published in 2005 Final Initial Quota Specifications (70 FR 33033, June 7, 2005), totaled 71.8 mt ww. This preliminary estimate has been revised using the longline discards calculated

from logbook tallies, adjusted as warranted when observer counts in stratum exceeded logbook reports. The revised 2004 calendar year dead discard estimate is 72.0 mt ww.




* Closed except to vessels complying with specific conditions (see 50 CFR 635 for details).

**Figure 3.28 Areas Closed to Pelagic Longline Fishing by U.S. Flagged Vessels**

### 3.4.1.3 Safety Issues

Like all offshore fisheries, pelagic longlining can be dangerous. Trips are often long, the work is arduous, and the nature of setting and hauling longline gear may result in injury or death. Like all other HMS fisheries, longline fishermen are exposed to unpredictable weather. NMFS does not wish to exacerbate unsafe conditions through the implementation of regulations. Therefore, NMFS considers safety factors when implementing management measures in the pelagic longline fishery. 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.

### 3.4.1.4 International Issues and Catch

Pelagic longline fisheries for Atlantic HMS primarily target swordfish and tunas. Directed pelagic longline fisheries in the Atlantic have been operated by Spain, the United States, and Canada since the late 1950s or early 1960s. The Japanese pelagic longline tuna fishery started in 1956 and has operated throughout the Atlantic since then (NMFS, 1999). Most of the 35 other ICCAT nations now also operate pelagic longline vessels.

ICCAT generally establishes management recommendations on a species (*e.g.*, swordfish) or issue basis (*e.g.*, data collection) rather than by gear type. For example, ICCAT typically establishes quotas or landing limits by species, not gear type. In terms of data collection, ICCAT may require use of specific collection protocols or specific observer coverage levels in certain fisheries or on vessels of a certain size, but these are usually applicable to all gears, and not specific to any one gear type. However, there are a handful of management recommendations that are specifically applicable to the international pelagic longline fishery. These include, a prohibition on longlining in the Mediterranean Sea in June and July by vessels over 24 meters in length, a prohibition on pelagic longline fishing for bluefin tuna in the Gulf of Mexico, and mandated reductions in Atlantic white and blue marlin landings for pelagic longline and purse seine vessels from specified levels, among others.

Because most ICCAT management recommendations pertain to individual species or issues, as discussed above, it is often difficult to obtain information specific to the international pelagic longline fishery. For example, a discussion of authorized total allowable catches (TAC) for specific species in this section of the document would be of limited utility because it is not possible to identify what percentage of quotas are allocated to pelagic longline. Division of quota, by gear type, is typically done by individual countries.

Nevertheless, ICCAT does report landings by gear type. Available data indicate that longline effort produces the second highest volume of catch and effort, and is the most broadly distributed (longitudinally and latitudinally) of the gears used to target ICCAT managed species (Figure 3.29) (SCRS, 2004). Purse seines produce the highest volume of catch of ICCAT managed species from the Atlantic (SCRS, 2004). From 1999 through 2002 (inclusive) there was a declining trend in estimated international landings of HMS for fisheries in which the United States participated. In 2004, international landings of HMS for fisheries in which the U.S. participated totaled 106,774 mt, which represented a modest decrease from 2003 (SCRS, 2005). Detailed information on international Atlantic pelagic longline catches can be found in

Table 3.33.

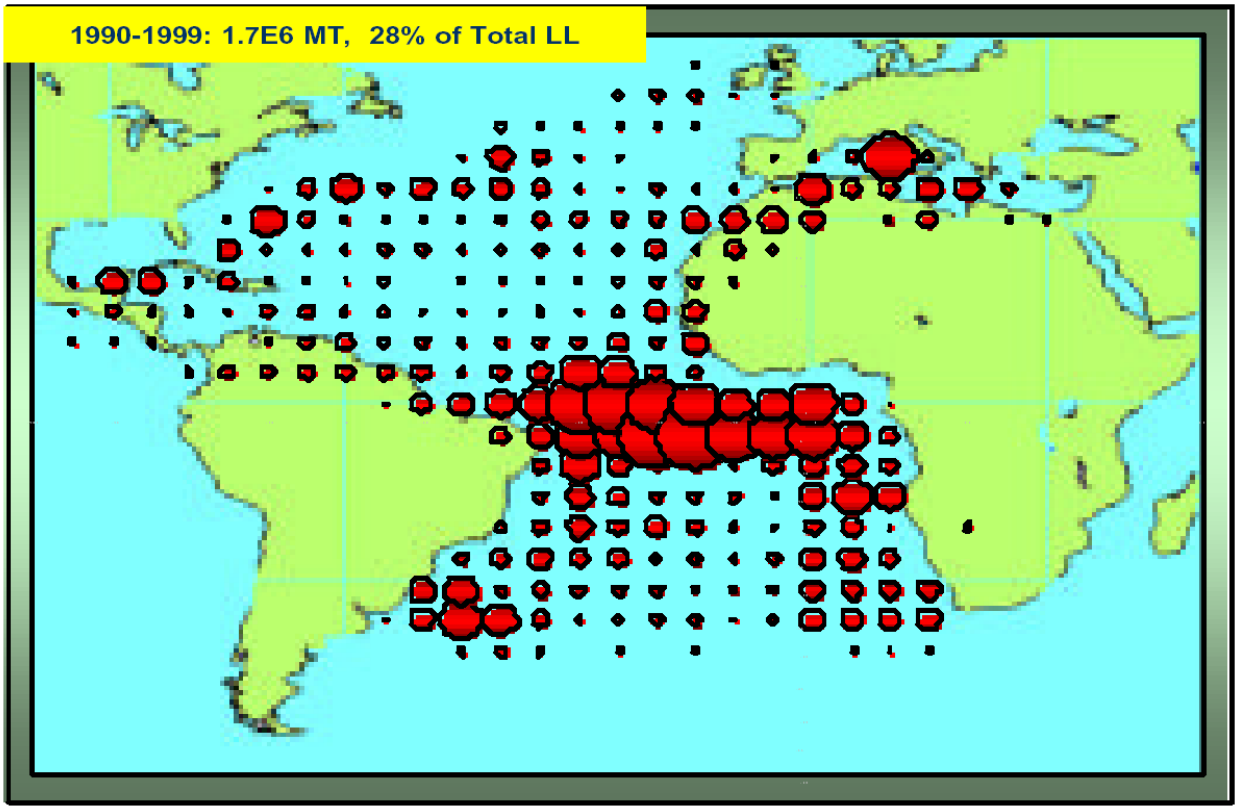



**Figure 3.29 Distribution of Atlantic Longline Catches for all Countries 1990-1999.** Source: SCRS, 2004

Scientific observer data are being collected on a range of pelagic longline fleets in the Atlantic and will be increasingly useful in better quantifying total catch, catch composition, and disposition of catch as these observer programs mature. Previous ICCAT observer coverage requirements of five percent for non-purse seine vessels that participated in the bigeye and yellowfin tuna fishery, including pelagic longline (per ICCAT Recommendation 96-01), are no longer in force. There is currently no ICCAT required minimum level of observer coverage specific to pelagic longline fishing. Nevertheless, the United States has implemented a mandatory observer program in the U.S. pelagic longline fishery. Japan is required to have eight percent observer coverage of its vessels fishing for swordfish in the North Atlantic, which are primarily pelagic longline vessels, however, the recommendation is not specific to vessel or gear type. ICCAT recommendation 04-01, a conservation and management recommendation for the bigeye tuna fishery, entered into force in mid-2005 and requires at least five percent observer coverage of pelagic longline vessels over 24 meters fishing for bigeye.

ICCAT has also developed a running tabulation of the diversity of species caught by the various gears used to target tunas and tuna like species in the Atlantic and Mediterranean (Table 3.32). For all fish species, longline gear shows the highest documented diversity of catch,

followed by gillnets and purse seine. For seabirds, longline gear again shows the highest diversity of catch, while for sea turtles and marine mammals, purse seine and gillnet have a higher documented diversity of species for Atlantic tuna fleets (SCRS, 2004).

**Table 3.32 ICCAT Bycatch Table (LL, longline; GILL, gillnets; PS, purse-seine; BB, baitboat; HARP, harpoon; Trap, traps).** Source: SCRS, 2004.

ICCAT Bycatch Table (www.iccat.es)

| Count | Group | LL | GILL | PS | BB | HARP | TRAP | OTHER |
|---|---|---|---|---|---|---|---|---|
| 214 | *All Groups* | **149** | **110** | **78** | **12** | **33** | **20** | **43** |
| | | 69.6% | 51.4% | 36.4% | 5.6% | 15.4% | 9.3% | 20.1% |
| 12 | *Skates and Rays* | **10** | **6** | **6** | **0** | **2** | **0** | **1** |
| | | 83.3% | 50.0% | 50.0% | 0.0% | 16.7% | 0.0% | 8.3% |
| 46 | *Coastal Sharks* | **45** | **19** | **6** | **1** | **7** | **2** | **9** |
| | | 97.8% | 41.3% | 13.0% | 2.2% | 15.2% | 4.3% | 19.6% |
| 11 | *Pelagic Sharks* | **10** | **7** | **5** | **0** | **5** | **2** | **4** |
| | | 90.9% | 63.6% | 45.5% | 0.0% | 45.5% | 18.2% | 36.4% |
| 23 | *Teleosts (ICCAT Species)* | **23** | **18** | **16** | **9** | **6** | **7** | **11** |
| | | 100.0% | 78.3% | 69.6% | 39.1% | 26.1% | 30.4% | 47.8% |
| 82 | *Teleosts (excluding Scombridae and billfishes)* | **44** | **37** | **25** | **2** | **5** | **4** | **17** |
| | | 53.7% | 45.1% | 30.5% | 2.4% | 6.1% | 4.9% | 20.7% |
| 5 | *Sea Turtles* | **3** | **4** | **5** | **0** | **2** | **1** | **1** |
| | | 60.0% | 80.0% | 100.0% | 0.0% | 40.0% | 20.0% | 20.0% |
| 9 | *Sea Birds* | **8** | **2** | **0** | **0** | **0** | **0** | **0** |
| | | 88.9% | 22.2% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 26 | *Marine Mammals* | **6** | **17** | **15** | **0** | **6** | **4** | **0** |
| | | 23.1% | 65.4% | 57.7% | 0.0% | 23.1% | 15.4% | 0.0% |

*U.S. Pelagic Longline Catch in Relation to International Catch*

Highly Migratory Species

The U.S. pelagic longline fleet represents a small fraction of the international pelagic longline fleet that competes on the high seas for catches of tunas and swordfish. In recent years, the proportion of U.S. pelagic longline landings of HMS, for the fisheries in which the United States participates, has remained relatively stable in proportion to international landings (Table 3.33). The U.S. fleet accounts for less than 0.5 percent of the landings of swordfish and tuna from the Atlantic Ocean south of 5°N. latitude, and does not operate at all in the Mediterranean Sea. Tuna and swordfish landings by foreign fleets operating in the tropical Atlantic and Mediterranean are greater than the catches from the north Atlantic area where the U.S. fleet operates. Even within the area where the U.S. fleet operates, the U.S. portion of fishing effort (in numbers of hooks fished) is less than 10 percent of the entire international fleet's effort, and likely less than that due to differences in reporting effort between ICCAT countries (NMFS, 2001).

**Table 3.33 Estimated International Longline Landings of HMS, Other than Sharks, for All Countries in the Atlantic: 1999-2004 (mt ww)[1].** Source: SCRS, 2005.

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Swordfish (N. Atl + S. Atl) | 25,268 | 25,091 | 22,702 | 22,278 | 21,746 | 23,872 |
| Yellowfin Tuna (W. Atl)[2] | 11,596 | 11,638 | 12,740 | 11,605 | 9,996 | 15,008 |
| Bigeye Tuna | 76,527 | 71,194 | 55,265 | 46,584 | 51,065 | 43,620 |
| Bluefin Tuna (W. Atl.)[2] | 914 | 859 | 610 | 727 | 228 | 542 |
| Albacore Tuna (N. Atl + S. Atl) | 27,209 | 28,896 | 29,722 | 27,798 | 27,893 | 20,940 |
| Skipjack Tuna (W. Atl)[2] | 58 | 23 | 60 | 143 | 95 | 231 |
| Blue Marlin (N. Atl. + S. Atl.)[3] | 2,359 | 2,209 | 1,638 | 1,331 | 1,690 | 1,376 |
| White Marlin (N. Atl. + S. Atl.)[3] | 981 | 893 | 592 | 725 | 582 | 528 |
| Sailfish (W. Atl.)[4] | 524 | 815 | 812 | 1,271 | 860 | 657 |
| **Total** | **145,436** | **141,618** | **124,141** | **112,462** | **114,155** | **106,774** |
| U.S. Longline Landings (from 2003, 2004, and 2005 U.S. Natl. Reports)[5] | **8,331.1** | **7,253.5** | **5,694.9** | **6,193.7** | **5,442.3** | **5649.1** |
| U.S. Longline Landings as a Percent of Total Longline Landings | **5.7** | **5.1** | **4.6** | **5.5** | **4.8** | **5.3** |

[1]Landings include those classified by the SCRS as longline landings for all areas
[2]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 or the E. Atl skipjack tuna fishery since 1982.
[3]Includes U.S. *dead discards and Brazilian live discards.*
[4]Includes U.S. *dead discards.*
[5]Includes swordfish, blue marlin, white marlin, and sailfish longline discards.

### *Atlantic Sharks*

There is currently 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. The most recent landings reports for blue and shortfin mako sharks are presented in Table 3.34 and Table 3.35, respectively. In 2001, ICCAT passed a resolution on Atlantic sharks to determine needed improvements in data collection for Atlantic shortfin mako and blue sharks, and to conduct an interim meeting in 2003 to discuss the issue. In addition, the resolution called upon contracting parties and non-contracting parties to: (1) submit catch and effort data on Atlantic shortfin mako, porbeagle, and blue sharks; (2) encourage the release of live sharks that are caught incidentally; (3) minimize waste and discards from shark catches; and (4) voluntarily agree not to increase fishing effort targeting Atlantic porbeagle, shortfin mako and blue sharks until sustainable levels of harvest can be determined through stock assessments.

At its annual meeting in New Orleans in 2004, ICCAT adopted a recommendation to, among other things, ban shark finning, require vessels to fully utilize their entire catches of sharks, encourage the release of live sharks that are caught incidentally and are not used for food, and review the assessment of shortfin mako sharks in 2005, and reassess blue sharks and shortfin mako no later than 2007. The ICCAT recommendation also encouraged countries to engage in research to identify shark nursery areas, and collect data on shark catches.

**Table 3.34 Nominal Catches of Blue Shark Reported to ICCAT (landings and discards in t) by Major Gear and Flag between 1990 and 2002.** Source: SCRS, 2004; SCRS, 2005.

| | | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Atlantic Total* | | 2,348 | 3,533 | 2,343 | 7,879 | 8,310 | 8,422 | 9,036 | 36,895 | 33,211 | 34,208 | 33,462 | 34,301 | 31,357 |
| LANDINGS | longline | 1,387 | 2,265 | 1,667 | 5,749 | 7,366 | 7,501 | 7,767 | 36,279 | 32,578 | 33,790 | 32,616 | 33,415 | 31,146 |
| | others | 220 | 496 | 491 | 994 | 372 | 300 | 558 | 431 | 422 | 309 | 709 | 780 | 143 |
| DISCARDS | longline | 741 | 772 | 184 | 1136 | 572 | 618 | 609 | 185 | 189 | 105 | 137 | 105 | 68 |
| | others | 0 | 0 | 0 | 0 | 0 | 3 | 102 | 0 | 22 | 4 | 0 | 0 | 0 |
| LANDINGS | BENIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 4 | 27 | 0 | 0 | 0 |
| | BRASIL | 0 | 0 | 0 | 0 | 0 | 0 | 743 | 1103 | 0 | 179 | 1689 | 2173 | 1971 |
| | CANADA | 0 | 0 | 0 | 0 | 0 | 276 | 12 | 11 | 5 | 54 | 18 | 0 | 5 |
| | CAP-VERT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | CHINA.PR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 750 | 420 |
| | EC-CYPRUS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 |
| | EC-DENMARK | 2 | 1 | 1 | 0 | 1 | 2 | 3 | 1 | 1 | 0 | 2 | 1 | 13 |
| | EC-ESPANA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29,917 | 28,137 | 29,005 | 26,046 | 25,110 | 21,037 |
| | EC-FRANCE | 130 | 187 | 276 | 322 | 350 | 266 | 278 | 213 | 163 | 0 | 395 | 207 | 109 |
| | EC-IRELAND | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66 | 9 | 66 | 11 |
| | EC-PORTUGAL | 1,387 | 2,257 | 1,583 | 5,726 | 4,669 | 5,569 | 5,710 | 3,966 | 3,318 | 3,337 | 4,220 | 4,713 | 4,602 |
| | EC-U.K | 1 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 1 | 0 | 12 | 9 | 6 |
| | JAPAN | 0 | 0 | 0 | 0 | 2,596 | 1,589 | 1,044 | 996 | 850 | 893 | 492 | 518 | 675 |
| | MEXICO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| | NAMIBIA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2213 |
| | PANAMA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 177 | 22 | 0 | 0 |
| | SENEGAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 456 | 0 |
| | SOUTHAFRICA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 21 | 0 | 83 | 63 |
| | TRINIDAD&TOBAG | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| | U.S.A | 87 | 308 | 215 | 680 | 29 | 23 | 283 | 211 | 255 | 217 | 291 | 42 | 0 |
| | UK-BERMUDA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| | URUGUAY | 0 | 8 | 84 | 15 | 93 | 64 | 252 | 286 | 242 | 126 | 119 | 59 | 159 |
| DISCARDS | CANADA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 |
| | U.S.A | 741 | 772 | 184 | 1,136 | 572 | 618 | 710 | 185 | 195 | 101 | 137 | 106 | 68 |
| | UK-BERMUDA | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 8 | 0 | 0 | 0 |

**Table 3.35 Nominal Catches of Shortfin Mako Shark Reported to ICCAT (landings and discards in t) by Major Gear and Flag between 1990 and 2002.** Source: SCRS, 2004; SCRS, 2005.

| | | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Atlantic Total* | | *486* | *538* | *511* | *1,824* | *1,352* | *2,646* | *1,680* | *5,300* | *4,105* | *3,731* | *4,366* | *4,522* | *4,792* |
| LANDINGS | longline | 218 | 328 | 235 | 1,137 | 1,017 | 1,177 | 1,421 | 5,125 | 3,941 | 3,630 | 4,044 | 4,278 | 4,527 |
| | others | 268 | 210 | 250 | 667 | 317 | 1440 | 259 | 175 | 165 | 100 | 322 | 244 | 266 |
| DISCARDS | longline | 0 | 0 | 26 | 20 | 18 | 29 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| LANDINGS | BRASIL | 0 | 0 | 0 | 0 | 0 | 0 | 83 | 190 | 0 | 27 | 219 | 409 | 226 |
| | CANADA | 0 | 0 | 0 | 0 | 0 | 111 | 67 | 110 | 69 | 70 | 78 | 69 | 78 |
| | CHINA.PR | 0 | 0 | 0 | 34 | 45 | 23 | 27 | 19 | 74 | 126 | 306 | 22 | 208 |
| | COTE D'IVOIRE | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 10 | 9 | 15 | 0 |
| | EC-ESPANA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,777 | 3,347 | 2,895 | 2,679 | 2,921 | 2,859 |
| | EC-PORTUGAL | 193 | 314 | 220 | 796 | 649 | 749 | 785 | 519 | 425 | 446 | 706 | 523 | 471 |
| | EC-U.K | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 2 | 1 |
| | JAPAN | 0 | 0 | 0 | 0 | 0 | 0 | 213 | 248 | 0 | 0 | 0 | 0 | 0 |
| | MEXICO | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 16 | 0 |
| | NAMIBIA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 459 |
| | PANAMA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 1 | 0 | 0 |
| | SOUTH AFRICA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 13 | 0 | 79 | 19 |
| | ST.VINCENT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| | TRINIDAD&TOBAGO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | U.S.A | 268 | 210 | 250 | 945 | 628 | 1703 | 465 | 408 | 148 | 69 | 292 | 395 | 413 |
| | UK-BERMUDA | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |
| | URUGUAY | 25 | 14 | 15 | 29 | 12 | 21 | 24 | 28 | 21 | 43 | 63 | 70 | 58 |
| DISCARDS | MEXICO | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | U.S.A | 0 | 0 | 26 | 20 | 18 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | UK-BERMUDA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |

Sea Turtles

From 1999 to 2003, the U.S. pelagic longline fleet targeting HMS captured an average of 772 loggerhead and 1,013 leatherback sea turtles per year, based on observed takes and total reported effort. In 2004, the U.S. pelagic longline fleet was estimated to have captured 734 loggerhead and 1,359 leatherback sea turtles (Garrison, 2005). In 2005, the U.S. pelagic longline fishery was estimated to have interacted with 274 loggerhead and 351 leatherback sea turtles outside of experimental fishing operations (Walsh and Garrison, 2006). Since other ICCAT nations do not monitor incidental catches of sea turtles, an exact assessment of their impact is not possible. However, high absolute numbers of sea turtle catches in the foreign fleets have been reported from other sources (NMFS, 2001). Throughout the Atlantic basin, including the Mediterranean Sea, a total of 210,000 – 280,000 loggerhead and 30,250 – 70,000 leatherback sea turtles are estimated to be captured by pelagic longline fisheries each year (Lewiston *et al*., 2004).

Mortality in the domestic and foreign pelagic longline fisheries is just one of numerous factors affecting sea turtle populations in the Atlantic (National Research Council, 1990). Many sources of anthropogenic mortality are outside of U.S. jurisdiction and control. If the U.S. swordfish quota was relinquished to other fishing nations, the effort now expended by the U.S. fleet would likely be replaced by foreign effort. This could significantly alter the U.S. position at ICCAT and make the implementation of international conservation efforts more difficult. This would also eliminate the option of gear or other experimentation with the U.S. longline fleet, thus making it difficult to find take reduction solutions which could be transferred to other longlining nations to effect a greater global reduction in sea turtle takes in pelagic longline fisheries. The United States has, and will continue to make efforts at ICCAT, Inter-American Tropical Tuna Commission (IATTC), and other international forums, to encourage adoption of sea turtle conservation measures by international fishing fleets.

The first international agreement devoted solely to the protection of sea turtles – the Inter-American Convention for the Protection and Conservation of Sea Turtles – was concluded on September 5, 1996, in Salvador, Brazil, and entered into force in May 2001. The Inter-American Convention called for the Parties to establish national sea turtle conservation programs. In addition to domestic rulemaking in various fisheries, NMFS has been active at the international level in promoting sea turtle conservation efforts. A summery of some of these efforts is provided below.

In February 2003, the United States supported a workshop consisting of technical experts on sea turtle biology and longline fishery operations from interested nations in order to share information and discuss possible solutions to reduce incidental capture of marine turtles in these fisheries. The United States introduced the NED sea turtle bycatch mitigation research at the November 2003, ICCAT meeting in Dublin, Ireland, and co-sponsored ICCAT Resolution 03-11 which encouraged other nations to improve data collection and reporting on sea turtle bycatch and promote the safe handling and release of incidentally captured sea turtles. A poster and video describing the NED research experiment and preliminary results were displayed, as well as many of the experimentally tested release gears.

In January 2004, the Northeast Distant Waters Longline Research ad hoc advisory group met in Miami, Florida. The purpose of this meeting was to present a summary of the 2001 and 2002 NED pelagic longline sea turtle bycatch mitigation research and the preliminary results for the 2003 research, and to discuss future research needs. Also in January 2004, the IATTC - CIAT Bycatch Working Group met in Kobe, Japan. The purpose of U.S. attendance at this meeting was to present results of sea turtle mitigation research by the U.S, to hear research results on bycatch mitigation from other countries, to encourage IATTC countries to evaluate or adopt sea turtle mitigation technology in their fisheries, and to address other bycatch issues in longline fisheries. A Workshop was held in conjunction with the Sea Turtle Symposium in San Jose, Costa Rica in February 2004. The focus of this workshop was on providing information on the safe release of sea turtles to participants from nations with longline fleets. In June 2004, NMFS SEFSC staff conducted longline mitigation training and workshops in Peru, in cooperation with the IATTC. In August 2004, a workshop was held in Panama on conducting circle hook experiments similar to those undertaken in Ecuador (see description below) and on the use of dehooking devices and safe handling and release techniques. Also in August 2004, a workshop was held in Guatemala on conducting circle hook experiments similar to Ecuador and on the use of dehooking devices, safe handling and release techniques. In October 2004, Southwest Fisheries Science Center (SWFSC) staff followed up on a training workshop held in 2003 in cooperation with the Instituo del Mar del Peru (IMARPE) for fisheries observers, by working with Peruvian researchers to initiate circle hook implementation and experiments in the artisanal dolphin and shark fisheries.

At the Annual ICCAT meeting in New Orleans in November 2004, NMFS staff conducted a workshop discussing experimental results and the use of circle hooks, the use of dehooking devices, and safe handling and release techniques. Also in November, a workshop was conducted at the meeting of the Gulf and Caribbean Fisheries Institute in Saint Petersburg, Florida.

In collaboration with the World Wildlife Fund (WWF), IATTC, and the Western Pacific Regional Fishery Management Council (WPRFMC), NMFS provided hooks, dehooking devices, and technical assistance to Ecuador for the testing of non-offset 14/0 and 15/0 circle hooks in the dolphin fishery and 10 degree offset 16/0 and 18/0 circle hooks in the tuna/shark fisheries. Work began in March 2004 and initial results indicate that the majority of the bycatch is entangled, not hooked. Pacific Islands Fisheries Science Center (PIFSC) staff has been consulting with WPRFMC, Blue Ocean Institute, and Japan on a cooperative research design to test the efficiency of circle hooks in the Japanese tuna fishery. A draft research plan was reviewed in May 2004, and a meeting to refine the draft was held in Honolulu in Sept 2004. In June 2004, NMFS staff gave a presentation promoting cooperative research and the use of circle hooks at a Symposium on Bycatch Reduction hosted by the National Fisheries Research and Development Institute (NFRDI) in Korea.

The first Technical Assistance Workshop on Sea Turtle Bycatch Reduction Experiments in Longline Fisheries was held in April 2005, in Honolulu. This workshop was held to provide technical assistance for participants from the FAO Technical Consultation to design programs for the development and testing of turtle bycatch reducing technology appropriate to the longline fisheries of participating nations. The Third International Fishers Forum was held in Yokahama,

Japan in July 2005, and United States' and regional research results on sea turtle bycatch avoidance methods were presented. In 2005, the United States assisted in designing experiments to evaluate sea turtle mitigation techniques and provided technical assistance for the following countries: Australia; Brazil; Costa Rica; Ecuador; Iceland; Italy; Japan; Korea; Taiwan; Mexico; Peru; Philippines; Spain; Uraquay; and, Vietnam.

### 3.4.2 Purse Seine

#### 3.4.2.1 Domestic History and Current Management

Purse seine gear consists of a floated and weighted encircling net that is closed by means of a drawstring; know as a purseline, threaded through rings attached to the bottom of the net. The efficiency of this gear can be enhanced by the assistance of spotter planes used to locate schools of tuna. Once a school is spotted, the vessel, with the aid of a smaller skiff, intercepts and uses the large net to encircle it. Once encircled, the purseline is pulled, closing the bottom of the net and preventing escape. The net is hauled back onboard using a powerblock, and the tunas are removed and placed onboard the larger vessel. Economic and social aspects of the fisheries are described in Sections 3.5 and Chapter 9.0 of this document, respectively.

Vessels using purse seine nets have participated in the U.S. Atlantic tuna fishery continuously since the 1950s; although a number of purse seine vessels did target and land BFT off the coast of Gloucester, MA as early as the 1930s. In 1958, continued commercial purse seining effort for Atlantic tunas began with a single vessel in Cape Cod Bay and expanded rapidly into the region between Cape Hatteras and Cape Cod during the early 1960s. The purse seine fishery between Cape Hatteras and Cape Cod was directed mainly at small and medium BFT, YFT, and at skipjack tuna, primarily for the canning industry. North of Cape Cod, purse seining was directed at giant BFT. High catches of juvenile BFT were sustained throughout the 1960s and into the early 1970s. These high catch rates by U.S. purse seine vessels are believed to have played a role in the decline in abundance during subsequent years. Currently these purse seine vessels focus their effort on giant BFT, versus other tunas, due to the international market that developed for giant BFT in the late 1970s. These fresh caught BFT are primarily flown directly to Japan for processing into sushi or sashimi. By the late 1980s, high ex-vessel prices and the increased importance of the Japanese market had increased effort on all size classes of BFT. In 1992, NMFS responded by banning the sale of school, large school, and small medium BFT (27 inches to less than 73 inches curved fork length).

A limited entry system with non-transferable individual vessel quotas (IVQs) for purse seining was established in 1982, effectively excluding any new entrants into this category. Equal baseline quotas of BFT 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 Atlantic tuna purse seine fleet and in 1996 the quotas were made transferable among the five vessels.

Vessels that are participating in the Atlantic tunas purse seine fishery are required to target the larger size class BFT, more specifically the giant sized class (81 inches or larger) and are granted a tolerance limit of 15 percent by weight, of the total amount of giant BFT landed during a season. These vessels may commence fishing starting on July 15 of each year and may

continue through December 31, provided the vessel has not fully attained its IVQ. Over the last few years, the Purse seine category has not fully harvested its allocated quota. This can be attributed to a number of different reasons outside of the industry's or NMFS' control, such as lack of availability or schools being comprised of mixed size classes. NMFS has issued several EFPs to this sector of the fishery and will continue to assess current regulations and their impact on providing reasonable opportunities to harvest available quota.

#### 3.4.2.2 Recent Catch and Landings

Table 3.36 shows purse seine landings of Atlantic tunas from 1999 through 2004. Purse seine landings typically make up approximately 20 percent of the total annual U.S. landings of BFT (about 25 percent of total commercial landings), but account for only a small percentage, if any, of the landings of other HMS. In the 1980s and early 1990s, purse seine landings of YFT were often over several hundred metric tons. Over 4,000 mt ww of YFT were recorded landed in 1985. In recent years, via informal agreements with other sectors of the tuna industry, the purse seine fleet has opted not to direct any effort on HMS other than BFT.

**Table 3.36 Domestic Atlantic Tuna Landings for the Purse Seine Fishery: 1999-2004 (mt ww). Northwest Atlantic Fishing Area. Source**: U.S. National Report to ICCAT: 2005.

| Species | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Bluefin Tuna | 247.9 | 275.2 | 195.9 | 207.7 | 265.4 | 31.8 |
| Yellowfin Tuna | 0 | 0 | 0 | 0 | 0 | 0 |
| Skipjack Tuna | 0 | 0 | 0 | 0 | 0 | 0 |

#### 3.4.2.3 Safety Issues

Accidents that can occur on purse seine vessels include general injuries caused by handling fish (e.g., poisoning from being stuck by fin spines), as well as accidents related to the vessels fishing operations themselves, such as, deploying the skiff or using cables and winches to move giant BFT from the net to the hold.

#### 3.4.2.4 International Issues and Catch

The U.S. purse seine fleet has historically accounted for a small percentage of the total International Atlantic tuna landings. Over the past six years, the U.S. purse seine fishery has contributed to less than 0.15 percent of the total purse seine landings reported to ICCAT.

**Table 3.37 Estimated International Purse Seine Atlantic Tuna Landings in the Atlantic and Mediterranean: 1999-2004 (mt ww).** Source: SCRS, 2005

| Species | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| **Bluefin Tuna** | 15,884 | 17,616 | 17,520 | 18,548 | 15,525 | 122,309 |
| **Yellowfin Tuna** | 83,445 | 80,253 | 102,641 | 95,613 | 80,111 | 61,849 |
| **Skipjack Tuna** | 95,367 | 80,762 | 77,995 | 70,714 | 92,770 | 89,317 |
| **Bigeye Tuna** | 20,923 | 17,909 | 22,060 | 16,192 | 22,237 | 13,388 |
| **Albacore** | 238 | 244 | 288 | 158 | 998 | 674 |
| **Total** | **215,857** | **196,784** | **220,504** | **201,225** | **211,641** | **177,537** |
| **U.S. Total** | **248** | **275** | **196** | **208** | **265** | **32** |
| **U.S. Percentage** | **0.12%** | **0.14%** | **0.09%** | **0.10%** | **0.13%** | **0.02%** |

Since the 1999 ICCAT meeting, ICCAT has continued to implement a Fish Aggregation Device (FAD) closed area in the Gulf of Guinea. The closure (which became mandatory in mid-1999) was in response to concern over catches of juvenile and undersize tunas by non-U.S. internationally flagged purse seiners relying on FADs. The full evaluation of this program is somewhat hindered by the multi-species nature of surface fisheries and the existence of other types of fisheries. The updated analysis indicated that this regulation appeared effective at reducing mortality for juvenile bigeye. Full compliance with this regulation by all surface fisheries will greatly increase the effectiveness of this regulation.

### 3.4.3 Commercial Handgear

#### 3.4.3.1 Domestic History and Current Management

Commercial handgears, including handline, harpoon, rod and reel, and bandit gear are often used to fish for Atlantic HMS by fishermen on private vessels, charter vessels, and headboat vessels. Rod and reel gear may be deployed from a vessel that is at anchor, drifting, or underway (*i.e.*, trolling). In general, trolling consists of dragging baits or lures through, on top of, or even above the water's surface. While trolling, vessels often use outriggers, kites, or green-sticks to assist in spreading out or elevating baits or lures and to prevent fishing lines from tangling. For more information on green-stick fishing gear, and the configurations allowed under current regulations, please refer to the discussions of alternative H4 in Chapters 2 and 4 of this document. Operations, frequency and duration of trips, and distance ventured offshore vary widely. Most of the vessels are greater than seven meters in length and are privately owned by individual fishermen.

The handgear fisheries are typically most active during the summer and fall, although in the South Atlantic and Gulf of Mexico fishing occurs during the winter months. Fishing usually takes place between eight and 200 km from shore and for those vessels using bait, the baitfish typically includes herring, mackerel, whiting, mullet, menhaden, ballyhoo, butterfish, and squid. The commercial handgear fishery for BFT occurs mainly in New England, and more recently off

the coast of southern Atlantic states, such as Virginia, North Carolina and South Carolina, with vessels targeting large medium and giant BFT. The majority of U.S. commercial handgear fishing activities for bigeye, albacore, yellowfin, and skipjack tunas take place in the northwest Atlantic. Beyond these general patterns, the availability of Atlantic tunas at a specific location and time is highly dependent on environmental variables that fluctuate from year to year.

Currently the U.S. Atlantic tuna commercial handgear fisheries are managed through an open access vessel permit program. Vessels that wish to sell their Atlantic tunas must obtain a commercial handgear permit in one of the following categories: General (rod and reel, harpoon, handline, bandit gear), Harpoon (harpoon only), or Charter/Headboat (rod and reel and handline). These vessels may also need permits from the states they operate out of in order to land and sell their catch. All commercial permit holders are encouraged to check with their local state fish/natural resource management office regarding these requirements. Permitted vessels are also required to sell their Atlantic tunas to federally permitted Atlantic tuna dealers. As the Atlantic tunas dealer permits are issued by the Northeast Region Permit Office, vessel owner/operators are encouraged to contact the permitting office directly, either by phone at (978) 281-9438 or via the web at http://www.nero.noaa.gov/ro/doc/vesdata1.htm, to obtain a list of permitted dealers in their area.

Vessels that are permitted in the General and Charter/Headboat categories commercially fish under the General category rules and regulations. For instance, regarding BFT, vessels that possess either of the two permits mentioned above have the ability to retain a daily bag limit of zero to three BFT, measuring 73 inches or greater curved fork length per vessel per day while the General category BFT fishery is open. The General category BFT fishery opens on June 1 of each year and remains open until January 31 of the subsequent year, or until the quota is filled. Vessel owner/operators should check with the agency via websites (www.hmspermits.gov) or telephone information lines (1-888-872-8862) to verify the BFT retention limit on any given day. The General category BFT quota is approximately 47 percent of the U.S. quota and equates to a base line allocation of approximately 690 mt.

Vessels that are permitted in the Harpoon category fish under the Harpoon category rules and regulations. For instance, regarding BFT, vessels have the ability to keep two bluefin measuring 73 inches to less than 81 inches curved fork length per vessel trip per day while the fishery is open. There is no limit on the number of BFT that measure longer than 81 inches curved fork length, as long as the Harpoon category season is open. The Harpoon category season also opens on June 1 of each year and remains open until November 15, or until the quota is filled. The Harpoon category BFT quota is approximately 3.9 percent of the U.S. quota and equates to a base line allocation of approximately 57 mt.

U.S. commercial swordfish fishing in the Atlantic Ocean is reported to have begun in the early 1800s as a harpoon fishery off the coast of New England. This fishery traditionally consisted of harpoon vessels operating out of Rhode Island and Massachusetts where they took extended trips for swordfish north and east of the Hudson Canyon and particularly off Georges Bank, and could land as many as 20 to 25 large swordfish over a ten-day period. These fish primarily consisted of large fish that finned on the surface and were available to the harpoon gear, some weighing as much as 600 lbs dw, but averaging about 225 to 300 lbs dw at the turn of the

century. Because of the limited effort directed towards large fish, the stock was sufficient to support a sustainable seasonal swordfish fishery for more than 150 years. Most swordfish caught in the United States in the early 1900s were harvested with harpoons; harpoon landings declined from the 1940s through the 1960s. Due to a decreased availability of the large swordfish in the northeast this fishery has essentially ceased to exist. However, a recently emerging swordfish handgear fishery, both commercial and recreational, has appeared to develop off the east coast of Florida. This fishery is essentially prosecuted at night with rod and reel or handline gear. Some vessels participating in this fishery are currently utilizing individual handlines attached to free-floating buoys. This fishery has been operating under the current regulations, which require that handlines be restricted to no more than two hooks and be released and retrieved by hand. The current regulations do not limit the number of individual handlines/buoys that may be possessed or deployed.

Currently the U.S. commercial swordfish fishery is managed through limited access vessel permits. Vessels that possess a limited access handgear permit must abide by the minimum size limits for swordfish (*i.e.,* 29 inches form cleithrum to caudal keel; 47 inches lower jaw fork length; or 33 lbs dressed weight) and seasonal retention limits. When the directed swordfish fishery is open, permitted handgear vessel do not have a possession limit. However, during a directed fishery closure, permitted handgear vessels may land two swordfish per trip, provided these two fish were not taken with harpoon gear. Fishermen with a commercial handgear swordfish permit are required to report fishing activities in an approved logbook within 48 hours of each day's fishing activities for multi-day trips, or before offloading for one-day trips, and submit the logbook within seven days of offloading.

The shark commercial handgear fishery plays a very minor role in contributing to the overall shark landing statistics. For further information regarding the shark fishery refer to Section 3.4.5. Economic and social aspects of all the domestic handgear fisheries are described later in this document (Section 3.5 and Chapter 9.0 respectively).

#### 3.4.3.2 Recent Catch and Landings

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 3.38.

In 2004, BFT commercial handgear landings accounted for approximately 42 percent of the total U.S. BFT landings, and almost 75 percent of commercial BFT landings.

Also in 2004, four percent of the total yellowfin catch, or nine percent of the commercial yellowfin catch, was attributable to commercial handgear. Commercial handgear landings of skipjack tuna accounted for approximately ten percent of total skipjack landings, or about 30 percent of commercial skipjack landings. For albacore, commercial handgear landings accounted for approximately one percent of total albacore landings, or about six percent of commercial albacore landings. Commercial handgear landings of bigeye tuna accounted for approximately one percent of total bigeye landings and one percent of total commercial bigeye landings.

Updated tables of landings for the commercial handgear fisheries by gear and by area for 1999 – 2004 are presented in the following tables.

**Table 3.38 Domestic Landings for the Commercial Handgear Fishery, by Species and Gear, for 1999-2004 (mt ww).** Source: U.S. National Report to ICCAT: 2005

| Species | Gear | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|
| Bluefin Tuna | Rod and Reel | 643.6 | 590.9 | 889.7 | 878.5 | 529.2 | 331.4 |
| | Handline | 15.5 | 3.2 | 9.0 | 4.5 | 2.6 | 1.3 |
| | Harpoon | 115.8 | 184.2 | 102.1 | 55.6 | 75.5 | 41.2 |
| | **TOTAL** | **774.9** | **778.3** | **1,000.8** | **938.6** | **607.3** | **373.9** |
| Bigeye Tuna | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 12.3 | 5.7 | 33.7 | 14.4 | 6.3 | 3.1 |
| | **TOTAL** | **12.3** | **5.7** | **33.7** | **14.4** | **6.3** | **3.1** |
| Albacore Tuna | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 4.4 | 7.9 | 3.9 | 6.6 | 3.4 | 5.6 |
| | **TOTAL** | **4.4** | **7.9** | **3.9** | **6.6** | **3.4** | **5.6** |
| Yellowfin Tuna | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 220.0 | 284.0 | 300.0 | 244.0 | 216.0 | 234.0 |
| | **TOTAL** | **220.0** | **284.0** | **300.0** | **244.0** | **216.0** | **234.0** |
| Skipjack Tuna | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 6.4 | 9.7 | 10.5 | 12.7 | 9.4 | 10.4 |
| | **TOTAL** | **6.4** | **9.7** | **10.5** | **12.7** | **9.4** | **10.4** |
| Swordfish | Handline | 5.0 | 8.9 | 8.9 | 11.7 | 20.6 | 20.0 |
| | Harpoon | 0.0 | 0.6 | 7.4 | 2.8 | 0.0 | 0.5 |
| | **TOTAL** | **5.0** | **9.5** | **16.3** | **14.5** | **20.6** | **20.5** |

**Table 3.39 Domestic Landings for the Commercial Handgear Fishery by Species and Region for 1999-2004 (mt ww).** Source: U.S. National Report to ICCAT: 2005

| Species | Region | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|
| Bluefin Tuna | NW Atl | 774.4 | 778.3 | 1,000.8 | 938.3 | 607.3 | 373.9 |
| Bigeye Tuna | NW Atl | 11.9 | 4.1 | 33.2 | 13.8 | 6.0 | 3.0 |
| | GOM | 0.2 | 0.1 | 0.5 | 0.6 | 0.3 | 0.1 |
| | Caribbean | 0.2 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| Albacore Tuna | NW Atl | 0.6 | 2.9 | 1.7 | 3.9 | 1.4 | 5.4 |
| | GOM | $\leq$ .05 | 0.0 | 0.0 | 0.0 | $\leq$ .05 | 0.0 |
| | Caribbean | 3.8 | 5.0 | 2.2 | 2.7 | 2.0 | 2.1 |
| Yellowfin Tuna | NW Atl | 192.0 | 235.7 | 242.5 | 137.0 | 148.0 | 208.0 |
| | GOM | 12.7 | 28.6 | 43.4 | 100.0 | 59.0 | 19.0 |
| | Caribbean | 14.5 | 19.4 | 14.3 | 7.0 | 9.0 | 7.0 |
| Skipjack Tuna | NW Atl | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.6 |
| | GOM | 0.4 | 0.7 | 0.0 | 0.0 | 0.0 | 0.2 |
| | Caribbean | 5.8 | 8.8 | 10.3 | 12.5 | 9.2 | 9.6 |
| Swordfish | NW Atl | 5.0 | 8.3 | 16.0 | 11.6 | 10.8 | 18.9 |
| | GOM | $\leq$ .05 | 1.2 | 0.3 | 2.9 | 9.8 | 1.6 |

*Handgear Trip Estimates*

Table 3.40 displays the estimated number of rod and reel and handline trips targeting large pelagic species in 2001 through 2004. The trips include commercial and recreational trips, and are not specific to any particular species. It should be noted that these estimates are still preliminary and subject to change.

**Table 3.40 Estimated number of vessel trips targeting large pelagic species, 2001-2004.** Source: Large Pelagics Survey database

| Year | AREA | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | NH/ME | MA | CT/RI | NY | NJ (north) | NJ (south) + MD/DE | VA | |
| **Private Vessels** | | | | | | | | |
| 2001 | 1,944 | 3,641 | 497 | 2,039 | 3,040 | 2,675 | 910 | 14,746 |
| 2002 | 5,090 | 15,180 | 2,558 | 7,692 | 2,762 | 22,757 | 6,524 | 62,563 |
| 2003 | 4,501 | 13,411 | 2,869 | 12,466 | 3,214 | 21,619 | 5,067 | 63,147 |
| 2004 | 2,025 | 10,033 | 3,491 | 11,525 | 3,632 | 22,433 | 4,406 | 57,545 |
| | | | | | | | | |
| **Charter Vessels** | | | | | | | | |
| 2001 | 133 | 567 | 203 | 280 | 660 | 655 | 307 | 2,805 |
| 2002 | 1,132 | 3,357 | 937 | 1,686 | 1,331 | 6,300 | 1,510 | 16,253 |
| 2003 | 221 | 2,561 | 1,246 | 2,035 | 1,331 | 5,201 | 546 | 13,141 |
| 2004 | 312 | 2,021 | 1,564 | 2,285 | 1,094 | 5,080 | 1,579 | 13,935 |

### 3.4.3.3 Safety Issues Associated with the Fishery

The U.S. Coast Guard (USCG) conducts routine vessel safety inspections at sea on a variety of vessels throughout the year. During the busy General category BFT season the USCG has been known to concentrate patrol activities on General category BFT boats. Boarding officers indicate that the majority of the commercial handgear vessels have the necessary safety equipment; however, many part-time fishermen operating smaller vessels do not meet the necessary safety standards. There have been several cases of vessels participating in the commercial handgear fishery that have capsized due to weight while attempting to boat commercial-sized BFT (measuring 73 inches or greater and weighing several hundred pounds).

Over the last few years, the USCG focused boardings on small vessels, especially those owned by "part-time" commercial handgear 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 port.

Currently, NMFS does not require proof of proper safety equipment as a condition to obtain a commercial handgear 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 commercial handgear permit, NMFS cannot be certain that all participants in the commercial handgear fisheries are adequately prepared for the conditions they may encounter. NMFS is concerned about the safety of all vessels participating in the commercial handgear fisheries and continues to work with the USCG to improve communication of vessel safety requirements to commercial handgear vessel operators.

It is unlawful for Atlantic tuna vessels to engage in fishing unless the vessel travels to and from the area where it will be fishing under its own power and the person operating that vessel brings any BFT 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 BFT 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 BFT; others have been observed leaving 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 couple of years, NMFS has received a number of vessel permit applications from kayak owner/operators. In addition to the requirement mentioned above, NMFS only issues permits to vessels that possess a USCG Documentation number, a state registration number, or a foreign registration number (recreational permit only). As kayaks typically do not require such documentation NMFS has denied all applications for a kayak to date.

NMFS also has concerns regarding individuals embarking on HMS trips by themselves. Recently there have been a few incidents of fishermen either severely injuring themselves or dying while pursing HMS by themselves. Certain hazardous situations could be mitigated by having an additional person onboard the vessel while conducting a trip targeting large pelagics. NMFS encourages vessel owner/operators to practice safe fishing techniques.

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.

#### 3.4.3.4 U.S. vs. International Issues and 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 2004 are summarized in Table 3.21.

### 3.4.4 Recreational Handgear

The following section describes the recreational portion of the handgear fishery, and is primarily focused upon rod and reel fishing. The HMS Handgear (rod and reel, handline, and harpoon) fishery includes both commercial and recreational fisheries and is described fully in Section 2.5.8 of the 1999 FMP. Handgear components may also be deployed as a specialized trolling gear to target surface-feeding tunas. Under this configuration, the line and leaders are elevated and actively trolled so that the baits fish on or above the water's surface. This style of fishing is often referred to as "green-stick fishing," and reports indicate that it can be extremely efficient compared to conventional fishing techniques. For more information on green-stick fishing gear and the configurations allowed under current regulations, please refer to the discussions of alternative H4 in Chapters 2 and 4 of this document. The recreational billfish fishery is described fully in Section 2.1.3 of the 1999 Billfish Amendment. The commercial sale, barter or trade of Atlantic billfish by U.S. commercial interests is prohibited, only recreational landings are authorized.

#### 3.4.4.1 Overview of History and Current Management

Atlantic tunas, swordfish, and sharks are managed under the 1999 FMP and Amendment 1 to the 1999 FMP, while Atlantic billfish are managed separately under the Billfish FMP, as amended. Summaries of the domestic aspects of the Atlantic tuna fishery, the Atlantic swordfish fishery, and the Atlantic shark fishery are found in Sections 2.2.3, 2.3.3, and 2.4.3, respectively, of the 1999 FMP. A history of Atlantic billfish management is provided in Section 1.1.1 of the Billfish Amendment and Section 3.1.2 of this document.

Atlantic tunas, sharks, swordfish, and billfish are all targeted by domestic recreational fishermen using rod and reel gear. The recreational swordfish fishery had declined dramatically over the past twenty years, but recent information indicates that the recreational swordfish fishery is rebuilding in the Mid-Atlantic Bight, and off the east coast of Florida. Effective March 1, 2003, an HMS Angling category permit has been required to fish recreationally for any HMS-

managed species (Atlantic tunas, sharks, swordfish, and billfish) (67 FR 77434, December 18, 2002). Prior to March 1, 2003, the regulations only required vessels fishing recreationally for Atlantic tunas to possess an Atlantic Tunas Angling category permit.

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

The recreational swordfish fishery has been managed through the use of a minimum size requirement and landings requirement (swordfish may be headed and gutted but may not be cut into smaller pieces). However, regulations effective March 2003 (68 FR 711) established a recreational retention limit of one swordfish per person up to three per vessel per day. Regardless of the length of a trip, no more than the daily limit of North Atlantic swordfish can be possessed onboard a vessel.

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

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

ICCAT has made several recommendations to recover billfish resources throughout the Atlantic Ocean that are discussed in detail in Section 3.1.2.

#### 3.4.4.2 Most Recent Catch and Landings Data

The recreational landings database for HMS consists of information obtained through surveys including the Marine Recreational Fishery Statistics Survey (MRFSS), Large Pelagic Survey (LPS), Southeast Headboat Survey (HBS), Texas Headboat Survey, and Recreational Billfish Survey Tournament Data (RBS). Descriptions of these surveys, the geographic areas they include, and their limitations, are discussed in Section 2.6.2 of the 1999 FMP and Section 2.3.2 of the 1999 Billfish Amendment.

Reported domestic landings of Atlantic bluefin tuna (1983 through 1998) and BAYS tuna (1995 through 1997) were presented in Section 2.2.3 of the 1999 FMP. As landings figures for 1997 and 1998 were preliminary in the 1999 FMP, updated landings for recreational rod and reel fisheries are presented in Table 3.41 through 2004. 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.

An ad hoc committee of NMFS scientists reviewed the methodology and data used to estimate recreational landings of Atlantic HMS during 2004. The Committee was charged with

reviewing the 2002 estimates of U.S. recreational landings of bluefin tuna, white marlin and blue marlin reported by NMFS to ICCAT. The committee was also charged with recommending methods to be used for the estimation of 2003 recreational fishery landings of bluefin tuna and marlin. Although the Committee discovered and corrected a few problems with the raw data from the LPS and the estimation program used to produce the estimates, the Committee concluded that the estimation methods for producing the 2002 estimates were consistent with methods used in previous years. The report of the Committee is available at: http://www.nmfs.noaa.gov/sfa/hms/Tuna/2002-2003_Bluefin-Marlin_Report-120304.pdf.

**Table 3.41 Updated Domestic Landings for the Atlantic Tunas, Swordfish and Billfish Recreational Rod and Reel Fishery, 1997-2004 (mt ww)*.**
Sources: NMFS, 2004; NMFS, 2005. (Recreational shark landings are provided in Table 3.44 through Table 3.47).

| Species | Region | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| Bluefin tuna** | NW Atlantic | 299 | 184 | 103.0 | 49.5 | 242.9 | 519.4 | 314.6 | 387.8 |
| | GOM | 0 | 0 | 0.4 | 0.9 | 1.7 | 1.5 | 0 | 0 |
| | **Total** | **299** | **184** | **103.4** | **50.4** | **244.6** | **520.9** | **314.6** | **387.8** |
| Bigeye tuna | NW Atlantic | 333.5 | 228.0 | 316.1 | 34.4 | 366.2 | 49.6 | 188.5 | 94.6 |
| | GOM | 0 | 0 | 1.8 | 0 | 0 | 0 | 0 | 6 |
| | Caribbean | | | | | 0 | 0 | 4.0 | 0 |
| | **Total** | **333.5** | **228.0** | **317.9** | **34.4** | **366.2** | **49.6** | **192.5** | **100.6** |
| Albacore | NW Atlantic | 269.5 | 601.1 | 90.1 | 250.75 | 122.3 | 323.0 | 333.8 | 500.5 |
| | GOM | 65.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Total** | **334.7** | **601.1** | **90.1** | **250.75** | **122.3** | **323.0** | **333.8** | **500.5** |
| Yellowfin tuna | NW Atlantic | 3,560.9 | 2,845.7 | 3,818.2 | 3,809.5 | 3,690.5 | 2,624 | 4,672 | 3,434 |
| | GOM | 7.7 | 80.9 | 149.4 | 52.3 | 494.2 | 200 | 640 | 247 |
| | Caribbean | | | 0 | 0 | 0.1 | 7.2 | 16 | 0 |
| | **Total** | **3,569** | **2,927** | **3,967.6** | **3,861.8** | **4184.7** | **2,831.2** | **5,328** | **3,681** |
| Skipjack tuna | NW Atlantic | 42.0 | 49.5 | 63.6 | 13.1 | 32.9 | 23.3 | 34.0 | 27.3 |
| | GOM | 21.7 | 37.0 | 34.8 | 16.7 | 16.1 | 13.2 | 11.0 | 6.3 |
| | Caribbean | | | 0 | 0 | 0 | 13.2 | 15.7 | 40.4 |
| | **Total** | **63.7** | **86.5** | **98.4** | **29.8** | **49.0** | **49.7** | **60.7** | **74.0** |
| Blue marlin*** | NW Atlantic | 25.0 | 34.1 | 24.8 | 13.8 | 9.0 | | | |
| | GOM | 11.5 | 4.5 | 7.5 | 4.7 | 5.1 | | | |
| | Caribbean | 8.6 | 10.6 | 4.6 | 5.7 | 2.3 | | | |
| | **Total** | **45.1** | **49.2** | **36.9** | **24.2** | **16.4** | **5.6** | **19** | **24** |

| Species | Region | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| White marlin *** | NW Atlantic | 0.9 | 2.4 | 1.5 | 0.23 | 2.8 | | | |
| | GOM | 0.9 | 0.2 | 0.1 | 0 | 0.3 | | | |
| | Caribbean | 0.0 | 0.02 | 0 | 0 | 0 | | | |
| | **Total** | **1.8** | **2.6** | **1.6** | **0.23** | **3.1** | **5.6** | **0.6** | **0.8** |
| Sailfish*** | NW Atlantic | 0 | 0.1 | 0.07 | 1.75 | 61.2 | | | |
| | GOM | 0.4 | 1.0 | 0.6 | 0.24 | 0.6 | | | |
| | Caribbean | 0.2 | 0.05 | 0 | 0.06 | 0 | | | |
| | **Total** | **0.6** | **1.5** | **0.67** | **2.05** | **61.8** | **103** | **53** | **33** |
| Swordfish | **Total** | **10.9** | **4.7** | **21.3** | **15.6** | **1.5** | **21.5** | **5.9** | **24.3** |

* 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 and landings estimates of bluefin tuna less than 73" curved fork length (CFL) based on statistical surveys of the U.S. recreational harvesting sector. Rod and reel catch of bluefin > 73" CFL are commercial and may also include a few metric tons of "trophy" bluefin (recreational bluefin 73").

*** Blue and white marlin (1997-2003), and sailfish (1997-2002) landings are based on prior U.S. National Reports to ICCAT and consist primarily of reported tournament landings. Reporting method was changed to a total count (blue and white marlin) in 2004.

*Atlantic Billfish Recreational Fishery*

Due to the rare nature of billfish encounters and the difficulty of monitoring landings outside of tournament events, reports of recreational billfish landings are sparse. However, the RBS provides a preliminary source for analyzing recreational billfish landings. Table 3.42 documents the number of billfish landed in 1999 – 2004, as reported by the RBS.

**Table 3.42 Preliminary RBS Recreational Billfish Landings in numbers of fish (calendar year).** Source: NMFS Recreational Billfish Survey (RBS).

| Species | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Blue Marlin | 172 | 117 | 75 | 84 | 96 | 110 |
| White Marlin | 36 | 8 | 22 | 33 | 20 | 25 |
| Sailfish | 30 | 18 | 11 | 14 | 24 | 9 |
| Swordfish | - | - | 0 | 16 | 48 | 168 |

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 U.S. 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 RBS, as well as available size information. Document SCRS/01/138 estimated U.S. sailfish catch estimates from various recreational fishery surveys.

All recreational, non-tournament landings of billfish, including swordfish, must be reported within 24 hours of landing to NMFS by the permitted owner of the vessel landing the fish. This requirement is applicable to all permit holders, both private and charter/headboat vessels, not fishing in a tournament. In Maryland and North Carolina, vessel owners should report their billfish landings at state-operated landings stations. A landed fish means a fish that is kept and brought to shore. Due to large-scale non-compliance with the call-in requirement, the landings in Table 3.43 are considered a minimum estimate of the non-tournament landings of billfish.

**Table 3.43 Number of billfish reported to NMFS via call-in system by fishing year, 2002-2005.** Source: G. Fairclough, pers. comm.

| Species | 2002* | 2003 | 2004 | 2005** |
|---|---|---|---|---|
| Blue Marlin | 0 | 7 | 2 | 5 |
| White Marlin | 0 | 1 | 0 | 2 |
| Sailfish | 3 | 16 | 57 | 58 |
| Swordfish | 28 | 188 | 314 | 381 |

Based on a fishing year of June 1 – May 31.
* Reporting requirement did not go into effect until March 1, 2003
** 2005 landings as of May 16, 2006

*Swordfish Recreational Fishery*

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

Historically, fishery survey strategies have not captured all landings of recreational handgear-caught swordfish. Although some handgear swordfish fishermen have commercial permits[1], many others land swordfish strictly for personal consumption. Therefore, NMFS published regulations to improve recreational swordfish monitoring and conservation. A trip limit of one swordfish per person, up to three per vessel, and mandatory reporting of all recreationally-landed swordfish and billfish via a toll-free call-in system became effective on March 2, 2003 (68 FR 711). Accordingly, all reported recreational swordfish landings are counted against the incidental swordfish quota.

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

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

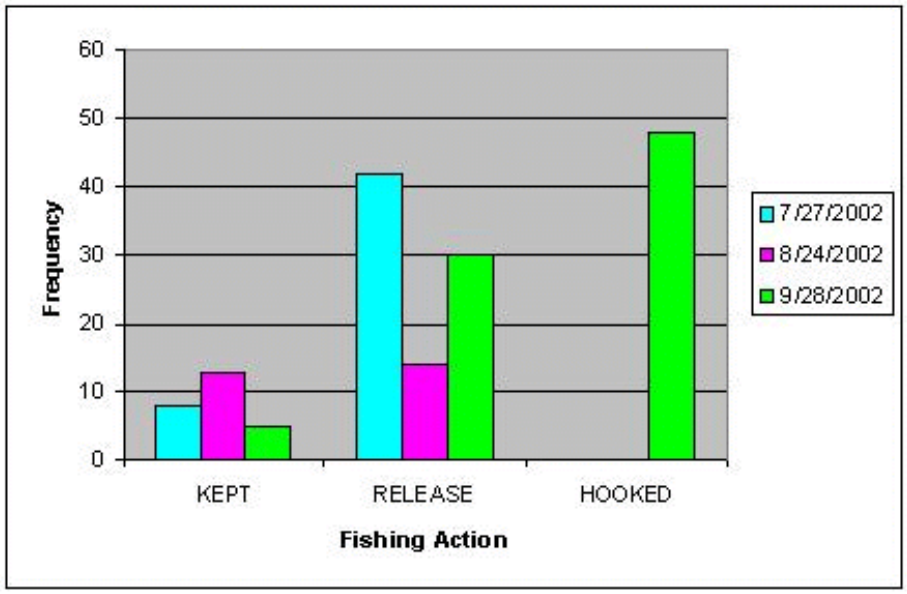



**Figure 3.30 Total Number of Swordfish Caught, Kept and Released in Three Sampled Recreational Swordfish Tournaments off Southeast Florida during 2002.** Source: J. Levesque, pers. comm.

Figure 3.30 indicates that 112 swordfish were caught during the three monitored tournaments. Of these, 26 swordfish were retained and 86 swordfish were released alive. Additional data from the September 28, 2002, tournament indicated that, in that tournament, 48 swordfish were hooked, 30 were released, and four were kept. The definition of hooked, for these purposes, was a swordfish that was on the line for any given amount of time. All hooked fish were assumed to be swordfish. The three fishing tournaments implemented a 55-inch, or 140 cm LJFL minimum size requirement for landed swordfish, although current federal regulations are 119 cm (46.9 in) LJFL.

Sizes for landed swordfish ranged from 130 – 230 cm (51.2 – 90.6 in) fork length. The mean size for landed swordfish was 160 cm (63 in) fork length. Weights for landed swordfish ranged from 36 – 144 kg (79.3 – 317.2 lb). The mean weight for the landed swordfish was 62.6 kg (137.9 lb). Estimated weights for the released swordfish ranged from 13 – 32 kg (28.6 – 70.5 lb). The mean estimated weight for released swordfish was 19.5 kg (43 lb).

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

Tournament caught swordfish reported to the RBS have increased in recent years. There were none reported in 2001, 16 in 2002, 48 in 2003, and 168 in 2004. While total tournament landings of swordfish are still low in terms of numbers of fish, it appears that as swordfish have recovered in the past few years, tournament landings of swordfish have increased.

*Shark Recreational Fishery*

Recreational landings of sharks are an important component of HMS fisheries. Recreational shark fishing with rod and reel is a popular sport at all social and economic levels, largely because the resource is accessible. Sharks can be caught virtually anywhere in salt water, depending upon the species. Recreational shark fisheries are oftentimes exploited in nearshore waters by private vessels and charter/headboats. However, there is also some shore-based fishing and some offshore fishing. The following tables provide a summary of landings for each of the three species groups. Amendment 1 to the 1999 Atlantic Tunas, Swordfish, and Shark FMP limited the recreational fishery to rod and reel and handline gear only.

**Table 3.44 Estimates of Total Recreational Harvest of Atlantic Sharks: 1998-2004 (numbers of fish in thousands).** Source: 1998-2000 (Cortés, pers. comm.); 2001-2004 (Cortés, 2005a; 2005b). Estimates for 2001-2004 do not include prohibited species.

| Species Group | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|
| LCS | 169.6 | 92.3 | 131.5 | 127.9 | 76.3 | 86.1 | 66.3 |
| Pelagic | 11.8 | 11.1 | 13.3 | 3.8 | 4.7 | 4.3 | 5.1 |
| SCS | 175.1 | 125.7 | 197.8 | 211.6 | 154.6 | 134.7 | 128.5 |
| Unclassified | 8.0 | 6.9 | 11.0 | 22.2 | 5.3 | 18.1 | 27.3 |

**Table 3.45 Recreational Harvest of Atlantic Large Coastal Sharks (LCS) by Species, in number of fish: 1998-2004.** Sources: 1998-2000 (Cortés, pers. comm.); 2001-2004 (Cortés, 2005a; 2005b). Total estimates for 2001-2004 do not include prohibited species.

| LCS Species | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|
| Basking** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bignose* | 0 | 0 | 0 | 0 | 0 | 0 | 71 |
| Bigeye sand tiger** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blacktip | 83,045 | 35,585 | 69,668 | 48,757 | 38,237 | 40,442 | 31,197 |
| Bull | 1,663 | 3,150 | 6,116 | 4,151 | 1,893 | 3,344 | 4,885 |
| Caribbean Reef* | 74 | 3 | 122 | 0 | 741 | 0 | 692 |
| Dusky* | 4,499 | 5,570 | 2,501 | 5,583 | 1,047 | 2,731 | 0 |
| Galapagos* | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerhead, Great | 476 | 388 | 925 | 3,382 | 4 | 68 | 9 |
| Hammerhead, Scalloped | 2,052 | 1,367 | 3,433 | 1,087 | 1,061 | 2,816 | 714 |
| Hammerhead, Smooth | 375 | 1 | 2 | 703 | 2 | 1 | 0 |
| Hammerhead, Unclassified | 390 | 75 | 3,675 | 0 | 5,293 | 0 | 0 |
| Lemon | 2,161 | 173 | 2,785 | 5,488 | 3,454 | 4,879 | 5,710 |
| Night* | 133 | 50 | 24 | 0 | 0 | 0 | 0 |
| Nurse | 2,455 | 1,503 | 2,233 | 3,672 | 2,680 | 647 | 3,594 |
| Sandbar | 35,766 | 20,602 | 10,878 | 36,094 | 8,324 | 5,185 | 3,843 |
| Sand tiger** | 0 | 0 | 0 | 604 | 0 | 0 | 0 |

| LCS Species | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|
| Silky | 5,376 | 3,863 | 5,120 | 3,808 | 1,780 | 1,998 | 502 |
| Spinner | 10,805 | 6,361 | 5,402 | 3,651 | 3,835 | 4,460 | 3,380 |
| Tiger | 1,380 | 153 | 1,480 | 758 | 170 | 110 | 1 |
| Whale** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| White** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large Coastal Unclassified | 18,979 | 13,444 | 17,102 | 16,211 | 9,535 | 22,086 | 12,466 |
| Total: | 169,62 | 92,288 | 131,466 | 134,045 | 76,294 | 86,036 | 66,301 |

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

**Table 3.46 Recreational Harvest of Atlantic Pelagic Sharks by Species, in number of fish: 1998-2004.** Sources: 1998-2000 (Cortés, pers. comm.); 2001-2004 (Cortés, 2005a; 2005b). Total estimates for 2001-2004 do not include prohibited species**.**

| Pelagic Shark Species | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|
| Bigeye thresher* | 0 | 0 | 0 | 0 | 65 | 0 | 0 |
| Bigeye sixgill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue Shark | 6,085 | 5,218 | 7,010 | 950 | 0 | 376 | 0 |
| Mako, Longfin* | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mako, Shortfin | 5,633 | 1,383 | 5,813 | 2,871 | 3,206 | 3,957 | 5,144 |
| Mako, Unclassified | 8 | 9 | 0 | 0 | 0 | 0 | 0 |
| Oceanic whitetip | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Porbeagle | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sevengill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sixgill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thresher | 36 | 4,512 | 528 | 0 | 1,467 | 0 | 0 |
| Total: | 11,762 | 11,122 | 13,351 | 3,821 | 4,673 | 4,333 | 5,144 |

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

**Table 3.47 Recreational Harvest of Atlantic SCS by Species, in number of fish: 1998-2004.** Source: 1998-2000 (Cortés, pers. comm.); 2001-2004 (Cortés, 2005a; 2005b). Total estimates for 2001-2004 do not include prohibited species.

| SCS Species | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|
| Atlantic Angel* | 110 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blacknose | 10,523 | 6,049 | 9,795 | 15,179 | 11,416 | 6,705 | 15,126 |
| Bonnethead | 29,147 | 38,835 | 56,142 | 58,511 | 50,903 | 39,863 | 42,354 |
| Finetooth | 139 | 78 | 1,438 | 6,701 | 2,942 | 1,774 | 581 |
| Sharpnose, Atlantic | 135,137 | 80,694 | 130,371 | 131,165 | 89,365 | 86,340 | 70,469 |
| Sharpnose, Caribbean* | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Smalltail* | 0 | 4 | 26 | 26 | 0 | 0 | 11 |
| Total: | 175,056 | 125,660 | 197,772 | 211,582 | 154,626 | 134,682 | 128,530 |

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

### 3.4.4.3 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 legal sized. Bluefin tuna trips may yield undersized bluefin, or a seasonal closure may prevent landing of a bluefin tuna above a minimum or maximum size. In some cases, therefore, rod and reel catch may be discarded. The Magnuson-Stevens Act (16 USC 1802 (2)) stipulates that bycatch does not include fish under recreational catch-and-release.

The 1999 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, and thereby increase release rates of billfish caught in this fishery. Current billfish release rates range from 89 to 99 percent. The recreational white shark fishery is by regulation a catch-and-release fishery only and white sharks are not considered bycatch.

Bycatch can result in death or injury to discarded fish. Therefore, bycatch mortality should be incorporated into fish stock assessments, and into the evaluation of management measures. Rod and reel discard estimates from Virginia to Maine during June – October could be monitored through the expansion of survey data derived from the LPS (dockside and telephone surveys). However, the actual numbers of fish discarded for many species are so low that presenting the data by area could be misleading, particularly if the estimates are expanded for unreported effort in the future. The number of kept and released fish reported or observed through the LPS dockside intercepts for 1997 – 2004 is presented in Table 3.48.

Outreach programs to address bycatch were included in the 1999 FMP and the Billfish Amendment. These programs have not yet been implemented, but the preparation of program designs is currently in progress. One of the key elements in the outreach program will be to provide information that leads to an improvement in post-release survival from both commercial and recreational gear. Additionally, an outreach program to encourage the use of circle hooks to increase post-release survival within HMS fisheries was introduced in a proposed rule published in 2001 (66 FR 66386, December 26, 2001). The final rule to promote the voluntary use of circle hooks published in 2003 (68 FR 711, January 7, 2003). Initial implementation of the outreach program began in 2004 with workshops conducted on the proper handling and release of sea turtles.

A study by Graves *et al.* (2002), investigated short-term (five days) post-release mortality of Atlantic blue marlin using pop-up satellite tag technology. A total of nine recreationally caught blue marlin were tagged and released during July and August of 1999. All hooks employed in the study were "J" hooks. The attached tags were programmed to detach from the fish after five days and to record direct temperature and inclination of the buoyant tag to determine if the fish were actively swimming after being released. After detachment, the tags floated to the surface and began transmitting recorded position, temperature and inclination data to satellites of the Argos™ system. Three different lines of evidence provided by the tags

(movement, water temperature, and tag inclination) suggested that at least eight of the nine blue marlin survived for five days after being tagged and released. One of the tags did not transmit any data, which precluded the derivation of a conclusion regarding the tagged marlin's survival.

This study was continued in 2003 for white marlin to evaluate post release survival and habitat use (NMFS, 2004). Pop-up satellite archival tags (PSATs) were used to estimate survival of white marlin released from four locations in the western North Atlantic recreational fishery. Forty-one tags were attached to white marlin caught using dead baits rigged on straight-shank ("J") hooks (n=21) or circle hooks (n=20) offshore of the U.S. Mid-Atlantic, the Dominican Republic, Mexico, and Venezuela. Survival was significantly higher ($p<0.01$) for white marlin caught on circle hooks (100 percent) relative to those caught on straight-shank ("J") hooks (65 percent). These results, along with previous studies on circle hook performance, suggest that a simple change in hook type can significantly increase the survival of white marlin released from recreational fishing gear. Data from these short term deployments also suggest that white marlin strongly associated with warm, near surface waters. However, based on the frequency, persistence, and patterns of vertical movements, white marlin appear to direct a considerable proportion of foraging effort well below surface waters, a behavior that may account for relatively high catch rates of white marlin on some pelagic longline sets.

**Table 3.48 Observed or reported number of HMS kept [1] and released in the rod and reel fishery, Maine through Virginia, 1997-2004.** Source: Large Pelagic Survey (LPS) Preliminary Data.

| | Number of Fish Kept [1] | | | | | | | | Number of Fish Released Alive | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** |
| White Marlin [2] | 7 | 11 | 6 | 2 | 5 | 8 | 12 | 6 | 203 | 465 | 156 | 59 | 118 | 215 | 160 | 378 |
| Blue Marlin[2] | 3 | 3 | 3 | 0 | 1 | 0 | 4 | 5 | 30 | 27 | 28 | 17 | 14 | 30 | 39 | 80 |
| Sailfish[2] | 0 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 2 | 2 | 3 | 0 | 2 | 6 | 6 | 2 |
| Swordfish | 5 | 1 | 3 | 14 | 1 | 5 | 9 | 9 | 6 | 5 | 1 | 5 | 10 | 6 | 21 | 22 |
| Giant Bluefin Tuna [3] | 51 | 69 | 56 | 34 | 20 | 176 | 58 | 50 | 6 | 11 | 6 | 0 | 0 | 8 | 0 | 3 |
| Large Medium Bluefin Tuna[3] | 6 | 26 | 13 | 3 | 7 | 11 | 11 | 13 | 3 | 8 | 5 | 3 | 6 | 2 | 0 | 36 |
| Small Medium Bluefin Tuna | 28 | 19 | 8 | 30 | 87 | 62 | 83 | 30 | 34 | 26 | 44 | 37 | 5 | 8 | 13 | 21 |
| Large School Bluefin Tuna | 60 | 134 | 106 | 95 | 457 | 391 | 287 | 291 | 158 | 67 | 42 | 22 | 128 | 47 | 40 | 107 |
| School Bluefin | 1,000 | 392 | 212 | 151 | 338 | 556 | 509 | 927 | 840 | 412 | 136 | 159 | 58 | 200 | 174 | 1,297 |
| Young School Bluefin | 5 | 13 | 1 | 4 | 0 | 7 | 4 | 16 | 139 | 581 | 94 | 23 | 40 | 182 | 10 | 1,885 |
| Bigeye Tuna | 26 | 17 | 27 | 16 | 9 | 32 | 21 | 46 | 6 | 9 | 0 | 0 | 8 | 1 | 3 | 2 |
| Yellowfin Tuna | 2,472 | 2,646 | 2,501 | 2,366 | 2,423 | 2,595 | 3,216 | 3,858 | 222 | 645 | 682 | 97 | 74 | 328 | 200 | 1,093 |
| Skipjack Tuna | 296 | 261 | 146 | 32 | 100 | 117 | 681 | 197 | 468 | 267 | 88 | 69 | 130 | 250 | 526 | 362 |
| Albacore | 146 | 558 | 133 | 513 | 302 | 534 | 546 | 1,458 | 43 | 92 | 52 | 17 | 52 | 95 | 31 | 66 |
| Thresher Shark | 7 | 7 | 3 | 2 | 5 | 20 | 24 | 58 | 2 | 2 | 2 | 1 | 0 | 5 | 8 | 27 |
| Mako Shark | 74 | 78 | 49 | 49 | 27 | 72 | 141 | 216 | 94 | 92 | 49 | 114 | 65 | 120 | 208 | 350 |
| Sandbar Shark | 5 | 2 | 2 | 1 | 2 | 0 | 9 | 7 | 30 | 56 | 6 | 4 | 10 | 17 | 26 | 68 |
| Dusky Shark | 6 | 6 | 1 | 0 | 0 | 1 | 0 | 0 | 50 | 54 | 7 | 32 | 8 | 9 | 0 | 60 |
| Tiger Shark | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 5 | 5 | 0 | 3 | 2 | 3 | 12 | 0 |
| Porbeagle | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 6 | 0 | 0 | 0 | 14 | 3 | 1 |
| Blacktip Shark | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 5 | 0 | 0 | 6 | 0 | 1 |
| Atlantic | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Number of Fish Kept [1] | | | | | | | | Number of Fish Released Alive | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** |
| Sharpnose Shark | | | | | | | | | | | | | | | | |
| Blue Shark | 27 | 26 | 11 | 12 | 2 | 36 | 65 | 74 | 1,897 | 780 | 572 | 374 | 141 | 505 | 2,061 | 2,242 |
| Hammerhead Shark | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 1 | 4 | 4 | 5 | 0 | 1 | 6 | 38 | 2 |
| Wahoo | 10 | 71 | 45 | 41 | 34 | 49 | 68 | 110 | 1 | 2 | 0 | 0 | 13 | 6 | 3 | 5 |
| Dolphin | 1,022 | 7,263 | 2,139 | 955 | 1,294 | 2,509 | 4,209 | 3,050 | 61 | 194 | 73 | 48 | 108 | 111 | 677 | 192 |
| King Mackerel | 171 | 198 | 141 | 289 | 19 | 36 | 66 | 11 | 1 | 10 | 8 | 24 | 10 | 5 | 5 | 1 |
| Atlantic Bonito | 384 | 328 | 254 | 194 | 77 | 704 | 315 | 410 | 203 | 300 | 166 | 27 | 49 | 176 | 282 | 389 |
| Little Tunny | 428 | 1,231 | 97 | 139 | 48 | 240 | 121 | 231 | 1,015 | 1,507 | 133 | 118 | 118 | 585 | 443 | 1,130 |
| Amberjack | 3 | 6 | 9 | 6 | 19 | 7 | 44 | 0 | 18 | 40 | 24 | 20 | 14 | 57 | 111 | 1 |
| Spanish Mackerel | 0 | 2 | 1 | 13 | 3 | 5 | 35 | 9 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |

[1] 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 estimates for other species, NMFS may produce estimates for other species in future SAFE reports.
[2] 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.
[3] Includes some commercial handgear landings.

### 3.4.4.4 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 1999 FMP and the Billfish Amendment contain only minimal safety information regarding recreational HMS fisheries. Safety issues associated with handline fisheries for tunas are discussed in Section 3.4.4.4. The USCG compiles statistics on the total number of recreational boating accidents and casualties, independent of the activity or fishery in which they are engaged (Table 3.49). Two common situations often place recreational boaters in potential danger. Individuals in small vessels often venture out farther than their vessels are designed to travel without proper navigational equipment, and may encounter rougher water than their boats are designed to withstand. Since fishermen targeting HMS species, particularly marlin, often travel 75 to 100 miles offshore, having a properly equipped vessel of adequate size is very important for the safety of recreational HMS constituents. Additionally, as the recreational swordfish fishery off the southeastern coast of Florida occurs at night and usually in small boats ranging from 23 to 40 feet in length, it presents other unique risks. Shipping traffic regularly runs through the recreational swordfish fleet, which could lead to incidents if someone is not on watch at all times. Another frequent safety concern of the Coast Guard is when someone is up in the flying bridge. Both of these situations can lead to people falling overboard. In 2004, approximately 72 percent of all boating casualties were due to drowning and in 89 percent of the drowning deaths, the victim was not wearing a personal floatation device (PFD) (Table 3.50).

**Table 3.49 Total 2004 Reported Boating Accident Types.** Source: USCG Boating Statistics, 2004.

| Accident Type | # Accidents | # of Injuries | # of Fatalities | Total Property Damage |
|---|---|---|---|---|
| Capsizing | 393 | 229 | 184 | $2,267,043 |
| Carbon Monoxide | 12 | 28 | 3 | $0 |
| Collision with Fixed Object | 525 | 382 | 46 | $4,271,785 |
| Collision with Floating Object | 95 | 62 | 6 | $499,692 |
| Vessel Collision | 1,479 | 999 | 68 | $8,037,552 |
| Departed Vessel | 19 | 10 | 9 | $0 |
| Ejected from Vessel | 45 | 32 | 16 | $244,500 |
| Falls within Boat | 176 | 189 | 3 | $106,496 |
| Falls on PWC | 50 | 49 | 2 | $27,433 |
| Fall Overboard | 488 | 339 | 199 | $288,205 |
| Fire/Explosion (fuel) | 162 | 89 | 4 | $8,297,780 |
| Fire/Explosion (other than fuel) | 56 | 14 | 1 | $2,462,181 |
| Flooding or Swamping | 257 | 81 | 52 | $1,853,848 |
| Grounding | 215 | 159 | 5 | $2,488,744 |

| Accident Type | # Accidents | # of Injuries | # of Fatalities | Total Property Damage |
|---|---|---|---|---|
| Other Casualty | 69 | 56 | 3 | $93,200 |
| Sinking | 131 | 30 | 10 | $2,507,989 |
| Skier Mishap | 380 | 388 | 7 | $25,050 |
| Struck by Boat | 108 | 96 | 6 | $158,719 |
| Struck by Motor | 64 | 61 | 5 | $500 |
| Struck Submerged Object | 102 | 32 | 8 | $974,112 |
| **Total** | **4,904** | **3,363** | **676** | **$35,038,306** |

**Table 3.50 Overall 2004 Reported Boating Accident Cause-of-Death Statistics.** Source: USCG Boating Statistics, 2004.

| Cause of Death | # Fatalities | PFD Worn | |
|---|---|---|---|
| | | Yes | No |
| Carbon Monoxide Poisoning | 2 | 0 | 2 |
| Drowning | 484 | 53 | 431 |
| Hypothermia | 10 | 3 | 7 |
| Other | 32 | 11 | 21 |
| Trauma | 114 | 50 | 64 |
| Unknown | 34 | 6 | 28 |
| **Total** | **676** | **123** | **553** |

### 3.4.4.5 U.S. vs. International Catch

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

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

At the 1999 ICCAT meeting in Rio de Janeiro, Brazil, the Commission adopted a resolution to improve the quantity and quality of recreational data collection. Recreational fisheries were to be discussed and 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 this time additional information is not available regarding international HMS recreational catches.

At the 2004 ICCAT meeting in New Orleans, U.S., the Commission adopted a recommendation concerning prohibited gear in the sport and recreational fisheries in the Mediterranean Sea (04-12). Prohibited gear includes towed and encircling nets, seine sliding, dredgers, gill nets, trammel net and longline to fish for tuna and tuna-like species. The recommendation also prohibits the sale of sport and recreational tuna and tuna-like species and stipulates that data on these fisheries be collected and transmitted to the SCRS.

### 3.4.5 Bottom Longline

#### 3.4.5.1 Domestic History and Current Management

In 1993, NMFS implemented the FMP for Sharks of the Atlantic Ocean, which established three management units: large coastal sharks (LCS), small coastal sharks (SCS), and pelagic sharks. At that time, NMFS identified LCS as overfished, and implemented commercial quotas for LCS and established recreational harvest limits for all sharks. In 2003, NMFS amended the measures enacted in the 1999 FMP based on the 2002 LCS and SCS stock assessments, litigation, and public comments. Implementing regulations for Amendment 1 to the 1999 FMP were published on December 24, 2003 (68 FR 74746). Management measures enacted in the amendment included: re-aggregating the large coastal shark complex, using maximum sustainable yield (MSY) as a basis for setting commercial quotas, eliminating the commercial minimum size restrictions, establishing three regional commercial quotas (Gulf of Mexico, South Atlantic, and North Atlantic) for LCS and SCS management units, implementing trimester commercial fishing seasons effective January 1, 2005, imposing gear restrictions to reduce bycatch, and a time/area closure off the coast of North Carolina effective January 1, 2005. As a result of using MSY to establish quotas, and implementing a new rebuilding plan, the overall annual landings quota for LCS in 2004 was established at 1,017 metric tons (mt) dressed weight (dw). The overall annual landings quota for SCS was established at 454 mt dw and the pelagic, blue, and porbeagle shark quotas were established at 488 mt dw, 273 mt dw, and 92 mt dw, respectively.

The regional quotas which were established in Amendment 1 to the 1999 HMS FMP for LCS and SCS were intended to improve overall management of the stocks by tailoring quotas to specific regions based on landings information. These quotas were based upon average historical landings (1999 – 2001) from the canvass and quota monitoring databases. The canvass database provides a near-census of the landings at major dealers in the southeast United States (including state landings) and the quota monitoring database collects information from dealers in the South Atlantic and Gulf of Mexico.

On November 30, 2004, NMFS issued a final rule (69 FR 69537), which established, among other things, new regional quotas based on updated landings information from 1999 –

2003. This final rule did not change the overall quotas for LCS, SCS, and pelagic sharks established in Amendment 1 to the 1999 HMS FMP, but did revise the percentages allocated to each of the regions. The updated information was based on several different databases, including the canvass and quota monitoring databases, the Northeast Commercial Fisheries Database (CFDBS), and the snapper grouper logbook. The new regional quotas and trimester seasons for the commercial Atlantic shark fishery became effective January 1, 2005.

Commercial shark fishing effort is generally concentrated in the southeastern United States and Gulf of Mexico (Cortes and Neer, 2002). During 1997 – 2003, 92 – 98 percent of LCS, 38 – 49 percent of pelagic sharks, and nearly all SCS (80 – 100 percent) came from the southeast region (Cortes, pers. comm.). McHugh and Murray (1997) found in a survey of shark fishery participants that the largest concentration of bottom longline fishing vessels is found along the central Gulf coast of Florida, with the John's Pass - Madeira Beach area considered the center of directed shark fishing activities. Consistent with other HMS fisheries, some shark fishery participants move from their homeports to other fishing areas as the seasons change and fish stocks move.

The Atlantic bottom longline fishery targets both LCS and SCS. Bottom longline is the primary commercial gear employed in the LCS and SCS fisheries in all regions. Gear characteristics vary by region, but in general, an approximately ten-mile long bottom longline, containing about 600 hooks, is fished overnight. Skates, sharks, or various finfishes are used as bait. The gear typically consists of a heavy monofilament mainline with lighter weight monofilament gangions. Some fishermen may occasionally use a flexible 1/16 inch wire rope as gangion material or as a short leader above the hook.

#### 3.4.5.2 Recent Catch and Landings Data

The following section provides information on shark landings as reported in the shark bottom longline observer program. For recent catch and landings data for the shark fishery as a whole, which includes landings from BLL and other gears combined, please refer to Section 3.4.7. In January 2002, the observer coverage requirements in the shark bottom longline fishery changed from voluntary to mandatory participation if selected. NMFS selects approximately 40 - 50 vessels for observer coverage during each season. Vessels are randomly selected if they have a directed shark limited access permit, have reported landings from sharks during the previous year, and have not been selected for observer coverage during each of the three previous seasons.

The U.S. Atlantic commercial shark bottom longline fishery has been monitored by the University of Florida and Florida Museum of Natural History, Commercial Shark Fishery Observer Program (CSFOP) since 1994. In June 2005, responsibility for the observer program was transferred to the Southeast Fisheries Science Center's Panama City Laboratory. The observer program trains and places the observers aboard vessels in the directed shark bottom longline fishery in the Atlantic and Gulf of Mexico to collect data on the commercial shark fishery and thus improve overall management strategies for the fishery. Observers provide baseline characterization information, by region, on catch rates, species composition, catch disposition, relative abundance, and size composition within species for the large coastal and small coastal shark bottom longline fisheries.

During 2003, six observers logged 263 sea days on shark fishing trips aboard 20 vessels in the Atlantic from North Carolina to Florida and in the eastern Gulf of Mexico off Florida. The number of trips taken on each vessel ranged from one to five and the number of sea days each observer logged ranged from nine to 35. Observers documented the catches and fishing effort on approximately 150 longline sets that fished 103,351 hooks. During 2004, five observers logged 196 sea days on 56 shark fishing trips aboard 11 vessels. Observers documented the catches and fishing effort during 120 longline sets that fished 90,980 hooks.

Data from the shark observer program between 2000 and 2002 show that LCS comprised 66.2 percent of the total catch (Burgess and Morgan, 2002). During 2003, LCS comprised 68.4 percent of the total catch, and in 2004 LCS comprised 66.7 percent of the total catch. Sandbar sharks dominated the observed catches with 30.6 percent of total LCS catch in 2003 and 26.6 percent in 2004 (Table 3.52). The overall catch and disposition of species for 2004 is listed in Table 3.53. Regional differences in sandbar shark abundance were evident. For example, in the Carolina region, sandbar sharks comprised 67.4 percent of the total catch and 77.2 percent of the large coastal shark catch. In the Florida Gulf region, sandbar sharks comprised 62.0 percent of the total catch and 66.5 percent of the large coastal catch, whereas in the Florida East Coast region, sandbar sharks comprised only 17.2 percent of the total observed catch, and 37.1 percent of the large coastal shark catch (Burgess and Morgan, 2003). Blacktip sharks comprised 13.9 percent of total observed catch and 20.3 percent of the large coastal catch (Burgess and Morgan, 2002). Tiger sharks comprised 7.5 percent of the total observed catch and 11.0 percent of the large coastal shark catch. A majority of tiger sharks (71.7 percent) and nurse sharks (98.8 percent) were tagged and released.

During 2003, shark observer program data indicate that SCS comprised 28.0 percent of the total observed catch (Burgess and Morgan, 2003; Burgess and Morgan 2004). Atlantic sharpnose shark dominated the SCS catch (80.3 percent). The remainder of the small coastal catch consisted of blacknose sharks (5.5 percent), bonnethead (0.03 percent), and finetooth (0.02 percent)(Table 3.52). In previous seasons, the Atlantic sharpnose shark was the most frequently caught shark in the Florida East Coast region and accounted for 51.6 percent of the total observed catch, and 96.0 percent of the small coastal catch in that region (Burgess and Morgan, 2002).

Bottom longlining for sharks has relatively low observed bycatch rates. Historically, finfish bycatch has averaged approximately five percent in the bottom longline fishery. Finfish bycatch for the bottom longline fishery includes, but is not limited to, skates, rays, cobia, redfish, bluefish, and great barracuda. During the second semi-annual season of 2003, observer data indicate that approximately 4,320 sharks were caught compared to 432 other fish, four invertebrates, and three sea turtles (Burgess and Johns, 1999). In terms of bycatch rates, observed shark catches constitute 91 percent of the 4,759 total animals caught, with other fish comprising 10 percent, invertebrates less than .01 percent, and sea turtles less than .01 percent. For more information on bycatch see Section 3.8.

#### 3.4.5.3 Bottom Longline Bycatch

Under the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.) the Atlantic shark gillnet fishery is classified as Category II (occasional serious injuries and mortalities), and

the shark bottom longline as Category III (remote likelihood or no known serious injuries or mortalities) (July 20, 2004, 69 FR 43338). On October 29, 2003, NMFS issued a biological opinion (BiOp) pursuant to the Endangered Species Act (ESA) regarding Atlantic shark fisheries. This BiOp concluded that the level of anticipated take in the Atlantic shark fishery resulting from measures implemented in Amendment 1 to the 1999 FMP (68 FR 74746), were not likely to jeopardize the continued existence of endangered green, leatherback, and Kemp's ridley sea turtles, the endangered smalltooth sawfish, or the threatened loggerhead sea turtle. Furthermore, it concluded that the actions in the rule were not likely to adversely affect marine mammals. As a result of this conclusion, NMFS (NMFS, 2003) anticipates that the continued operation of the shark bottom longline fishery will result in a five year total incidental take of the following numbers of sea turtles: Leatherback – 172; loggerhead – 1,370; a total of 30 in any combination of hawksbill, green, and Kemp's ridley sea turtles. NMFS also anticipates a five year take of 261 smalltooth sawfish, of which no lethal takes are expected. If the actual calculated incidental captures or mortalities exceed the incidental take statement, a formal consultation for that gear type must be re-initiated immediately. More information is available in Amendment 1 to the 1999 FMP and the October 2003 BiOp and is not repeated here.

*Loggerhead Sea Turtles*

In the bottom longline fishery, a total of 65 sea turtles were observed caught from 1994 through 2006 (Table 3.54 Table 3.55 and Figure 3.31). Seasonal variation indicates that most of the sea turtles were caught early in the year. Of the 65 observed sea turtles, 50 were loggerhead sea turtles, of which 26 were released alive. Another nine loggerheads were released in an unknown condition and eight were released dead. Based on extrapolation of observer data in Amendment 1 to the 1999 FMP, it was estimated that a total of 2,003 loggerhead sea turtles were taken in the shark bottom longline fishery from 1994 through 2002 (NMFS, 2003a). An additional 503 unidentified sea turtles were estimated to have been taken. On average, 222 loggerhead sea turtles and 56 unidentified sea turtles were estimated to have been taken annually during this time period in the shark bottom longline fishery.

*Leatherback Sea Turtles*

Of the 65 observed sea turtle interactions in the bottom longline fishery from 1994 – 2006, six were leatherback sea turtles of which one was dead and three were released with their condition unknown (Table 3.54 Table 3.55 and Figure 3.31). Based on extrapolation of observer data done for Amendment 1 to the FMP, it was estimated that 269 leatherback sea turtles were taken in the shark bottom longline fishery from 1994 through 2002 (NMFS, 2003a). On average, 30 leatherback sea turtle interactions occurred each year in the shark bottom longline fishery during this period. This analysis only estimates takes without discriminating between live and dead releases. Of the observed leatherback takes, approximately 25 percent were lethal. Applying the observed mortality rate of 25 percent to the total leatherback takes and an additional 42 percent post-release mortality estimate due to hook ingestion to the remaining, results in an estimated total number of leatherbacks killed as a result of the interaction with bottom longline gear at 17 per year. The leatherback mortality is very conservative because it is known that leatherbacks rarely ingest or bite hooks, but are usually foul hooked on their flippers or carapaces, reducing the likelihood of post-hooking release mortality. However, leatherback-specific data for this fishery is not available and therefore the most conservative estimate is used.

*Smalltooth Sawfish*

As of April 1, 2003, NMFS listed smalltooth sawfish as an endangered species (68 FR 15674) under the ESA. After reviewing the best scientific and commercial information, the status review team determined that the continued existence of the U.S. Distinct Population Segment of smalltooth sawfish was in danger of extinction throughout all or a significant portion of its range from a combination of the following four listing factors: the present or threatened destruction, modification, or curtailment of habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence. NMFS is working on designating critical habitat for smalltooth sawfish.

Sawfish have been observed caught (12 known interactions, 11 released alive, one released in unknown condition) in shark bottom longline fisheries from 1994 through 2006 (Morgan pers. comm., Burgess and Morgan, 2004; Carlson ) (Figure 3.32). Based on these observations, expanded sawfish take estimates for 1994 – 2002 were developed for the shark bottom longline fishery (NMFS, 2003a). A total of 466 sawfish were estimated to have been taken in this fishery from 1994 – 2002, resulting in an average of 52 per year. All but one of the observed sawfish was released alive.

*Marine Mammals*

Four delphinids have been observed caught and released alive between 1994 and 2004 (G. Burgess, pers. comm.). Bycatch estimates for the shark bottom longline fishery have not been extrapolated for marine mammals.

*Seabirds*

Bycatch of seabirds in the shark bottom longline fishery has been virtually non-existent. A single pelican has been observed killed from 1994 through 2005. The pelican was caught in January 1995 off the Florida Gulf Coast (between 25° 18.68 N, 81° 35.47 W and 25° 19.11 N, 81° 23.83 W) (G. Burgess, University of Florida, pers. comm., 2001). No expanded estimates of seabird bycatch or catch rates are available for the bottom longline fishery.

**Table 3.51 Species composition of observed bottom longline catch during 2003.** Source: Burgess and Morgan, 2004.

| Species | Total Number Caught | % Total Catch | % Management Category |
|---|---|---|---|
| **Large Coastal Sharks** | | | |
| Sandbar shark | 2719 | 30.63 | 44.78 |
| Blacktip shark | 1232 | 13.88 | 20.29 |
| Tiger shark | 665 | 7.49 | 10.95 |
| Spinner shark | 309 | 3.48 | 5.09 |
| Scalloped hammerhead | 259 | 2.92 | 4.27 |
| Bull shark | 257 | 2.90 | 4.23 |
| Nurse shark | 175 | 1.97 | 2.88 |
| Sand tiger | 108 | 1.22 | 1.78 |

| Species | Total Number Caught | % Total Catch | % Management Category |
|---|---|---|---|
| Dusky shark | 108 | 1.22 | 1.78 |
| Silky shark | 105 | 1.18 | 1.73 |
| Lemon shark | 60 | 0.68 | 0.99 |
| Great hammerhead | 55 | 0.62 | 0.91 |
| Bignose shark | 8 | 0.09 | 0.13 |
| Night shark | 8 | 0.09 | 0.13 |
| White shark | 3 | 0.03 | 0.05 |
| Caribbean shark | 1 | 0.01 | 0.02 |
| **Total** | 6072 | 68.41 | 100 |
| | | | |
| **Small Coastal Sharks** | | | |
| Atlantic sharpnose shark | 1996 | 22.49 | 80.32 |
| Blacknose shark | 484 | 5.45 | 19.48 |
| Bonnethead | 3 | 0.03 | 0.12 |
| Finetooth | 2 | 0.02 | 0.08 |
| **Total** | 2485 | 28.00 | 100.00 |
| | | | |
| **Pelagic Sharks** | | | |
| Sevengill | 5 | 0.06 | 45.45 |
| Shortfin mako | 2 | 0.02 | 18.18 |
| Bigeye sixgill | 2 | 0.02 | 18.18 |
| Bigeye thresher shark | 1 | 0.01 | 9.09 |
| Sixgill shark | 1 | 0.01 | 9.09 |
| **Total** | 11 | 0.12 | 100.00 |
| | | | |
| **Dogfish/Other Sharks** | | | |
| Smooth dogfish | 298 | 3.36 | |
| Unidentified sharks | 10 | 0.113 | |

**Table 3.52 Species composition of observed bottom longline catch during 2004.** Source: Burgess and Morgan, 2005.

| Species | Total Number Caught | % Total Catch | % Management Category |
|---|---|---|---|
| **Large Coastal Sharks** | | | |
| Sandbar shark | 2157 | 26.6 | 39.8 |
| Blacktip shark | 1107 | 13.6 | 20.4 |
| Tiger shark | 972 | 12.0 | 18.0 |
| Nurse shark | 440 | 5.4 | 8.1 |
| Silky shark | 254 | 3.1 | 4.7 |
| Scalloped hammerhead | 155 | 1.9 | 2.9 |
| Bull shark | 108 | 1.3 | 2.0 |
| Great hammerhead | 92 | 1.1 | 1.7 |

| Species | Total Number Caught | % Total Catch | % Management Category |
|---|---|---|---|
| Dusky shark | 54 | 0.7 | 1.0 |
| Night shark | 42 | 0.5 | 0.8 |
| Lemon shark | 17 | 0.2 | 0.3 |
| Sandtiger shark | 12 | 0.1 | 0.2 |
| Bignose shark | 5 | 0.1 | 0.1 |
| **Total** | 5415 | 66.7 | 100 |
| | | | |
| **Small Coastal Sharks** | | | |
| Atlantic sharpnose shark | 2231 | 27.5 | 85.8 |
| Blacknose shark | 353 | 4.3 | 13.6 |
| Bonnetheat shark | 10 | 0.1 | 0.4 |
| Finetooth shark | 5 | 0.1 | 0.2 |
| **Total** | 2599 | 32.0 | 100 |
| | | | |
| **Pelagic Sharks** | | | |
| Sevengill shark | 2 | 0.02 | 25.0 |
| Sixgill shark | 1 | 0.01 | 12.5 |
| Shortfin mako shark | 3 | 0.01 | 37.5 |
| Bigeye thresher shark | 2 | 0.02 | 25.0 |
| **Total** | 8 | 0.1 | 100 |
| | | | |
| **Dogfish Sharks** | | | |
| Smooth dogfish | 85 | 1.0 | 97.7 |
| Spiny dogfish | 2 | 0.02 | 2.3 |
| **Total** | 87 | 1.1 | 100 |
| | | | |
| **Other Sharks** | | | |
| Unidentified | 5 | 0.1 | 71.4 |
| *Carcharhinus* sp. | 2 | 0.02 | 28.6 |
| **Total** | 7 | 0.1 | 100 |

**Table 3.53 Directed bottom longline shark observed catch and disposition, 2003.** Source: Burgess and Morgan, 2004.

| | Number caught | Percent total mortality | Number Carcassed* | Percent Carcassed | Other mortality** | Percent other mortality | Number Tagged released | Percent Released |
|---|---|---|---|---|---|---|---|---|
| **Small Coastal** | 2,485 | 94.85 | 295 | 11.87 | 2,062 | 82.98 | 127 | 5.11 |
| **Large Coastal** | 6,072 | 86.68 | 4,677 | 77.03 | 586 | 9.65 | 809 | 13.32 |
| **Pelagic** | 11 | 90.91 | 2 | 18.18 | 8 | 72.73 | 1 | 9.09 |
| | | | | | | | | |
| **Large coastal sharks:** | | | | | | | | |
| Sandbar | 2,719 | 97.35 | 2,597 | 95.51 | 50 | 1.84 | 72 | 2.65 |
| Blacktip | 1,232 | 99.51 | 1,207 | 97.97 | 19 | 1.54 | 6 | 0.49 |
| Tiger | 665 | 40.60 | 41 | 6.17 | 229 | 34.44 | 395 | 59.40 |
| Spinner | 309 | 100.00 | 302 | 97.73 | 7 | 2.27 | | 0.00 |
| Scalloped hammerhead | 259 | 98.84 | 86 | 33.20 | 170 | 65.64 | 3 | 1.16 |
| Bull | 257 | 96.89 | 248 | 96.50 | 1 | 0.39 | 8 | 3.11 |
| Nurse | 175 | 0.57 | 0 | 0.00 | 1 | 0.57 | 174 | 99.43 |
| Dusky | 108 | 76.85 | 38 | 35.19 | 45 | 41.67 | 25 | 23.15 |
| Sand tiger | 108 | 0.00 | 0 | 0.00 | 0 | 0.00 | 108 | 100.00 |
| Silky | 105 | 97.14 | 78 | 74.29 | 24 | 22.86 | 3 | 2.86 |
| Lemon | 60 | 86.67 | 52 | 86.67 | 0 | 0.00 | 8 | 13.33 |
| Great hammerhead | 55 | 96.36 | 25 | 45.45 | 28 | 50.91 | 2 | 3.64 |
| Bignose | 8 | 75.00 | 3 | 37.50 | 3 | 37.50 | 2 | 25.00 |
| Night | 8 | 100.00 | 0 | 0.00 | 8 | 100.00 | | 0.00 |
| White | 3 | 33.33 | 0 | 0.00 | 1 | 33.33 | 2 | 66.67 |
| Caribbean | 1 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 100.00 |
| | | | | | | | | |
| **Small coastal sharks:** | | | | | | | | |
| Sharpnose | 1,996 | 96.24 | 14 | 0.70 | 1,907 | 95.54 | 74 | 3.71 |
| Blacknose | 484 | 89.05 | 276 | 57.02 | 155 | 32.02 | 53 | 10.95 |
| Bonnethead | 3 | 100.00 | 3 | 100.00 | 0 | 0.00 | 0 | 0.00 |
| Finetooth | 2 | 100.00 | 2 | 100.00 | 0 | 0.00 | 0 | 0.00 |
| | | | | | | | | |
| **Pelagic sharks:** | | | | | | | | |
| Bigeye thresher | 5 | 100.00 | 0 | 0.00 | 5 | 100.00 | 0 | 0.00 |
| Sevengill | 2 | 0.00 | 0 | 0.00 | 2 | 100.00 | 0 | 0.00 |
| Shortfin mako | 2 | 0.00 | 2 | 100.00 | 0 | 0.00 | 0 | 0.00 |
| Sixgill | 1 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 100.00 |
| Bigeye sixgill | 1 | 0.00 | 0 | 0.00 | 1 | 100.00 | 0 | 0.00 |

* Carcassed means sharks that are retained

** Other mortality refers to sharks brought to the vessel dead, but not retained

**Table 3.54 Total number of Observed Sea Turtle Interactions by Species by Month for Years 1994-2006 in the Shark Bottom Longline Fishery.** Source: Shark Bottom Longline Observer Program.

| Month | Leatherback Sea Turtle | Loggerhead Sea Turtle | Other Sea Turtles | Total |
|---|---|---|---|---|
| Jan | 1 | 12 | 1 | 14 |
| Feb | 3 | 10 | 6 | 19 |
| Mar | | 7 | | 7 |
| Apr | | 4 | | 4 |
| May | 1 | | | 1 |
| Jun | | | | |
| July | | 11 | | 11 |
| Aug | | 3 | | 3 |
| Sept | 1 | 2 | 1 | 4 |
| Oct | | 1 | 1 | 2 |
| Nov | | | | |
| Dec | | | | |
| **Total** | 6 | 50 | 9 | 65 |

**Table 3.55 Total number of Observed Sea Turtle Interactions by Year for Years 1994-2006 in the Shark Bottom Longline Fishery.** Source: Shark Bottom Longline Observer Program. Letters in parentheses indicate whether the sea turtle was released alive (A), dead (D), or in an unknown (U) condition.

| Year | Leatherback Sea Turtle | Loggerhead Sea Turtle | Other Sea Turtle | Total |
|---|---|---|---|---|
| 1994 | 1 (1U) | 5 (5U) | 6 (6U) | 12 |
| 1995 | | 4 (3A, 1D) | | 4 |
| 1996 | 1 (1U) | 6 (3A, 2D, 1U) | | 7 |
| 1997 | 1 (1U) | 5 (3A, 2U) | | 6 |
| 1998 | | 2 (1A, 1D) | 1 (1A) | 3 |
| 1999 | | 2 (2A) | | 2 |
| 2001 | 1 (1D) | 2 (2A) | | 3 |
| 2002 | | 5 (3A, 1D, 1U) | | 5 |
| 2003 | | 7 (6A, 1D) | 1 (1U) | 8 |
| 2004 | | 5 (3A, 2D) | | 5 |
| 2005 | 2 (1A, 1D) | 4 (1A, 3D) | 1 (1U) | 7 |
| 2006 | | 2 (1D, 1U) | | 3 |
| Total | 6 | 50 | 9 | 65 |

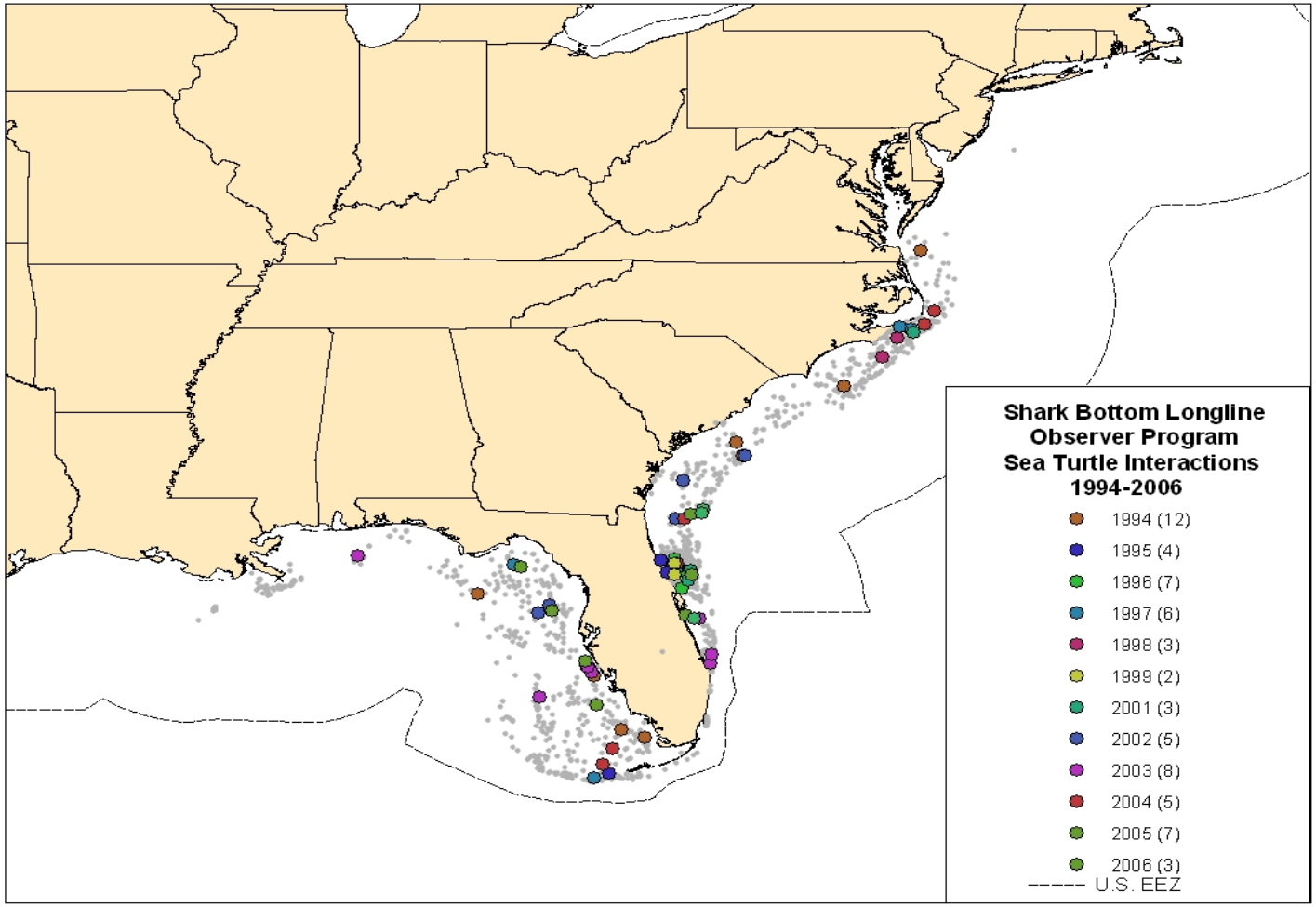



**Figure 3.31** **Observed sea turtle interactions and observed sets (smaller grey circles) in the shark bottom longline fishery from 1994-2004**. Source: Burgess and Morgan, 2004.

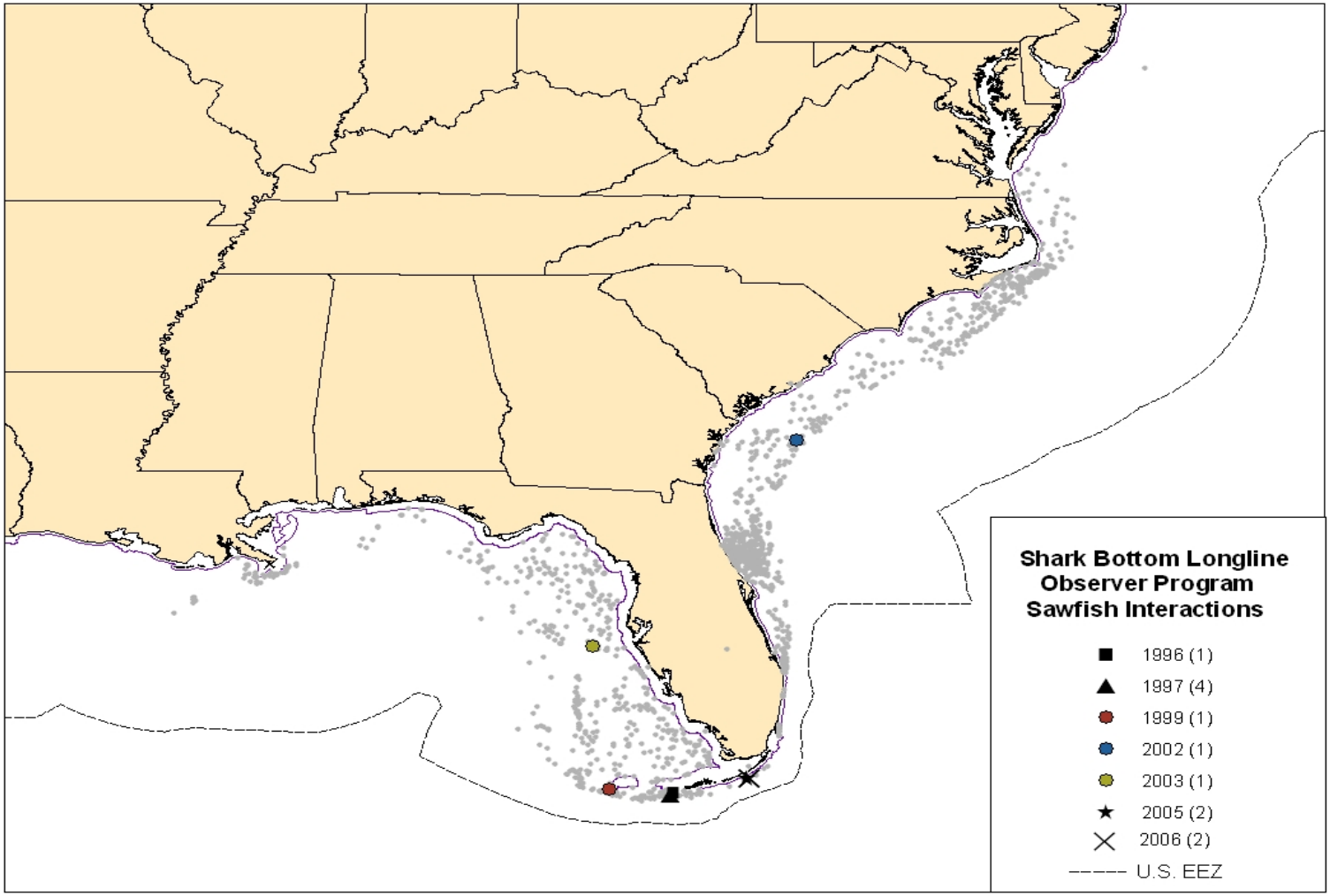



**Figure 3.32 Observed sawfish interactions and observed sets (smaller grey circles) in the shark bottom longline fishery from 1994-2006.** Source: Burgess and Morgan, 2004.

### 3.4.6 Gillnet Fishery

#### 3.4.6.1 Domestic History and Current Management

The southeast shark gillnet fishery is comprised of several vessels based primarily out of ports in northern Florida (South Atlantic Region) that use nets typically 456 to 2,280 meters long and 6.1 to 15.2 meters deep, with stretched mesh from 12.7 to 22.9 cm. This fishery is currently prohibited in the state waters off South Carolina, Georgia, and Florida, thereby forcing some of these vessels to operate in deeper waters under Federal jurisdiction, where gillnets are less effective. The entire process (set to haulback) takes approximately 9 hours (Carlson and Baremore, 2002a).

The 2005 Directed Shark Gillnet Fishery Observer Program report described the gear and soak time deployed by drift gillnet, strike gillnet, and sink gillnet fishermen. Set duration was generally 0.3 hours and haulback averaged 2.9 hours. The average time from setting the net through completion of haulback was 10.2 hours. The most frequently used mesh size for drift gillnets was 12.7 cm. Strikenetters use the largest mesh size (22.9 cm) and the set times were 2.7 hours. Sink gillnets used to target sharks generally use 17.8 cm mesh size and were soaked for approximately 0.8 hours. This gear was also observed being deployed to target non-HMS (kingfish or Spanish mackerel); using a stretched mesh size of 7.6 cm, to comply with mesh size regulations for the Spanish mackerel fishery, and soaked for approximately 5.9 hours (Carlson and Bethea, 2006).

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 March 31). 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. Additionally, in 2001, NMFS established a requirement to conduct net checks every two hours to look for and remove any protected species.

#### 3.4.6.2 Recent Catch and Landings

The following section provides information on shark landings as reported in the shark gillnet observer program. For recent catch and landings data for the shark fishery as a whole, which includes landings from gillnet, BLL, and other gears combined, please refer to Section 3.4.7. A total of 24 driftnet sets were observed on five vessels from February through September, 2004. Driftnet vessels carried nets ranging in length from 547.2 – 2736 m; depths from 7.6 – 13.7 m and stretched mesh sizes from 12.7 – 22.9 cm. The most frequently used mesh size was 12.7 cm. For all observed driftnet sets, set duration averaged 0.4 hrs. Sets were made in seawater averaging 15.4 m deep. Haulback and processing of the catch averaged 3.4 hrs. Average soak time for the driftnet (time net was first set minus time haulback began) was 10.8 hrs.

The observed driftnet catch consisted of nine species of sharks. Three species of sharks made up 92.9 percent (by number) of the observed shark catch (Table 3.57). These species were the Atlantic sharpnose shark, blacknose shark, and finetooth shark. By weight, the shark catch was made up of Atlantic sharpnose shark, (55.3 percent), blacknose shark (17.1 percent), blacktip shark (10.7 percent), and finetooth shark (10.3 percent). Total observed catch composition (percent of numbers caught) was 79.0 percent sharks, 20.7 percent teleosts, 0.3 percent rays, and 0.03 percent protected species (*i.e.*, marine mammals, sea turtles, sawfish).

*Gillnet Bycatch*

On September 23, 2002, NMFS implemented a restricted area to reduce bycatch of right whales from November 15 through March 31 (67 FR 59471). In this area, only gillnets used in a strikenet fashion can operate during times when right whales are present. Operation in this area at that time requires 100 percent observer coverage. Vessels fishing in a strikenet fashion used nets 364.8 meters long, 30.4 meters deep, and with mesh size 22.9 cm. Observed catch in the strikenet fishery consisted of 6 species of sharks (96.7 percent of total number caught) and seven species of teleosts and rays (3.3 percent of total number caught). No marine mammals or sea turtles were observed caught. The blacktip shark made up 97.5 percent of the number of sharks caught, and 86 percent of the overall catch. Bycatch included crevalle jack, red drum, and great barracuda (Table 3.56).

There were 23 species of teleosts, two species of rays, and one species of marine mammal observed caught during the driftnet season (Table 3.58). Four species of teleosts and rays made up 90.8 percent by number of the overall non-shark species in observed strikenet catches. These species were little tunny (45.6 percent); king mackerel (23.3 percent); great barracuda (11.8 percent); and red drum (10.2 percent). For incidental driftnet catch species, the highest proportion discarded dead (with observed catch greater than 10 specimens) was Atlantic sailfish, (100.0 percent), king mackerel (78.3 percent), and cobia (28.7 percent). Red drum had the highest discard proportion alive (98.1 percent) (Carlson and Baremore, 2003). Observed driftnet sets caught 23 species of teleosts and rays and no sea turtles or marine mammals. Only the great barracuda were retained, with all remaining bycatch discarded alive (Carlson, 2002).

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

On January 22, 2006, a dead right whale was spotted offshore of Jacksonville Beach, Florida. The survey team identified the whale as a right whale calf, and photos indicated the calf as having one large wound along the midline and smaller lesions around the base of its tail. The right whale calf was located at 30°14.4' N. Lat., 81° 4.2'' W. Long., which was approximately 1

nautical mile outside of the designated right whale critical habitat, but within the Southeast U.S. Restricted Area. NMFS determined that both the entanglement and death of the whale occurred within the Southeast U.S. Restricted Area, and all available evidence suggested the entanglement and injury of the whale by gillnet gear ultimately led to the death of the animal.

On February 16, 2006, NMFS published a temporary rule (71 FR 8223) to prohibit, through March 31, 2006, any vessel from fishing with any gillnet gear in the Atlantic Ocean waters between 32°00' N. Lat. (near Savannah, GA) and 27°51' N. Lat. (near Sebastian Inlet, FL) and extending from the shore eastward out to 80°00' W. long under the authority of the Atlantic Large Whale Take Reduction Plan (ALWTRP) (50 CFR 229.32 (g)) and the Endangered Species Act. NMFS took this action based on its determination that a right whale mortality was the result of an entanglement by gillnet gear within the Southeast U.S. Restricted Area.

The regulations at 50 CFR 229.32(g)(1) also require NMFS to close the Southeast U.S. Restricted Area for the rest of the time period, and for the time period November 15 through March 31 in each subsequent year, unless NMFS revises the restricted period or unless other measures are implemented. NMFS plans to seek assistance and recommendations from the ALWTRT at their next meeting in order to evaluate whether permanent closures within the Southeast U.S. Restricted Area are necessary.

*Loggerhead Sea Turtles*

Loggerhead sea turtles are rarely caught in the shark gillnet fishery. During the 1999 right whale calving season, no loggerhead sea turtles were observed caught in this fishery (Carlson and Lee, 1999), and no loggerheads were observed caught with strikenets during the 2000 – 2002 right whale calving seasons (Carlson 2000; Carlson and Baremore, 2001; Carlson and Baremore, 2002a). However, three loggerhead sea turtles were observed caught with drift gillnets during right whale calving season, one each year from 2000 to 2002 (Carlson, 2000; Carlson and Baremore, 2001; Carlson and Baremore, 2002a; Garrison, 2003). In 2004 there were no observed sea turtle interactions in either the strikenet or drift gillnet fisheries.

No loggerhead sea turtles were caught outside of the right whale calving season in 2002 (Carlson and Baremore, 2002b), and no loggerhead turtles were observed caught during or after the right whale calving season in 2003 or 2004 in the directed shark gillnet fishery (Carlson and Baremore 2003; Carlson, pers. comm). In 2005 five loggerheads were observed caught, and in 2006 three loggerheads were observed caught (Table 3.59). All but two were released alive. One loggerhead sea turtle mortality was reported in abandoned fishing gear in January 2004, and was not considered part of normal fishing operations.

*Leatherback Sea Turtles*

In the shark gillnet fishery, leatherback sea turtles are sporadically caught. During the 1999 right whale calving season, two leatherback sea turtles were caught in this fishery, and both were released alive (Carlson and Lee, 1999). No leatherback sea turtles were observed caught with strikenets during the 2000 – 2002 right whale calving seasons (Carlson, 2000; Carlson and Baremore, 2001; Carlson and Baremore, 2002a). Leatherback sea turtles have been observed caught in shark drift gillnets including 14 in 2001 and two in 2002 (Carlson, 2000; Carlson and

Baremore, 2001; Carlson and Baremore, 2002a; Garrison, 2003). NMFS temporarily closed the shark gillnet fishery (strikenetting was allowed) from March 9 to April 9, 2001, due to the increased number of leatherback interactions that year (66 FR 15045, March 15, 2001).

From 2003 – 2004, no leatherback sea turtles were observed caught in gillnets fished in strikenet or driftnet methods (Carlson and Baremore 2003; Carlson, pers. comm.).

*Smalltooth Sawfish*

To date there has been only one observed catch of a smalltooth sawfish in shark gillnet fisheries (Table 3.60). The sawfish was taken on June 25, 2003, in a gillnet off southeast Florida and was released alive (Carlson and Baremore, 2003). The set was characteristic of a typical drift gillnet set, with gear extending 30 to 40 feet deep in 50 to 60 feet of water. Prior to this event it was speculated that the depth at which drift gillnets are set above the sea floor may preclude smalltooth sawfish from being caught. Although sometimes described as a lethargic demersal species, smalltooth sawfish feed mostly on schooling fish, thus they would occur higher in the water column during feeding activity. In fact, smalltooth sawfish and Atlantic sharks may be attracted to the same schools of fish, potentially making smalltooth sawfish quite vulnerable if present in the area fished. The previous absence of smalltooth sawfish incidental capture records is more likely attributed to the relatively low effort in this fishery and the rarity of smalltooth sawfish, especially in Federal waters. These factors may result in little overlap of the species with the gear. The sawfish was cut from the net and released alive with no visible injuries. This indicates that smalltooth sawfish can be removed safely if entangled gear is sacrificed.

Given the high rate of observer coverage in the shark gillnet fishery, NMFS believes that smalltooth sawfish takes in this fishery are very rare. The fact that there were no smalltooth sawfish caught during 2001 when 100 percent of the fishing effort was observed indicates that smalltooth sawfish takes (observed or total) most likely do not occur on an annual basis. Based on this information, the 2003 BiOp estimated that one incidental capture of a sawfish (released alive) over the next five years, will occur as a result of the use of gillnets in this fishery (NMFS, 2003a).

*Marine Mammals*

Observed takes of marine mammals in the Southeast Atlantic shark gillnet fishery during 1999 – 2004, totaled 12 bottlenose dolphins and four spotted dolphins. Extrapolated observations from these data suggest serious injury and mortality of 25 bottlenose dolphin and one Atlantic spotted dolphin in the shark gillnet fishery from 1999 through 2002 (Garrison, 2003).

Table 3.56 Total Strikenet Shark Catch and Bycatch by Species in order of Decreasing Abundance for all Observed Trips, 2003. **Source: Carlson and Baremore, 2003.**

| Species | Total Number Caught | Kept (%) | Discarded Alive (%) | Discarded Dead (%) |
|---|---|---|---|---|
| Blacktip shark | 6,401 | 97.5 | .6 | 1.9 |
| Blacknose shark | 343 | 100.0 | 0 | 0 |
| Crevalle jack | 215 | 96.2 | 3.3 | .5 |
| Red Drum | 18 | 0 | 100 | 0 |
| Great barracuda | 13 | 92.3 | 0 | 7.7 |
| Manta ray | 10 | 0 | 100 | 0 |
| Bull shark | 8 | 75 | 12.5 | 12.5 |
| Permit | 8 | 50 | 37.5 | 12.5 |
| Nurse shark | 1 | 0 | 100 | 0 |
| Spinner shark | 1 | 100 | 0 | 0 |
| Finetooth shark | 1 | 100 | 0 | 0 |
| Cobia | 1 | 100 | 0 | 0 |
| Atlantic bonito | 1 | 0 | 0 | 100 |
| **Total** | **7,021** | | | |

**Table 3.57 Total Shark Catch by Species and Species Disposition in Order of Decreasing Abundance for all Observed Driftnet Sets, 2003.** Source: Carlson and Baremore, 2003.

| Species | Total Number Caught | Kept (%) | Discarded Alive (%) | Discarded Dead (%) |
|---|---|---|---|---|
| Atlantic sharpnose | 6,917 | 99.8 | 0 | .2 |
| Blacknose | 799 | 100 | 0 | 0 |
| Finetooth | 620 | 100 | 0 | 0 |
| Blacktip | 375 | 45 | 24 | 31 |
| Bonnethead | 168 | 100 | 0 | 0 |
| Scalloped Hammerhead | 62 | 3.2 | 0 | 96.8 |
| Spinner | 20 | 5 | 0 | 95 |
| Great Hammerhead | 6 | 100 | 0 | 0 |
| Lemon | 1 | 0 | 100 | 0 |
| **Total** | **8,968** | | | |

**Table 3.58 Total bycatch in NMFS observed drift gillnet sets in order of decreasing abundance and species disposition for all observed trips, 2003. Source: Carlson, 2003.**

| Species | Total Number Caught | Kept (%) | Discard Alive (%) | Discard Dead (%) |
|---|---|---|---|---|
| Little tunny | 1169 | 92.6 | 0 | 7.4 |
| King mackerel | 596 | 21.5 | .2 | 78.3 |
| Barracuda | 300 | 100 | 0 | 0 |
| Red drum | 262 | 0 | 98.1 | 1.9 |
| Cobia | 80 | 70 | 1.3 | 28.7 |
| Blackfin tuna | 36 | 100 | 0 | 0 |
| Atlantic sailfish | 30 | 0 | 0 | 100 |
| Cownose ray | 22 | 0 | 59.1 | 40.9 |
| Spanish mackerel | 11 | 100 | 0 | 0 |
| Remora | 9 | 0 | 33.4 | 66.6 |
| Crevalle jack | 8 | 0 | 0 | 100 |
| Blue runner | 8 | 87.5 | 0 | 12.5 |
| Tarpon | 5 | 0 | 0 | 100 |
| Manta ray | 5 | 0 | 100 | 0 |
| Dolphin | 5 | 100 | 0 | 0 |
| Tripletail | 4 | 100 | 0 | 0 |
| Spotted eagle ray | 2 | 0 | 100 | 0 |
| Blue marlin | 2 | 0 | 0 | 100 |
| Balloonfish | 2 | 0 | 0 | 100 |
| Wahoo | 1 | 100 | 0 | 0 |
| Pompano | 1 | 100 | 0 | 0 |
| Rainbow runner | 1 | 100 | 0 | 0 |
| Black drum | 1 | 0 | 100 | 0 |
| Bluefish | 1 | 0 | 0 | 100 |

**Table 3.59 Total number of Observed Sea Turtle Interactions by Year from 2000-2006 in the Shark Gillnet Fishery.** Source: Directed Shark Gillnet Observer Program. Letters in parentheses indicate whether the sea turtle was released alive (A), dead (D), or unknown (U).

| Year | Leatherback Sea Turtle | Loggerhead Sea Turtle | Total |
|---|---|---|---|
| 2000 | | 1 (U) | 1 |
| 2001 | | 1 (U) | 1 |
| 2002 | | 1 (U) | 1 |
| 2003 | | | 0 |
| 2004 | | | 0 |
| 2005 | 1(A) | 5 (4A, 1D) | 6 |
| 2006 | | 3 (2A, 1D) | 3 |
| **Total** | 1 | 11 | 12 |

**Table 3.60 Protected Species Interactions in Drift Gillnet Sets During the Directed Shark Gillnet Fishery for All Observed Trips, 2003.** Source: Carlson, 2003.

| Species | Total Number Caught | Released Alive | Discarded Dead | Released Condition Unknown or Comatose |
|---|---|---|---|---|
| Bottlenose dolphin | 2 | 0 | 1 | 1 |
| Smalltooth sawfish | 1 | 1 | 0 | 0 |

### 3.4.7 Fishery Data: Landings by Species

The following tables of finfish landings are taken from the 2005 National Report of the United States to ICCAT (NAT-038) (NMFS, 2005). 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 2004 HMS SAFE report. Landings for sharks were compiled from the most recent stock assessment documents.

**Table 3.61 U.S. Landings (mt) of Bluefin Tuna by Gear and Area, 1997-2004.** Source: NMFS, 2005

| Area | Gear | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 26.0 | 30.5 | 25.1 | 22.8 | 17.7 | 7.8 | 16.3 | 28.8 |
| | Handline | 17.4 | 29.2 | 15.5 | 3.2 | 9.0 | 4.5 | 2.5 | 1.5 |
| | Purse Seine | 249.7 | 248.6 | 247.9 | 275.2 | 195.9 | 207.7 | 265.4 | 31.8 |
| | Harpoon | 97.5 | 133.1 | 115.8 | 184.2 | 101.9 | 55.5 | 87.9 | 41.2 |
| | *Rod and reel (>145 cm LJFL) | 752.6 | 610.4 | 657.5 | 632.8 | 993.4 | 1,008.4 | 684.8 | 329.0 |
| | *Rod and reel (<145 cm LJFL) | 178.9 | 166.3 | 103.0 | 49.5 | 249.3 | 519.3 | 314.6 | 387.8 |
| | Unclassified | 2.2 | 0.6 | 0.1 | 0.2 | 0.5 | 0.0 | 0.0 | 0.2 |
| Gulf of Mexico | Longline | 23.8 | 18.3 | 48.4 | 43.3 | 19.8 | 32.8 | 53.8 | 67.3 |
| | *Rod and reel | 0.0 | 0.0 | 0.4 | 0.9 | 1.7 | 1.5 | 0.0 | 0.0 |
| NC Area 94a | Longline | | | 0.0 | 0.0 | 0.0 | 9.3 | 11.3 | |
| All Areas | All Gears | 1,348.1 | 1,237 | 1,214.1 | 1,212.1 | 1,582.8 | 1,840.2 | 1,428.2 | 887.6 |

* 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 3.62 U.S. Landings (mt) of Yellowfin Tuna by Gear and Area, 1997-2004.** Source: NMFS, 2005.

| Area | Gear | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 838.9 | 464.9 | 581.3 | 734.5 | 631.8 | 400 | 272 | 654 |
| | Rod and reel* | 3,560.9 | 2,845.7 | 3,818.2 | 3,809.5 | 3,690.5 | 2,624 | 4,672 | 3,434 |
| | Troll | 218 | 177.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Purse seine | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Gillnet | 1.3 | 1.7 | 0.2 | 0.2 | 7.6 | 5 | 1 | 3 |
| | Trawl | 1.9 | 0.7 | 4.1 | 1.8 | 2.7 | 0 | 2 | 1 |
| | Harpoon | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 34.3 | 0.0 | 192 | 235.7 | 242.5 | 137 | 148 | 208 |
| | Trap | ** | 0.1 | 0.8 | 0.5 | 0.1 | 0.0 | 0.0 | 0 |
| | Unclassified | 0.0 | 0.0 | 2.1 | 1.3 | 6.8 | ** | 0.0 | 13 |
| Gulf of Mexico | Longline | 2,571.3 | 1,864.5 | 2,736.6 | 2,133 | 1,505.5 | 2,109 | 1,828 | 1,813 |
| | Rod and reel* | 7.7 | 80.9 | 149.4 | 52.3 | 494.2 | 200 | 640 | 247 |
| | Handline | 55.6 | 60.8 | 12.7 | 28.6 | 43.4 | 100 | 59 | 19 |
| | Gillnet | 0.0 | 0.0 | ** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Unclassified | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Caribbean | Longline | 135.4 | 58.6 | 24.4 | 11.8 | 23.1 | 12 | 7 | 5 |
| | Troll | 19.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 0.7 | 3.9 | 14.5 | 19.4 | 14.3 | 7 | 9 | 7 |
| | Gillnet | ** | 0.0 | 0.0 | 0.1 | 0.3 | 0.0 | ** | 0.0 |
| | Trap | 0.1 | 0.0 | 0.1 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 |
| NC Area 94a | Longline | 6.1 | 4.6 | 0.2 | 2.1 | 3.5 | 0.0 | 5 | 0.0 |
| SW Atlantic | Longline | 221.9 | 55.3 | 32.4 | 19.8 | 36.2 | 52 | 42 | 17 |
| All Areas | All Gears | 7,673.7 | 5,619.2 | 7,569 | 7,050.9 | 6,702.8 | 5,646 | 7,685 | 6,421 |

* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.
** $\leq$ 0.05 mt

**Table 3.63 U.S. Landings (mt) of Skipjack Tuna by Gear and Area, 1997-2004.** Source: NMFS, 2005.

| Area | Gear | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 1.0 | 0.7 | 0.3 | 0.0 | 0.1 | ** | 0.9 | 0.1 |
| | Rod and reel* | 42.0 | 49.5 | 63.6 | 13.1 | 32.9 | 23.3 | 34.0 | 27.3 |
| | Troll | 0.6 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Purse seine | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Gillnet | 8.9 | 16.9 | 26.5 | 1.9 | 3.6 | ** | 0.9 | 15.8 |
| | Trawl | 0.0 | 0.2 | 1.0 | 0.0 | 0.2 | ** | 0.5 | 0.2 |
| | Handline | 0.1 | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.6 |
| | Trap | 0.0 | 0.0 | 17.5 | 0.0 | 0.0 | ** | 1.5 | ** |
| | Pound | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Unclassified | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gulf of Mexico | Longline | 1.3 | 0.6 | 0.4 | 0.2 | 0.2 | ** | ** | 0.3 |
| | Rod and reel* | 21.7 | 37.0 | 34.8 | 16.7 | 16.1 | 13.2 | 11.0 | 6.3 |
| | Handline | 0.0 | 0.0 | 0.4 | 0.7 | 0.0 | 0.0 | ** | 0.2 |
| | Trap | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Unclassified | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Caribbean | Longline | 1.2 | 0.0 | 1.3 | 1.6 | 4.0 | 2.5 | 3.3 | 0.3 |
| | Gillnet | 0.2 | 0.0 | 0.4 | 0.6 | 1.6 | 0.6 | 0.4 | 0.3 |
| | Rod and Reel* | NA | NA | NA | NA | NA | NA | 15.7 | 40.4 |
| | Harpoon | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 0.0 | 0.0 | 5.8 | 8.8 | 10.3 | 12.5 | 9.2 | 9.6 |
| | Trap | ** | 0.0 | 0.1 | 0.3 | 0.4 | 0.7 | 0.2 | ** |
| | Troll | 7.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| SW Atlantic | Unclassified | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| All Areas | Longline | ** | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | All Gears | 84.3 | 105.3 | 152.3 | 44.1 | 69.6 | 53.0 | 77.8 | 101.4 |

* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.
** $\leq$ 0.05 mt

**Table 3.64 U.S. Landings (mt) of Bigeye Tuna by Area and Gear, 1997-2004.** Source: NMFS, 2005.

| Area | Gear | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 476.3 | 544.3 | 737.8 | 333.2 | 506.1 | 328.6 | 168.7 | 264.9 |
| | Rod and reel* | 333.5 | 228.0 | 316.1 | 34.4 | 366.2 | 49.6 | 188.5 | 94.6 |
| | Troll | 3.9 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Gillnet | ** | 0.4 | 0.2 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 |
| | Handline | 2.7 | 0.0 | 11.9 | 4.1 | 33.2 | 13.8 | 6.0 | 3.0 |
| | Trawl | 1.0 | 0.5 | 1.2 | 1.7 | 0.4 | 0.5 | ** | 0.3 |
| | Unclassified | 0.5 | 0.0 | 0.9 | 0.0 | 1.8 | 0.0 | 0.0 | 1.4 |
| Gulf of Mexico | Longline | 33.9 | 25.6 | 54.6 | 44.5 | 15.3 | 41.0 | 27.5 | 20.2 |
| | Rod and reel* | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 |
| | Handline | ** | 0.1 | 0.2 | 0.1 | 0.5 | 0.6 | 0.3 | 0.1 |
| Caribbean | Longline | 50.0 | 48.5 | 23.2 | 13.7 | 31.9 | 29.7 | 7.2 | 3.5 |
| | Handline | 0.0 | 0.0 | 0.2 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| NC Area 94a | Longline | 91.8 | 48.4 | 35.3 | 63.1 | 61.0 | 45.2 | 36.9 | 5.0 |
| SW Atlantic | Longline | 142.8 | 28.5 | 78.2 | 77.4 | 68.2 | 91.3 | 44.6 | 14.4 |
| All Areas | All Gears | 1,136.4 | 928.3 | 1,261.4 | 573.6 | 1,084.7 | 600.3 | 479.8 | 413.3 |

* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.
** $\leq$ 0.05

**Table 3.65 U.S. Landings (mt) of Albacore Tuna by Gear and Area, 1997-2004.** Source: NMFS, 2005.

| Area | Gear | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 140.0 | 155.4 | 179.5 | 130.5 | 171.7 | 124.0 | 95.6 | 106.9 |
| | Gillnet | 42.8 | 40.1 | 27.0 | 0.8 | 3.3 | 2.6 | 0.1 | 4.7 |
| | Handline | 4.8 | 0.0 | 0.6 | 2.9 | 1.7 | 3.9 | 1.4 | 5.4 |
| | Trawl | 2.6 | 2.4 | 0.4 | 0.0 | 0.0 | 0.3 | ** | 2.6 |
| | Troll | 1.6 | 5.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Rod and reel* | 220.2 | 601.1 | 90.1 | 250.8 | 122.3 | 323.0 | 333.8 | 500.5 |
| | Pound | 1.3 | 0.9 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Unclassified | 0.2 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| Gulf of Mexico | Longline | 16.9 | 3.9 | 3.8 | 4.1 | 4.9 | 9.5 | 7.7 | 9.8 |
| | Rod and reel* | 49.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 0.0 | 0.0 | ** | 0.0 | 0.0 | 0.0 | ** | 0.0 |
| Caribbean | Longline | 16.1 | 17.8 | 8.3 | 9.2 | 8.7 | 8.4 | 4.0 | 3.2 |
| | Troll | 3.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Gillnet | ** | 0.0 | 0.2 | 0.1 | 0.5 | ** | ** | ** |
| | Trap | ** | 0.0 | ** | 0.2 | 0.3 | 0.6 | 0.2 | 0.0 |
| | Handline | 0.0 | 0.0 | 3.8 | 5.0 | 2.2 | 2.7 | 2.0 | 2.1 |
| NC Area 94a | Longline | 11.4 | 1.6 | 1.5 | 2.6 | 6.1 | 4.8 | 1.6 | 0.2 |
| SW Atlantic | Longline | 4.7 | 1.4 | 1.4 | 0.9 | 2.4 | 8.3 | 2.0 | 0.5 |
| All Areas | All Gears | 515.5 | 830.4 | 317 | 407.2 | 324.2 | 488.1 | 448.4 | 635.9 |

* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.
** $\leq$ 0.05 mt

**Table 3.66 U.S. Catches and Landings (mt) of Swordfish by Gear and Area, 1997-2004.** Source: NMFS, 2005.

| Area | Gear | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | *Longline | 1,262.2 | 1,624.1 | 1,872.3 | 1,547.6 | 1,220.8 | 1,132.8 | 1,341.3 | 1,157.8 |
| | Gillnet | 0.4 | 36.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | ** |
| | Pair Trawl | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 1.3 | 0.0 | 5.0 | 7.7 | 8.6 | 8.8 | 10.8 | 18.4 |
| | Trawl | 8.0 | 5.9 | 7.5 | 10.9 | 2.5 | 3.9 | 6.0 | 7.6 |
| | Troll | 0.4 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | *Unclassified | 11.9 | 9.1 | 3.8 | 1.4 | 1.8 | 0.1 | 1.6 | 9.8 |
| | Harpoon | 0.7 | 1.5 | 0.0 | 0.6 | 7.4 | 2.8 | 0.0 | 0.5 |
| | ***Rod and Reel | 10.9 | 4.7 | 21.3 | 15.6 | 1.5 | 21.5 | 5.9 | 24.3 |
| | Trap | 0.0 | 0.1 | ** | 0.0 | 0.0 | ** | 0.1 | 0.0 |
| Gulf of Mexico | *Longline | 759.9 | 633.1 | 579.6 | 631.7 | 494.6 | 549.1 | 507.6 | 500.0 |
| | Handline | 0.0 | 0.0 | ** | 1.2 | 0.3 | 2.9 | 9.8 | 1.6 |
| Caribbean | *Longline | 688.9 | 516.0 | 260.5 | 331.9 | 347.0 | 329.0 | 274.5 | 295.8 |
| | Trap | | | 0.0 | 0.3 | 0.0 | 0.1 | ** | ** |
| NC Atlantic | *Longline | 688.2 | 658.6 | 650.0 | 804.6 | 420.6 | 587.9 | 632.8 | 597.4 |
| SW Atlantic | *Longline | 417.9 | 170.1 | 185.2 | 143.8 | 43.2 | 199.9 | 20.9 | 15.7 |
| All Areas | All Gears | 3,850.7 | 3,660.2 | 3,585.2 | 3,497.3 | 2,548.3 | 2,838.9 | 2,811.3 | 2,628.9 |

* Includes landings and estimated dead discards from scientific observer and logbook sampling programs.
** $\leq$ = 0.5 mt
*** Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.

**Table 3.67 U.S. Landings (mt) and dead discards of Blue Marlin, White Marlin and Sailfish by Gear and Area, 1998-2002.** Source: NMFS, 2003.

| | | Blue Marlin | | | | | White Marlin | | | | | Sailfish | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Area** | **Gear** | **1998** | **1999** | **2000** | **2001** | **2002** | **1998** | **1999** | **2000** | **2001** | **2002** | **1998** | **1999** | **2000** | **2001** | **2002** |
| NW Atlantic | Longline* | 23.3 | 22.0 | 28.8 | 10.9 | 17.3 | 15.3 | 18.6 | 10.3 | 5.1 | 11.5 | 6.4 | 13.7 | 11.2 | 2.2 | 0.4 |
| | Unclassified* | 0.6 | 0.0 | 0.1 | 0.0 | 0.2 | 0.7 | 0.1 | 0.0 | 0.0 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Rod and reel** | 34.1 | 24.8 | 13.8 | 9.0 | 9.8 | 2.4 | - | - | - | - | 0.1 | - | - | - | - |
| Gulf of Mexico | Longline* | 18.5 | 55.2 | 29.6 | 9.4 | 17.8 | 11.8 | 31.5 | 29.9 | 10.1 | 15.6 | 17.0 | 57.4 | 33.9 | 8.2 | 6.3 |
| | Rod and reel** | 4.5 | 7.5 | 4.7 | 5.1 | 4.4 | 0.2 | - | - | - | - | 1.0 | - | - | - | - |
| Caribbean | Longline* | 2.3 | 1.6 | 0.5 | 1.2 | 0.8 | 1.3 | 5.0 | 0.5 | 0.7 | 1.5 | 0.2 | 0.5 | 0.1 | 0.0 | 0.2 |
| | Rod and reel** | 10.6 | 4.6 | 5.7 | 2.3 | 2.9 | <.05 | - | - | - | - | 0.05 | - | - | - | - |
| | Other | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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* | 6.1 | 1.6 | 0.7 | 0.9 | 0.5 | 2.8 | 1.1 | 0.1 | 0.6 | 0.7 | 0.8 | <.05 | 0.1 | 0.3 | <.05 |
| SW Atlantic | Longline* | 1.6 | 1.7 | 0.0 | 0.0 | 0.0 | 0.9 | 0.5 | 0.0 | 0.0 | 0.0 | 2.7 | <.05 | 0.1 | 0.0 | 0.0 |
| NW Atlantic & Caribbean & Gulf of Mexico | Rod and reel*** | - | - | - | - | - | - | 5.2 | 1.3 | 3.4 | 5.6 | - | 163.0 | 75.7 | 57.8 | 103.0 |
| All Areas | All Gears | 101.6 | 119.0 | 83.9 | 38.8 | 54.7 | 35.4 | 62.0 | 42.1 | 19.9 | 35.3 | 28.3 | 234.6 | 121.1 | 68.5 | 109.9 |

* 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).
*** Estimation method no longer provides area-specific information.

**Table 3.68** **Commercial landings of large coastal sharks in lb dw: 1999-2004.** Sources: Data from 1999-2001, Cortés pers. Comm.; data from 2002-2003, Cortés 2003; Cortés and Neer, 2005.

| Large Coastal Sharks | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Basking** | 0 | 0 | 0 | 0 | 0 | 0 |
| Bignose* | 9,050 | 672 | 1,442 | 0 | 318 | 0 |
| Bigeye sand tiger** | 0 | 0 | 0 | 0 | 0 | 0 |
| Blacktip | 1,259,016 | 1,633,919 | 1,135,199 | 1,099,194 | 1,487,604 | 1,092,600 |
| Bull | 28,603 | 24,980 | 27,037 | 40,463 | 93,816 | 49,556 |
| Caribbean Reef* | 0 | 0 | 1 | 0 | 0 | 0 |
| Dusky* | 110,942 | 205,746 | 1,973 | 8,779 | 23,288 | 1,025 |
| Galapagos* | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerhead, Great | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerhead, Scalloped | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerhead, Smooth | 0 | 0 | 0 | 0 | 0 | 92 |
| Hammerhead, Unclassified | 53,393 | 35,060 | 69,356 | 108,160 | 153,548 | 116,546 |
| Large Coastal, Unclassified | 67,197 | 16,575 | 172,494 | 147,359 | 51,433 | 0 |
| Lemon | 25,298 | 45,269 | 24,453 | 56,921 | 80,688 | 67,460 |
| Narrowtooth* | 0 | 0 | 0 | 0 | 0 | 0 |
| Night* | 4,287 | 0 | 0 | 0 | 20 | 0 |
| Nurse | 1,176 | 429 | 387 | 69 | 70 | 317 |
| Sandbar | 1,320,239 | 1,491,908 | 1,407,550 | 1,863,420 | 1,436,838 | 1,223,082 |
| Sand Tiger** | 6,401 | 6,554 | 1,248 | 409 | 975 | 1,832 |
| Silky | 9,961 | 31,959 | 14,197 | 30,731 | 51,588 | 11,808 |
| Spinner | 629 | 14,473 | 6,970 | 8,447 | 12,133 | 14,806 |

| Large Coastal Sharks | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Tiger | 30,779 | 24,443 | 26,973 | 16,115 | 18,536 | 30,976 |
| Whale** | 0 | 0 | 0 | 0 | 0 | 0 |
| White** | 82 | 1,201 | 26 | 0 | 1,454 | 58 |
| Unclassified, assigned to large coastal | 821,648 | 92,117 | 525,661 | 771,450 | 853,564 | 599,134 |
| Unclassified, fins | 116,570 | 87,820 | 23,988 | 142,565 | 181,431 | 128,409 |
| **Total** | **3,865,271 (1,753 mt dw)** | **3,713,125 (1,684 mt dw)** | **3,438,955 (1,560 mt dw)** | **4,294,082 (1,948 mt dw)** | **4,447,304 (2,017 mt dw)** | **3,206,377 (1,454 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.
*** Preliminary data, species not yet available.

**Table 3.69 Commercial landings of small coastal sharks in lb dw: 1999-2004.** Source: Cortés and Neer, 2002; Cortés, 2003. Cortés and Neer, 2005.

| Small coastal sharks | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Atlantic Angel* | 0 | 97 | 0 | 495 | 0 | 818 |
| Blacknose | 137,619 | 178,083 | 160,990 | 144,615 | 131,511 | 68,108 |
| Bonnethead | 58,150 | 69,411 | 63,461 | 36,553 | 38,614 | 29,402 |
| Finetooth | 285,230 | 202,572 | 303,184 | 185,120 | 163,407 | 121,036 |
| Sharpnose, Atlantic | 244,356 | 142,511 | 196,650 | 213,301 | 190,960 | 230,880 |
| Sharpnose, Atlantic, fins | 0 | 0 | 209 | 10 | 0 | 0 |
| Sharpnose, Caribbean* | 2,039 | 353 | 205 | 0 | 0 | 0 |
| Unclassified Small Coastal | 336 | 0 | 51 | 35,831 | 25,307 | 1,407 |
| **Total:** | **727,730 (330 mt dw)** | **593,027 (269 mt dw)** | **724,541 (329 mt dw)** | **615,915 (279 mt dw)** | **549,799 (249 mt dw)** | **450,833 (204 mt dw)** |

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

**Table 3.70 Commercial landings of pelagic sharks in lb dw: 1999-2004.** Sources: Data from 2000-2001, Cortés pers. comm.; Cortés, 2003; Cortés and Neer, 2005.

| Pelagic Sharks | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Bigeye thresher* | 18,683 | 4,376 | 330 | 0 | 0 | 719 |
| Bigeye sixgill* | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue shark | 886 | 3,508 | 65 | 137 | 6,324 | 423 |
| Mako, longfin* | 3,394 | 6,560 | 9,453 | 3,008 | 1,831 | 1,827 |
| Mako, shortfin | 150,073 | 129,088 | 171,888 | 159,840 | 150,076 | 217,171 |
| Mako, Unclassified | 56,625 | 74,690 | 73,556 | 58,392 | 33,203 | 51,413 |
| Oceanic whitetip | 1,480 | 657 | 922 | 1,590 | 2,559 | 1,082 |

| Pelagic Sharks | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|
| Porbeagle | 5,650 | 5,272 | 1,152 | 2,690 | 1,738 | 5,779 |
| Sevengill* | 0 | 0 | 0 | 0 | 0 | 0 |
| Sixgill* | 0 | 0 | 0 | 0 | 0 | 0 |
| Thresher | 96,266 | 81,624 | 56,893 | 53,077 | 46,502 | 44,915 |
| Unclassified, pelagic | 0 | 233 | 0 | 5,965 | 79,439 | 0 |
| Unclassified, assigned to pelagic | 41,006 | 40,951 | 31,636 | 182,983 | 297,126 | 356,522 |
| Unclassified, pelagic, fins | 2,408 | 3,746 | 12,239 | 0 | 0 | 0 |
| **Total:** | **376,471 (171 mt dw)** | **350,705 (159 mt dw)** | **358,134 (162 mt dw)** | **467,682 (212 mt dw)** | **618,798 (281 mt dw)** | **677,305 (307 mt dw)** |

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

**Table 3.71** **Estimates of total landings and dead discards for large coastal sharks from 1981 through 2004 (numbers of fish in thousands).** Modified from the 1998 and 2002 Report of the Shark Evaluation Workshop (NMFS 1998, 2002), Cortés and Neer (2002), and Cortés (2003, 2005).

| Year | Commercial Landings | Longline Discards | Recreational Catches | Unreported | Coastal Discards | Menhaden Fishery Bycatch | Total |
|---|---|---|---|---|---|---|---|
| 1981 | 16.2 | 0.9 | 265.0 | | | | 282.1 |
| 1982 | 16.2 | 0.9 | 413.9 | | | | 431.0 |
| 1983 | 17.5 | 0.9 | 746.6 | | | | 765.0 |
| 1984 | 23.9 | 1.3 | 254.6 | | | | 279.8 |
| 1985 | 22.2 | 1.2 | 365.6 | | | | 389.0 |
| 1986 | 54.0 | 2.9 | 426.1 | 24.9 | | | 507.9 |
| 1987 | 104.7 | 9.7 | 314.4 | 70.3 | | | 499.0 |
| 1988 | 274.6 | 11.4 | 300.6 | 113.3 | | | 699.9 |

| Year | Commercial Landings | Longline Discards | Recreational Catches | Unreported | Coastal Discards | Menhaden Fishery Bycatch | Total |
|---|---|---|---|---|---|---|---|
| 1989 | 351.0 | 10.5 | 221.1 | 96.3 | | | 678.8 |
| 1990 | 267.5 | 8.0 | 213.2 | 52.1 | | | 540.8 |
| 1991 | 200.2 | 7.5 | 293.4 | 11.3 | | | 512.4 |
| 1992 | 215.2 | 20.9 | 304.9 | | | | 541.1 |
| 1993 | 169.4 | 7.3 | 249.0 | | 11.3 | | 437.0 |
| 1994 | 228.0 | 8.8 | 160.9 | | 16.3 | 26.2 | 440.2 |
| 1995 | 222.4 | 5.2 | 180.8 | | 13.9 | 24.0 | 446.3 |
| 1996 | 160.6 | 5.7 | 191.5 | | 7.6 | 25.1 | 390.5 |
| 1997 | 130.6 | 5.6 | 168.1 | | 8.3 | 25.1 | 337.7 |
| 1998 | 174.9 | 4.3 | 170.7 | | 9.9 | 25.1 | 384.9 |
| 1999 | 111.5 | 9.0 | 91.7 | | 3.8 | 25.1 | 241.1 |
| 2000 | 111.2 | 9.4 | 131.9 | | 4.8 | 25.1 | 282.4 |
| 2001 | 95.7 | 5.6 | 128.6 | | 6.1 | 25.1 | 261.1 |
| 2002 | 123.4 | 2.4 | 76.3 | | 4.9 | 25.1 | 232.1 |
| 2003 | 122.1 | 3.5 | 86.0 | | 6.7 | 25.1 | 243.4 |
| 2004 | 98.9 | 5.2 | 66.3 | | 3.6 | 25.1 | 199.1 |

**Table 3.72 Commercial landings of LCS (including unclassified sharks) in the Atlantic and Gulf of Mexico by region and year in mt dw for QMS and Logbook data and mt ww for Canvass and CFDBS data from 1999-2003.**

| Year | South Atlantic | | | Gulf of Mexico | | | North Atlantic | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Canvass | QMS | Logbook | Canvass | QMS | Logbook | CFDBS* | Logbook | Canvass | QMS | Logbook |
| 1999 | 1246.9 | 474.5 | 789.2 | 1342.7 | 739.8 | 803.9 | 135.5 | 75.6 | 258.9 | 1415 | 1668.7 |
| 2000 | 1107 | 503.8 | 662.1 | 1255.3 | 912.1 | 760 | 168.7 | 167.6 | 2362.3 | 1591.3 | 1589.7 |
| 2001 | 1078.4 | 488.1 | 632.6 | 1270.4 | 639.4 | 898.8 | 254.4 | 98.9 | 2348.8 | 1390.1 | 1630.3 |
| 2002 | 1542 | 678.8 | 680.4 | 1406.5 | 614.7 | 1034.6 | 191.2 | 104 | 2948.5 | 1492.3 | 1819 |
| 2003 | 1226.7 | 674.9 | 635.7 | 1829.7 | 934.3 | 1168.4 | 178.3 | 64.6 | 3056.4 | 1804.9 | 1868.7 |
| Total | 6201 | 2820.1 | 3400 | 7104.6 | 3840.3 | 4665.7 | 928.1 | 510.7 | 13305.6 | 7693.6 | 8576.4 |
| Average | 1240.2 | 564.0 | 680 | 1420.9 | 768.1 | 933.1 | 185.6 | 102.1 | 2661.1 | 1538.7 | 1715.3 |
| Total Combined | 12526.2 | | | 15610.6 | | | 1438.8 | | 29575.6 | | |
| Average Combined | 835.1 | | | 1040.7 | | | 143.9 | | 2019.7 | | |
| Percent | 41% (416.9 mt dw) | | | 52% (528.8 mt dw) | | | 7% (71.2 mt dw) | | 100% | | |

*Northeast Commercial Fisheries Database System (CFDBS). There is no canvass data available for the North Atlantic.

**Table 3.73 Commercial landings of SCS in the Atlantic and Gulf of Mexico by region and year year in mt dw for QMS and Logbook data and mt ww for Canvass and CFDBS data from 1999-2003.**

| Year | South Atlantic | | | Gulf of Mexico | | | North Atlantic | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Canvass | QMS | Logbook | Canvass | QMS | Logbook | CFDBS* | Logbook | Canvass | QMS | Logbook |
| 1999 | 391.3 | 317.3 | 198.4 | 11.8 | 14.5 | 26.5 | 3.7 | 2.07 | 403.1 | 335.7 | 226.97 |
| 2000 | 357.5 | 229.9 | 74.5 | 11.6 | 24.1 | 13 | 12.6 | 9.3 | 369.1 | 266.6 | 96.8 |
| 2001 | 446.3 | 309 | 143.9 | 8.8 | 18.9 | 34.5 | 0.1 | 7.8 | 455.1 | 328 | 186.2 |
| 2002 | 311.1 | 248.9 | 156.7 | 36.9 | 11.4 | 42.4 | 15.4 | 5.4 | 348 | 275.7 | 204.5 |
| 2003 | 168.3 | 197.4 | 147.1 | 47.9 | 46.1 | 73.6 | 0 | 7.4 | 216.2 | 243.5 | 228.1 |
| Total | 1674.5 | 1302.5 | 720.6 | 117.0 | 115.0 | 190.0 | 31.8 | 31.97 | 1791.5 | 1449.5 | 942.57 |
| Average | 334.9 | 260.5 | 144.12 | 23.4 | 23.0 | 38.0 | 6.4 | 6.394 | 358.3 | 289.9 | 188.514 |
| Total Combined | 3697.6 | | | 422 | | | 63.8 | | 4183.4 | | |
| Average Combined | 246.5 | | | 28.1 | | | 6.4 | | 281.0 | | |
| Percent | 88% (398.2 mt dw) | | | 10% (45.4 mt dw) | | | 2% (10.3 mt dw) | | 100% | | |

*Northeast Commercial Fisheries Database System (CFDBS). There is no canvass data available for the North Atlantic.