# 2011

# STOCK ASSESSMENT AND FISHERY EVALUATION (SAFE) REPORT FOR

# ATLANTIC HIGHLY MIGRATORY SPECIES

**DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
**National Marine Fisheries Service**

# Stock Assessment and Fishery Evaluation (SAFE) Report for

# Atlantic Highly Migratory Species 2011

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This document is available at the following internet address: http://www.nmfs.noaa.gov/sfa/hms/hmsdocument_files/SAFEreports.htm. All documents cited in the SAFE report, as well as additional hard copies of the report, are available from the following address:


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Dealer Permits:

Tuna dealer permits are issued out of the Northeast Regional Office of NOAA Fisheries (978-281-9370), shark and swordfish dealer permits are issued out of the NOAA Fisheries Southeast Regional Office (727-824-5326).

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Atlantic Shark, Swordfish Permits, and Atlantic Tuna Longline:

Questions regarding renewals or transfers of shark, swordfish, and Atlantic tuna longline limited access permits should be directed to the NOAA Fisheries Southeast Regional Office (727-824-5326).

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## EXECUTIVE SUMMARY

The National Marine Fisheries Service (NMFS), Highly Migratory Species (HMS) Management Division announces the availability of the 2011 Stock Assessment and Fishery Evaluation (SAFE) Report. The SAFE Report contains a review of the current status of Atlantic HMS stocks (tunas, swordfish, billfish, and sharks) and describes the year's accomplishments in managing Atlantic HMS. The SAFE Report provides Atlantic HMS fishery constituents information on the latest developments in Atlantic HMS management as well as fulfills Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requirements.

In 2011, the HMS Management Division completed numerous management actions including a final rule requiring the use of weak hooks in the Gulf of Mexico pelagic longline fishery, which will allow spawning BFT to escape capture; a final rule that modifies the permitting requirements and retention limits for Atlantic HMS that are incidentally-caught in Atlantic trawl fisheries; a final rule that requires all vessels with mobile transmitting unit vessel monitoring systems (VMS) to be replaced with enhanced mobile transmitting unit VMS and to declare target fishery and gear types before departing for a trip; and a final rule to address adjustments to the Atlantic BFT General and Harpoon category regulations. The HMS Management Division also published a proposed rule that would require all shark, swordfish, and bigeye, albacore, yellowfin, and skipjack (BAYS) tunas dealers to report purchases in an electronic dealer system; a notice of intent (NOI) to rebuild certain species of sharks based on new stock assessments (Amendment 5); and an NOI regarding the Future of the Shark Fishery and consideration of catch shares (Amendment 6). In addition, the HMS Management Division continued working on Amendment 4 relating to the Caribbean issues as well as efforts to more thoroughly utilize the available bluefin tuna and swordfish quotas, and examined options to improve recreational monitoring of HMS fisheries. As described more thoroughly in Chapter 1, the HMS Management Division also implemented annual quota specifications for Atlantic tunas, swordfish, and sharks, completed several inseason management actions and participated in the International Commission for Conservation of Atlantic Tunas (ICCAT) negotiations to ensure U.S. interests were well represented.

Feedback and comments on this SAFE Report are encouraged and should be sent to the HMS Management Division, 1315 East West Highway, Silver Spring, MD 20910, phone: (301) 427-8503, fax: (301) 713-1917.

# 1.0 INTRODUCTION

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) is the primary Federal legislation governing the management and executive processes for marine fisheries of the United States. The National Standard (NS) 2 guidelines (50 CFR 600.315) require the National Marine Fisheries Service (NMFS) to prepare a Stock Assessment and Fishery Evaluation (SAFE) Report, or similar document, review it annually, and make changes as necessary for each fishery management plan (FMP). This document constitutes the 2011 SAFE Report for Atlantic highly migratory species (HMS) managed under the 2006 Consolidated HMS Fishery Management Plan (FMP) and its amendments.

Consistent with the NS 2 guidelines, this 2011 SAFE Report provides a summary of the best available scientific information on the condition of HMS stocks, marine ecosystems, and fisheries managed under Federal regulation. It also provides updated information regarding the economic status of HMS fisheries, fishing communities, and industries, as well as the socio-economic and environmental impacts of recently implemented regulations.

This document is one method utilized by NMFS to introduce new information and identify potential new management issues. This SAFE Report includes the latest stock assessment data, recommendations, and resolutions from the International Commission for the Conservation of Atlantic Tunas (ICCAT) and its Standing Committee on Research and Statistics (SCRS). The report also includes the latest domestic shark assessment information. In compliance with the NS 2 guidelines, the report presents a comprehensive summary of the most recent Atlantic HMS fisheries-related data from a variety of sources across a wide range of disciplines.

## 1.1 Summary and Update of Agency Activities and Regulatory Actions regarding HMS in Previous Year

Table 1.1 provides a list of most of the abbreviations and acronyms that are used in this document or that are commonly used in fisheries management.

From January 1 through December 2, 2011, NMFS enacted or proposed a number of actions with regard to Atlantic HMS. All such actions published in the Federal Register during that timeframe are listed in Table 1.2. Additionally, actions published in the Federal Register from November 3 – December 31, 2010, are included, as these actions were published after release of the 2010 HMS SAFE Report. Most documents related to these actions can be found on the Atlantic HMS webpage at http://www.nmfs.noaa.gov/sfa/hms/. Actions taken before November 3, 2010, are noted in similar tables in previous SAFE reports. A summary of the actions listed in the table is presented below.

NMFS held HMS Advisory Panel meetings on May 10 – 12, 2011, and September 20 – 22, 2011, in Silver Spring, MD (February 10, 2011, 76 FR 7547; August 1, 2011, 76 FR 45781, respectively). These meetings provided valuable opportunity for comments on a suite of management actions that NMFS pursued or considered in 2011. Meeting transcripts and copies of the meeting presentations and comments can be found on the HMS website at: http://www.nmfs.noaa.gov/sfa/hms/. These documents are also available by calling the HMS Management Division at 301-427-8503.

On April 5, 2011, NMFS published a final rule for the reduction of bluefin tuna (BFT) bycatch in the Gulf of Mexico pelagic longline fishery (76 FR 18653). The final rule implemented measures to require the use of "weak hooks" in the fishery. Weak hooks allow incidentally hooked BFT to escape capture because the hooks are more likely to straighten when a large fish is hooked. Requiring weak hooks in the Gulf of Mexico will reduce bycatch of BFT; allow the long-term beneficial socio-economic benefits of normal operation of directed fisheries with minimal short-term negative socio-economic impacts; and have both short- and long-term beneficial impacts on the stock status of Atlantic BFT. These pelagic longline requirements became effective May 5, 2011.

On May 24, 2010, NMFS received a petition from the Center for Biological Diversity (CBD) to list BFT as threatened or endangered under the Endangered Species Act (ESA) and designate critical habitat concurrently with its listing. On September 21, 2010, NMFS announced a 90-day finding (75 FR 57431) that the petition presented substantial scientific information indicating the petitioned action may be warranted. NMFS conducted a species status review of BFT to determine if the petitioned action was warranted. On May 27, 2011, NOAA announced that listing BFT as endangered or threatened is not warranted at this time. NOAA has committed to revisit this decision by early 2013, when more information will be available about the effects of the Deepwater Horizon BP oil spill, the 2012 BFT stock assessment, and the 2012 International Commission for the Conservation of Atlantic Tunas (ICCAT) BFT recommendations. NOAA also announced on May 27, 2011, that it is formally designating both the western Atlantic and eastern Atlantic and Mediterranean stocks of BFT as "species of concern" under the ESA. This places the species on a watchlist for concerns about its status and threats to the species.

On June 28, 2011 (76 FR 37750), NMFS published a proposed rule requiring Federal Atlantic swordfish, shark, and tunas dealers to report commercially-harvested Atlantic sharks, swordfish, and bigeye, albacore, skipjack, and yellowfin (BAYS) tunas to NMFS through an electronic reporting system. The proposed rule also included additional measures such as the implementation of flexible reporting regimes, which would allow NMFS to collect more frequent dealer reports as needed; a change in who is considered an Atlantic HMS dealer; and requirements for timely submission of Atlantic HMS dealer reports. These measures are necessary to ensure timely and accurate reporting, which is critical for quota monitoring and management of these species, especially for fisheries that are quota limited.

NMFS held eight public hearings on the proposed rule (Peabody, MA; Bronx, NY; Atlantic City, NJ; Manteo, NC; Panama City, FL; Orlando, FL; Miami, FL; and Kenner, LA). In addition, the new electronic reporting system will be embedded within existing electronic reporting programs, such as the Standard Atlantic Fisheries Information System (SAFIS) for federally-permitted seafood dealers and Trip Tickets, thus reducing the number of places that dealers need to report. NMFS is currently working on the final rule for this action and developing the electronic reporting system in conjunction with the associated federal and state partners. Implementation is expected in 2012.

On July 5, 2011, NMFS published a final rule for Atlantic BFT quotas and Atlantic tuna fisheries management measures. NMFS modified Atlantic BFT base quotas for all domestic fishing categories; established BFT quota specifications for the 2011 fishing year; reinstated pelagic longline target catch requirements for retaining BFT in the Northeast Distant Gear Restricted Area (NED); amended the Atlantic tunas possession-at-sea and landing regulations to allow removal of Atlantic tunas tail lobes; and clarifying the transfer-at-sea regulations for Atlantic tunas (76 FR 39019). The amendments to § 635.27 became effective July 5, 2011. The 2011 quota specifications became effective between July 5, 2011 and December 31, 2011. The remaining actions became effective August 4, 2011.

In April and October, NMFS announced stock status determinations for scalloped hammerhead sharks, and sandbar, dusky, and blacknose sharks, respectively, based on new and updated stock assessment information. To address overfished/overfishing statuses from these determinations NMFS published a Notice of Intent on October 7, 2011 (76 FR 62331) to prepare an Environmental Impact Statement to assess the potential effects on the human environment of action proposed through rulemaking to rebuild and end overfishing of these stocks. To begin scoping for this rulemaking to amend the HMS FMP, NMFS is requesting comments on a range of commercial and recreational management measures, in both directed and incidental fisheries. The comment period for scoping ends on December 31, 2011. NMFS must complete this rulemaking by April 28, 2013, in order to implement conservation and management measures to rebuild overfished stocks within two years of the scalloped hammerhead shark stock status determination (April 28, 2011; 76 FR 23794).

In June and September, NMFS released the proposed and final annual swordfish specifications, respectively (June 23, 2011, 76 FR 36892; September 12, 2011, 76 FR 56120). In July, NMFS published a notice closing the commercial non-sandbar large coastal shark fishery in the Gulf of Mexico (July 15, 2011, 76 FR 41723). Also in July, NMFS published a notice closing the non-sandbar portion of the shark research fishery (July 26, 2011, 76 FR 44501). The porbeagle fishery closed in August (August 26, 2011; 76 FR 53343). The non-sandbar large coastal fishery in the Atlantic region closed on November 15, 2011 (76 FR 39169). NMFS issued 2011 fishing year specifications (June 3, 2011; 76 FR 32086) and inseason retention limits for BFT (April 4, 2011, 76 FR 18416 and June 3, 2011, 76 FR 53343) in April, June and July (July 27, 2011, 76 FR 44834), August (August 24, 2011, 76 FR52886), and November (November 8, 2011, 76 FR 69137). In January, June, September and October, NMFS announced additional Atlantic shark identification and protected species safe handling, release, and identification workshops (January 31, 2011; 76 FR 2312; June 13, 2011, 76 FR 34209; September 27, 2011, 76 FR 59661; October 17, 2011, 76 FR 64074). On October 31, 2011, NMFS issued a proposed rule for the 2012 Shark Specifications (76 FR 67121), and NMFS also announced its intention to issue shark research fishery permits and requested applications (76 FR 67149). NMFS also requested nominations for the HMS Advisory Panel on November 3, 2011 (76 FR 6725).

On August 10, 2011, NMFS published a final rule (76 FR 49368) to modify the permitting requirements and retention limits for Atlantic HMS that are incidentally-caught in

Atlantic trawl fisheries. The action reduced regulatory dead discards of incidentally-caught Atlantic swordfish in the Illex squid trawl fishery by establishing a new Incidental HMS Squid Trawl permit for all valid Illex squid moratorium permit holders. The new Incidental HMS Squid Trawl permit allows up to 15 swordfish per trip to be retained. The final rule also established a retention limit for smoothhound sharks in all Atlantic trawl fisheries; however implementation of that provision has been delayed indefinitely.

On September 16, 2011 (76 FR 57709), NMFS published a NOI that announced NMFS' intent to prepare an EIS and FMP Amendment that would consider catch shares for the Atlantic shark fisheries. The NOI also established a control date for eligibility to participate in an Atlantic shark catch share program, announced the availability of a white paper describing design elements of catch share programs in general and issues specific to the Atlantic shark fisheries, and requested public comment on the implementation of catch shares in the Atlantic shark fisheries. On November 23, 2011 (76 FR 72383), NMFS published a federal register notice announcing the dates and locations of five scoping workshops to provide the opportunity for public comment on various design elements of potential catch shares programs in the Atlantic shark fisheries. This notice also extended the comment period until March 31, 2012, to provide additional opportunities for the five Fishery Management Councils, the Atlantic and Gulf States Marine Fisheries Commissions, and other interested parties to comment on the consideration of catch shares.

On November 30, 2011, NMFS published a final rule (76 FR 74003) to address adjustments to the Atlantic Bluefin Tuna General and Harpoon category regulations. This final rule increased the General category maximum daily retention limit, allowed the General category season to remain open until the January subquota was reached, as well as increased the Harpoon category daily incidental retention limit. This action enabled more thorough utilization of the available U.S. BFT quota for the General and Harpoon categories; minimized bycatch and bycatch mortality to the extent practicable; expanded fishing opportunities for participants in the commercial winter General category fishery; and increased NMFS' flexibility for setting the General category retention limit depending on available quota.

On December 2, 2011, NMFS published a final rule (76 FR 75492) to facilitate enhanced communication with HMS vessels at sea, provide HMS fishery participants with an additional means of sending and receiving information at sea, ensure that HMS VMS units are consistent with the current VMS technology and type approval requirements that apply to newly installed units, and to provide NMFS enforcement with additional information describing gear onboard and target species. This final rule required that a qualified marine electrician install all E-MTU VMS units (effective January 1, 2012), required replacement of Mobile Transmitting Unit (MTU) Vessel Monitoring System (VMS) units with Enhanced Mobile Transmitting Unit (E-MTU) VMS units in Atlantic HMS fisheries (effective March 1, 2012), and implemented a declaration system that required vessels to declare target fishery and gear type(s) possessed on board. The final rule affects all HMS pelagic longline, bottom longline and shark gillnet fishermen who are required to have VMS onboard their vessels.

In November, NMFS released a positive 90 day finding regarding a petition to list scalloped hammerhead sharks under ESA. NMFS is required to make a determination on whether to list scalloped hammerhead sharks by August 2012.

**Table 1.1 List of Commonly Used Fishery Management Abbreviations, Acronyms, and Initials.**

| | |
|---|---|
| AA | Assistant Administrator for Fisheries |
| ABC | Acceptable biological catch |
| ACCSP | Atlantic Coastal Cooperative Statistics Program |
| ACL | Annual catch limit |
| ACS | Angler consumer surplus |
| ACT | Annual catch target |
| AM | Accountability measure |
| ANPR | Advanced Notice of Proposed Rulemaking |
| AOCTRP | Atlantic Offshore Cetacean Take Reduction Plan |
| AOCTRT | Atlantic Offshore Cetacean Take Reduction Team |
| AP | Advisory Panel |
| APA | Administrative Procedure Act |
| ASMFC | Atlantic States Marine Fisheries Commission |
| ATCA | Atlantic Tunas Convention Act |
| B | Biomass |
| BAYS | Bigeye, albacore, yellowfin, skipjack tunas |
| BiOp | Biological Opinion |
| $B_{MSY}$ | Biomass expected to yield maximum sustainable yield |
| $B_{OY}$ | Biomass expected to yield optimum yield |
| CAR | Caribbean |
| CFMC | Caribbean Fishery Management Council |
| CFL | Curved fork length |
| CFR | Code of Federal Regulations |
| CHB | Charter/Headboat |
| CIE | Center for Independent Experts |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| CPC | Contracting parties, non-contracting parties, entities, or fishing entities |

| | |
|---|---|
| CPUE | Catch per unit effort |
| CSFOP | Commercial shark fishery observer program |
| CZMA | Coastal Zone Management Act |
| DEIS | Draft Environmental Impact Statement |
| DPS | Distinct population segment |
| dw | Dressed weight |
| EA | Environmental Assessment |
| EEZ | Exclusive economic zone |
| EFH | Essential fish habitat |
| EFP | Exempted fishing permit |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| ESA | Endangered Species Act |
| F | Instantaneous fishing mortality |
| FAD | Fish aggregating device |
| FAO | Food and Agriculture Organization |
| FEC | Florida East Coast |
| FEIS | Final Environmental Impact Statement |
| FL | Fork Length |
| FMP | Fishery Management Plan |
| $F_{MSY}$ | Instantaneous fishing mortality rate expected to yield maximum sustainable yield |
| FMU | Fishery management unit |
| $F_{OY}$ | Fishing mortality rate expected to yield optimum yield |
| FR | Federal Register |
| FRFA | Final regulatory flexibility analysis |
| GOM | Gulf of Mexico |
| GSAFF | Gulf and South Atlantic Fishery Foundation |
| GMFMC or GOMFMC | Gulf of Mexico Fishery Management Council |
| GSMFC | Gulf States Marine Fisheries Commission |
| HAPC | Habitat area of particular concern |
| HMS | Highly migratory species: Atlantic sharks, tunas, swordfish, and billfish |

| | |
|---|---|
| HMS FMP | Consolidated Highly Migratory Species Fishery Management Plan |
| ICCAT | International Commission for the Conservation of Atlantic Tunas |
| IPOA | International Plan of Action |
| IRFA | Initial regulatory flexibility analysis |
| ITP | International trade permit |
| ITQ | Individual transferable quota |
| ITS | Incidental take statement |
| IUU | Illegal, unreported, unregulated |
| LAP | Limited access permit |
| LCS | Large coastal sharks |
| LOA | Letter of acknowledgment |
| LPS | Large Pelagic Survey |
| LWTRP | Large Whale Take Reduction Plan |
| LWTRT | Large Whale Take Reduction Team |
| MAB | Mid Atlantic Bight |
| MAFMC | Mid-Atlantic Fishery Management Council |
| Magnuson-Stevens Act | Magnuson-Stevens Fishery Conservation and Management Act |
| MFMT | Maximum fishing mortality threshold |
| MMPA | Marine Mammal Protection Act |
| MPA | Marine protected area |
| MRFSS | Marine Recreational Fishing Statistics Survey |
| MSST | Minimum stock size threshold |
| MSY | Maximum sustainable yield |
| mt | Metric tons |
| NCA | North Central Atlantic |
| NEC | Northeast Coastal |
| NED | Northeast Distant Waters |
| NEFMC | New England Fishery Management Council |
| NEFSC | Northeast Fisheries Science Center |
| NEPA | National Environmental Policy Act |
| NERO | Northeast Regional Office |
| NGO | Non-governmental organization |

| | |
|---|---|
| nmi | Nautical mile |
| NOA | Notice of Availability |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanographic and Atmospheric Administration |
| NOI | Notice of Intent |
| NPOA | National Plan of Action |
| NS | National Standards |
| NWGB | National Working Group on Bycatch |
| OSF | Office of Sustainable Fisheries |
| OY | Optimum yield |
| PLL | Pelagic longline |
| POP | Pelagic observer program |
| OPR | Office of Protected Resources |
| PRA | Paperwork Reduction Act |
| Reg Flex Act | Regulatory Flexibility Act |
| RFMO | Regional Fishery Management Organization |
| RIR | Regulatory Impact Review |
| RPAs | Reasonable and Prudent Alternatives |
| RPMs | Reasonable and Prudent Measures |
| SAB | South Atlantic Bight |
| SAFE Report | Stock Assessment and Fishery Evaluation report |
| SAFMC | South Atlantic Fishery Management Council |
| SAR | Sargasso |
| SBRM | Standardized bycatch reporting methodology |
| SCRS | Standing Committee for Research and Statistics |
| SCS | Small coastal sharks |
| SDC | Status determination criteria |
| SEFSC | Southeast Fisheries Science Center |
| SEIS | Supplemental environmental impact statement |
| SERO | Southeast Regional Office |
| SEW | Stock evaluation workshop |
| SFA | Sustainable Fisheries Act |
| SFL | Straight fork length |

| | |
|---|---|
| SK Program | Saltonstall-Kennedy Program |
| SRP | Scientific research permit |
| SSB | Spawning stock biomass |
| TAC | Total allowable catch |
| TAL | Total allowable landings |
| TCs | Terms and Conditions |
| TL | Total length |
| TUN | Tuna North |
| TUS | Tuna South |
| USCG | United States Coast Guard |
| USFWS | United States Fish and Wildlife Service |
| VMS | Vessel monitoring system |
| VTR | Vessel trip report |
| WTP | Willingness to pay |
| ww | Whole weight |

**Table 1.2 Summary of NMFS' Atlantic HMS Fisheries Actions from November 2, 2010, to December 2, 2011.**

| Action Type Regulatory Identification Number (RIN) | 50 CFR Part | Action Description | Publication Info |
|---|---|---|---|
| Notice<br>RIN 0648-XA042 | N/A | Fisheries of the Gulf of Mexico and South Atlantic; Southeast Data, Assessment, and Review (SEDAR); Assessment Process Webinar for Highly Migratory Species (HMS) Fisheries Sandbar, Dusky, and Blacknose Sharks | Nov 17, 2010<br>75 FR 70216 |
| Notice<br>RIN 0648-XA059 | N/A | Atlantic Highly Migratory Species; Advisory Panel | Nov 30, 2010<br>75 FR 74004 |
| Notice<br>RIN 0648-XAO61 | N/A | Schedules for Atlantic Shark Identification Workshops and Protected Species Safe Handling, Release, and Identification Workshops | Dec 1, 2010<br>75 FR 74693 |
| Notice<br>RIN 0648-XA008 | N/A | Atlantic Highly Migratory Species; Exempted Fishing, Scientific Research, Display, and Chartering Permits; Letters of Acknowledgment | Dec 3, 2010<br>75 FR 75458 |
| Fishery Closure<br>RIN 0648-XA052 | 635 | Atlantic Highly Migratory Species; Inseason Action to Close the Commercial Non-Sandbar Large Coastal Shark Fishery in the Atlantic<br>Region | Dec 3, 2010<br>75 FR 75416 |
| Proposed Rule<br>RIN0648-BA39 | 635 | Atlantic Highly Migratory Species; Bluefin Tuna Bycatch Reduction in the Gulf of Mexico Pelagic Longline Fishery | Jan 13, 2011<br>76 FR 2313 |
| Notice<br>RIN0648-XA061 | N/A | Schedules for Atlantic Shark Identification Workshops and Protected Species Safe Handling, Release and Identification Workshops, Correction | Jan 31, 2011<br>76 FR 5340 |
| Notice<br>RIN 0648–XA200 | N/A | Atlantic Highly Migratory Species; Announcement of Billfish and Swordfish Catch Card Pilot Program<br>for Puerto Rico | Feb 9, 2011<br>76 FR 7155 |

| Action Type Regulatory Identification Number (RIN) | 50 CFR Part | Action Description | Publication Info |
|---|---|---|---|
| Notice<br>RIN 0649-XA198 | N/A | Atlantic Highly Migratory Species; Meeting of the Atlantic Highly Migratory Species Advisory Panel | Feb 10, 2011<br>76 FR 7547 |
| Notice<br>RIN 0648–BA65 | 635 | Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Quota and Atlantic Tuna Fisheries Management | March 14, 2011<br>76 FR 13583 |
| Notice, Correction<br>RIN 0648–XA250 | N/A | Fisheries of the Gulf of Mexico and South Atlantic; Southeast Data, Assessment, and Review (SEDAR); Public Meetings | March 15, 2011<br>76 FR 13985 |
| Proposed Rule<br>RIN 0648–BA45 | 635 | Atlantic Highly Migratory Species; Modification of the Retention of Incidentally-Caught Highly Migratory Species in Atlantic Trawl Fisheries | March 18, 2011<br>76 FR 14884 |
| Proposed Rule<br>RIN 0648–BA65 | 635 | Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Quotas and Atlantic Tuna Fisheries Management<br>Measures; Correction | March 21, 2011<br>76 FR 15276 |
| Temporary Rule<br>RIN 0648–XA327 | 635 | Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Fisheries; Angling Category Inseason Action | April 4, 2011<br>76 FR 18416 |
| Notice<br>RIN 0648–BA65 | 635 | Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Quotas and Atlantic Tuna Fisheries Management<br>Measures | April 4, 2011<br>76 FR 18504 |
| Final Rule<br>RIN 0648–BA39 | 635 | Atlantic Highly Migratory Species; Bluefin Tuna Bycatch Reduction in the Gulf of Mexico Pelagic Longline<br>Fishery | April 5, 2011<br>76 FR 18653 |
| Notice<br>RIN0648-XA196 | N/A | Stock Status Determination for Atlantic Highly Migratory Scalloped<br>Hammerhead Shark | April 28, 2011<br>76 FR 23794 |

| Action Type Regulatory Identification Number (RIN) | 50 CFR Part | Action Description | Publication Info |
|---|---|---|---|
| **Proposed Rule RIN 0648–BA69** | **635** | **Atlantic Highly Migratory Species; Atlantic Shark Management Measures; Proposed 2011 ICCAT Shark Rule** | **April 29, 2011 76 FR 23935** |
| **Temporary Rule RIN 0648–XA393** | **635** | **Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Fisheries; BFT Retention Limit Adjustment** | **June 3, 2011 76 FR 32086** |
| **Notice RIN 0648–XA450** | **N/A** | **Schedules for Atlantic Shark Identification Workshops and Protected Species Safe Handling, Release, and Identification Workshops** | **June 13, 2011 76 FR 34209** |
| **Proposed Rule RIN 0648–BA64** | **635** | **Atlantic Highly Migratory Species; Vessel Monitoring Systems** | **June 21, 2011 76 FR 36071** |
| **Proposed Rule RIN 0648–BA90** | **N/A** | **Atlantic Highly Migratory Species; 2011 North and South Atlantic Swordfish Quotas** | **June 23, 2011 76 FR 36892** |
| **Proposed Rule RIN 0648–BA75** | **635** | **Atlantic Highly Migratory Species; Electronic Dealer Reporting Requirements** | **June 28, 2011 76 FR 37750** |
| **Correction RIN 0648-BA64** | **635** | **Atlantic Highly Migratory Species; Electronic Dealer Reporting Requirements** | **June 29, 2011 76 FR 38107** |
| **Notice RIN 0648-BA64** | **635** | **Atlantic Highly Migratory Species; Vessel Monitoring Systems** | **July 1, 2011 76 FR 38598** |
| **Final Rule RIN 0648-BA65** | **635** | **Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Quotas and Atlantic Tuna Fisheries Management Measures** | **July 5, 2011 76 FR 30919** |
| **Notice RIN 0648-AW83** | **N/A** | **Atlantic Highly Migratory Species; Environmental Assessment for Amendment 4 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan** | **July 13, 2011 76 FR 71216** |
| **Fishery Closure RIN 0648-XA541** | **635** | **Atlantic Highly Migratory Species; Inseason Action To Close the Commercial Gulf of Mexico Non-Sandbar Large Coastal Shark Fishery** | **July 15, 2011 76 FR 41723** |

| Action Type Regulatory Identification Number (RIN) | 50 CFR Part | Action Description | Publication Info |
|---|---|---|---|
| **Notice**<br>**RIN 0648-XA580** | **635** | **Atlantic Highly Migratory Species; Inseason Action To Close the Commercial Non-Sandbar Large Coastal Shark Research Fishery** | **July 26, 2011**<br>**76 FR 44501** |
| **Closure**<br>**RIN 0648-XA550** | **635** | **Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Fisheries; Northern Area Trophy Fishery** | **July 27, 2011**<br>**76 FR 44834** |
| **Notice**<br>**RIN 0648-XA573** | **N/A** | **Atlantic Highly Migratory Species; Meeting of the Atlantic Highly Migratory Species Advisory Panel** | **Aug 1, 2011**<br>**76 FR 45781** |
| **Final Rule**<br>**RIN 0648-BA45** | **635** | **Atlantic Highly Migratory Species; Modification of the Retention of Incidentally-Caught Highly Migratory Species in Atlantic Trawl Fisheries** | **Aug 10, 2011**<br>**76 FR 49368** |
| **Temporary Rule**<br>**RIN 0648-XA630** | **635** | **Atlantic Highly Migratory Species; Atlantic Bluefin Tuna Fisheries; General Category Retention Limit Sept-Dec** | **Aug 24, 2011**<br>**76 FR 52886** |
| **Temporary Rule; Fishery Closure**<br>**RIN 0648-XA658** | **635** | **Atlantic Highly Migratory Species; Commercial Porbeagle Shark Fishery Closure** | **Aug 26, 2011**<br>**76 FR 53343** |
| **Final Rule**<br>**RIN 0648-BA69** | **635** | **Atlantic Highly Migratory Species; Atlantic Shark Management Measures; ICCAT Shark Measures** | **Aug 29, 2011**<br>**76 FR 53652** |
| **Final Rule**<br>**RIN 0648-BA90** | **635** | **Atlantic Highly Migratory Species; North and South Atlantic Swordfish Quotas** | **Sept 12, 2011**<br>**76 FR 56120** |
| **Notice**<br>**RIN 0648-BA17.e** | **635** | **Atlantic Highly Migratory Species; Atlantic Shark Management Measures; Catch Share Notice of Intent** | **Sept 16, 2011**<br>**76 FR 57709** |
| **Notice**<br>**RIN 0648-XA670** | **N/A** | **Schedules for Atlantic Shark Identification Workshops and Protected Species Safe Handling, Release, and Identification Workshops** | **Sept 27, 2011**<br>**76 FR 59661** |

| Action Type Regulatory Identification Number (RIN) | 50 CFR Part | Action Description | Publication Info |
|---|---|---|---|
| Notice of Availability<br>RIN 0648-XA662 | N/A | Stock Assessment Reports for Dusky,<br>Sandbar, and Blacknose Sharks in the<br>U.S. Atlantic and Gulf of Mexico | Oct 3, 2011<br>76 FR 61092 |
| Notice<br>RIN 0648-BB29 | 635 | Atlantic Highly Migratory Species; Atlantic Shark Management Measures; Stock Status Determinations | Oct 7, 2011<br>76 FR 62331 |
| Notice<br>RIN 0648-XA670 | N/A | Schedules for Atlantic Shark Identification Workshops and Protected Species Safe Handling, Release, and Identification Workshops; Correction | Oct 17, 2011<br>76 FR 64074 |
| Notice<br>RIN 0648-XA776 | N/A | Atlantic Highly Migratory Species; Advisory Panel for Atlantic Highly Migratory Species Southeast Data, Assessment, and Review Workshops | Oct 24, 2011<br>76 FR 65700 |
| Notice<br>RIN 0648-BB29 | 635 | Atlantic Highly Migratory Species; Atlantic Shark Management Measures; Correction; Stock Status Determinations | Oct 24, 2011<br>76 FR 65673 |
| Notice<br>RIN 0648-XA775 | N/A | Atlantic Highly Migratory Species; Atlantic Shark Management Measures; 2012 Research Fishery | Oct 31, 2011<br>76 FR 67149 |
| Proposed Rule<br>RIN 0648-<br>BB36 | 635 | Atlantic Highly Migratory Species; 2012 Atlantic Shark Commercial Fishing Season | Oct 31, 2011<br>76 FR 67121 |
| Notice<br>RIN 0648-XA777 | N/A | Atlantic Highly Migratory Species; Advisory Panel | Nov 3, 2011<br>76 FR 68162 |
| Temporary Rule<br>RIN 0648-XA802 | 635 | Atlantic Highly Migratory Species; Quota Tranfser Retention Limit | Nov 8, 2011<br>76 FR 69137 |
| Fishery Closure<br>RIN 0648-XA781 | 635 | Atlantic Highly Migratory Species; Inseason Action To Close the Commercial Non-Sandbar Large Coastal Shark Fishery in the Atlantic<br>Region | Nov 8, 2011<br>76 FR 69139 |

| Action Type Regulatory Identification Number (RIN) | 50 CFR Part | Action Description | Publication Info |
|---|---|---|---|
| **Final Rule RIN 0648-BB43** | **635** | **Atlantic Highly Migratory Species, Update to Information on the Effective Date of Atlantic Smoothhound Shark fishery Management Measures** | **Nov 10, 2011 76 FR 70064** |
| **Notice RIN0648-BA17** | **635** | **Atlantic Highly Migratory Species; Atlantic Shark Management Measures; Notice of Workshops** | **Nov 23, 2011 76 FR 72383** |
| **Notice RIN 0648-XA799** | **N/A** | **Atlantic Highly Migratory Species; Exempted Fishing, Scientific Research, Display, and Chartering Permits; Letters of Acknowledgements** | **Nov 25, 2011 76 FR 72678** |
| **Final Rule RIN 0648-AX85** | **635** | **Atlantic Highly Migratory Species; Adjustments to the Atlantic Bluefin Tuna General and Harpoon Category Regulations** | **Nov 30, 2011 76 FR 74003** |
| **Notice RIN 0648-XA844** | **N/A** | **Vessel Monitoring systems; Approved Mobile Transmitting Units and Communications Service Providers for Use in Atlantic Migratory Species (HMS) Fisheries** | **Dec 2, 2011 76 FR 75523** |
| **Final Rule RIN 0648-BA64** | **635** | **Vessel Monitoring Systems** | **Dec 2, 2011 76 FR 75492** |

## 1.2 2011 Accomplishments of the International Commission for the Conservation of Atlantic Tunas (ICCAT)

ICCAT is an international regional fishery management organization (RFMO) with 49 members, including the United States. The 22nd Regular Meeting of ICCAT was held in Istanbul, Turkey, November 9-19, 2011. It was preceded by two days of Compliance Committee meetings. The United States helped develop recommendations aimed at promoting the conservation, management, and rebuilding of Atlantic highly migratory fish stocks (*e.g.*, tunas, swordfish, billfish, and sharks), including those critical to U.S. fishermen.

ICCAT made progress on a number of issues and adopted new management measures for tropical tunas, North Atlantic and Mediterranean Swordfish, North and South Atlantic albacore, billfish, sharks taken in association with ICCAT-managed fisheries. A measure to reduce incidental catch of seabirds in the South Atlantic was also adopted. Measures for monitoring, control, and surveillance were also adopted, in addition to measures to increase the efficiency and effectiveness of the organization.

*North Atlantic Swordfish*: At the 2011 meeting, Recommendation 11-02 was adopted which replaces Recommendation 10-02. The two year measure (2012 and 2013) maintains the total allowable catch (TAC) at 13,700 mt ww. The ICCAT Standing Committee on Research and Statistics (SCRS) has indicated that if this TAC is maintained, the biomass of North Atlantic Swordfish will remain above $B_{MSY,}$ with greater than 50 percent probability. The United States' quota of 3,907 mt ww is maintained. The new recommendation includes a 150 mt ww quota transfer from the United States to Morocco to support joint scientific research but discontinues the 25 mt ww quota transfer from the United States to Canada. ICCAT's contracting parties, non-contacting parties, entities, or fishing entities (Parties) that have an initial catch limit of less than 500 mt ww will be able to continue to carry forward up to 50 percent of their underharvest. However, those Parties with catch limits greater than 500 mt ww may carry forward 25 percent of their initial catch limit. The maximum under harvest that the United States can carry forward is 976.75 mt. The provision allowing Parties with a TAC allocation to make a one-time transfer within a fishing year of up to 15 percent of their TAC allocations to other Parties with TAC allocations was maintained. The recommendation also extends the provision allowing the United States to harvest up to 200 mt ww of its annual catch limit between 5 degrees North latitude and 5 degrees South latitude. Similar to the previous measure, Recommendation 11-02 maintains the requirement that Parties submit an annual fishery development/management plan to ICCAT by September 15 of each year. Finally, an alternative minimum size standard for swordfish that have been dressed at sea is included in Recommendation 11-02. A cleithrum to caudal keel (CK) measurement of 63 cm (25") can be applied as an alternative to the existing minimum sizes of 25 kg (55 lbs)/125 cm (49") Lower Jaw Fork Length (LJFL) (allows a 15 percent tolerance for smaller fish) **or** 15 kg (33 lbs) /115 cm (45") LJFL (no tolerance for smaller fish). The next stock assessment for North Atlantic Swordfish is scheduled for 2013.

*Western Atlantic, Eastern Atlantic, and Mediterranean BFT*: Management plans through 2012 remain in effect for western, eastern, and Mediterranean BFT. These measures were adopted at the 2010 meeting and establish TACs and other management measures for 2011 and 2012. Stock assessments for all BFT stocks are scheduled for 2012.

*Bigeye/Yellowfin Tuna*: At the 2011 meeting, the Commission adopted Recommendation 11-01, which establishes a comprehensive, multi-year (2012 – 2015) conservation and management plan for both bigeye and yellowfin tuna. Bigeye tuna were assessed in 2010. The stock is not overfished or experiencing overfishing. Yellowfin tuna were assessed in 2011 and the SCRS determined that the stock is overfished but overfishing is not occurring. This recommendation maintains the TAC at 85,000 mt ww for bigeye tuna and establishes the first TAC for yellowfin tuna at 110,000, in conformance with scientific recommendations. The recommendation also includes provisions that would expand reporting of catch, observer coverage, and the need for Parties to submit a list of vessels greater than 20 m length overall (LOA) authorized to fish for yellowfin or bigeye tuna. The Commission also established an expanded time/area closure in the Gulf of Guinea to protect juvenile yellowfin and bigeye tuna. The closure is in effect from January 1 to February 28 each year. The dates for the next stock assessment for both these species have not yet been established by the Commission.

*North and South Atlantic Albacore*: The Commission adopted Recommendation 11-04, which continues the rebuilding plan for north Atlantic albacore and maintains the TAC at 28,000 mt ww, in conformance with scientific advice for 2012 and 2013. Recommendation 11-05 implements a TAC for South Atlantic Albacore (caught south of 5degrees north latitude) of 24,000 mt ww for 2012 and 2013. This measure also includes a sharing arrangement for Parties with significant harvests of South Atlantic Albacore. North and South Atlantic Albacore will both be assessed in 2013. The U.S. allocations for north Atlantic albacore and south Atlantic albacore were maintained at 527 and 100 mt ww, respectively.

*Blue and White Marlin:* The Commission adopted Recommendation 11-07, which is a one year measure which maintains many of the provisions of Recommendation 06-09, with the exception of operative paragraph (3) from Recommendation 06-09, concerning catch limits for blue and white marlin. The new recommendation implements a catch limit of 2,000 mt for blue marlin consistent with the 2011 stock assessment. Parties are required to limit landings on pelagic longline and purse seine vessels to 30 percent of their highest annual landing level between 1996 and 2004 for blue marlin and white marlin. No carryforward of underharvest is authorized if Parties catch less than this limit, with the exception of those Parties whose catch limit is less than 5 mt ww. These Parties would be limited to 50 percent of their initial catch limit from one year to the next. This recommendation also requires the Commission and SCRS to review data collection programs in countries with artisanal fisheries for marlins and requires the SCRS to analyze the potential benefits of time/area closures for marlins in 2012. The assessment for white marlin is scheduled for 2012. The recommendation commits Parties to establishing a multi-year plan to rebuild blue and white marlin populations on the basis of SCRS advice at the 2012 meeting.

*Sharks*: The Commission adopted Recommendation 11-08 which prohibits retention, transshipping, or landing of any part or whole carcass of silky shark caught in association with ICCAT fisheries. The recommendation provides an exemption for developing coastal Parties that harvest silky sharks for local consumption, provided they do not increase their catches and the fish do not enter international trade. The measure also strengthens the data reporting requirements for developing coastal Parties that harvest silky sharks.

*Seabirds*: Recommendation 11-09 includes new measures to reduce bycatch of seabirds in ICCAT fisheries in areas south of 25 degrees south latitude. Specifically, in these areas, longline vessels will be required to employ at least two of the authorized mitigation measures beginning in July 2013. Recommendation 07-07 is still in effect for areas between 20 and 25 degrees south latitude.

A suite of measures to combat illegal, unreported and unregulated (IUU) fishing were adopted at the 2011 meeting. Countries must now disclose agreements that allow their vessels to fish in other countries' waters, thereby increasing the transparency of these fishing arrangements, ensuring that catches are reported to ICCAT, and facilitating action to address IUU fishing. The Commission adopted U.S. proposed amendments to ICCAT's IUU vessel listing measure by lowering the minimum length of vessels that can be listed to 12 meters. The Commission also strengthened provisions on inspection of IUU vessels. ICCAT parties agreed on next steps for implementing an electronic, near real-time, version of its Atlantic BFT tracking system that follows catch from the point of landing through international trade. Once fully operational, this system will help prevent fraud and reduce the administrative burden of the existing paper-based system.

Another measure adopted by ICCAT is designed to harmonize requirements for parties to collect data on bycatch and discards in their waters and report this information to ICCAT, including means for artisanal fisheries in developing coastal States to develop alternative methods for data collection. ICCAT also agreed on a process to advance consideration of amending the ICCAT Convention to bring its provisions more in line with modern international fisheries management principles.

## 1.3 Existing State Regulations

Table 1.3 outlines the existing state regulations as of November 1, 2011, with regard to HMS species. While the HMS Management Division updates this table periodically throughout the year, persons interested in the current regulations for any state should contact that state directly.

Atlantic tunas (bluefin, bigeye, albacore, yellowfin, and skipjack tunas) are under federal jurisdiction from the outer boundary of the exclusive economic zone (EEZ) to the shoreline, including state waters, with the following three exceptions: state waters of Maine, Connecticut, and Mississippi (50 CFR 635.1(b)). Federal HMS regulations apply in all other state waters of the Atlantic, Gulf of Mexico, and Caribbean. NMFS periodically reviews state tuna regulations for federal consistency as required under the Atlantic Tuna Convention Act (ATCA). Table 1.3 describes the state regulations as stated in available source material and makes no statement about the consistency of the specific, individual fishery regulations with Federal regulations.

The Atlantic States Marine Fisheries Commission (ASMFC) is composed of 15 member states along the Atlantic coast from Maine to Florida. The Gulf States Marine Fisheries Commission is composed of five member states along the Gulf of Mexico from Florida to Texas. Through the Commissions, member states coordinate fisheries management measures to create consistent regulations and ensure stocks are protected across state boundaries. In August 2008, the ASMFC approved the Interstate FMP for Atlantic Coastal Sharks. This FMP was modified via Coastal Sharks Addendum I in September 2009 and was effective as of January 1, 2010. All management measures for coastal shark species in the FMP and Addendum I have been implemented by ASMFC members, unless they have been granted *de minimus* status (Maine, Massachusetts, and New Hampshire) or have equivalent conservation measures in place. Member states can implement more restrictive management measures. A state can request permission to implement an alternative to any mandatory compliance measure only if that state can show to the Board’s satisfaction that its alternative proposal will have the same conservation value as the measure contained in this management plan or any addenda prepared under Adaptive Management

## Table 1.3 State Rules and Regulations Pertaining to Atlantic HMS.

Please note that state regulations are subject to change. Please contact the appropriate state personnel to ensure that the regulations listed below remain current. X = Regulations in Effect; n = Regulation Repealed; FL = Fork Length; CL = Carcass Length; TL = Total Length; LJFL = Lower Jaw Fork Length; CFL = Curved Fork Length; DW = Dressed Weight; and SCS = Small Coastal Sharks; LCS = Large Coastal Sharks.

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | *Tuna* | *Swords* | *Billfish* | *Sharks* | | | |
| ME | X | | | X | **Tuna** -ME Rev. Stat. Ann. tit. 12, " 6001, 6502, and 6551<br>**Sharks** - Code ME R. 13-188 ' 50.01(1) and 50.10 | **Tuna** - Retention limit - 1 tuna/year – non-resident special tuna permit holder; Unlawful to fish for tuna with gear other than harpoon or hook and line or possess tuna taken in unlawful manner; No minimum size limits<br>**Sharks** – Prohibited species same as federal, plus silky and sandbar; commercial harvest of porbeagle sharks prohibited in state waters, porbeagle cannot be landed after federal quota closes; sharks must be landed with head, fins, and tail naturally attached to the carcass | ME Department of Marine Resources<br>George Lapointe<br>Phone: (207) 624-6553<br>Fax: (207) 624-6024 |
| NH | | | X | X | **Billfish** - FIS 603.13<br>**Sharks** - FIS 603.20 | **Billfish** - Possession limit - 1 billfish/trip; Minimum size (LJFL) - Blue marlin - 99"; White marlin - 66"; Sailfish - 57"; May be taken by hook and line only; Unlawful to sell billfish<br>**Sharks** - Prohibited sharks listed; Federal Dealer permit required for all shark dealers; Porbeagle sharks can only be taken by recreational fishing; Head, fins and tail must remain attached to all shark species through landing | NH Fish and Game<br>Douglas Grout<br>Phone: (603) 868-1095<br>Fax: (603) 868-3305 |
| MA | X | | | X | **Bluefin Tuna** - 322 CMR 6.04<br>**Sharks** – 322 CMR 6.37 | **Bluefin Tuna** - References ATCA and federal regulations; Bluefin tuna may be retained if caught in a trap as incidental catch; Fishing for bluefin tuna by means of any net is prohibited prior to September 1 of the year; Fishing for tuna by means of purse seine is allowed in state waters if the vessel is compliant with the registration requirements set forth in 322 CMR 6.04(4); Purse seining for bluefin tuna is prohibited in Cape Cod Bay.<br>**Sharks** – ASMFC Coastal Shark Plan (no shark species may be landed with tails or fins removed 322 CMR 6.37(3)(d)) | MA Division of Marine Fisheries<br>Jared Silva<br>Phone: (617) 626-1534<br>Fax: (617) 626-1509<br>All MA commercial and recreational fishing regulations can be found online: http://www.mass.gov/dfwele/dmf/commercialfishing/ |

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | *Tuna* | *Swords* | *Billfish* | *Sharks* | | | |
| | | | | | | | cmr_index.htm |
| RI | | | | X | **Sharks** - RIMFC Regulations part VII 7.24 | **Sharks** – ASMFC Coastal Shark Plan | RI Department of Environment Management<br>Brian Murphy<br>Phone: (401) 783-2304 |
| CT | | | | X | **Sharks** – Regulations of Connecticut State Agencies § 26-159a-1; Connecticut General Statutes §26-142a(d)<br>Declarations: 10-03, 10-05, 10-07 | **Sharks** – Prohibited species same as federal regulations; No commercial fishing for large coastal sharks; No commercial small coastal shark fishing until further notice | CT Department of Environmental Protection<br>David Simpson<br>Phone: (860) 434-6043<br>Fax: (860) 434-6150 |
| NY | | | X | X | **Billfish** -NY Environmental Conservation ' 13-0339 (5)<br>**Sharks** - NY Environmental Conservation ' 13-0338; State of New York Codes, Rules and Regulations (Section 40.7) | **Billfish** - Blue marlin, white marlin, sailfish, and longbill spearfish shall not be bought, sold or offered for sale; Striped marlin, black marlin, shortbill spearfish shall not be bought, sold or offered for sale unless tagged and identified prior to entry into the state<br>**Sharks** – ASMFC Coastal Shark Plan | NY Department of Environmental Conservation<br>Stephen W. Heins<br>Phone: (631) 444-0430<br>Fax: (631) 444-0449 |
| NJ | | | | X | **Sharks**-NJ Administrative Code, Title 7. Department of Environmental Protection, NJAC 7:25-18.1 and 7:25-18.12(d) | **Sharks** – ASMFC Coastal Shark Plan | NJ Fish and Wildlife<br>Hugh Carberry<br>Phone: (609)748-2020<br>Fax: (609) 748-2032 |
| DE | | | X | X | **Billfish** - DE Code Ann. tit. 7, ' 1310<br>**Sharks** - DE Code Regulations 3541 | **Billfish -** Prohibition on sale of Atlantic sailfish and blue/white/striped marlin<br>**Sharks** – ASMFC Coastal Shark Plan | DE Division of Fish and Wildlife<br>Craig Shirey<br>Phone: (302) 739-9914 |

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | *Tuna* | *Swords* | *Billfish* | *Sharks* | | | |
| MD | X | X | X | X | **Tuna** - Code of Maryland Regulations 08.02.12.03 and 08.02.05.23<br>**Swordfish** - Code of Maryland Regulations 08.02.12.03 and 08.02.05.27<br>**Billfish** - Code of Maryland Regulations 08.02.12.03 and 08.02.05.26<br>**Sharks** - Code of Maryland Regulations 08.02.12.03 and 08.02.22.01-.04 | **Tuna** - Federal regulations used to control size and seasons and recreational catch required to be tagged<br>**Swordfish** - Federal regulations used to control size and seasons and recreational catch required to be tagged<br>**Billfish** (blue and white marlin and sailfish) - Federal regulations control size and seasons and recreational catch required to be tagged<br>**Sharks** – ASMFC Coastal Shark Plan | MD Department of Natural Resources<br>Gina Hunt<br>Phone: (410) 260-8326 |
| VA | | | X | X | **Billfish** - 4 VA Administrative Code 20-350-10<br>**Sharks** - 4 VA Administrative Code 20-490-10 | **Billfish** - Prohibition on sale of billfish<br>**Sharks** – ASMFC Coastal Shark Plan | VA Marine Resources Commission<br>Jack Travelstead<br>Phone: (757) 247-2247<br>Fax: (757) 247-2020 |
| NC | X | | X | X | **Tuna** - NC Administrative Code tit. 15A 03M.0520<br>**Billfish** -NC Administrative Code tit. 15A, r.3M.0507 and 15A 03M.0507<br>**Sharks** -NC Administrative Code tit. 15A, r.3M.0505 | **Tuna** – Commercial and recreational minimum size: yellowfin tuna – 27” CFL, bigeye tuna - 27” CFL, bluefin tuna – 73” CFL; Recreational bag limit: 3 yellowfin tuna/day<br>**Billfish** - Recreational possession limit - 1 blue or white marlin/vessel/trip; 1 sailfish/person/day; Minimum size - blue marlin - 99", white marlin - 66", sailfish - 63"; Unlawful to sell or offer for sale blue or white marlin and sailfish<br>**Sharks** - Director may impose restrictions for size, seasons, areas, quantity, *etc*. via proclamation; ASMFC Coastal Shark IFMP; additionally: LL in the shark fishery shall not exceed 500 yds or have more than 50 hooks | NC Division of Marine Fisheries<br>Randy Gregory<br>Phone: (252) 726-7021<br>Fax: (252) 726-0254 |

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | *Tuna* | *Swords* | *Billfish* | *Sharks* | | | |
| SC | X | X | X | X | **Tuna/Swordfish** -SC Code Ann. ' 50-5-2725 and 2730<br><br>**Billfish** - SC Code Ann. ' 50-5-1700, 1705, 2725 and 2730 ; 50-1-30 (6)<br><br>**Sharks** -SC Code Ann. ' 50-5-2725, 2730 | **Tuna/Swordfish** – Defer to federal regulations<br><br>**Billfish** – Defer to federal regulations; Unlawful to sell billfish; Hook and line gear only; Unlawful to possess while transporting gillnets, seines, or other commercial gear<br><br>**Sharks** – Defer to federal regulations; Gillnets may not be used in the shark fishery in state waters; State permit required for shark fishing in state waters | SC Department of Natural Resources<br>Josh Loefer<br>Phone: (843) 953-9835<br>Fax: (843) 953-9386 |
| GA | | | X | X | **Gear Restrictions/Prohibitions** - GA Code Ann. ' 27-4-7;<br><br>**Billfish** - GA Code Ann. ' 27-4-130.2; GA Comp. R. & Regs. ' 391-2-4-.04<br><br>**Sharks** - GA Code Ann. ' 27-4-130.1; GA Comp. R. & Regs. ' 391-2-4-.04 | Gear Restrictions/Prohibitions - Use of gillnets and longlines is prohibited in state waters<br><br>**Billfish** - Possession prohibited in state waters, except for catch and release<br><br>**Sharks –** Commercial/Recreational: 2/person/boat for sharks from the Small Shark Composite (bonnethead, sharpnose, and spiny dogfish, min size 30” FL;  All other sharks - 2 shark/person or boat, whichever is less, min size 48” FL; unlawful to have in possession more than one shark greater than eighty-four inches (84") total length; Prohibited Species: same as federal, plus silky sharks; All species must be landed head and fins intact; Sharks may not be landed in Georgia if harvested using gillnets | GA Department of Natural Resources<br>Carolyn Belcher<br>Phone: (912) 264-7218<br>Fax: (912) 262-3143 |

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | *Tuna* | *Swords* | *Billfish* | *Sharks* | | | |
| FL | | X | X | X | **Sharks** -FL Administrative Code 68B-44<br><br>**Swordfish/ Billfish** - FL Administrative Code 68B-33 | **Billfish** – Longbill/Mediterranean/roundscale spearfish – harvest/possession/landing/purchase/sale/exchange prohibited<br><br>**Blue/white marlin and sailfish** – Sale prohibited; Aggregate possession of 1 fish/person/day; Gear restriction (hook and line only); Minimum size limit (blue marlin – 99” LJFL; white marlin – 66” LJFL; sailfish – 63” LJFL); Recreational catch reporting requirement (all non-tournament landings must be reported NOAA within 24 hours); Must land in whole condition (gutting allowed)<br><br>**Swordfish** - Minimum size - 47 in LJFL/29” CK; Possession limit 1 fish/person/day or 4 fish/vessel/day (with 4 or more persons onboard) on private boats, limit of 1/fish/paying customer/day up to 15 fish/vessel/day on for-hire vessels; Captain and crew on for-hire vessels have zero bag limit. Commercial harvest and sale allowed only with Florida saltwater products license and a federal LAP for swordfish, so federal regulations apply in state waters unless state regulations are more restrictive; Recreational catch reporting requirement (all non-tournament landings must be reported NOAA within 24 hours)<br><br>**Sharks –** Commercial/recreational: min size – 54” except no min. size on blacknose, blacktip, bonnethead, smooth dogfish, finetooth, Atlantic sharpnose; Commercial/recreational possession limit – 1 shark/person/day, max. 2 sharks/vessel on any vessel with 2 or more persons on board; Allowable gear – hook and line only; State waters close to commercial harvest when adjacent federal waters close; Federal permit required for commercial harvest, so federal regulations apply in state waters unless state regulations are more restrictive; Finning, removing heads and tails, and filleting prohibited; Prohibited species same as federal regulations plus-prohibition on harvest of lemon and sandbar sharks in state waters, direct and continuous transit through state waters to place of landing of lemon sharks and sandbar sharks legally caught in federal waters is allowed. Prohibition on harvest of tiger sharks and great, smooth, and scalloped hammerheads from state waters will be implemented on January 1, 2012. | FL Fish and Wildlife Conservation Commission<br>Lisa Gregg<br>Phone: (850) 487-0554<br>Fax: (850) 487-4847 |

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | ***Tuna*** | ***Swords*** | ***Billfish*** | ***Sharks*** | | | |
| AL | X | X | X | X | **Tuna/Swordfish/Billfish/Shark –** AL Administrative Code r.220-3-.30(6)<br><br>**Tuna** - AL Administrative Code r.2203.30<br><br>**Sharks** - AL Administrative Code r.220-3-.30, r.220-3-.37, r.220-3-.42, and r.220-2-.77 | **Tuna/swordfish/billfish/sharks** - Reference to federal landing form regulations<br><br>**Tuna** - Recreational and commercial fishermen must have a federal permit to fish for tunas; Yellowfin and bigeye – 27" CFL min size<br><br>**Sharks –** Recreational & commercial: bag limit – 1 sharpnose/person/day and 1 bonnethead/person/day; no min size; all other sharks – 1/person/day; min size – 54" FL or 30" dressed; state waters close when federal season closes; no shark fishing on weekends, Memorial Day, Independence Day, or Labor Day; Prohibited species: dusky, sand tiger, bigeye sand tiger, basking, whale, and white sharks; Restrictions of chumming and shore-based angling if creating unsafe bathing conditions; Regardless of open or closed season, gillnet fishermen targeting other fish may retain sharks with a dressed weight not exceeding 10% of total catch | AL Department of Conservation and Natural Resources<br>Phone: (251) 861 2882 |

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | *Tuna* | *Swords* | *Billfish* | *Sharks* | | | |
| LA | X | X | X | X | **Tuna** -LA Administrative Code Title 76, Pt. VII, Ch. 3, § 361<br><br>**Swords/Billfish** - LA Administrative Code Title76, Pt. VII, Ch. 3, § 355<br><br>**Sharks** - LA Administrative Code Title 76, Pt. VII, Ch. 3, § 357 | **Tuna** - Recreational and commercial minimum size for yellowfin and bigeye is 27" CFL; Recreational bag limits – 3 yellowfin/person. Recreational minimum size for bluefin tuna is 73" CFL and bag limit is 1/vessel/year. Recreational and commercial tuna fishing requires a federal permit. LA Admin Code States: ""No person who, pursuant to state or federal law, is subject to the jurisdiction of this state shall violate any federal law, rule or regulation particularly those rules and regulations enacted pursuant to the Magnuson-Stevens Fishery Conservation Act and published in the Code of Federal Regulations as amended Title 50 and 15, for tunas while fishing in the EEZ, or possess, purchase, sell, barter, trade, or exchange tunas within or without the territorial boundaries of Louisiana in violation of any state or federal law, rule or regulation particularly those rules and regulations enacted pursuant to the Magnuson-Stevens Fishery Conservation Act and published in the Code of Federal Regulations as amended Title 50 and 15 law."<br><br>**Billfish/Swordfish** - Minimum size: blue marlin (99 in LJFL), white marlin (66" LJFL), sailfish (63 in LJFL), swordfish (29 in carcass length or 33 lbs dw, 47" LJFL if not dressed); Recreational creel limit - 5 swordfish/vessel/trip; Federal swordfish permit required for commercial swordfish fishing; Dealers must have federal permit to buy swordfish; state swordfish fishery closes with federal fishery; reference to federal billfish regulations<br><br>**Sharks** - Recreational: min size – 54" FL, except Atlantic sharpnose and bonnethead; bag limit - 1 sharpnose/person/day, all other sharks – 1 fish/person/day; Commercial: 33/vessel/day limit; no min size; Com & rec harvest prohibited: 4/1-6/30; Prohibited species: same as federal regulations; Fins must remain naturally attached to carcass though off-loading. Commercial shark fishing requires annual state shark permit. Owners/operators of vessels other than those taking sharks in compliance with state or federal commercial permits are restricted to no more than one shark from either the large coastal, small coastal, or pelagic group per vessel per trip within or without Louisiana waters. | LA Department of Wildlife and Fisheries<br>Jason Adriance<br>(504) 284-2032 or 225 765-2889<br><br>Fax( 504) 284-5263 or (225) 765-2489 |

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | *Tuna* | *Swords* | *Billfish* | *Sharks* | | | |
| MS | X | | X | X | **Tuna/Billfish/Sharks** - MS Code Title-22 part 7 | **Tuna** – No directed BFT fishing; only recreational anglers can retain incidentally caught BFT up to 1/boat/week; Recreational and commercial min size for yellowfin and bigeye is 27" CFL; Recreational retention limit for yellowfin is 3/person (possession limit)<br><br>**Billfish** – Unlawful to sell blue and white marlin and sailfish without proper federal documentation; Recreational minimum size: blue marlin 99" LJFL; white marlin 66" LJFL; sailfish 63" LJFL; No possession for longbill spear fish; No limit for recreational take<br><br>**Sharks** – Recreational: min size - LCS/Pelagics 37" TL; SCS 25" TL; bag limit - LCS/Pelagics 1/person (possession limit) up to 3/vessel (possession limit); SCS 4/person (possession limit); Commercial and prohibited species – same as federal regulations; Prohibition on finning | MS Department of Marine Resources<br>Kerwin Cuevas<br>Phone: (228) 374-5000 |
| TX | | X | X | X | **Billfish/Swordfish/Sharks** - TX Administrative Code Title 31, Part 2, Parks and Wildlife Code Title 5, Parks and Wildlife Proclamations 57.971, 57.973 and 57.981 | Blue marlin, white marlin, sailfish, sharks, longbill spearfish, and broadbill swordfish are gamefish and may only be taken with pole and line (including rod and reel); Blue marlin, white marlin, sailfish, and longbill spearfish may not be sold for any purpose<br><br>**Billfish** - Bag limit none; min size blue marlin – 131" TL; white marlin – 86" TL; sailfish – 84" TL<br><br>**Sharks** - Commercial/recreational: bag limit - 1 shark/person/day; Commercial/recreational possession limit is twice the daily bag limit (*i.e.*, 2 sharks/person/day); min size 24" TL for Atlantic sharpnose, blacktip, and bonnethead sharks and 64" TL for all other lawful sharks. Prohibited species: same as federal regulations | TX Parks & Wildlife Department<br>Mark Lingo<br>Phone: (956) 350-4490<br>Fax: (956) 350-3470 |

| State | Species | | | | Cite Reference | Regulatory Details | Contact Information |
|---|---|---|---|---|---|---|---|
| | ***Tuna*** | ***Swords*** | ***Billfish*** | ***Sharks*** | | | |
| Puerto Rico | X | X | X | X | Regulation #6768<br>Article 8 – General Fishing Limits<br>Article 13 – Limitations<br>Article 17 – Permits for Recreational Fishing<br>(March 2004) | Illegal to sell, offer for sale, or traffic in any billfish or marlin, either whole or processed, captured in jurisdictional waters of Puerto Rico.<br>Swordfish or billfish, tuna and shark are covered under the federal Atlantic HMS regulations (50 CFR, Part 635); Fishers who capture these species are required to comply with said regulation; billfish captured incidentally with long line must be released by cutting the line close to the fishhook, avoiding the removal of the fish from the water; in the case of tuna and swordfish, fishers shall obtain a permit according to the requirements of the federal government; Year-round closed season on nurse sharks. | Puerto Rico Department of Natural and Environmental Resources<br>Craig Lilyestrom<br>Phone: (787) 999-2200 x2689<br>Fax: (787) 999-2271<br>http://www.caribbeanfmc.com/REGULATIONS%20PR-USVI/reg%20pesca%20pr/Rgl6768-%20feb%202004.pdf |
| U.S. Virgin Islands | X | X | X | X | V.I.C., Title 12, Chapter 9A. | Federal regulations and federal permit requirements apply in territorial waters.<br>http://caribbeanfmc.com/pdfs/booklet%20usvi%20Commercial%202009.pdf | 6291 Estate Nazareth<br>St. Thomas, VI 00802<br>(340) 775-6762<br>45 Mars Hill Complex<br>Frederiksted, St. Croix, VI 00840<br>(340) 773-1082 |

## 2.0 STATUS OF THE STOCKS

The thresholds used to determine the status of Atlantic HMS are presented in Figure 2.1. They are fully described in Chapter 3 of the 1999 Tunas, Swordfish, and Shark FMP (1999 FMP) and in Amendment 1 to the Billfish FMP. These thresholds were carried over in full in the 2006 Consolidated HMS FMP and are based upon the thresholds described in a paper providing the technical guidance for implementing NS 1 of the Magnuson-Stevens Act (Restrepo *et al*., 1998).

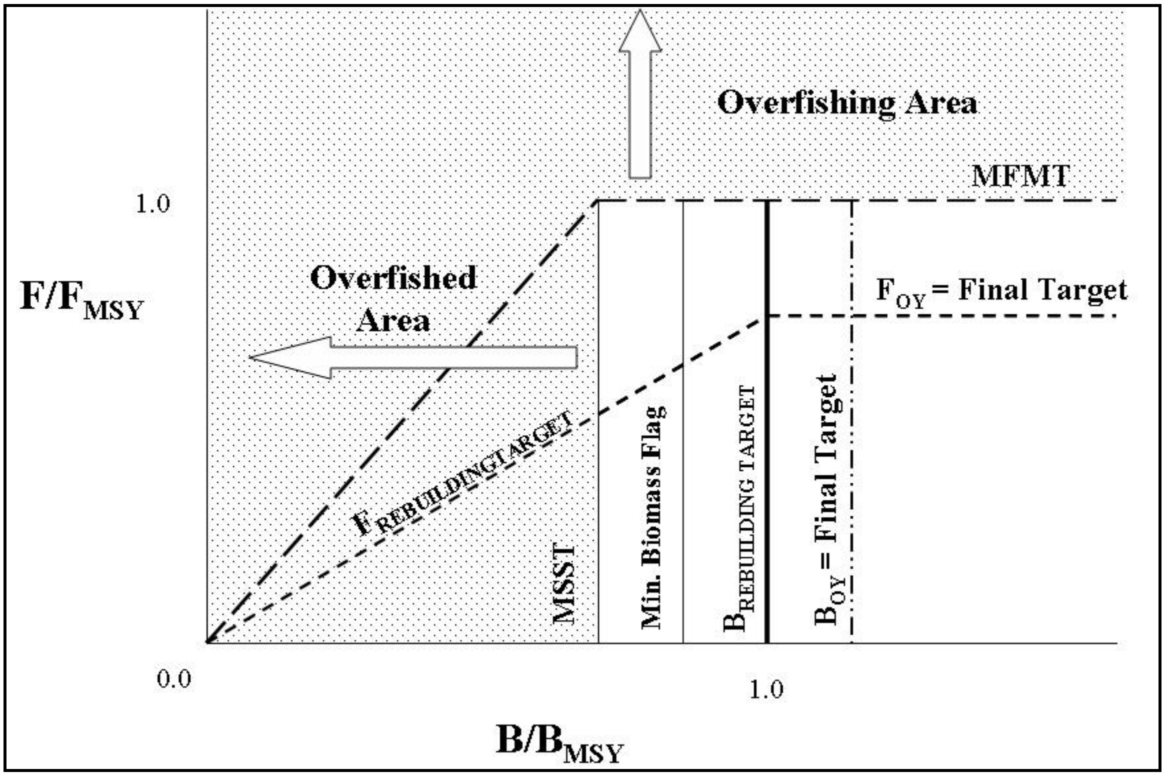


**Figure 2.1 Illustration of the status determination criteria and rebuilding terms**

In summary, a species is considered overfished when the current biomass (B) is less than the minimum stock size threshold ($B < B_{MSST}$). The minimum stock size threshold (MSST) is determined based on the natural mortality of the stock and the biomass at maximum sustainable yield ($B_{MSY}$). Maximum sustainable yield (MSY) is the maximum long-term average yield that can be produced by a stock on a continuing basis. The biomass can be lower than $B_{MSY}$, and the stock not be declared overfished as long as the biomass is above $B_{MSST}$. It is important to note that other bodies, such as ICCAT, use different thresholds for stock status determination. For instance, the ICCAT Convention defines an overfished status as $B/B_{MSY} < 1.0$, not $B_{year}/B_{MSY} <$ MSST.

Overfishing may be occurring on a species if the current fishing mortality (F) is greater than the fishing mortality at MSY ($F_{MSY}$) ($F > F_{MSY}$). In the case of F, the maximum fishing mortality threshold is $F_{MSY}$. Thus, if F exceeds $F_{MSY}$, the stock is experiencing overfishing.

If a species is declared overfished or overfishing is occurring, action to rebuild the stock and/or prevent further overfishing is required by law. A species is considered rebuilt when B is greater than $B_{MSY}$ and F is less than $F_{MSY}$. A species is considered healthy when B is greater than or equal to the biomass at optimum yield ($B_{OY}$) and F is less than or equal to the fishing mortality at optimum yield ($F_{OY}$).

In summary, the thresholds used to calculate the status of Atlantic HMS, as described in the 1999 FMP and Amendment 1 to the Billfish FMP, are:

- Maximum Fishing Mortality Threshold (MFMT) = $F_{limit}$ = $F_{MSY}$;
- Overfishing is occurring when $F_{year} > F_{MSY}$;
- Minimum Stock Size Threshold (MSST) = $B_{limit}$ = $(1\text{-}M)B_{MSY}$ when M < 0.5; MSST = $0.5B_{MSY}$ when M >= 0.5 (for billfish, the specific MSST values are: blue marlin = $0.9B_{MSY}$; white marlin = $0.85B_{MSY}$; west Atlantic sailfish = $0.75B_{MSY}$);
- Overfished when $B_{year}/B_{MSY}$ < MSST;
- Biomass target during rebuilding = $B_{MSY}$;
- Fishing mortality during rebuilding < $F_{MSY}$;
- Fishing mortality for healthy stocks = $0.75F_{MSY}$;
- Biomass for healthy stocks = $B_{OY}$ = ~1.25 to $1.30B_{MSY}$;
- Minimum biomass flag = $(1\text{-}M)B_{OY}$; and
- Level of certainty of *at least* 50 percent but depends on species and circumstances.
- For bluefin tuna, spawning stock biomass (SSB) is used as a proxy for biomass
- For sharks, in some cases, spawning stock fecundity (SSF) or spawning stock number (SSN) can be used as a proxy for biomass since biomass does not influence pup production in sharks.

With the exception of many Atlantic sharks stocks, stock assessments for Atlantic HMS are conducted by ICCAT's SCRS. In 2011, the SCRS completed stock assessments for Atlantic yellowfin tuna, south Atlantic albacore, and blue marlin. All SCRS final stock assessment reports can be found at http://www.iccat.int/en/assess.htm.

Atlantic shark stock assessments for LCS and small coastal sharks (SCS) are generally completed by the Southeast Data, Assessment, and Review (SEDAR) process. SEDAR assessments for sandbar, blacknose, and dusky sharks were recently completed in September 2011. In some cases, NMFS looks to available resources, including peer reviewed literature, for external assessments that, if deemed appropriate, could be used for domestic management purposes. NMFS followed this process in determining the stock status of scalloped hammerhead sharks based on an assessment for scalloped hammerhead sharks that was completed by Hayes et al. (2009). The results of all these assessments are shown below in Table 2.1.

Table 2 .1 summarizes stock assessment information and the current status of Atlantic HMS as of November 2011. In addition, NMFS updates all U.S. fisheries stock statuses each quarter and provides a Status of U.S. Fisheries Report to Congress on an annual basis. The status of the stock reports can be found at: http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm.

**Table 2.1 Stock Assessment Summary Table for Atlantic tunas, swordfish, and marlin. Source: SCRS, 2007; SCRS, 2008; SCRS, 2009a; SCRS, 2009b; SCRS 2010; SCRS 2011; Gibson and Campana, 2005; Cortés *et al*., 2006; NMFS, 2006; NMFS, 2007; Hayes et al., 2009; SEDAR 2011a, 2011b, 2011c, 2011d).**

| Species | Current Relative Biomass Level | Minimum Stock Size Threshold | Current Relative Fishing Mortality Rate | Maximum Fishing Mortality Threshold | Outlook – From Status of Stocks for U.S. managed species* |
|---|---|---|---|---|---|
| **West Atlantic Bluefin Tuna** | *$SSB_{09}/SSB_{MSY}$ = 1.1 (0.89-1.35) (low recruitment)<br><br>$SSB_{09}/SSB_{MSY}$ = 0.15 (0.10-0.22) (high recruitment)<br><br>$SSB_{09}/SSB_{75}$ = 0.34 | $0.86SSB_{MSY}$ (10,941t; low recruitment)<br><br>(78,872t; high recruitment) | $F_{06-08}/F_{MSY}$ = 0.73 (0.59-0.91) (low recruitment)<br><br>$F_{06-08}/F_{MSY}$ =1.88 (1.49-2.35) (high recruitment) | **$F_{MSY}$ = 0.16 (0.14-0.18) (low recruitment)<br><br>$F_{MSY}$ = 0.06 (0.06-0.07) (high recruitment) | Low recruitment scenario: Not overfished; overfishing is not occurring.<br><br>High recruitment scenario: Overfished; overfishing is occurring |
| | The SCRS, as stated in the stock assessment, has no strong evidence to favor either scenario over the other and notes that both are reasonable (but not extreme) lower and upper bounds on rebuilding potential. | | | | |
| **Atlantic Bigeye Tuna** | $B_{10}/B_{MSY}$ = 1.01 (0.72-1.34) | $0.6B_{MSY}$ (253,578t) | $F_{09}/F_{MSY}$ = 0.95 (0.65-1.55) | $F_{MSY}$ =0.17 | Not overfished (Rebuilding); overfishing not occurring. |
| **Atlantic Yellowfin Tuna** | $B_{10}/B_{MSY}$ = 0.85 (0.61-1.12) | $0.5B_{MSY}$ (age 2+) | $F_{current}/F_{MSY}$=0.87 (0.68-1.40) | $F_{MSY}$ | Not overfished; overfishing not occurring. |
| **North Atlantic Albacore Tuna** | $B_{07}/B_{MSY}$ =0.62 (0.45-0.79) | $0.7B_{MSY}$ (120,680t; based on $B_{MSY}$) (40,719t; based on $SSB_{MSY}$) | $F_{07}/F_{MSY}$ = 1.05 (0.85-1.23) | $F_{MSY}$ =0.17 | Overfished; overfishing is occurring. |
| **West Atlantic Skipjack Tuna** | $B_{08}/B_{MSY}$: most likely>1 | *Unknown* | $F_{08}/F_{MSY}$: most likely<1 | $F_{MSY}$ | Unknown |
| **North Atlantic Swordfish** | $B_{09}/B_{MSY}$ = 1.05 (0.94-1.24) | $0.8B_{MSY}$; ($B_{MSY}$ = 61,860t) | $F_{08}/F_{MSY}$ = 0.76 (0.67-0.96) | $F_{MSY}$ = 0.22 (0.14-0.27) | Not overfished; overfishing not occurring |
| **South Atlantic Swordfish** | $B_{09}/B_{MSY}$ = 1.04 (0.82-1.22) | $0.8B_{MSY}$ | $F_{08}/F_{MSY}$ = 0.75 (0.60-1.01) | $F_{MSY}$ = 0.31 | Unknown |

| Species | Current Relative Biomass Level | Minimum Stock Size Threshold | Current Relative Fishing Mortality Rate | Maximum Fishing Mortality Threshold | Outlook – From Status of Stocks for U.S. managed species* |
|---|---|---|---|---|---|
| **Blue Marlin** | $B_{09}/B_{MSY}$ = 0.67 (0.53-0.81) | $0.9B_{MSY}$ (22,870 t; based on $SSB_{MSY}$) | $F_{09}/F_{MSY}$ = 1.63 (1.11-2.16) | $F_{MSY}$= 0.07 | Overfished: overfishing is occurring |
| **White Marlin** | $B_{04}<B_{MSY}$: yes | $0.85B_{MSY}$ (13,104-23,619 mt) | $F_{04}>F_{MSY}$: Possibly | 0.07-0.11 | Overfished: overfishing is occurring |
| **West Atlantic Sailfish** | $B_{07}<B_{MSY}$: Possibly | $0.78B_{MSY}$ *Unknown* | $F_{07}>F_{MSY}$: Possibly | *Unknown* | Overfished; overfishing is occurring |
| **Longbill Spearfish** | *Unknown* | *Unknown* | *Unknown* | *Unknown* | *Unknown* |
| **Roundscale Spearfish** | *Unknown* | *Unknown* | *Unknown* | *Unknown* | *Unknown* |
| **LCS Complex** | *Unknown* | $(1\text{-}M)B_{MSY}$ | *Unknown* | *Unknown* | *Unknown* |
| **Sandbar** | $SSF_{09}/SSF_{MSY}$ = 0.51 – 0.72 | $(1\text{-}M)B_{MSY}$ (3.9 - 4.2 E+05) | $F_{09}/F_{MSY}$ = 0.29-2.62 | 0.004-0.06 | Overfished; overfishing is not occurring |
| **Gulf of Mexico Blacktip** | $SSF_{04}/SSF_{MSY}$ = 2.54-2.56 | $(1\text{-}M)B_{MSY}$ (0.99-1.07E+07) | $F_{04}/F_{MSY}$ = 0.03–0.04 | 0.20 | Not overfished; overfishing not occurring |
| **Atlantic Blacktip** | *Unknown* | $(1\text{-}M)B_{MSY}$ | *Unknown* | *Unknown* | *Unknown* |
| **Dusky Sharks** | $SSB_{09}/SSB_{MSY}$ = 0.41-0.50 | $(1\text{-}M)B_{MSY}$ | $F_{09}/F_{MSY}$ = 1.39-4.35 | 0.01-0.05 | Overfished; overfishing is occurring |
| **Scalloped Hammerhead Sharks** | $N_{05}/N_{MSY}$ = 1.29 | $(1\text{-}M)B_{MSY}$ | $F_{05}/F_{MSY}$ = 0.45 | 0.11 | Overfished; overfishing is occurring |
| **SCS Complex** | $N_{05}/N_{MSY}$ = 1.69 | $(1\text{-}M)B_{MSY}$ (2.1E+07) | $F_{05}/F_{MSY}$ = 0.25 | 0.09 | Not overfished; overfishing not occurring |
| **Bonnethead Sharks** | $SSF_{05}/SSF_{MSY}$ = 1.13 | $(1\text{-}M)B_{MSY}$ (1.4 E+06) | $F_{05}/F_{MSY}$ = 0.6 | 0.31 | Not overfished; overfishing not occurring |
| **Atlantic Sharpnose Sharks** | $SSF_{05}/SSF_{MSY}$ = 1.47 | $(1\text{-}M)B_{MSY}$ (4.09 E+06) | $F_{05}/F_{MSY}$ = 0.74 | 0.19 | Not overfished; overfishing not occurring |
| **Atlantic Blacknose Sharks** | $SSF_{09}/SSF_{MSY}$ = 0.43 – 0.64 | $(1\text{-}M)B_{MSY}$ (7.7. E +04 - 2.8 E+05) | $F_{09}/F_{MSY}$ = 3.26 – 22.53 | 0.01-0.15 | Overfished; overfishing is occurring |
| **Gulf of Mexico Blacknose Sharks** | *Unknown* | $(1\text{-}M)B_{MSY}$ | *Unknown* | *Unknown* | *Unknown* |
| **Finetooth Sharks** | $N_{05}/N_{MSY}$ = 1.80 | $(1\text{-}M)B_{MSY}$ (2.4E+06) | $F_{05}/F_{MSY}$ = 0.17 | 0.03 | Not overfished; overfishing not occurring |

| Species | Current Relative Biomass Level | Minimum Stock Size Threshold | Current Relative Fishing Mortality Rate | Maximum Fishing Mortality Threshold | Outlook – From Status of Stocks for U.S. managed species* |
|---|---|---|---|---|---|
| **Northwest Atlantic Porbeagle Sharks** | $B_{08}/B_{MSY}$ = 0.43 – 0.65 | $(1\text{-}M)B_{MSY}$ | $F_{08}/F_{MSY}$ = 0.03 – 0.36 | 0.025-0.075 | Approaching an overfished status; overfishing is occurring |
| **North Atlantic Blue Sharks** | $B_{07}/B_{MSY}$ = 1.87-2.74 | $(1\text{-}M)B_{MSY}$ | $F_{07}/F_{MSY}$ = 0.13-0.17 | 0.15 | Not overfished; overfishing not occurring |
| **North Atlantic Shortfin Mako Sharks** | $B_{07}/B_{MSY}$ = 0.95-1.65 | $(1\text{-}M)B_{MSY}$ | $F_{07}/F_{MSY}$ = 0.48-3.77 | 0.007-0.05 | Approaching an overfished status; overfishing is occurring |

* Note: The Species Information System (SIS), which informs the Status of the Stocks Report, allows only one status determination per stock. Therefore, a joint distribution was calculated assuming equal plausibility of the high and low recruitment scenarios for Western Atlantic bluefin tuna. $F_{current}$ refers to the geometric mean of the estimates for 2006-2008 (a proxy for recent F levels; median and 10th percentile-90th percentile shown). $SSB_{2009}/SSB_{MSY}$: 0.48 (0.12-1.26); $F_{current}/F_{MSY}$: 1.15 (0.63-2.17); $SSB_{MSY}$: 38410 (12570-102460); $F_{MSY}$: 0.11 (0.06-0.18)

** Where F year refers to the geometric mean of the estimates for 2006-2008 (a proxy for recent F levels).

## 2.1 Stock Assessment Details

Detailed stock assessments for each of the species listed in Table 2.1 can be found in the websites listed below.

**Western Atlantic Bluefin Tuna**

Assessed by ICCAT's SCRS in 2010. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2010_BFT_ASSESS_REP_ENG.pdf

**Atlantic Bigeye Tuna**

Assessed by ICCAT's SCRS in 2010. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2010_BET_Assessment_REP_ENG.pdf

**Atlantic Yellowfin Tuna**

Assessed by ICCAT's SCRS in 2011. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2011_YFT_ASSESS_REP.pdf

**North Atlantic Albacore Tuna**

Assessed by ICCAT's SCRS in 2009. The stock assessment can be found online: http://www.iccat.int/Documents/SCRS/DetRep/DET-ALB-NA.pdf

**West Atlantic Skipjack Tuna**

Assessed by ICCAT's SCRS in 2008. The stock assessment can be found online: http://www.iccat.int/Documents/SCRS/DetRep/DET-YFT-SKJ.pdf

### North Atlantic Swordfish

Assessed by ICCAT's SCRS in 2009. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2009_SWO_ASSESS_ENG.pdf

### South Atlantic Swordfish

Assessed by ICCAT's SCRS in 2009. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2009_SWO_ASSESS_ENG.pdf

### Blue Marlin

Assessed by ICCAT's SCRS in 2011. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2011_BUM_ASSESS_ENG.pdf

### White Marlin

Assessed by ICCAT's SCRS in 2006. The stock assessment can be found online: http://www.iccat.int/Documents/SCRS/DetRep/DET_BUM-WHM.pdf

### West Atlantic Sailfish

Assessed by ICCAT's SCRS in 2009. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2009_SAI_ASSESS_ENG.pdf

### Spearfish

Spearfish have not been individually assessed by ICCAT's SCRS due to the paucity of data. Some information can be found in the 2001 sailfish stock assessment located online: http://www.iccat.int/Documents/SCRS/DetRep/DET_sai.pdf

### LCS Complex

Assessed in 2006 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=11

### Sandbar

Assessed in 2010/2011 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=21

### Gulf of Mexico Blacktip

Assessed in 2006 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=11

### Atlantic Blacktip

Assessed in 2006 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=11

### Dusky Sharks

Assessed in 2010/2011 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=21

**SCS Complex**

Assessed in 2007 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=13

**Bonnethead Sharks**

Assessed in 2007 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=13

**Atlantic Sharpnose Sharks**

Assessed in 2007 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=13

**Blacknose Sharks (Atlantic and Gulf of Mexico)**

Assessed in 2010/2011 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=21

**Finetooth Sharks**

Assessed in 2007 through the SEDAR process. The stock assessment can be found online: http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=13

**Northwest Atlantic Porbeagle Sharks**

Assessed by ICCAT's SCRS in 2009. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2009_POR_ASSESS_ENG.pdf

**North Atlantic Blue Sharks**

Assessed by ICCAT's SCRS in 2008. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2008_SHK_Report.pdf

**North Atlantic Shortfin Mako Sharks**

Assessed by ICCAT's SCRS in 2008. The stock assessment can be found online: http://www.iccat.int/Documents/Meetings/Docs/2008_SHK_Report.pdf

**Scalloped Hammerhead Sharks**

Assessed in a peer reviewed paper: Hayes, C.G., Y. Jiao, and E. Cortes. 2009. Stock Assessment of Scalloped Hammerheads in the Western North Atlantic Ocean and Gulf of Mexico. North American Journal of Fisheries Management 29:1406-1417.

## 2.2 Chapter 2 References


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SEDAR. 2011c. SEDAR 21 Complete Stock Assessment Report: HMS Gulf of Mexico Blacknose Shark. SEDAR, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405. 415 pp.

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# 3.0 ESSENTIAL FISH HABITAT

## 3.1 Designations in the Consolidated Atlantic Highly Migratory Species Fishery Management Plan and its Amendments

The Magnuson-Stevens Act requires NMFS to identify and describe Essential Fish Habitat (EFH), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. In 2009, NMFS completed the five year review and update of EFH for Atlantic HMS with the publishing of the Final Amendment 1 to the Consolidated HMS FMP (June 12, 2009, 74 FR 288018). In Amendment 1, NMFS updated and revised existing identifications and descriptions of EFH for Atlantic HMS, designated a Habitat Area of Particular Concern (HAPC) for BFT in the Gulf of Mexico, and analyzed fishing and non-fishing impacts on EFH pursuant to Section 305(b) of the Magnuson-Stevens Act.

Since the publication of Amendment 1, NMFS has published a Final Environmental Impact Statement (FEIS) for Amendment 3 to the 2006 Consolidated HMS FMP (June 1, 2010, 75 FR 30484) which, among other things, added smooth dogfish (*Mustelus canis*) under Secretarial management. As a Magnuson-Stevens Act condition of adding a species to federal management, NMFS designated EFH for smooth dogfish using the same methodology employed in Amendment 1. Details, including a map of the final EFH, can be found in Chapter 11 of the Amendment 3 FEIS.

On September 22, 2010, NMFS published an interpretive rule and final action (75 FR 57698) which, among other things, recognized roundscale spearfish (*Tetrapturus georgii*) to the definition of terms in the implementing regulations of the Magnuson-Stevens Act and the Atlantic HMS regulations, and defined EFH for roundscale spearfish. Roundscale spearfish and white marlin were managed as one species before this final action because the roundscale spearfish were not recognized as a distinct species taxonomically until recently. Therefore, the designation of roundscale spearfish EFH is the same as the EFH designation for white marlin found in Amendment 1 to the HMS FMP. A summary of the management history of HMS EFH is given in Table 3.1.

**Table 3.1 Management history for HMS EFH.**

| FMP or Amendment | Species for which EFH was identified |
|---|---|
| 1999 FMP for Atlantic Tunas, Swordfish, and Sharks | EFH first identified and described for Atlantic tunas, swordfish and sharks |
| 1999 Amendment 1 to the Billfish FMP | EFH first identified and described for Atlantic billfish |
| 2003 Amendment 1 to the FMP for Atlantic Tunas, Swordfish and Sharks | EFH updated for five shark species (blacktip, sandbar, finetooth, dusky, and nurse sharks) |
| 2006 Consolidated Atlantic HMS FMP | Comprehensive review of EFH for all HMS. EFH for all Atlantic HMS consolidated into one FMP No changes to EFH descriptions or boundaries |
| 2009 Amendment 1 to the Consolidated Atlantic HMS FMP | EFH updated for all federally managed Atlantic HMS. HAPC for BFT spawning area designated in the Gulf of Mexico |
| 2010 Amendment 3 to the Consolidated Atlantic HMS FMP | EFH first defined for smooth dogfish |
| 2010 White Marlin/ Roundscale Spearfish Interpretive Rule and Final Action | EFH first defined for roundscale spearfish; same as white marlin EFH designation in Amendment 1 |

*Identification and Description of EFH*

A search of new literature and information was undertaken to assess habitat use and ecological roles of HMS EFH. Published and unpublished scientific reports, fishery dependent and independent data sets, and expert and anecdotal information detailing the habitats used by the managed species were evaluated and synthesized for inclusion in Amendments 1 and 3. NMFS also conducted a comprehensive review of all federally and non-federally managed fishing gears that formed the basis for further analysis on gear impacts in the amendment. Additionally, NMFS took into account comments received from the HMS Advisory Panel and the public on how best to proceed to update EFH, data considerations, extent of EFH, impacts on EFH, and concerns about HAPCs, including requests to consider HAPCs for BFT spawning areas in the Gulf of Mexico.

NMFS established new EFH boundaries based on the 95 percent probability boundary using Geographic Information System (GIS) analyses and Hawth's analysis tool. The probability boundary was created by taking all of the available distribution points for a particular species and life stage and creating a percent volume contour (PVC, or probability boundary). The probability boundaries are based on all data points collected ocean-wide and not just data points inside the EEZ, thus taking into account the migratory nature of HMS. As EFH designations are restricted from extending beyond the U.S. EEZ, the EEZ boundary was used as the cut-off point for the EFH delineations.

EFH maps are presented in hard copy in Amendments 1 and 3 and electronically on the internet via spatial files in Adobe (pdf) format. The electronic maps and downloadable spatial EFH files for HMS and all federally managed species can be found on the NMFS EFH Mapper at: http://sharpfin.nmfs.noaa.gov/website/EFH_Mapper/map.aspx.

*Habitat Areas of Particular Concern*

NMFS has two established HAPCs for HMS, one in the Gulf of Mexico for spawning BFT and one for sandbar sharks along the Atlantic coast. More information regarding these HAPCs can be found in Amendment 1. NMFS is currently conducting research in the Gulf of Mexico regarding impacts from the 2010 Deepwater Horizon BP oil spill, and any resulting information related to the oil spill's impacts on BFT EFH will be documented in upcoming SAFE reports.

*Fishing and Non-fishing Impacts*

Amendment 1 included an analysis of fishing and non-fishing impacts on EFH as required by the Magnuson-Stevens Act and the EFH regulations. Most HMS EFH is comprised of the water column. As water column characteristics such as temperature, salinity, and dissolved oxygen are unlikely to be affected by fishing gears, NMFS concluded that fishing gears are not having a negative effect on most HMS EFH. For some shark species, EFH includes specific benthic habitat types such as sand, mud, or submerged aquatic vegetation and of the gears used in HMS fisheries only shark bottom longline (BLL) gear is considered to potentially affect EFH. NMFS reviewed all available relevant information such as the intensity, extent, and frequency of any adverse effects on EFH and concluded that shark BLL gear as currently used in the shark fishery is having no more than a minimal and temporary effect on EFH. Likewise, other HMS gears are not considered to have an impact on EFH. As a result, NMFS implemented no measures to regulate shark BLL gear or any other HMS gears to minimize fishing impacts in Amendment 1.

## 3.2 Shark Nursery Grounds and Essential Fish Habitat Studies

NMFS continues to study EFH for HMS to refine our understanding of important habitat areas for HMS. The Magnuson-Stevens Act defines EFH as habitat necessary for spawning, breeding, feeding, and growth to maturity. The Magnuson-Stevens Act requires the identification of EFH in FMPs, and towards that end NMFS has funded two cooperative survey programs designed to further delineate shark nursery habitats in the Atlantic and Gulf of Mexico. The Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) Survey, and the Cooperative Gulf of Mexico States Shark Pupping and Nursery (GULFSPAN) Survey are designed to assess the geographical and seasonal extent of shark nursery habitat, determine which shark species use these areas, and gauge the relative importance of these coastal habitats in order to provide information that can then be used in EFH determinations. Also, survey data collected are being incorporated into stock assessment models as abundance trends and life history parameters.

The COASTSPAN program, administered by the NMFS Northeast Fisheries Science Center's Narragansett, Rhode Island laboratory, has been collecting information on shark nursery areas along the U.S. Atlantic coast since 1998. It involves NMFS scientists along with state and university researchers in Massachusetts, Delaware, North Carolina, South Carolina, Georgia, Florida and the U.S. Virgin Islands. NMFS initiated the GULFSPAN program in 2003 to expand upon the COASTSPAN Survey. This cooperative program, which is administered by the NMFS Southeast Science Center's Panama City, Florida laboratory, includes, in addition to NMFS scientists, the states of Florida, Alabama, Mississippi, and Louisiana. Following is a summary of the results from the 2010 COASTSPAN and GULFSPAN surveys (Bethea *et al*., 2011; McCandless *et al*., 2011).

*Massachusetts*

COASTSPAN sampling was conducted in Plymouth, Kingston, and Duxbury Bays in 2010. The shark catch consisted entirely of immature sand tiger sharks, with the majority of the catch being young-of-the-year. There were also several captures of age 1+ sharks this year, including five sharks that were tagged in Plymouth Bay in 2009 as young-of-the-year and recaptured there the following year, suggesting some sharks utilize this bay repeatedly in their first years. This work confirms the importance of these areas as summer nursery habitat for this prohibited species.

*Rhode Island*

COASTSPAN sampling was conducted off Point Judith, Rhode Island in 2010. A total of 21 sand tiger sharks were tagged and released, with the majority of the catch being young-of-the-year. There were also several age 1 fish captured, including two fish that were later recaptured off Cape Cod and Downeast Maine. These results indicate the potential for Rhode Island waters to provide nursery habitat for this prohibited species and transitional habitat during their migrations to northern waters.

*Delaware Bay*

COASTSPAN sampling encompassed the entire Bay from the mouth of the Delaware River to the mouth of Delaware Bay using a random stratified design based on depth and geographic location. Additional sampling was also conducted at historical fixed stations throughout the bay. Sandbar shark was the most abundant shark species caught in 2010, followed by smooth dogfish, sand tiger, and one juvenile white shark. The majority of sandbar sharks caught were immature, with nearly a third of these as young-of the-year; the remaining sandbar sharks caught were considered mature females based on length and girth measurements. Smooth dogfish were represented nearly equally by juvenile and adult fish in 2010, with the overwhelming majority of immature and mature fish as young-of-the-year and females, respectively. Mature and immature sand tigers were also represented with nearly a one to one ratio in 2010. The lone white shark was an immature male (159 cm fork length) caught in the coolest recorded surface temperature in the Bay for the season (21 degrees C); south of Brandywine Light in 17 m of water. Delaware Bay continues to provide important nursery habitat for sandbar shark, smooth dogfish and sand tiger sharks. The extensive use of the Bay by all life stages of sand tiger and smooth dogfish continues to highlight the seasonal importance of this essential shark habitat.

*North Carolina*

Sampling occurred year round in inland (Pamlico Sound and Pungo, Neuse, New, and Cape Fear Rivers) and nearshore waters along the southern coast of North Carolina from New River Inlet to the South Carolina border. No sharks were captured during limited sampling in Pamlico Sound and the Pungo and Neuse Rivers. In the remaining inland waters, Atlantic sharpnose shark was the most abundant species. In the Atlantic coastal waters, the catch was seasonally dominated by spiny dogfish and smooth dogfish in the cooler months. Atlantic sharpnose sharks dominated the catch in the warmer months.

*South Carolina*

COASTSPAN sampling took place in both nearshore and estuarine waters along the South Carolina coast including: Bulls Bay, Charlestown Harbor, North Edisto, Port Royal Sound, St. Helena Sound, and Winyah Bay. Thirteen species of sharks were captured, the most abundant of which was Atlantic sharpnose. Other sharks captured, in order of abundance, were finetooth, sandbar, bonnethead, blacktip, blacknose, scalloped hammerhead, spinner, nurse, smooth dogfish, lemon, tiger, and bull sharks. Six species were also captured as young-of-the-year in South Carolina estuarine waters: Atlantic sharpnose, blacktip, finetooth, scalloped hammerhead, sandbar, and spinner sharks. The majority of each shark species captured were immature, with the exception of three species: Atlantic sharpnose, blacknose, and bonnethead sharks. These findings continue to highlight the importance of South Carolina estuarine and nearshore waters as nursery habitat for many small and large coastal shark species and indicate the extensive use of these waters as habitat for several adult small coastal shark species.

*Georgia*

COASTSPAN sampling took place in both estuarine (St. Simon and St. Andrew sound systems) and nearshore waters along the Georgia coast from Sapelo Island to the Florida border. Of the ten species of shark captured, Atlantic sharpnose was the most abundant. Other sharks included bonnethead, blacknose, sandbar, blacktip, scalloped hammerhead, spinner, finetooth, bull, and tiger sharks, and one spiny dogfish. Four species captured were also present as young-of-the-year in estuarine waters: Atlantic sharpnose, blacktip, scalloped hammerhead, and sandbar sharks. In addition, Atlantic sharpnose, blacknose, blacktip and spinner sharks were present as young-of-the-year in Georgia's nearshore waters. The majority of sharks captured were immature, highlighting the importance of these areas as potential nursery habitat for both small and large coastal shark species. In addition, the majority of blacknose sharks and bonnetheads were mature, indicating these waters continue to provide important adult habitat for these small coastal shark species.

*Atlantic coast of Florida*

COASTSPAN sampling occurred within 2 km of Florida's north Atlantic coast in and around the following locations: Cumberland Sound, Nassau Sound, Tolomato River, St. Johns River, St. Augustine Inlet, and Matanzas Inlet. Species represented in the catch included, in order of abundance: Atlantic sharpnose, blacktip, scalloped hammerhead, bonnethead, blacknose, sandbar shark, finetooth, lemon, nurse, and spinner sharks. Nassau Sound continues to provide nursery habitat for juvenile Atlantic sharpnose, blacktip, and scalloped hammerhead sharks. Cumberland Sound also continues to provide nursery habitat for these species as well as habitat for adult bonnethead females. The continued use of these areas provides supporting evidence that they provide essential shark habitat for multiple species and life stages. In addition, the waters of the Tolomato River, particularly around Pine Island, may serve as inshore nursery habitat for scalloped hammerheads.

*U.S. Virgin Islands*

COASTSPAN sampling took place in Coral Bay and Fish Bay of St. John in 2010. Two species of shark were captured, blacktip and lemon sharks. All sharks captured were immature and were also present as young-of-the-year in both bays. Long-term passive tracking data indicates strong site fidelity towards these two bays and continues to show connectivity between areas with similar habitat composition (mangrove associated seagrass and macroalgae beds), such as Lameshure Bay and Hurricane Hole, St John. In addition, previously tagged juveniles were detected in Rendezvous, Princess, Otter, Water and Brown Bays around the island of St John in 2010. These results continue to highlight Coral and Fish Bay as important nursery habitat for blacktip and lemon sharks. In addition, these results indicate the potential many of the bays around St John have in providing additional nursery habitat for these species.

*Panhandle of Florida*

GULFSPAN sampling covered 5 areas in the Florida panhandle: St. Andrew Bay, Crooked Island Sound, St. Joseph Bay, the Gulf of Mexico side of St. Vincent Island, and Apalachicola Bay. Ten species of sharks and three species of rays were captured; the most abundant of which was Atlantic sharpnose shark. Others included blacknose, blacktip, bonnethead, finetooth, Florida smoothhound, sandbar, scalloped hammerhead, and spinner sharks, as well as cownose, smooth butterfly, and southern stingrays. The majority of the sharks captured were immature, indicating that areas along the Florida panhandle are potentially important nursery areas for both large and small coastal shark species. In general, young-of-the-year sharks were more often collected in shallower water with higher temperature, lower salinity, and more turbid conditions compared to juveniles and adults. Benthic habitat included shallow seagrass beds, clay, sand, mud and oyster shoals.

*Big Bend of Florida*

GULFSPAN sampling by Florida State University in 2011 was similar to 2010, covering more than 300 km of Florida's coastline from St. George Sound to Anclote Keys. Longlines and gillnets were used to collect data. Twelve elasmobranch species were caught; the majority of which was Atlantic sharpnose, bonnethead, blacktip, and blacknose sharks. Others included bull, lemon, tiger, great hammerhead, nurse, and Florida smoothound sharks, as well as cownose and smooth butterfly rays. As in previous years, sampling in 2011 indicates that this region serves as a primary nursery for at least three species of small coastal sharks (Atlantic sharpnose, bonnethead sharks, and blacknose) and one species of large coastal shark (blacktip).

*West Coast of Florida*

Sampling for GULFSPAN was conducted the Cedar Key region (Suwannee Sound, Cedar Key, and Waccasassa Bay) in August and October 2011. Three species of shark were caught: Atlantic sharpnose, blacktip, and bonnethead. Immature sharks of all species were more frequently caught in hard mud and seagrass habitats.

*Alabama*

GULFSPAN sampling took place in Mississippi Sound (Point Aux Pins, Dauphin island), Mobile Bay (Dog River, Fairhope and Cedar Point south to Pelican Bay), and the Perdido system (Perdido Bay to Orange Beach and Perdido Pass). Seven species of sharks were collected; the most abundant of which was Atlantic sharpnose. Others included finetooth, blacktip, bull, bonnethead, scalloped hammerhead, and spinner sharks. Immature individuals made up majority of the catch, indicating potential nursery areas for the species captured. Similar to previous surveys, western and southern sites of coastal Alabama (i.e., Mississippi Sound) had higher levels of observed shark abundance, occupying a wide range of habitats and environmental conditions within those areas.

*Conclusion*

The data obtained from both COASTSPAN and GULFSPAN surveys continues to provide the needed information to identify new EFH areas and to further refine areas already designated as EFH by determining specific habitat characteristics associated with these EFH. Time series for both surveys continue to be used in the stock assessments for large and small coastal shark species and are essential for monitoring these populations and their habitat use in the areas surveyed.

## 3.3 Chapter 3 References


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McCandless, C.T., B. DeAngelis, B. Frazier, C. Belcher, J. Gelsleichter, J. Kneebone, B. Legare, G. Skomal, and C. Collier. 2011. Summary Report of the 2010 Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) Survey. An internal report to NOAA Fisheries, Highly Migratory Species Division.

# 4.0 FISHERY DATA UPDATE

In this section, HMS fishery data, with the exception of some data on Atlantic sharks, are analyzed by gear type. Section 4.1 provides a summary of landings by species. While HMS fishermen generally target particular species, the non-selective nature of many fishing gears warrants 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 bycatch, incidental catch, and protected resource interaction statistics can be found in Chapter 7.0 of this document.

The revised list of authorized fisheries 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 List of Fisheries (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)." Authorized gear types include:

- Swordfish handgear fishery – rod and reel, harpoon, handline, bandit gear, buoy gear
- Swordfish recreational fishery - rod and reel, handline
- Pelagic longline fishery – longline, green-stick
- Shark gillnet fishery – gillnet
- Shark bottom longline fishery – longline
- Shark handgear fishery - rod and reel, handline, bandit gear
- Shark recreational fishery – rod and reel, handline
- Tuna purse seine fishery – purse seine
- Tuna recreational fishery– rod and reel, handline, speargun (speargun allowed for tunas other than bluefin), green-stick (only for vessels possessing the Atlantic HMS Charter-Headboat permit),
- Tuna handgear fishery – rod and reel, harpoon, handline, bandit gear
- Tuna harpoon fishery - harpoon
- Atlantic billfish recreational fishery – rod and reel only
- Tuna green-stick fishery – green stick

Due to the nature of the Standing Committee for Research and Statistics (SCRS) data collection, Table 4.1 depicts a summary of U.S. and international HMS catches by species rather than gear type. International catch levels and U.S. reported catches for HMS, other than sharks, are taken from the 2011Standing Report of the SCRS (SCRS, 2011). The U.S. percentage of regional and total catch of HMS species is presented (Table 4.1) to provide a basis for comparison of the U.S. catch 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 dead discards and recreational landings; and swordfish include commercial landings and dead discards. International catch and landings tables are included for the pelagic longline and purse seine fisheries in Sections 4.1 and 4.2 of this document. At this point, data necessary to assess the U.S. regional and total percentage of international catch levels for most Atlantic shark species are unavailable.

**Table 4.1 Calendar Year 2010 U.S. vs. International Catch (mt ww) of HMS Reported to ICCAT.** Source: SCRS, 2011.

| Species | Total International Reported Catch | Region | Total Regional Catch | U.S. Catch | U.S. Percentage of Regional Catch | U.S. Percentage of Total Atlantic Catch |
|---|---|---|---|---|---|---|
| Atlantic Swordfish | 24,720 | North Atlantic | 12,154 | 2,714 | 22.3% | 10.9% |
| | | South Atlantic | 12,566 | 0 | 0% | |
| Atlantic Bluefin Tuna | 13,124 | West Atlantic | 1,830 | 803 | 43.8% | 6.2% |
| | | East Atlantic/ Med. | 11,294 | 0 | 0% | |
| Atlantic Bigeye Tuna | 75,833 | Atlantic/Med | 75,833 | 673 | 0.88% | 0.88% |
| Atlantic Yellowfin Tuna | 108,343 | West Atlantic | 22,210 | 2,648 | 11.9% | 2.4% |
| | | East Atlantic/Med. | 86,133 | 0 | 0% | |
| Atlantic Albacore Tuna | 40,673 | North Atlantic | 19,649 | 329 | 1.6% | 0.81% |
| | | South Atlantic/Med. | 21,023 | 0 | 0% | |
| Atlantic Skipjack Tuna | 182,429 | West Atlantic | 18,140 | 55 | 0.30% | 0.03% |
| | | East Atlantic/Med. | 164,289 | 0 | 0% | |
| Atlantic Blue Marlin | 3,160 | North Atlantic | 1,644 | 21 | 1.3% | 0.67% |
| | | South Atlantic | 1,516 | 0 | 0% | |
| Atlantic White Marlin | 372 | North Atlantic | 196 | 10 | 5.1% | 2.7% |
| | | South Atlantic | 176 | 0 | 0% | |
| Atlantic Sailfish | 3,396 | West Atlantic | 625 | 8 | 1.28% | 0.24% |
| | | East Atlantic | 2,771 | 0 | 0% | |

| Species | Total International Reported Catch | Region | Total Regional Catch | U.S. Catch | U.S. Percentage of Regional Catch | U.S. Percentage of Total Atlantic Catch |
|---|---|---|---|---|---|---|
| Blue Sharks | 65,183 | North Atlantic | 37,238 | 8 | 0.02% | 0.01% |
| | | South Atlantic/Med. | 27,945 | 0 | 0% | |
| Porbeagle Sharks | 134 | North Atlantic | 120 | 1 | 0.83% | 0.74% |
| | | South Atlantic/Med | 14 | 0% | 0% | |
| Shortfin Mako Sharks | 6,500 | North Atlantic | 4,016 | 217 | 5.4% | 3.3% |
| | | South Atlantic/Med | 2,484 | 0 | 0% | |

### 4.2 Pelagic Longline (PLL) Fishery

#### 4.2.1 Current Management

The PLL fishery for Atlantic HMS primarily targets swordfish, yellowfin tuna, and bigeye tuna in various areas and seasons. Secondary target species include dolphin, albacore tuna, and, to a lesser degree, sharks. Although this gear can be modified (*e.g.*, depth of set, hook type, hook size, bait, *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. PLL 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. PLL gear 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 (MMPA). Any species (or undersized catch of permitted species) that cannot be landed due to fishery regulations is required to be released, regardless of whether the catch is dead or alive.

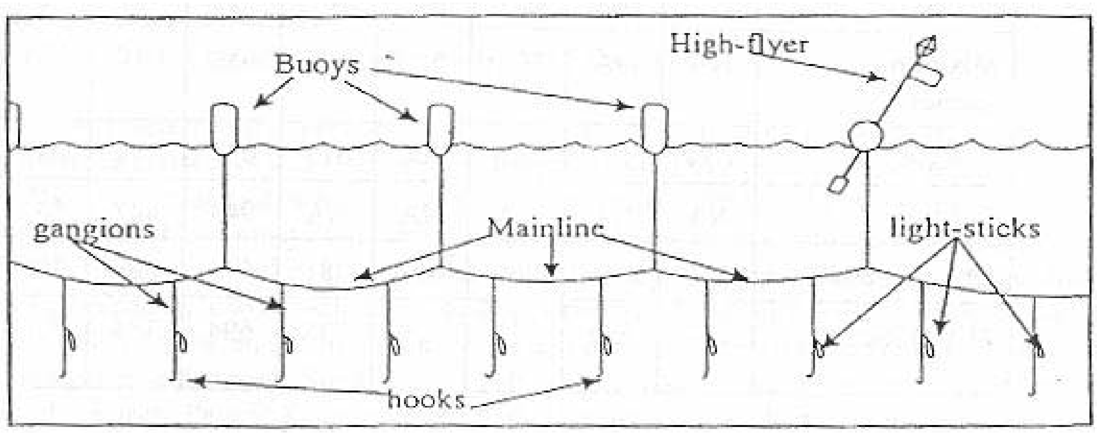


**Figure 4.1 Typical U.S. Pelagic Longline Gear.** Source: Arocha, 1996.

PLL gear is composed of several parts (Figure 4.1). 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. Based upon observer reports from 2005 - 2006, the shortest length of a mainline set on an observed trip was 9.5 nautical miles (nm) while the longest set during a trip was 44.2 nm (Keene, *et. al*., 2010). 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 light emitting chemicals, 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).

When targeting swordfish, PLL 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, fished deeper in the water column, and hauled back 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 4.2).

**Table 4.2 Average Number of Hooks per PLL Set, 2002 - 2010.** Source: PLL logbook data.

| Target Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Swordfish | 695 | 711 | 701 | 747 | 742 | 672 | 708 | 687 | 759 |
| Bigeye tuna | 755 | 967 | 400 | 634 | 754 | 773 | 751 | 755 | 653 |
| Yellowfin tuna | 715 | 720 | 696 | 691 | 704 | 672 | 678 | 689 | 687 |
| Mix of tuna species | 767 | 765 | 779 | 692 | 676 | 640 | 747 | 744 | 837 |
| Shark | 640 | 696 | 717 | 542 | 509 | 494 | 377 | 354 | 455 |
| Dolphin | 542 | 692 | 1,033 | 734 | 988 | 789 | 989 | 1,033 | 1,131 |
| Other species | 300 | 865 | 270 | 889 | 236 | NA | NA | NA | 467 |
| Mix of species | 756 | 747 | 777 | 786 | 777 | 757 | 749 | 781 | 761 |

Figure 4.2 illustrates basic differences between swordfish (shallow) and tuna (deep) longline sets. Swordfish sets are buoyed to the surface, have fewer hooks between floats, and are relatively shallow. This same type of gear arrangement is used for mixed target species 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 tuna sets hook fewer turtles than the swordfish sets because of the difference in fishing depth. In addition, tuna sets use bait only, while swordfish sets use 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.

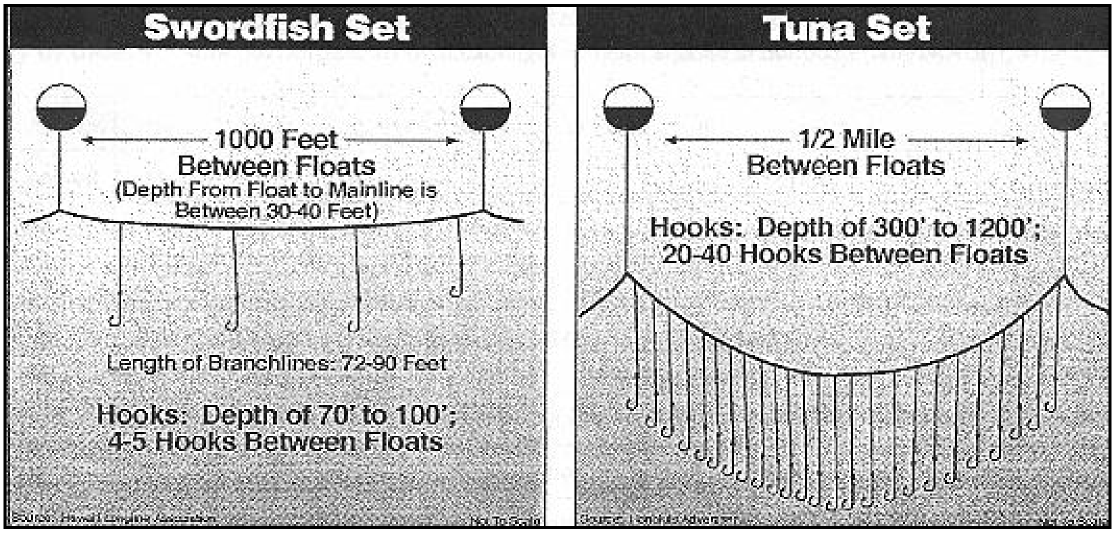


**Figure 4.2 Different Pelagic Longline Gear Deployment Techniques.**
Source: Hawaii Longline Association and Honolulu Advertiser.

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. PLL fishery has historically been comprised of five relatively distinct segments with different fishing practices and strategies. These segments are: 1) the Gulf of Mexico yellowfin tuna fishery; 2) the South Atlantic-Florida east coast to Cape Hatteras swordfish fishery, which has been greatly affected by the Florida East Coast, Charleston Bump time/area closures; 3) the Mid-Atlantic and New England swordfish and bigeye tuna fishery; 4) the U.S. distant water swordfish fishery; and, 5) 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 a year (NMFS, 1999). Due to the various changes in the fishery, *i.e.*, regulations, operating costs, market conditions, species availability, etc., the fishing practices and strategies of these different segments may change over time.

<u>The Gulf of Mexico Yellowfin Tuna Fishery</u>

Gulf of Mexico vessels primarily target yellowfin tuna year-round; however, a handful of these vessels 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, but are not limited to, Madiera Beach, Florida; Panama City, Florida; Dulac, Louisiana; and Venice, Louisiana (NMFS, 1999).

For catching tuna, the longline gear is configured similarly to swordfish longline gear but is deployed differently. The gear is typically set in the morning (between two a.m. and noon) and retrieved in the evening or night (4 p.m. to midnight). Fishing occurs in varying water temperatures; however, yellowfin tuna are generally 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 the Gulf of Mexico 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 PLL gear. In the Gulf of Mexico, and all other areas, except the Northeast Distant waters (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. In 2011, NMFS implemented a requirement for PLL vessels fishing in the Gulf of Mexico to use "weak hooks" that are designed to release spawning BFT while retaining yellowfin tuna and swordfish (76 FR 18653, April 5, 2011). This action will provide protection for spawning BFT in the Gulf of Mexico and help to better align landings and dead discards of BFT with the Longline category BFT subquota.

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

Historically, South Atlantic PLL 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 PLL closed area (year-round closure) and the Charleston Bump PLL closed area (February through April closure) became effective. These PLL closures, implemented to reduce bycatch and bycatch mortality of protected species, non-target species, and undersized fish, effectively shut down a large portion of the PLL fishery in the South Atlantic.

Prior to the PLL closures, smaller vessels made short fishing trips from the Florida Straits north to the bend in the Gulf Stream off Charleston, South Carolina (Charleston Bump). Mid-sized and larger vessels in this segment of the fishery migrate seasonally on longer trips to areas ranging from the Yucatan Peninsula throughout the West Indies and Caribbean Sea. Some trips also 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. Home ports (including seasonal ports) for this fishery include, but are not limited to, Georgetown, South Carolina; Charleston, South Carolina; Fort Pierce, Florida; Pompano Beach, Florida; and Key West, Florida. This segment 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 BLL and/or shark fishing during the winter when the LCS season is open. 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). In 1999, NMFS closed the Northeastern U.S. area in June to PLL gear to reduce BFT discards (64 FR 29090, May 28, 1999). Section 7.7 of this document describes changes in discards of BFT and other species. Additionally, in 2009, NMFS published the final Pelagic Longline Take Reduction Plan (PLTRP) (74 FR 23349, May 19, 2009) to protect pilot whales and Risso's dolphins which included, among other measures, a requirement that NMFS Fisheries at least 48 hours prior to a trip, and carry observers if requested.

The U.S. Atlantic Northeast Distant Water (NED) Swordfish Fishery

This fishing ground covers virtually the entire span of the western north Atlantic, from as far east as the Azores and the Mid-Atlantic Ridge. Large fishing vessels that fish in these distant waters 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 coastal fishing vessels, enabled the United States to become a significant participant in the north Atlantic swordfish fishery. In the past, some of these vessels have also fished for swordfish in the south Atlantic (*i.e*., south of 5° N. lat.). In recent years however, no U.S. vessels have fished for swordfish in the South Atlantic.

The NED vessels traditionally have been larger than their southeast counterparts because of the greater distances to the fishing grounds. Thus, trips in this fishery tend to be longer than in the other longline fisheries. 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). In recent years U.S. longline vessels have also offloaded catch in Canadian ports such as Trapassey and Bay Bull Newfoundland. 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 these vessels have returned to the NED fishery since the area was reopened pursuant to the issuance of the July 6, 2004, rule to reduce sea turtle bycatch and bycatch mortality (69 FR 40734, July 6, 2004)). Unlike 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 NED is also allocated a 25-mt BFT quota.-mt bluefin tuna quota. Beginning in November 2003, NMFS allowed retention of 25 mt of BFT caught incidentally to fishing under the NED experimental fishery (consistent with the 2002 ICCAT recommendation concerning western Atlantic BFT) with no target catch requirements. NMFS believed that that the strict controls of the experiment could have the effect of preventing fishermen from meeting the target catch requirements and, as a result, all BFT incidentally caught during the experiment would have to be discarded if the target catch requirements had remained in place. To avoid a wasteful result, NMFS specified that only once the 25 mt limit was reached would the target catch requirements apply.

From 2004 until 2009, NED landings were less than the available quota for that area (25 mt), despite the lack of NED target catch requirements. In 2009, the 25 mt quota in the NED was met during the fishing year, while northern area longline activity was ongoing. As a result, the BFT target catch requirements specified for the longline category became applicable in the NED from October 20 - December 31, 2009 (74 FR 53671, October 20, 2009). In 2010, NED landings were 9 mt. In July 2011, NMFS reinstated pelagic longline target catch requirements for retaining BFT in the NED. In recent years, many individuals and environmental organizations have expressed concern that the lack of target catch requirements in the NED provided economic incentive to increase fishing effort to retain BFT in what is intended to be an incidental fishery. The same target catch requirements now apply both inside and outside of the NED (i.e., one large medium or giant BFT per vessel per trip may be landed, provided that at least 2,000 lb of species other than BFT are legally caught, retained, and offloaded from the same trip and are recorded on the dealer weighout slip as sold; two large medium or giant BFT may be landed incidentally to at least 6,000 lb of species other than BFT; and three large medium or giant BFT may be landed incidentally to at least 30,000 lb of species other than BFT). Both the weak hook action in the Gulf of Mexico and the reimplementation of target catch requirements in the NED were intended to address BFT bycatch issues in PLL fisheries, including managing BFT catch and landings within available quotas.

The Caribbean Tuna and Swordfish Fishery

In the past, this fleet has been similar to the southeast coastal fishing fleet in that it consisted primarily of smaller vessels making short, relatively near-shore trips, producing high quality fresh product (NMFS, 1999). The U.S. Caribbean fleet historically landed swordfish and tunas that supported the tourist trade in the Caribbean as well as a tuna canning industry that no longer exists. In recent years, yellowfin tuna have been the primary species of tuna landed using PLL gear, with additional landings of skipjack, bigeye, and albacore tunas. Because no Atlantic Tunas Longline permits are currently held by residents of Puerto Rico or the U.S. Virgin Islands, it can be assumed that these tuna landings were reported by vessels fishing in the Caribbean, but based out of other U.S. ports.

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

The U.S. Atlantic PLL fishery is guided by a swordfish quota that is divided between the North and South Atlantic (separated at 5° N. Lat.). Other regulations include minimum sizes for swordfish, yellowfin tuna, bigeye tuna, and BFT; BFT target catch requirements; shark quotas; protected species incidental take limits; reporting requirements (including logbooks); gear and bait requirements; limited access vessel permits, and mandatory workshop requirements. Current billfish regulations prohibit the retention of billfish by commercial vessels, or the sale of billfish from the Atlantic Ocean. As a result, all billfish hooked on PLL gear must be discarded, and are considered bycatch. PLL is a heavily managed gear type and is strictly monitored. Because it is difficult for PLL fishermen to avoid undersized or prohibited fish in some areas, NMFS has closed areas in the Gulf of Mexico and along the U.S. East Coast. The intent of these closures was to decrease bycatch in the PLL fishery by closing areas with the highest bycatch rates. There are also time/area closures for PLL fishermen designed to reduce the incidental catch of BFT and sea turtles. In order to enforce time/area closures and to monitor the fishery, NMFS requires all PLL vessels to report positions on an approved VMS.

In addition to the regulations mentioned above, to protect sea turtles, vessels with PLL gear onboard must, at all times, in all areas open to PLL fishing except the NED, possess onboard and/or use only 16/0 or larger non-offset circle hooks and/or 18/0 or larger circle hooks with an offset not to exceed 10 degrees. Only whole finfish and squid baits may be possessed and/or utilized with allowable hooks. 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. All PLL vessels must possess and use sea turtle handling and release gear in compliance with NMFS careful release protocols. Additionally, all PLL vessel owners and operators must be certified in the use of the protected species handling and release gear. Certification must be renewed every three years and can be obtained by attending a training workshop. Approximately 18 - 24 workshops are conducted annually, and they are held in areas with significant numbers of PLL permit holders.

In 2009, to protect pilot whales and Risso's dolphins, the PLTRP (74 FR 23349, May 19, 2009) included a requirement that PLL vessel operators fishing in the Cape Hatteras Special Research Area must contact NMFS at least 48 hours prior to a trip, and carry observers if requested. The PLTRP also established a 20 nm upper limit on mainline length for all PLL sets in the mid-Atlantic Bight (MAB), and required that an informational placard be displayed in the wheelhouse and on the working deck of all active PLL vessels in the Atlantic fishery.

In April 2011, NMFS implemented a requirement for PLL vessels to use "weak hooks" - hooks that are designed to release large BFT while retaining yellowfin tuna and swordfish – when fishing in the Gulf of Mexico (76 FR 18653, April 5, 2011). This action provides protection for spawning BFT in the Gulf of Mexico and helps to better align landings and dead discards of BFT with the Longline category BFT subquota.

Permits

The 1999 FMP established six different limited access permit (LAP) types: (1) directed swordfish, (2) incidental swordfish, (3) swordfish handgear, (4) directed shark, (5) incidental shark, and (6) Atlantic tunas longline. To reduce bycatch in the PLL 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 October 2011, approximately 242 tuna longline limited access permits had been issued. In addition, approximately 178 directed swordfish limited access permits, 67 incidental swordfish limited access permits, 217 directed shark limited access permits, and 262 incidental shark LAPs had been issued (see Table 8.1 for more information on permits). Vessels with limited access swordfish and shark permits do not necessarily use PLL gear, but these are the only permits that allow for the use of PLL gear in HMS fisheries.

In 2010, the procedures for issuing the Atlantic tunas longline permits were consolidated within the SERO permits office in St. Petersburg, Florida. This streamlined PLL permitting process has made it easier for fishermen to obtain combinations of permits, when necessary, and made it more efficient to administer.

Monitoring and Reporting

PLL fishermen and the dealers who purchase Atlantic 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, scientific observer coverage, and vessel monitoring systems. 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.

PLL Observer Program

During 2010, NMFS observers recorded 725 PLL sets for overall non-experimental fishery coverage of 9.7 percent (Garrison and Stokes, 2010). Table 4.3 details the amount of observer coverage in past years for this fleet.

In the PLTRP (74 FR 23349, May 19, 2009), it was recommended that NMFS increase observer coverage to 12 to 15 percent throughout all Atlantic PLL fisheries that interact with pilot whales and Risso's dolphins to ensure representative sampling of fishing effort. If resources are not available to provide such observer coverage for all fisheries, regions, and seasons, the PLTRT recommended NMFS allocate observer coverage to fisheries, regions, and seasons with the highest observed or reported bycatch rates of pilot whales. The PLTRT recommended that additional coverage be achieved either by increasing the number of NMFS observers who have been specially trained to collect additional information supporting marine mammal research, or by designating and training special "marine mammal observers'' to supplement traditional observer coverage. In 2010, total observer coverage, including experimental sets, was 11.0 percent (Table 4.3).

**Table 4.3 Observer Coverage of the Pelagic Longline Fishery.** Source: Yeung, 2001; Garrison, 2003b; Garrison and Richards, 2004; Garrison, 2005; Fairfield-Walsh and Garrison, 2006; Fairfield-Walsh & Garrison, 2007; Fairfield & Garrison, 2008; Garrison, Stokes & Fairfield, 2009; Garrison and Stokes, 2010, 2011.

| 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% |
| 2002* | 856 | 353 | 503 | 8.9% | 3.9% | 100% |
| 2003* | 1,088 | 552 | 536 | 11.5% | 6.2% | 100% |
| | Total | Non-EXP | EXP | Total | Non-EXP | EXP |
| 2004** | 702 | 642 | 60 | 7.3% | 6.7% | 100% |
| 2005** | 796 | 549 | 247 | 10.1% | 7.2% | 100% |
| 2006 | 568 | - | - | 7.5% | - | - |
| 2007 | 944 | - | - | 10.8% | - | - |
| 2008 | 1,190 | - | 101*** | 13.6% | - | 100%*** |
| 2009 | 1,588 | 1,376 | 212*** | 17.3% | 15.0% | 100%*** |
| 2010 | 884 | 725 | 159*** | 11.0% | 9.7% | 100%*** |

*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).
*** In 2008- 2010, 100 percent observer coverage was required in experimental fishing in the FEC, Charleston Bump, and GOM, but these sets are not included in extrapolated bycatch estimates because they are not representative of normal fishing.

### 4.2.2 Recent Catch and Landings

U.S. PLL catch (including bycatch, incidental catch, and target catch) is largely related to vessel characteristics and gear configuration. The reported catch is summarized for the whole fishery in Table 4.4. Table 4.5 provides a summary of U.S. PLL landings, as reported to the International Commission for the Conservation of Atlantic Tunas (ICCAT). Additional information regarding U.S. landings and discards is available in the 2009 U.S. National Report to ICCAT (NMFS, 2010).

**Table 4.4 Reported Catch of Species Caught by U.S. Atlantic PLLs, in Number of Fish, for 2002-2010.** Source: PLL Logbook Data.

| Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Swordfish Kept | 49,320 | 51,835 | 46,440 | 41,139 | 38,241 | 45,933 | 42,800 | 45,378 | 33,831 |
| Swordfish Discarded | 13,035 | 11,829 | 10,675 | 11,134 | 8,900 | 11,823 | 11,194 | 7,484 | 6,107 |
| Blue Marlin Discarded | 1,175 | 595 | 712 | 567 | 439 | 611 | 687 | 1,013 | 504 |
| White Marlin Discarded | 1,438 | 809 | 1,053 | 989 | 557 | 744 | 670 | 1,064 | 605 |
| Sailfish Discarded | 379 | 277 | 424 | 367 | 277 | 321 | 506 | 774 | 312 |
| Spearfish Discarded | 148 | 108 | 172 | 150 | 142 | 147 | 197 | 335 | 212 |
| Bluefin Tuna Kept | 178 | 273 | 475 | 375 | 261 | 337 | 343 | 629 | 392 |
| Bluefin Tuna Discarded | 585 | 881 | 1,031 | 765 | 833 | 1,345 | 1,417 | 1,290 | 1,488 |
| Bigeye, Albacore, Yellowfin, Skipjack Tunas Kept | 79,917 | 63,321 | 76,962 | 57,132 | 73,058 | 70,390 | 50,108 | 57,461 | 51,786 |
| Pelagic Sharks Kept | 2,987 | 3,037 | 3,440 | 3,149 | 2,098 | 3,504 | 3,500 | 3,060 | 3,872 |
| Pelagic Sharks Discarded | 22,828 | 21,705 | 25,355 | 21,550 | 24,113 | 27,478 | 28,786 | 33,721 | 45,511 |
| Large Coastal Sharks Kept | 4,077 | 5,326 | 2,292 | 3,362 | 1,768 | 546 | 115 | 403 | 434 |
| Large Coastal Sharks Discarded | 3,815 | 4,813 | 5,230 | 5,877 | 5,326 | 7,133 | 6,732 | 6,672 | 6,726 |
| Dolphin Kept | 30,384 | 29,372 | 38,769 | 25,707 | 25,658 | 68,124 | 43,511 | 62,701 | 30,454 |
| Wahoo Kept | 4,188 | 3,919 | 4,633 | 3,348 | 3,608 | 3,073 | 2,571 | 2,648 | 749 |
| Turtle Interactions | 465 | 399 | 369 | 152 | 128 | 300 | 476 | 137 | 94 |
| *Number of Hooks (x 1,000)* | *7,150* | *7,008* | *7,276* | *5,911* | *5,662* | *6,291* | *6,498* | *6,979* | *5,729* |

**Table 4.5 Reported Landings in the U.S. Atlantic Pelagic Longline Fishery (in mt ww) for 2002-2010.** Source: NMFS ICCAT National Report 2011.

| Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Yellowfin Tuna | 2,573.0 | 2,164.0 | 2,492.2 | 1,746.2 | 2,009.9 | 2,394.5 | 1,324.5 | 1,700.1 | 1463.1 |
| Skipjack Tuna | 2.5 | 1.4 | 0.7 | 0.6 | 0.2 | 0.0 | 1.5 | 0.5 | 1.5 |
| Bigeye Tuna | 535.8 | 283.9 | 310.1 | 311.9 | 520.6 | 380.7 | 407.7 | 430.1 | 545.9 |
| Bluefin Tuna* | 49.9 | 133.9 | 180.1 | 211.5 | 204.6 | 185.2 | 232.5 | 334.3 | 211.5 |
| Albacore Tuna | 155.0 | 107.6 | 120.4 | 108.5 | 102.9 | 126.8 | 117.9 | 158.3 | 173.7 |
| Swordfish N.* | 2,598.8 | 2,756.3 | 2,518.5 | 2,272.8 | 1,960.8 | 2,474.0 | 2,353.6 | 2,691.1 | 2524.7 |
| Swordfish S.* | 199.9 | 20.5 | 15.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |

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

In recent years, there has been concern regarding the amount of swordfish that the U.S. has been landing, as it has been well below the ICCAT-recommended quota. To address this concern, NMFS has taken a number of steps to modify swordfish management measures as the North Atlantic swordfish stock has rebuilt. In 2007, NMFS published a final rule (72 FR 31688, June 7, 2007) to change PLL vessel upgrading requirements, increase incidental swordfish landing limits, and increase recreational (Angling and Charter/Headboat) landing limits. Additionally, NMFS implemented regulations in 2008 (73 FR 38144, July 3, 2008) to allow Atlantic tunas longline permits that had been expired for more than one year to be renewed. This action enabled some PLL fishermen to renew permits which previously could not be renewed for technical reasons, because they did not have a vessel to assign the permit to.

In the U.S. PLL fishery, fish may be discarded for a variety reasons. Swordfish, yellowfin tuna, and bigeye tuna may be discarded because they are undersized or unmarketable (*e.g.*, bitten by sharks). Blue sharks, as well as other species, are discarded because of limited markets (resulting in low prices) and perishability of the product. LCSs are discarded when the shark season is closed. BFT 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.

From 2005 through 2006, the Pelagic Observer Program (POP) recorded a total of 8,953 elasmobranchs (20 percent of the total catch) caught by U.S. PLL vessels targeting tunas and swordfish (Keene, *et al.*, 2010). Of the 31 elasmobranch species observed, blue sharks were numerically dominant (33 percent of the total elasmobranch catch), with blue, pelagic rays, silky, night, shortfin mako, tiger, and requiem sharks making up the majority (85.8 percent).

At this time, the direct use of observer data with pooling for estimating dead discards in the PLL 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 for a number of years.

Bycatch mortality of marlins, sailfish, swordfish, and BFT 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 PLL fishery, NMFS implemented regulations to close certain areas to this gear type (Figure 4.3) and has banned the use of live bait by PLL vessels in the Gulf of Mexico.

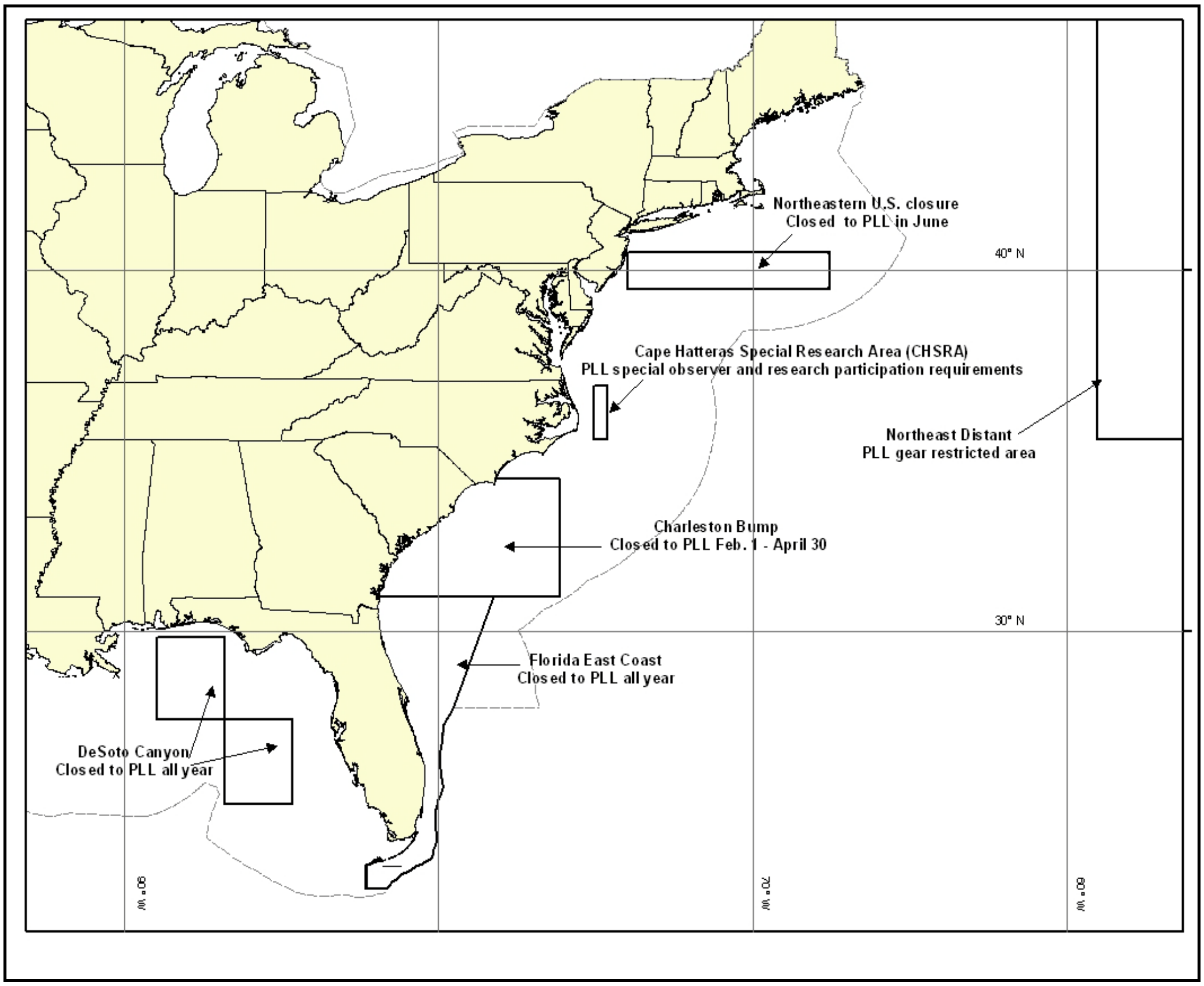


**Figure 4.3 Areas Closed to Pelagic Longline Fishing by U.S. Flagged Vessels**

*Protected Species*

Marine Mammals

Many of the marine mammals that are hooked by U.S. PLL fishermen are released alive, although some animals suffer serious injuries and may die after being released. The observed and estimated marine mammal interactions for 2002 – 2009 are summarized in Table 4.6. Marine mammals are caught primarily during the third and fourth quarters in the MAB and Northeast Coastal (NEC) areas (Table 4.6). In 2009, the majority of observed interactions were with pantropical spotted dolphin, Risso's dolphin, and pilot whales (Garrison and Stokes, 2010**)**. 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 4.6 Summary of Marine Mammal Interactions in the Pelagic Longline Fishery, 2002 - 2010. Sources: Yeung, 2001; Garrison, 2003b; Garrison and Richards, 2004; Garrison, 2005; Walsh and Garrison, 2006; Fairfield-Walsh and Garrison, 2007; Fairfield and Garrison, 2008; Garrison, Stokes & Fairfield, 2009; Garrison and Stokes, 2010, 2011.**

| Year | Species | Total | | Mortality | | Serious Injury | | Alive | |
|---|---|---|---|---|---|---|---|---|---|
| | | Obs | Est | Obs | Est | Obs | Est | Obs | Est |
| 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 | - | - |

| Year | Species | Total | | Mortality | | Serious Injury | | Alive | |
|---|---|---|---|---|---|---|---|---|---|
| | | Obs | Est | Obs | Est | Obs | Est | Obs | Est |
| | 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 |
| 2006 | Atlantic spotted dolphin | | 1.9 | - | - | - | - | - | 1.9 |
| | Beaked whale | | 2.2 | - | - | - | - | - | 2.2 |
| | Bottlenose dolphin | | 0.6 | - | - | - | - | - | 0.6 |
| | Pilot whale | 20 | 274.5 | 1 | 15.5 | 12 | 168.6 | 7 | 90.4 |
| | Unidentified dolphin | 2 | 26.5 | - | - | 2 | 26.5 | - | - |
| | Unidentified marine mammal | 1 | 12.6 | 1 | 12.6 | - | - | - | - |
| 2007 | Atlantic spotted dolphin | | 1.4 | - | - | - | - | - | 1.4 |
| | Bottlenose dolphin | 2 | 12.6 | - | - | 1 | - | 1 | 12.6 |
| | Beaked whale | 1 | 1.5 | - | - | - | - | 1 | 1.5 |
| | Pilot whale | 8 | 86.6 | - | - | 5 | 56.7 | 3 | 30.7 |
| | Risso’s dolphin | 2 | 20.3 | - | - | 1 | 9.3 | 1 | 11.0 |
| | Unidentified dolphin | 2 | 3.8 | 1 | 1.5 | - | - | 1 | 2.3 |
| | Unidentified marine mammal | 2 | 22.1 | - | - | 2 | 22.1 | - | - |
| 2008 | Atlantic spotted dolphin | | 3.1 | | | | | | 3.1 |
| | Bottlenose dolphin | 1 | 6.6 | - | - | - | - | 1 | 6.6 |
| | Beaked whale | 1 | 6.1 | - | - | - | - | 1 | 6.1 |
| | Killer whale | 1 | 3.4 | - | - | - | - | 1 | 3.4 |
| | Pilot whale | 8 | 141.5 | - | - | 5 | 98.2 | 3 | 43.3 |
| | Risso’s dolphin | 9 | 64.4 | 1 | 4.4 | 4 | 20.4 | 4 | 39.6 |
| | Sperm whale | 1 | 1.6 | - | - | - | - | 1 | 1.6 |
| | Unidentified dolphin | | 3.2 | - | - | - | - | | 3.2 |
| | Unidentified marine mammal | 2 | 34.7 | - | - | 1 | 20.4 | 1 | 14.3 |
| 2009 | Bottlenose dolphin | 3 | 23 | - | - | 2 | 11.3 | 1 | 11.6 |
| | Common dolphin | 1 | 8.5 | 1 | 8.5 | - | - | - | - |
| | False Killer whale | | 2.5 | - | - | - | - | | 2.5 |
| | Pantropical spotted dolphin | 5 | 26.6 | - | - | 4 | 14.1 | 1 | 12.5 |
| | Pilot whale | 4 | 35.7 | - | - | 2 | 16.5 | 2 | 19.2 |
| | Risso’s dolphin | 5 | 38.5 | - | - | 2 | 11.4 | 3 | 27.1 |
| | Unidentified dolphin | 1 | 1.6 | - | - | - | - | 1 | 1.6 |
| | Unidentified marine mammal | 1 | 8.0 | - | - | 1 | 8.0 | - | - |
| 2010 | Bottlenose dolphin | 2 | 16.9 | - | - | 1 | 1 | 1 | 15.9 |
| | Minke whale | 1 | 24.4 | - | - | - | - | 2 | 24.4 |
| | Pantropical spotted dolphin | 3 | 6.1 | - | - | - | - | 2 | 5.1 |
| | Pilot whale | 10 | 149.9 | - | - | 8 | 126.5 | 2 | 20.5 |
| | Pygmy sperm whale | 1 | 1.2 | 1 | 1.2 | - | - | - | - |
| | Risso’s dolphin | 1 | 9.9 | - | - | - | - | 1 | 9.9 |
| | Unidentified dolphin | 1 | 1.5 | - | - | - | - | 1 | 1.5 |
| | Unidentified marine mammal | 4 | 27.5 | 1 | 5.5 | 3 | 21.9 | - | - |

Sea Turtles

As a result of increased sea turtle interactions in 2001 and 2002, NMFS reinitiated consultation for the PLL fishery and completed a new BiOp on June 1, 2004. The June 2004 BiOp concluded that long-term continued operation of the Atlantic PLL fishery as proposed was not likely to jeopardize the continued existence of loggerhead, green, hawksbill, Kemp's ridley, or olive ridley sea turtles, but was likely to jeopardize the continued existence of leatherback sea turtles. The BiOp included a Reasonable and Prudent Alternative (RPA) which was adopted and implemented within the PLL fishery, and an Incidental Take Statement (ITS) for 2004 – 2006 combined, and for each subsequent three-year period (NMFS, 2004b). The estimated sea turtle takes for regular fishing and experimental fishing effort for 2002- 2009 are summarized in Table 4.7, Table 4.8, and Table 4.9. Loggerhead interactions are more widely distributed, however, the NED, and the NEC appear to be areas with high interaction levels each year.

The PLL fishery interacted with an estimated 168 leatherback sea turtles and 344 loggerhead sea turtles outside of experimental fishing operations in 2010. The majority of loggerhead sea turtle interactions occurred in the NEC, NED, and SAB areas (Table 4.7). The interactions with leatherback sea turtles were highest in the NED and NEC areas (Table 4.8). NMFS monitors observed interactions with sea turtles and marine mammals on a quarterly basis and reviews data for additional appropriate action, if any, as necessary.

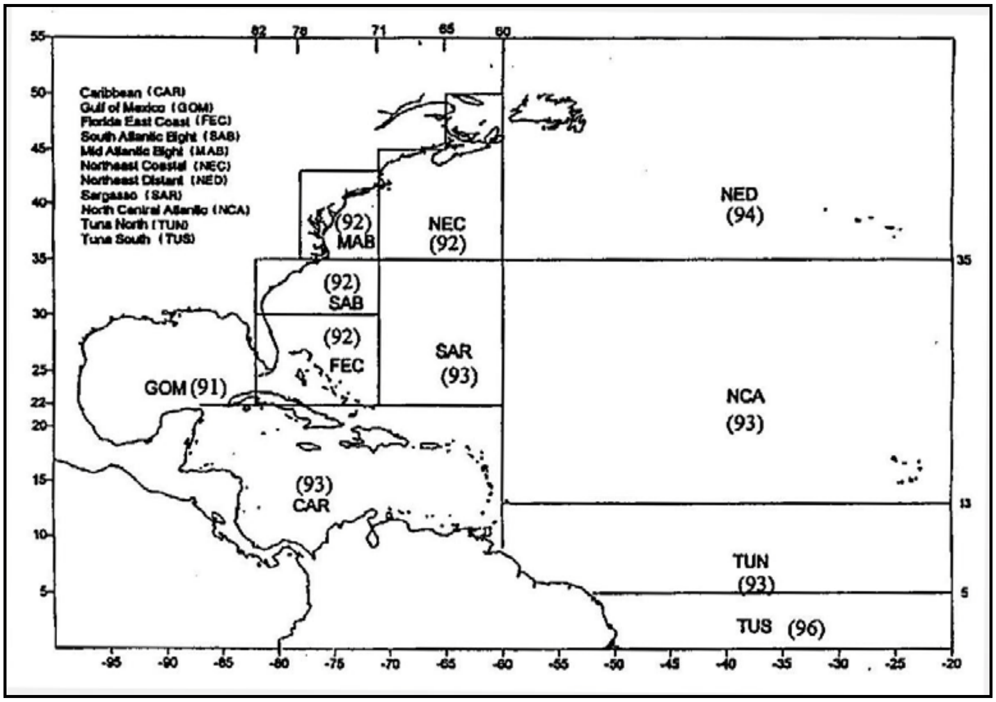


**Figure 4.4 Geographic Areas Used in Summaries of Pelagic Logbook Data.** Source: Cramer and Adams, 2000

**Table 4.7 Estimated Number of Loggerhead Sea Turtle Interactions in the U.S. Atlantic Pelagic Longline Fishery, 2002 - 2010 by statistical area. Sources: Walsh and Garrison, 2006; Garrison, 2005; Garrison and Richards, 2004; Garrison 2003; Fairfield-Walsh and Garrison, 2007; Fairfield and Garrison, 2008; Garrison et al., 2009; Garrison and Stokes, 2010, 2011.**

| Area | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| CAR | 43 | 36 | 61 | 40 | 16 | 7 | 17 | 9 | 12 |
| GOM | 170 | 135 | 45 | 19 | 17 | 10 | 10 | 38 | 2 |
| FEC | 99 | 137 | 99 | 0 | 40 | 83 | 47 | 41 | 26 |
| SAB | 22 | 52 | 194 | 34 | 18 | 34 | 70 | 47 | 39 |
| MAB | 94 | 18 | 92 | 54 | 70 | 155 | 20 | 37 | 55 |
| NEC | 147 | 241 | 150 | 67 | 135 | 48 | 237 | 43 | 101 |
| NED | 0 | 0 | 52 | 20 | 235 | 200 | 352 | 22 | 97 |
| SAR | 0 | 70 | 41 | 38 | 19 | 4 | 16 | 7 | 13 |
| NCA | 0 | 39 | 0 | 3 | 10 | 2 | 1 | 0 | 0 |
| TUN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 |
| TUS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| **Area** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** |
|---|---|---|---|---|---|---|---|---|---|
| Total | 575 | 728 | 734 | 275 | 559 | 543 | 770 | 243 | 344 |
| NED exp’tal fishery (2001-03) | 100 | 92 | - | - | - | - | - | - | - |
| Exp’tal fishery (2004-05; 2008-10) | - | - | 0 | 8 | - | - | 1 | 0 | 0 |
| Total | 675 | 820 | 734 | 283 | 559 | 543 | 771 | 243 | 344 |

**Table 4.8 Estimated Number of Leatherback Sea Turtle Interactions in the U.S. Atlantic Pelagic Longline Fishery, 2002 - 2010 by statistical area. Sources: Walsh and Garrison, 2006; Garrison, 2005; Garrison and Richards, 2004; Garrison 2003; Fairfield-Walsh and Garrison, 2007; Fairfield and Garrison, 2008; Garrison et al, 2009; Garrison and Stokes, 2010, 2011.**

| Area | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| CAR | 0 | 0 | 17 | 2 | 4 | 1 | 2 | 1 | 10 |
| GOM | 695 | 838 | 780 | 179 | 109 | 212 | 144 | 93 | 26 |
| FEC | 100 | 27 | 64 | 62 | 28 | 7 | 30 | 19 | 20 |
| SAB | 93 | 75 | 164 | 7 | 39 | 0 | 0 | 31 | 13 |
| MAB | 70 | 94 | 184 | 11 | 30 | 114 | 43 | 31 | 0 |
| NEC | 5 | 76 | 33 | 6 | 73 | 76 | 140 | 73 | 40 |
| NED | 0 | 0 | 98 | 63 | 116 | 84 | 0 | 37 | 55 |
| SAR | 0 | 0 | 18 | 20 | 14 | 5 | 14 | 3 | 2 |
| NCA | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| TUN | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 1 | 0 |
| TUS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 962 | 1113 | 1359 | 351 | 415 | 499 | 381 | 286 | 166 |
| NED exp'tal fishery (2001-03) | 158 | 79 | - | - | - | - | - | - | - |
| Exp'tal fishery (2004-05; 2008-10) | - | - | 3 | 17 | - | - | 4 | 4 | 2 |
| Total | 1120 | 1192 | 1362 | 368 | 415 | 499 | 385 | 290 | 168 |

**Table 4.9 Estimated Sea Turtle Interactions by Species in the US Atlantic Pelagic Longline fishery, 2002-2010, and Incidental Take Levels (ITS).**

| PLL Fishery | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 3 year ITS 2004-06/2007-09 [1] Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Leatherback | 962 | 1,112 | 1,362 | 368 | 415 | 500 | 385 | 286 | 168 | 1,981 / 1,764 |
| Loggerhead | 575 | 727 | 734 | 282 | 558 | 542 | 772 | 243 | 344 | 1,869 / 1,905 |
| Other/Unidentified sea turtles | 50 | 38 | 0 | 0 | 11 | 1 | 0 | 0 | 3 | 105 / 105 |
| Marine mammals | 201 | 300 | 164 | 372 | 313 | 151 | 265 | 144 | 238 | NA |

[1] Applies to all subsequent 3-year ITS periods

Sea Birds

Observer data indicate that seabird bycatch is relatively low in the U.S. Atlantic PLL fishery (Table 4.10) (NMFS, 2009). In 2007, there were 121 active U.S. PLL vessels fishing for swordfish in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea that reportedly set approximately 6.1 million hooks. A total of one seabird was observed taken, a brown pelican which was released alive. Extrapolated estimates of seabird bycatch have varied substantially since 1992. Live discards ranged from zero to 486 per year, averaging 60 per year. Estimates of dead discards of seabirds ranged from zero to 623 per year, averaging 150 per year. The annual bycatch rate of birds discarded dead ranged from zero to 0.015 birds per 1,000 hooks, while the rate of total seabird catch ranged from zero to 0.106 birds per 1,000 hooks.

**Table 4.10 Observed Seabird Bycatch in the U.S. Atlantic Pelagic Longline Fishery, 2004-2010. Source**: NMFS, 2008; NMFS PLL fishery observer program (POP) data.

| Year | Month [1] | Area | Type of Bird | Number observed | Status |
|---|---|---|---|---|---|
| 2004 | 1 | MAB | Gull | 5 | dead |
| 2004 | 3 | MAB | Shearwater greater | 1 | alive |
| 2004 | 3 | MAB | Shearwater greater | 4 | dead |
| 2004 | 4 | NED | Seabird | 1 | dead |
| 2005 | 1 | SAB | Gull herring | 1 | dead |
| 2005 | 1 | SAB | Shearwater spp | 1 | dead |
| 2005 | 3 [2] | NEC | Shearwater greater | 1 | alive |
| 2005 | 3 [2] | NEC | Shearwater greater | 1 | dead |
| 2006 | 4 | MAB | Shearwater greater | 1 | dead |
| 2006 | 4 | NEC | Shearwater spp | 1 | alive |
| 2006 | 4 | NED | Shearwater greater | 1 | dead |
| 2007 | 1 | MAB | Gull blackbacked | 6 | dead |
| 2008 | 2 | GOM | Pelican brown | 1 | alive |
| 2009 | 1 | MAB | Northern gannet | 2 | alive |
| 2009 | 1 | MAB | Northern gannet | 1 | dead |
| 2009 | 2 | GOM | Brown pelican | 1 | dead |
| 2009 | 3 | MAB | Shearwater greater | 3 | dead |
| 2009 | 3 | MAB | Unid | 1 | dead |
| 2010 | 4 | MAB | Gull herring | 1 | dead |

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

**Table 4.11 Status of Seabird Bycatch in the U.S. Atlantic Pelagic Longline Fishery, 1992- 2010.** Source: NMFS Pelagic longline fishery observer program (POP).

| Species | Release Status | | Total | Percent Dead |
|---|---|---|---|---|
| | Dead | Alive | | |
| Greater shearwater | 28 | 3 | 31 | 90.3 |
| Cory's shearwater | 1 | - | 1 | 100.0 |
| Unidentified shearwater | 2 | 1 | 3 | 66.7 |
| Herring gull | 9 | - | 9 | 100.0 |
| Great black-backed gull | 9 | 1 | 10 | 90.0 |
| Laughing gull | 1 | 1 | 2 | 50.0 |
| Unidentified gull | 14 | 8 | 22 | 63.6 |
| Northern gannet | 2 | 9 | 8 | 11.1 |
| Storm petrel | 1 | - | 1 | 100.0 |
| Unidentified seabird | 40 | 19 | 59 | 67.8 |
| Brown pelican | 2 | 0 | 1 | 100.0 |
| Grand Total | 109 | 42 | 151 | 72.2 |

**Table 4.12 Expanded estimates of seabird bycatch (alive and dead) in the U.S. Atlantic pelagic longline fishery, 2000 - 2007.** Source: NMFS, 2008.

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|
| Gulls | 22 | - | 248 | - | 77 | 8 | - | 54 |
| Gannets | 22 | - | - | - | - | - | - | - |
| Seabirds | - | - | 36 | 39 | 6 | - | - | - |
| Shearwaters | - | 283 | - | - | 75 | 31 | 27 | - |
| Storm-petrels | - | - | - | - | - | - | - | - |
| All | 44 | 283 | 284 | 39 | 158 | 39 | 27 | 54 |

### 4.2.3 International Issues and Catch

PLL fisheries for Atlantic HMS primarily target swordfish and tunas. Directed PLL fisheries in the Atlantic have been operated by Spain, the United States, and Canada since the late 1950s or early 1960s. The Japanese PLL tuna fishery started in 1956 and has operated throughout the Atlantic since then (NMFS, 1999). Many of the 48 other ICCAT parties now also operate PLL vessels.

As described in past SAFE Reports, ICCAT generally establishes management recommendations on a species (*e.g.*, swordfish) or issue basis (*e.g.*, data collection) rather than by gear type. 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 PLL fishery.  Nevertheless, ICCAT reports 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 (SCRS, 2004b).  Purse seines produce the highest volume of catch of ICCAT managed species from the Atlantic (SCRS, 2004b).  Figure 4.5 shows the aggregate distribution of hooks from all fishing fleets from 2000-2006.

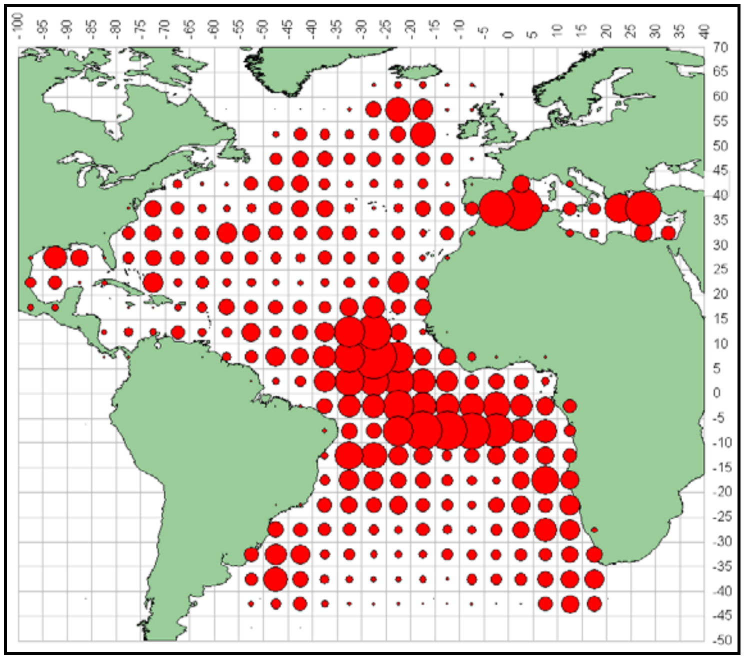


**Figure 4.5 Aggregate Distribution of Hooks Deployed by All ICCAT Parties 2000-2006.** Source: SCRS, 2008**.**

Scientific observer data are being collected on a range of PLL 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.  Previously, there was no ICCAT required minimum level of observer coverage specific to PLL fishing.  However, in 2010 the U.S. proposal for scientific observers was adopted by ICCAT.  One of the requirements is a minimum of 5 percent observer coverage of fishing effort in PLL, purse seine, and bait boat fisheries.  Japan is required to have eight percent observer coverage of its vessels fishing for swordfish in the North Atlantic, which are primarily PLL 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, requires at least five percent observer coverage of PLL vessels over 24 meters participating in that particular fishery.  The United States has already implemented a mandatory observer program in the U.S. PLL fishery.

<u>Highly Migratory Species</u>

The U.S. PLL fleet represents a small fraction of the international PLL fleet that competes on the high seas for catches of tunas and swordfish.  In recent years, the proportion of U.S. PLL landings of HMS, for the fisheries in which the United States participates, has remained relatively stable in proportion to international landings. Historically, the U.S. fleet has accounted for less than 0.5 percent of the landings of swordfish and tuna from the Atlantic Ocean south of 5° N. Lat. 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. Within the area where the U.S. longline fleet operates, U.S. longline landings still represent a limited fraction of total landings. In recent years (2002 - 2010), U.S. longline landings have averaged 5.0 percent of total Atlantic longline landings, ranging from a high of 5.5 percent in 2002 to a low of 4.6 percent in 2008. Table 4.13 contains aggregate longline landings of HMS, other than sharks, for all countries in the Atlantic for the period 2002 - 2010.

**Table 4.13 Estimated International Longline Landings of HMS, Other than Sharks*, for All Countries in the Atlantic: 2002-2009 (mt ww).** Source: SCRS, 2009; U.S. ICCAT National Reports 2003 – 2011; SCRS, 2010; SCRS 2011.

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Swordfish (N. Atl + S. Atl) | 22,240 | 21,709 | 23,891 | 24,442 | 24,563 | 26,507 | 22,096 | 23,252 | 23,290 |
| Yellowfin Tuna (W. Atl)[2] | 11,921 | 10,166 | 16,019 | 14,449 | 14,249 | 13,557 | 13,192 | 13,019 | 13,065 |
| Bigeye Tuna | 46,438 | 54,466 | 48,396 | 38,035 | 34,182 | 46,232 | 41,063 | 43,533 | 42,638 |
| Bluefin Tuna (W. Atl.)[2] | 730 | 186 | 644 | 425 | 565 | 420 | 606 | 366 | 529 |
| Albacore Tuna (N. Atl + S. Atl) | 27,851 | 28,325 | 21,652 | 19,888 | 22,963 | 18,324 | 15,865 | 15,320 | 17,420 |
| Skipjack Tuna (W. Atl)[2] | 349 | 95 | 206 | 207 | 286 | 52 | 49 | 20 | 17 |
| Blue Marlin (N. Atl. + S. Atl.)[3] | 1,378 | 1,767 | 1,427 | 1,571 | 1319 | 2,000 | 1,769 | 1,769 | 1,668 |
| White Marlin (N. Atl. + S. Atl.)[3] | 727 | 624 | 658 | 577 | 363 | 527 | 522 | 544 | 304 |
| Sailfish (W. Atl.)[4] | 1,265 | 873 | 747 | 1,062 | 646 | 765 | 1,015 | 963 | 523 |
| **Total International Longline Landings (from SCRS, 2011)** | **12,899** | **118,211** | **113,640** | **100,656** | **99,136** | **108,384** | **96,177** | **98,816** | **99,454** |
| **Total U.S. Longline Landings (from 2003-2011 U.S. Natl. Reports)[5]** | **6,194** | **5,509** | **5,638** | **4,918** | **5,032** | **5,809** | **4,436** | **5,271** | **4,921** |
| **U.S. Longline Landings as a Percent of Total International Longline Landings** | **5.5%** | **4.7 %** | **5.0 %** | **5.0 %** | **5.1 %** | **5.4 %** | **4.6 %** | **5.3%** | **4.9%** |

*Estimated International longline landings for Sharks are below in Table 4.14
[1]Landings include those classified by the SCRS as longline landings.
[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*

Stock assessments and data collection for international shark fisheries have improved in recent years due to increased reporting requirements adopted by ICCAT. Specifically, since 2004, there have been several shark-related Recommendations and Resolutions (e.g., 04-10, 06-10, 07-06. 08-07, 08-08, 09-07, 10-06, 10-07, and 10-08). Additionally, SCRS has assessed several species of sharks including blue, shortfin mako, and porbeagle sharks. For more information on ICCAT shark actions, see previous SAFE reports and ICCAT webpage (http://www.iccat.int/en/).

The most recent catch totals for blue, shortfin mako, and porbeagle sharks are presented in Table 4.14.

**Table 4.14 Estimated International Longline Landings of Pelagic Sharks for All Countries in the Atlantic: 2002-2010 (mt ww)[1].** Source: SCRS, 2011.

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Blue Shark (N. Atl + S. Atl + MED) | 31,189 | 34,591 | 34,750 | 41,809 | 39,116 | 46,126 | 53,375 | 57,992 | 64,276 |
| Shortfin Mako (N. Atl + S. Atl + MED) | 5,080 | 7,189 | 7,104 | 6,305 | 6,022 | 6,714 | 5,175 | 5,605 | 6,041 |
| Porbeagle (N. Atl + S. Atl + MED) | 848 | 648 | 745 | 571 | 507 | 515 | 600 | 475 | 134 |
| **Total International Longline Catches** | **37,117** | **42,428** | **42,599** | **48,685** | **45,645** | **53,355** | **59,150** | **64,072** | **70,451** |
| U.S. Blue Shark Catches[1] | 68 | 0 | 72 | 68 | 47 | 55 | 138 | 107 | 172 |
| U.S. Shortfin Mako Catches[1] | 415 | 142 | 411 | 187 | 130 | 216 | 188 | 202 | 217 |
| U.S. Porbeagle Catches[1] | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 4 |
| **Total U.S. Catches[1]** | **484** | **142** | **484** | **255** | **177** | **271** | **327** | **310** | **393** |
| **U.S. Catches[1] as a Percent of Total International Longline Catches** | **1.3 %** | **0.3 %** | **1.1 %** | **0.5 %** | **0.4 %** | **0.5 %** | **0.6 %** | **0.5%** | **0.6%** |

[1] Includes catches and discards

Sea Turtles

Sea turtle bycatch in the U.S. PLL fishery has decreased significantly in the last decade. From 1999 to 2003, the U.S. PLL fleet targeting HMS interacted with 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. PLL fleet was estimated to have interacted with 734 loggerhead and 1,362 leatherback sea turtles (Garrison, 2005). The numbers have been reduced recently and in 2010, the U.S PLL fishery was estimated to have interacted with 344 loggerhead sea turtles and 168 leatherback sea turtles (Garrison and Stokes, 2011) (Table 4.7and Table 4.8).

Although ICCAT adopted a resolution in 2003 (03-11) encouraging CPCs to collect and provide the SCRS with all available information on sea turtle interactions in ICCAT fisheries, an exact assessment of basin-wide incidental catches is not available. However, high numbers of estimated sea turtle catches in foreign fleets have been described in other sources. Lewison, *et al*. (2004) estimated that a total of 210,000 – 280,000 loggerhead and 30,250 – 70,000 leatherback sea turtles were captured by PLL fisheries each year throughout the Atlantic basin, including the Mediterranean Sea. More recently, a report by Lewison and Crowder (2007) indicates that applying bycatch rates to accurately estimate the number of turtles taken internationally by PLL fleets is challenging because high variability in bycatch rates within and among fleets constrains the estimation. The report states that international sea turtle bycatch estimates are important, but given the high level of uncertainty, any precision beyond one or two significant digits is questionable. Given this caveat, Lewison and Crowder (2007) estimated that total annual sea turtle bycatch (all species) for PLLs throughout the Atlantic basin, including the Mediterranean Sea, ranged from 28,180 to 39,080 interactions, which represents a notable decrease from 2004 estimates. The study suggested that PLLs may not be the highest source of fishery-induced mortality but, because the gear interacts with older age classes, efforts to reduce sea turtle bycatch are warranted.

In 2010, ICCAT adopted Recommendation 10-09 that requires CPCs to collect and annually report to the Commission, information on interactions of its fleet with sea turtles by gear type. Furthermore, CPCs fishing with PLL must carry on-board, safe handling and release equipment and be trained in safe-handling and release techniques.

Mortality in the domestic PLL fisheries is just one of several 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. Nevertheless, NMFS works to reduce sea turtle bycatch in domestic and international fisheries through collaborative research programs and coordinated education and recovery efforts in partnership with Regional Fishery Management Organizations (RFMOs) and other international bodies, governments, universities, private institutions, and local communities in relevant areas throughout the world. Among these activities, NMFS conducts joint research and holds workshops for fishers and fisheries managers on sea turtle handling, release, and resuscitation methods; sea turtle biology and species identification; and measures to mitigate sea turtle interactions.

In recent years, NMFS funded and/or held numerous workshops or training sessions and cooperative research initiatives to promote the protection and conservation of sea turtles in the Atlantic Ocean, including:

Training/Workshops

- Workshops on the use of circle hooks, dehookers and line cutters in artisanal and industrial longline fisheries in Morocco, in cooperation with the Universite Abdelmalek Essaadi, Department of Biology. Because Morocco's drift gill net fishery is changing to PLL fishing, these were designed to teach techniques with sea turtle mitigation gear and circle hooks to ensure both the viability of the new fishery as well as protection for endangered and threatened sea turtles
- Provision of laminated cards with sea turtle ID and handling guidelines and a sea turtle safe handling video to numerous countries, including Brazil, Spain, Mexico, Uruguay, Italy, Costa Rica, and Indonesia (the guidelines have been translated into Spanish and Vietnamese)
- Training for Korean and Japanese representatives in sea turtle handling protocols used by NOAA Fisheries observers
- Collaboration in 2009 with World Wildlife Fund to test the use of circle hooks in mahi mahi and shark-directed fisheries in Central America.
- NOAA sponsorship of 2011 International Symposium on Circle Hooks
- Ongoing training with domestic U.S. PLL fishery and with state enforcement agencies (Florida DFW, Texas Parks & Wildlife) on proper use of required sea turtle release equipment.

Cooperative Research

- A 2006 leatherback turtle research program in the Dominican Republic
- Cooperative research with Spain concerning loggerhead turtles hooked with longline hooks in the Azores
- Participation in a European technical meeting in June 2008 concerning bycatch in fisheries in the Canary Islands
- Work with Spanish field trials assisting with tests of bait type with regard to sea turtle capture rates, including planned future work to test circle hooks in a Spanish swordfish fishery
- Assistance for research to reduce sea turtle bycatch in longline fisheries, coordinating field trials in Brazil, Uruguay, and Italy, including provision of satellite tags to Brazilian and Uruguayan longline observers to investigate the post-hooking survivorship of turtles after their release from fishing gear
- Work with Korean fisheries scientists on statistical analysis of data gained from bycatch reduction experiments
- Collaboration with World Wildlife Fund to test the use of circle hooks in both tuna and swordfish-directed fisheries in Italy.

Working with the Department of State, NMFS has also conducted several programs involving technology transfer and training for the protection and conservation of Atlantic sea turtles, including:

- Transfer of sea turtle mitigation technology to Spain, Canada, Mexico, Italy, Uruguay, and Venezuela
- Provision of hooks designed to reduce sea turtle bycatch throughout Latin America.

Many other outreach, education, and research projects have been conducted and/or funded by NMFS regarding sea turtle bycatch reduction in the Pacific Ocean.

## 4.2 Purse Seine

### 4.2.1 Current Management

Purse seine gear consists of a floated and weighted encircling net that is closed by means of a drawstring, known 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 Chapter 5.0 of this report.

A number of purse seine vessels targeted and landed BFT off the coast of Gloucester, Massachusetts as early as the 1930s and purse seine vessels have participated in the U.S. Atlantic tuna fishery continuously since the 1950s. In 1958, continued commercial purse seining effort for Atlantic tunas began with a single vessel in Cape Cod Bay, Massachusetts and expanded rapidly into the mid-Atlantic 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, yellowfin, and 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.

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, *i.e.*, five qualified participants. In 1996, the quotas were made transferable among the five entities provided they notified NMFS in writing. The 1999 FMP and its implementing regulations established BFT baseline percentage quota shares for each of the domestic fishing categories. These percentage shares were based on allocation procedures that NMFS developed over several years. The baseline percentage quota shares established in the 1999 FMP were carried forward in the 2006 Consolidated HMS FMP (effective since June 1, 1999) and set the Purse Seine category allocation at 18.6 percent of the U.S. quota.

Vessels participating in the Atlantic tunas purse seine fishery are required to target the larger size class BFT, more specifically the giant size class (81 inches or larger) and are granted a tolerance limit for large medium size class BFT (73 to less than 81 inches); *i.e*., large medium catch may not exceed 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 BFT quota. In 2008 and 2010, the Purse Seine category did not harvest any Atlantic tunas (Table 4.15). Figure 4.6 compares the BFT allocations listed in the 2006 Consolidated HMS FMP, originally established in the 1999 FMP, to the 2010 landings; these pie charts clearly depict the lack of Purse seine landings in 2010. This can be attributed to a number of different reasons outside of the industry’s or NMFS' control, such as lack of availability, schools of mixed size classes, high operating costs, vessel sales, etc. NMFS has issued several exempted fishing permits to this sector of the fishery (to assist in archival tagging of BFT and other research projects) and will continue to assess current regulations and their impact on providing reasonable opportunities to harvest available quota. Given the relative inactivity of vessels utilizing purse seine gear, and new challenges in the management of BFT, Advisory Panel members have suggested that NMFS consider new ways to optimize the use of BFT quota, including the use of transfers from the Purse Seine category to other categories.

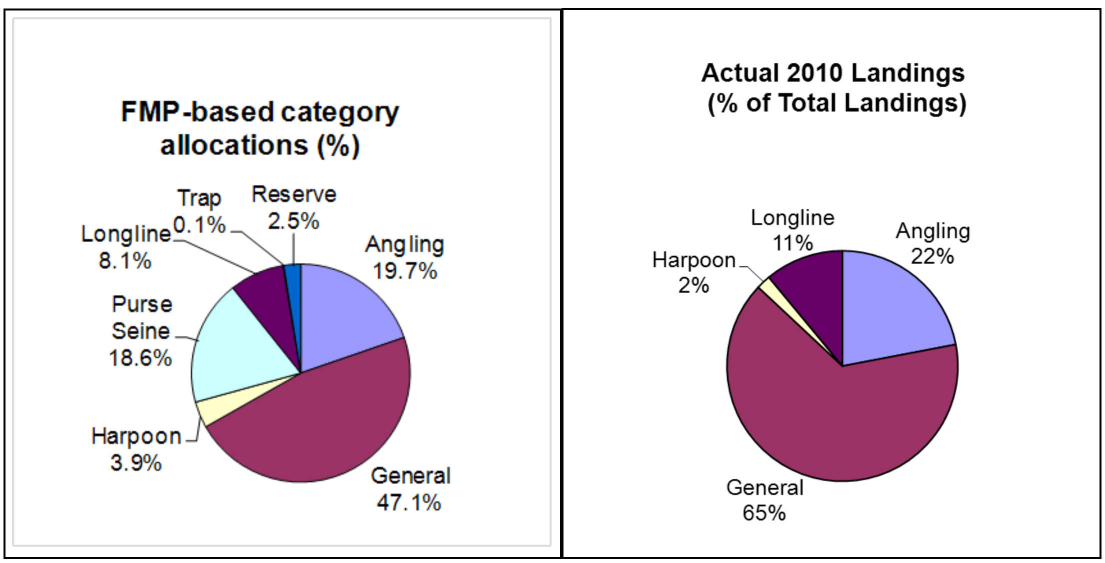


**Figure 4.6 2006 Consolidated HMS FMP BFT quota allocation vs. actual BFT landings (2010).** Source: NMFS Commercial BFT Landings Database; NMFS, 2006; and NMFS, 1999.

### 4.2.2 Recent Catch and Landings

Table 4.15 shows purse seine landings of Atlantic tunas from 2003 through 2010. Purse seine landings historically have made up approximately 20 percent of the total annual U.S. landings of BFT (about 25 percent of total commercial landings), but recently only account for a small percentage (See Figure 4.6). In the 1980s and early 1990s, purse seine landings of yellowfin tuna were often over several hundred metric tons. Over 4,000 mt ww of yellowfin were recorded landed in 1985. Over the past 15 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 BFTBluefin, therefore Table 4.15 only includes BFT.

**Table 4.15 Domestic Atlantic Tuna Landings for the Purse Seine Fishery: 2003-2010 (mt ww). Northwest Atlantic Fishing Area.** Source: U.S. National Report to ICCAT: 2011.

| Species | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| Bluefin Tuna | 265.4 | 31.8 | 178.3 | 3.6 | 27.9 | 0 | 11.4 | 0 |

### 4.2.3 International Issues and Catch

The U.S. purse seine fleet has historically accounted for a small percentage of the total international Atlantic tuna landings. Table 4.16 shows that over the past 10 years, the U.S. purse seine fishery has contributed to less than 0.15 percent of the total purse seine landings reported to ICCAT. In recent years, ICCAT has not taken any action that affects the U.S. purse seine fleet.

**Table 4.16 Estimated International Purse Seine Atlantic Tuna Landings in the Atlantic and Mediterranean: 2003-2010 (mt ww).** Source: SCRS, 2011.

| Species | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| **Bluefin Tuna** | 17,922 | 19,895 | 23,524 | 20,356 | 22,980 | 12,641 | 9,479 | 4,985 |
| **Yellowfin Tuna** | 82,088 | 62,228 | 61,410 | 62,761 | 52,733 | 70,047 | 77,757 | 74,172 |
| **Skipjack Tuna** | 92,347 | 93,284 | 89,704 | 71,215 | 81,335 | 73,080 | 84,494 | 125,467 |
| **Bigeye Tuna** | 22,731 | 18,417 | 18,595 | 16,457 | 17,553 | 15,536 | 22,658 | 23,769 |
| **Albacore** | 998 | 717 | 949 | 3432 | 1289 | 169 | 259 | 213 |
| **Total** | **216,086** | **194,541** | **194,182** | **174,221** | **175,890** | **171,473** | **194,659** | **228,606** |
| **U.S. Total** | **265** | **32** | **178** | **4** | **28** | **0** | **11** | **0** |
| **U.S. Percentage** | **0.12%** | **0.02%** | **0.09%** | **<0.01%** | **0.02%** | **0%** | **<0.01%** | **0%** |

## 4.3 Commercial Handgear

### 4.3.1 Current Management

Commercial handgears, including handline, harpoon, rod and reel, buoy gear and bandit gear, are 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 to assist in spreading out or elevating baits or lures and to prevent fishing lines from tangling. Buoy-gear is discussd in detail in Section 4.7.

The handgear fisheries for all HMS 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 two hundred 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. Figure 4.7 shows BFT commercial landings, which are predominately handgear landings, in metric tons by geographic region. 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.

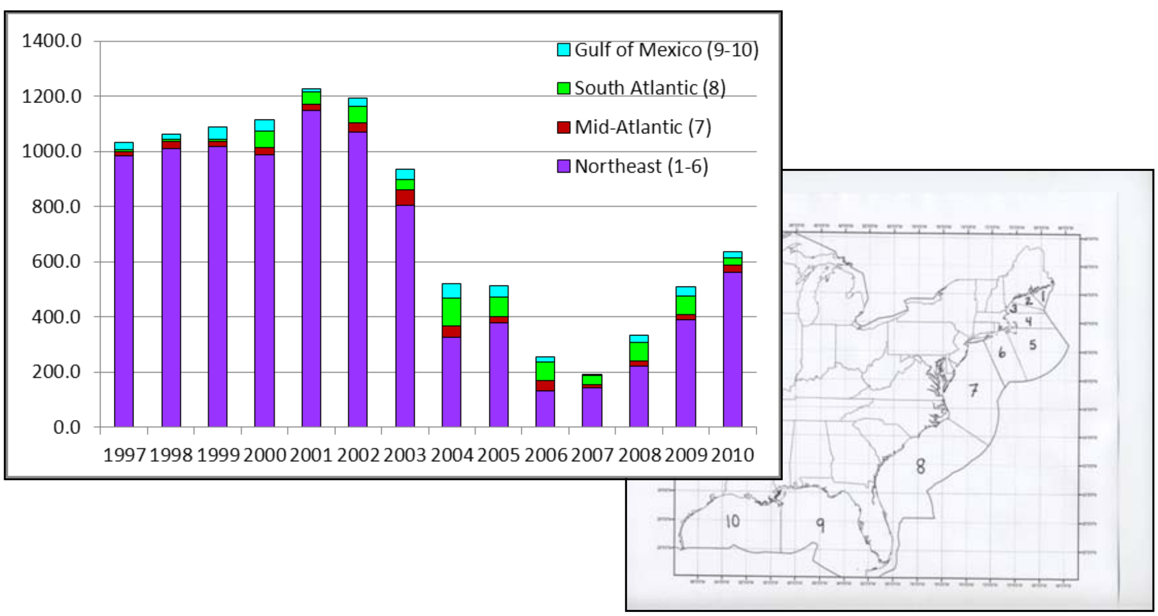


**Figure 4.7 Commercial BFT landings by geographic area (1997 – 2010).** Source: NMFS Commercial BFT Landings Database.

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 permit in one of the following categories: General (handgears including rod and reel, harpoon, handline, bandit gear, and green-stick), Harpoon (harpoon only), or Charter/Headboat (rod and reel, handline, bandit gear, and green-stick). These federally permitted vessels may also need permits from the states they operate from in order to land and sell their catch. All commercial permit holders are encouraged to check with their local state fish/natural resource management agency regarding these requirements. Federally permitted vessels are required to sell Atlantic tunas only to federally permitted Atlantic tuna dealers. Because 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 one to five 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 January 1 of each year and remains open until either the January quota allocation has been caught, or until, March 31, whichever comes first. The fishery then reopens on June 1 and remains open until December 31 or until the quota is filled. Vessel owner/operators should check with the agency via internet (http://www.hmspermits.com) or telephone information lines (888-872-8862) to verify the BFT retention limit on any given day. In accordance with the fishery management plan, the General category receives approximately 47 percent of the U.S. BFT quota.

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 four BFT measuring 73 inches to less than 81 inches curved fork length (“large medium”) per vessel trip per day while the fishery is open. There is no limit on the number of BFT that can be retained measuring longer than 81 inches curved fork length (“giant”), 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.

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 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 harpoon. 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, in recent years, a new commercial swordfish fishery utilizing handgear, especially buoy-gear, has developed off the east coast of Florida. For information regarding the commercial buoy gear fishery, refer to Section 4.7.

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 Sections 4.5 and 4.6. Economic and social aspects of all the domestic handgear fisheries are described later in this document (Chapter 5.0).

### 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 and Table 4.17.

In 2010, BFT commercial handgear landings accounted for approximately 67 percent of the total U.S. BFT landings, and almost 86 percent of commercial BFT landings. Figure 4.8 shows the U.S. Atlantic BFT landings in metric tons by category since 1996. Note that the commercial handgear landings are comprised of BFT landed by both the General and Harpoon categories.

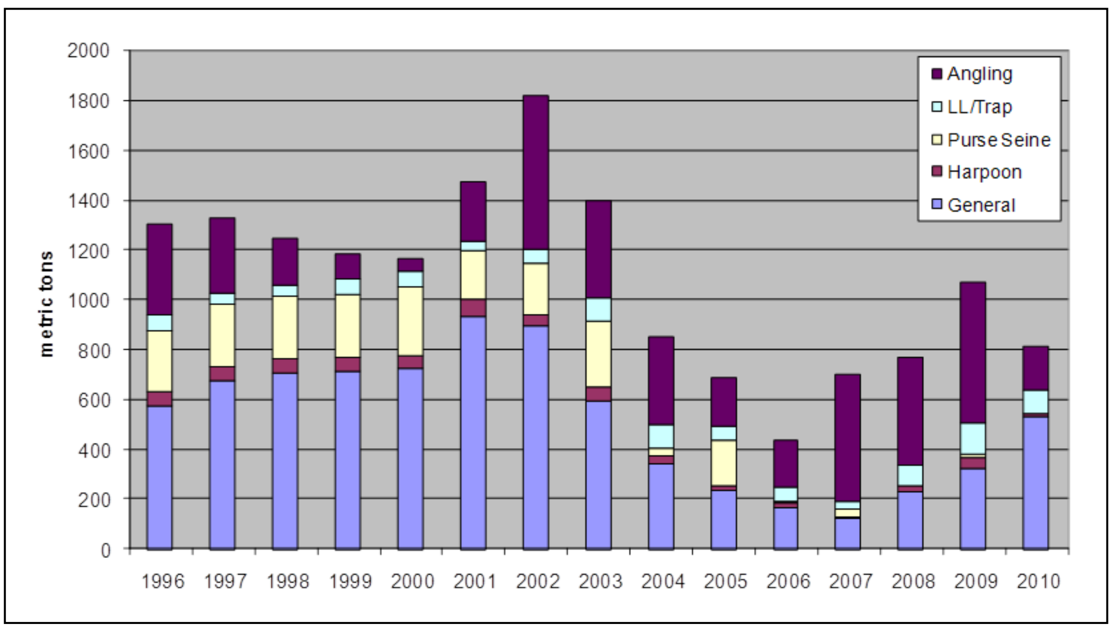


**Figure 4.8 Landings of BFT by category (1996 – 2010)Source: NMFS Commercial BFT Landings Database.**

Also in 2010, two percent of the total yellowfin catch, or three percent of the commercial yellowfin catch, was attributable to commercial handgear. Commercial handgear landings of skipjack tuna accounted for approximately three percent of total skipjack landings, or about 17 percent of commercial skipjack landings. For albacore, commercial handgear landings accounted for approximately less than one percent of total albacore landings, or about one percent of commercial albacore landings. Commercial handgear landings of bigeye tuna accounted for approximately less than one percent of total bigeye landings and less than one percent of total commercial bigeye landings. Updated landings for the commercial handgear fisheries by gear and by area for 2003 – 2010 are presented in the following tables.

**Table 4.17 Domestic Atlantic Landings for the Commercial Handgear Fishery, by Species (not including sharks) and Gear, for 2003-2010 (mt ww).** Source: U.S. National Report to ICCAT: 2011.

| Species | Gear | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Bluefin Tuna | Rod and Reel | 529.2 | 353.2 | 226.6 | 164.1 | 120.8 | 226.6 | 301.7 | 515.1 |
| | Handline | 2.5 | 1.5 | 2.3 | 0.3 | 0.0 | 0.6 | 0.1 | 2.7 |
| | Harpoon | 87.9 | 41.2 | 31.5 | 30.3 | 22.5 | 30.2 | 66.1 | 29.0 |
| | **TOTAL** | **619.6** | **395.9** | **260.4** | **194.7** | **143.3** | **257.4** | **367.9** | **546.8** |
| Bigeye Tuna | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.8 | 0.6 | 0.0 |
| | Handline | 6.3 | 3.5 | 6.3 | 21.5. | 16.8 | 6.9 | 4.6 | 2.5 |
| | **TOTAL** | **6.3** | **3.5** | **6.3** | **21.5** | **17.7** | **7.7** | **5.2** | **2.5** |
| Albacore Tuna | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.07 | 0.04 |
| | Handline | 4.3 | 8.2 | 4.2 | 2.6 | 5.4 | 0.2 | 0.5 | 2.0 |
| | **TOTAL** | **4.3** | **8.2** | **4.2** | **2.6** | **5.6** | **0.4** | **0.57** | **2.04** |
| Yellowfin Tuna | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 6.9 | 2.4 | 5.4 | 1.2 |
| | Handline | 199.7 | 248.5 | 160.3 | 105.1 | 113.2 | 30.1 | 58.7 | 44.2 |
| | **TOTAL** | **199.7** | **248.5** | **160.3** | **105.1** | **120.1** | **32.5** | **64.1** | **45.4** |
| Skipjack Tuna | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 13.1 | 10.4 | 11.8 | 0.2 | 0.3 | 0.4 | 2.8 | 1.7 |
| | **TOTAL** | **13.1** | **10.4** | **11.8** | **0.2** | **0.3** | **0.4** | **2.8** | **1.7** |
| Swordfish | Handline | 20.6 | 22.7 | 34.7 | 32.5 | 125.2 | 83.2 | 123.0 | 220.6 |
| | Harpoon | 0.0 | 0.5 | 0.0 | 0.3 | 0.0 | 0.0 | 0.05 | 0.6 |
| | **TOTAL** | **20.6** | **23.2** | **34.7** | **32.8** | **125.2** | **83.2** | **123.05** | **221.2** |

**Table 4.18 Domestic Landings for the Commercial Handgear Fishery by Species and Region for 2001-2010 (mt ww). Source: U.S. National Report to ICCAT: 2010.**

| Species | Region | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bluefin Tuna | NW Atl | 1,000.8 | 938.3 | 607.3 | 395.6 | 260.4 | 194.7 | 143.3 | 257.3 | 366.3 | 546.8 |
| Bigeye Tuna | NW Atl | 33.2 | 13.8 | 6.0 | 3.3 | 6.2 | 21.5 | 16.8 | 6.9 | 4.6 | 2.5 |
| | GOM | 0.5 | 0.6 | 0.3 | 0.2 | 0.1 | 1.5 | 1.01 | 0.0 | 0.07 | 0.06 |
| | Caribbean | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Albacore Tuna | NW Atl | 1.7 | 3.9 | 1.7 | 6.1 | 3.0 | 2.6 | 5.4 | 0.2 | 0.5 | 2.0 |
| | GOM | 0.0 | 0.0 | $\leq$ .05 | 0.0 | 0.1 | 0.07 | 0.0 | 0.0 | 0.01 | 0.01 |
| | Caribbean | 2.2 | 2.7 | 2.6 | 2.1 | 1.1 | 0.4 | 0.2 | 0.4 | 0.003 | 0.05 |
| Yellowfin Tuna | NW Atl | 242.5 | 137.0 | 149.1 | 213.2 | 105.1 | 105.1 | 113.2 | 30.1 | 58.7 | 45.4 |
| | GOM | 43.4 | 100.0 | 39.9 | 28.3 | 45.5 | 49.9 | 26.2 | 11.2 | 21.6 | 13.7 |
| | Caribbean | 14.3 | 7.0 | 10.7 | 7.0 | 9.7 | 7.8 | 9.1 | 3.7 | 3.3 | 1.9 |
| Skipjack Tuna | NW Atl | 0.2 | 0.2 | 0.2 | 0.6 | 0.9 | 0.2 | 0.3 | 0.4 | 2.8 | 1.7 |
| | GOM | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 | 0.06 | 0.2 | 0.1 |
| | Caribbean | 10.3 | 12.5 | 12.9 | 9.6 | 12.9 | 10.0 | 13.7 | 16.0 | 8.8 | 6.2 |
| Swordfish | NW Atl | 16.0 | 11.6 | 10.8 | 19.2 | 34.4 | 32.8 | 125.2 | 83.2 | 123.05 | 221.2 |
| | GOM | 0.3 | 2.9 | 9.8 | 4.0 | 0.3 | 0.1 | 0.2 | 1.2 | 1.9 | 2.6 |

*Handgear Trip Estimates*

Table 4.19 displays the estimated number of rod and reel and handline trips targeting large pelagic species (e.g., tunas, billfishes, swordfish, sharks, wahoo, dolphin, and amberjack) from Maine through Virginia, in 2002 through 2010. The trips include commercial and recreational trips, and are not specific to any particular species. It should be noted that the 2010 estimates are still preliminary and subject to change.

**Table 4.19 Estimated number of vessel trips targeting Atlantic large pelagic species, 2002-2010.** Source: Large Pelagics Survey database.

| Year | AREA | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | NH/ME | MA | CT/RI | NY | NJ (north) | NJ (south) + MD/DE | VA | |
| **Private Vessels** | | | | | | | | |
| 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 |
| 2005 | 4,607 | 12,052 | 7,603 | 8,051 | 2,446 | 19,759 | 4,631 | 59,148 |
| 2006 | 3,303 | 24,951 | 5,430 | 11,114 | 3,043 | 19,187 | 5,274 | 72,302 |
| 2007 | 5,929 | 25,139 | 6,020 | 6,809 | 5,875 | 17,712 | 5,012 | 72,496 |
| 2008 | 3,873 | 19,157 | 3,546 | 7,587 | 3,099 | 15,807 | 3,081 | 56,150 |
| 2009 | 4,724 | 27,066 | 2,670 | 8,274 | 3,633 | 15,458 | 4,299 | 66,122 |
| 2010 | 6,102 | 19,679 | 2,276 | 6,737 | 3,898 | 12,493 | 2,591 | 53,776 |
| **Charter Vessels** | | | | | | | | |
| 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 |
| 2005 | 329 | 2,397 | 551 | 2,033 | 1,024 | 3,476 | 763 | 10,573 |
| 2006 | 96 | 1,294 | 677 | 1,057 | 891 | 3,452 | 828 | 8,296 |
| 2007 | 789 | 4,073 | 1,141 | 1,445 | 1,420 | 4,579 | 610 | 14,057 |
| 2008 | 892 | 3,295 | 751 | 1,525 | 1,026 | 4,340 | 370 | 12,199 |
| 2009 | 568 | 4,930 | 726 | 1,677 | 1,142 | 3,348 | 534 | 12,923 |
| 2010 | 917 | 3,581 | 549 | 1,432 | 1,111 | 2,679 | 511 | 10,780 |

## 4.4 Recreational Handgear

The following section describes the recreational portion of the handgear fishery and is primarily focused upon rod and reel fishing.

### 4.4.1 Current Management

All Atlantic HMS are targeted by domestic recreational fishermen using a variety of handgear including rod and reel gear. Since 2003, recreational fishing for any HMS-managed species requires an HMS Angling permit (67 FR 77434, December 18, 2002), and all non-tournament recreational landings of Atlantic marlins, sailfish, and swordfish must be reported. Additionally, all HMS fishing tournaments are required to register with NMFS at least four weeks prior to the commencement of tournament fishing activities. If selected, tournament operators are required to report the results of their tournament to the NMFS Southeast Fisheries Science Center.

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

The recreational swordfish fishery is managed through the use of a minimum size limit, trip-based retention limits, and landing requirements (swordfish may be headed and gutted but may not be cut into smaller pieces). For whole (head on) North Atlantic swordfish, the minimum lower jaw fork length (LJFL) is 47 in (119 cm). If the head or tail of the swordfish has been removed prior to landing, a minimum length of 29 in (73 cm), measured from cleithrum to caudal keel (CK), shall be applied. Recreational anglers may not land South Atlantic swordfish (south of 5° N latitude). Effective July 9, 2007 (72 FR 31688, June 7, 2007), recreational swordfish retention limits were modified for HMS Angling and Charter/Headboat permit holders. Vessel owners issued an HMS Angling permit may retain one swordfish per passenger, up to four swordfish per vessel/trip. Vessel owners operating a charter vessel and issued an HMS Charter/Headboat permit may retain one swordfish per paying passenger and up to six swordfish per vessel/trip. Vessel owners operating a headboat vessel and issued an HMS Charter/Headboat permit may retain one swordfish per paying passenger and up to fifteen swordfish per vessel/trip.

The recreational shark fishery is managed using bag limits, minimum size requirements, and landing requirements (sharks must be landed with head and fins naturally attached). Additionally, there are 21 species of sharks of which possession is prohibited. Recreational fishermen are allowed to keep non-ridgeback LCSs, tiger sharks, pelagic sharks, SCSs, and smoothhound sharks. As of July 24, 2008, recreational fishermen have been prohibited from keeping sandbar or silky sharks.

Atlantic blue and white marlin have a combined annual 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 carried out through the application of minimum size limits. The minimum LJFLfor each species is 99 in (251 cm) for blue marlin, 66 in (168 cm) for white marlin, and 63 in (160 cm) for sailfish. There are no recreational retention limits for Atlantic blue marlin, white marlin, and sailfish. Recreational anglers may not land longbill spearfish. On September 22, 2010, NMFS published a rule that added the roundscale spearfish, *Tetrapturus georgii*, to the Atlantic billfish management unit and implemented regulations for this newly recognized species identical to those currently in place for white marlin.

### 4.4.2 Recent Catch, Landings and Bycatch

The recreational landings database for Atlantic 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, Recreational Billfish Survey (RBS) tournament data, and the recreational non-tournament swordfish and billfish landings database. Descriptions of these surveys, the geographic areas they include, and their limitations were discussed in Section 2.6.2 of the 1999 FMP and Section 2.3.2 of the 1999 Billfish Amendment.

Historically, fishery survey strategies (including the MRFSS, LPS, and RBS) have not captured all landings of recreationally-caught swordfish. Although some swordfish handgear fishermen have commercial permits[1], many others land swordfish strictly for personal consumption; therefore, NMFS has implemented regulations to improve recreational swordfish and billfish monitoring and conservation. These regulations stipulate that all non-tournament recreational landings of swordfish and billfish must be reported by phone at (800) 894-5528 or web portal at http://www.hmspermits.gov. All reported recreational swordfish landings are counted toward the incidental swordfish quota.

Reported domestic landings of Atlantic BFT (1983 through 1998) and BAYS tuna (1995 through 1997) were presented in Section 2.2.3 of the 1999 FMP. Updated landings for all recreational rod and reel fisheries are presented below in Table 4.20 from 2002 through 2010. Recreational landings of swordfish are monitored by the LPS, MRFSS, RBS, and mandatory recreational reporting requirements via http://www.hmspermits.gov.http://www.hmspermits.gov.

The Marine Recreational Information Program (MRIP) is a new data collection and analysis initiative being implemented by NMFS to help ensure the long-term sustainability of America's fisheries and the health of our oceans. MRIP provides a more comprehensive and detailed picture of the number of trips being taken by recreational anglers, the amount and species of fish they are catching, the location and timeframe in which those fish are being caught, and the economic impact of recreational fishing on local, regional and national economies. Through the collection of more timely and accurate fishing data, MRIP provides policy makers with the information they need to make sound decisions based on the best science. As a program

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

built on broad and continuing stakeholder input, MRIP also empowers anglers and other ocean enthusiasts to become a part of the resource management, conservation, and economic decision-making processes that impact their lives.

MRIP is a system of coordinated data collection programs designed to address specific regional needs for recreational fishing information. This regional approach, based on nationally consistent standards, will ensure that the appropriate targeted, place-based information is being collected to best meet the needs of managers and stakeholders, and that it is being done in a scientifically rigorous way. One MRIP objective is to improve the information available for the management of HMS. A project is currently underway to pilot test specialized data collection approaches for estimating HMS recreational catch and effort in Puerto Rico. Atlantic HMS projects funded through MRIP that were recently completed include:

- Characterization of Rod and Reel HMS Fisheries in the South Atlantic and Gulf of Mexico
- Florida HMS Private Angler Telephone Survey
- HMS For-Hire Survey – Florida Pilot Study
- Evaluation of the Sampling Distribution of Tournament Versus Non-tournament Trips in the LPS

**Table 4.20 Updated Domestic Landings for the Atlantic Tunas and Swordfish Recreational Rod and Reel Fishery, 2002-2010 (mt ww)*.** Sources: NMFS, 2005; NMFS, 2006; NMFS, 2007; NMFS, 2009; NMFS, 2010; and NMFS, 2011. (Recreational shark landings are in Table 4)

| Species | Region | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Bluefin Tuna** | NW Atlantic | 519.3 | 314.6 | 370.2 | 254.4 | 158.2 | 398.6 | 352.2 | 143.3 | 111.4 |
| | GOM | 1.5 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| | **Total** | **520.8** | **314.6** | **370.2** | **254.4** | **158.8** | **398.6** | **352.2** | **143.3** | **111.4** |
| Bigeye tuna** | NW Atlantic | 49.6 | 188.5 | 94.6 | 165.0 | 422.3 | 126.8 | 70.9 | 77.6 | 115.5 |
| | GOM | 0.0 | 0.0 | 6 | 0.0 | 24.3 | 0.0 | 0.0 | 0.0 | 0.8 |
| | Caribbean | 0.0 | 4.0 | <0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | **Total** | **49.6** | **192.5** | **100.6** | **165.0** | **446.6** | **126.8** | **70.9** | **77.6** | **116.3** |
| Albacore** | NW Atlantic | 323.0 | 333.8 | 500.5 | 356.0 | 284.2 | 393.6 | 125.2 | 22.8 | 46.3 |
| | Caribbean | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 103.6 |
| | **Total** | **323.0** | **333.8** | **500.5** | **356.0** | **284.2** | **393.6** | **125.2** | **22.8** | **152.6** |
| Yellowfin tuna** | NW Atlantic | 2,624.0 | 4,672.1 | 3,433.7 | 3,504.8 | 4,649.2 | 2,726.0 | 657.1 | 742.6 | 1,087.0 |
| | GOM | 200.0 | 640.0 | 247.1 | 146.9 | 258.4 | 227.6 | 366.3 | 264.7 | 18.0 |
| | Caribbean | 7.2 | 16.0 | 0.0 | 0.0 | 0.0 | 12.4 | 0.0 | 3.5 | 4.5 |
| | **Total** | **2,831.2** | **5,328.0** | **3,684.8** | **3,651.7** | **4,907.6** | **2,966.0** | **1,023.4** | **1,010.8** | **1,109.5** |
| Skipjack tuna** | NW Atlantic | 23.3 | 34.1 | 27.3 | 8.1 | 34.6 | 27.4 | 21.0 | 75.7 | 28.9 |
| | GOM | 13.2 | 11.1 | 6.3 | 3.1 | 6.4 | 23.9 | 16.3 | 22.0 | 15.5 |
| | Caribbean | 13.2 | 15.7 | 40.4 | 3.9 | 7.7 | 0.2 | 11.3 | 4.3 | 0.4 |
| | **Total** | **49.7** | **60.9** | **74.0** | **15.1** | **48.7** | **51.5** | **48.6** | **102** | **44.8** |
| Swordfish | **Total** | **21.5** | **6.1** | **25.2** | **61.2** | **52.7** | **68.2** | **75.7** | **31.6** | **66.5** |

* 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 BFT tuna < 73 in curved fork length (CFL) based on statistical surveys of the U.S. recreational harvesting sector. Rod and reel catch of BFTbluefin > 73 in CFL are commercial and may also include a few metric tons of "trophy" BFTbluefin (recreational BFTbluefin ≥ 73 in).
*** Blue marlin, white marlin, and sailfish landings are based on prior U.S. National Reports to ICCAT and consist primarily of reported tournament landings.

*Atlantic Billfish Recreational Fishery*

Due to the rare nature of billfish encounters and the difficulty of monitoring landings outside of tournament events, reports of recreational billfish landings are sparse; however, the RBS provides a preliminary source for analyzing recreational billfish tournament landings. Table 4.21 documents the number of billfish and swordfish reported to the RBS that were landed in tournaments from 2002 – 2011.

**Table 4.21 Preliminary RBS Recreational Billfish Landings in Numbers of Fish 2002-2011.** Source: NMFS Recreational Billfish Survey (RBS).

| Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011* |
|---|---|---|---|---|---|---|---|---|---|---|
| Blue Marlin | 84 | 96 | 110 | 64 | 72 | 46 | 44 | 35 | 18 | 26 |
| White Marlin | 33 | 20 | 25 | 26 | 36 | 31 | 47 | 46 | 63 | 32 |
| Roundscale Spearfish | - | - | - | - | - | - | - | 5 | 10 | 3 |
| Sailfish | 14 | 24 | 9 | 3 | 4 | 1 | - | - | 3 | 5 |
| Swordfish | 16 | 48 | 168 | 385 | 207 | 274 | 114 | 85 | 46 | 27 |

*Data as of October 2011

All recreational, non-tournament landings of billfish, including swordfish, are required to be reported to NMFS within 24 hours of landing 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 are required to report their billfish landings at state-operated landings stations. A landed fish means a fish that is kept and brought to shore. Table 4.22 provides a summary of non-tournament billfish landings since 2004. However, due to the likelihood of large-scale non-compliance with the non-tournament reporting requirement, the landings in Table 4.22 are considered to be a minimum estimate of non-tournament billfish landings.

**Table 4.22 Number of Atlantic billfish reported to NMFS via call-in system by calendar year, 2004-2011.** Source: G. Fairclough, pers. comm.

| Species | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011* |
|---|---|---|---|---|---|---|---|---|
| Blue Marlin | 2 | 4 | 2 | 5 | 7 | 5 | 3 | 3 |
| White Marlin | 0 | 1 | 1 | 4 | 4 | 6 | 5 | 5 |
| Roundscale Spearfish | - | - | - | - | - | - | - | 0 |
| Sailfish | 35 | 61 | 58 | 101 | 143 | 140 | 185 | 146 |
| Swordfish | 290 | 388 | 549 | 716 | 369 | 389 | 285 | 271 |

* Data as of November 2011

Under ICCAT Recommendation 06-09 and as specified in § 635.27(d)(1), the recreational billfish fishery is limited to maximum of 250 Atlantic blue and white marlin landings, combined, per year. Table 4.23 below provides landings estimates in numbers of fish for Atlantic blue and white marlin and roundscale spearfish. NMFS added roundscale spearfish to the Atlantic HMS management unit (75 FR 57698; September 22, 2010) due to a relatively recent taxonomic change and identification of the species as distinct from white marlin, and efective January 2011, annual landings of roundscale spearfish are included in the 250 marlin count.

**Table 4.23 Atlantic blue and white marlin and roundscale spearfish landings (in numbers of fish) against domestic landings limit of 250.** Sources include Recreational Billfish Survey, HMS non-tournament landings, and Catch Card Programs in NC and MD

| | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| **White Marlin** | 39 | 59 | 53 | 72 |
| **Blue Marlin** | 59 | 58 | 44 | 28 |
| **Roundscale Spearfish*** | - | - | - | 19 |
| **Total Landings** | 98 | 117 | 97 | 119 |
| **Balance Remaining (from 250 limit)** | 152 | 133 | 153 | 131 |

*Roundscale spearfish were added to the HMS management unit (September 22, 2010; 75 FR 57698) and are included in the 250 fish domestic landings limit for Atlantic blue and white marlin. Roundscale spearfish landings are reported to ICCAT.

*Swordfish Recreational Fishery*

The recreational North Atlantic swordfish fishery declined dramatically from about 1980 through1999, due to decreased stock abundance, but has grown rapidly since 2003 as stock abundance has increased off the east coast of Florida and in the Mid-Atlantic Bight. In the past, the New York recreational swordfish landings took place incidentally during 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 swordfish fishery off the east coast of Florida and a summer fishery off the coasts of New Jersey and New York. Fish have also been reported from Maryland, Virginia, Texas, Louisiana, South Carolina, and Rhode Island.

The Florida fishery has primarily occurred at night with fishermen targeting swordfish while drift fishing with live or dead bait and using additional attractants such as lightsticks, LED lights, and light bars suspended under the boat. Notably, Florida recreational fishermen have recently begun targeting swordfish by fishing on the ocean bottom during the day in depths exceeding 1,600 ft. In general, swordfish captured by this method are larger than those captured during nighttime drift fishing. These fishermen use specialized gear including braided lines, high capacity reels (with electric or manual retrieve), heavy weights, and heavy duty rods.

*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 every social and economic level. Depending upon the species, sharks can be caught virtually anywhere in salt water. Recreational shark fisheries often occur in nearshore waters accessible to private vessels and charter/headboats; however, shore-based and offshore fishing also occur. The following tables provide a summary of landings for each of the three species groups, LCS, pelagic sharks, and SCS. Since 2003, the recreational fishery has been limited to rod and reel and handline gear only. Similar state regulations along the Atlantic seaboard are being implemented through an ASMFC interstate FMP.

**Table 4.24 Estimates of Total Recreational Harvest of Atlantic Sharks: 2002-2009 (numbers of fish in thousands).** Source: Cortés and Neer 2005, Cortés, pers. comm. Estimates include prohibited species.

| Species Group | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| LCS | 80.6 | 89 | 67.4 | 85 | 59.1 | 68.8 | 45 | 64.5 | 89.5 |
| Pelagic | 4.7 | 4.3 | 5 | 5.4 | 16.5 | 9 | 2.8 | 7.8 | 6.8 |
| SCS | 152.5 | 134.3 | 127 | 118.9 | 117.2 | 167.6 | 107.9 | 101.1 | 81.3 |
| Unclassified | 5.4 | 18.4 | 28.5 | 47.6 | 7.5 | 23.9 | 6.1 | 15.1 | 0.6 |

**Table 4.25 Recreational Harvest of Atlantic LCS by Species, in number of fish: 2002-2009.** Sources: Cortés and Neer 2005, Cortés, pers. comm.

| LCS Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Basking** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bignose* | 0 | 0 | 17 | 0 | 0 | 55 | 0 | 0 | 0 |
| Bigeye sand tiger** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blacktip | 39,126 | 40,044 | 30,885 | 43,408 | 31,038 | 28,864 | 13,318 | 12,921 | 23,640 |
| Bull | 1,916 | 3,743 | 5,186 | 1,561 | 4,262 | 5,849 | 1,735 | 6,811 | 260 |
| Caribbean reef* | 741 | 0 | 652 | 5 | 47 | 0 | 0 | 1 | 0 |
| Dusky* | 1,047 | 2,777 | 36 | 3,040 | 194 | 112 | 2,391 | 447 | 546 |
| Galapagos* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerhead, great | 4 | 47 | 9 | 55 | 98 | 786 | 13 | 128 | 3 |
| Hammerhead, scalloped | 996 | 2,921 | 879 | 5,021 | 458 | 1,726 | 119 | 1,667 | 199 |
| Hammerhead, smooth | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Hammerhead, unclassified | 5,247 | 0 | 0 | 2,676 | 1,099 | 807 | 0 | 0 | 0 |
| Lemon | 4,921 | 4,916 | 5,578 | 510 | 1,145 | 3 | 818 | 597 | 2,013 |
| Night* | 0 | 0 | 0 | 15 | 1 | 2 | 0 | 22 | 0 |
| Nurse | 2,562 | 563 | 3,463 | 2,341 | 1,553 | 334 | 268 | 822 | 251 |
| Sandbar*** | 8,301 | 5,151 | 3,724 | 2,798 | 821 | 7,060 | 5,801 | 4,908 | 6,277 |
| Sand tiger** | 0 | 0 | 0 | 0 | 1,040 | 0 | 0 | 0 | 0 |
| Silky*** | 1,795 | 1,870 | 399 | 3,576 | 2,108 | 1,973 | 1,226 | 782 | 157 |
| Spinner | 3,997 | 4,864 | 4,041 | 3,269 | 2,281 | 6,547 | 3,824 | 3,347 | 5,715 |
| Tiger | 126 | 110 | 1 | 1,321 | 1,309 | 1,815 | 1,418 | 4 | 473 |
| Whale** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| White** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Requiem shark unclassified | 9,815 | 22,020 | 12,488 | 15,423 | 11,652 | 12,837 | 11,519 | 32,024 | 49,920 |
| Total: | 80,596 | 89,027 | 67,359 | 85,019 | 59,108 | 68,770 | 45,010 | 64,481 | 89,454 |

*indicates species that were prohibited in the recreational fishery as of July 1, 1999.
** indicates species that were prohibited as of April 1997.
*** indicates species that were prohibited as of July 2008.

**Table 4.26 Recreational Harvest of Atlantic Pelagic Sharks by Species, in number of fish: 2002-2009.** Sources: Cortés and Neer 2005, Cortés, pers. comm.

| Pelagic Shark Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Bigeye thresher* | 65 | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 0 |
| Bigeye sixgill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue Shark | 0 | 376 | 0 | 31 | 980 | 1,622 | 117 | 0 | 1,384 |
| Mako, longfin* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mako, shortfin | 3,206 | 3,906 | 5,052 | 3,857 | 3,352 | 2,556 | 1,904 | 4,991 | 5,156 |
| Mako, unclassified | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 |
| Oceanic whitetip | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Porbeagle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sevengill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sixgill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thresher | 1,467 | 0 | 0 | 1,504 | 12,171 | 4,822 | 755 | 2,768 | 267 |
| Total: | 4,673 | 4,282 | 5,052 | 5,392 | 16,545 | 9,000 | 2,776 | 7,759 | 6,807 |

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

**Table 4.27 Recreational Harvest of Atlantic SCS by Species, in number of fish: 2002-2009.** Sources: Cortés and Neer 2005, Cortés, pers. comm.

| SCS Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Atlantic angel* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blacknose | 11,390 | 6,615 | 15,101 | 7,101 | 9,914 | 9,177 | 3,718 | 5,845 | 2,050 |
| Bonnethead | 51,667 | 41,314 | 42,429 | 32,227 | 24,885 | 42,444 | 22,973 | 28,743 | 14,683 |
| Finetooth | 3,159 | 1,788 | 366 | 3,129 | 572 | 4,048 | 2,308 | 797 | 862 |
| Sharpnose, Atlantic | 86,259 | 84,626 | 69,067 | 76,347 | 81,817 | 111,967 | 78,885 | 65,709 | 63,695 |
| Sharpnose, Caribbean* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Smalltail* | 0 | 0 | 67 | 71 | 0 | 0 | 0 | 0 | 0 |
| Total: | 152,475 | 134,343 | 127,030 | 118,875 | 117,188 | 167,636 | 107,884 | 101,094 | 81,290 |

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

*Bycatch Issues*

Bycatch in the recreational rod and reel fishery is difficult to quantify because many fishermen simply value the experience of fishing and may not be targeting a particular pelagic species. Recreational “marlin” or “tuna” trips may yield dolphin, tuna, wahoo, and other species, both undersized and legal sized. BFT trips may yield undersized BFT, or a seasonal closure may prevent landing of a BFT above a minimum or maximum size. Sharks may be discarded because they are a prohibited species or undersized. In these and similar cases, rod and reel catch may be discarded and the fish may be alive or dead. The Magnuson-Stevens Act (16 USC 1802 MSA § 3 (2)) specifies that fish released under a recreational catch-and-release program are not considered bycatch.

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 solidifies the existing catch-and-release ethic of recreational billfish fishermen, and thereby increases 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 is incorporated into fish stock assessments, and into the evaluation of management measures. Rod and reel discard estimates from Virginia to Maine from the months of June through October could be monitored through the expansion of survey data derived from the LPS (dockside and telephone surveys), or could be assessed through other monitoring programs such as logbooks etc.). 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 2002 – 2010 is presented in Table 4.27 and 4.28.

An outreach program to address bycatch and to educate anglers on the benefits of circle hooks has been implemented by NMFS. One of the key elements of the outreach program is to provide information that leads to an improvement in post-release survival from recreational gear by encouraging recreational anglers to use circle hooks. Implementation of this outreach program began in 2007 with the distribution of DVDs to tournament operators showing the proper rigging and deployment of circle hooks with natural baits. Also, a final rule to require the mandatory use of circle hooks when fishing with natural baits and natural/artificial bait combinations in Atlantic, Gulf of Mexico, and U.S. Caribbean billfish tournaments was published in May 2007 (72 FR 26735, May 11, 2007) and became effective on January 1, 2008. As of publication of this report, NMFS has distributed over 9,000 copies of the circle hook DVDs. In January 2011, NMFS also developed and released a brochure that provides guidelines on how to increase the survival of hook-and-line caught large pelagic species. This brochure can be found at:
http://www.nmfs.noaa.gov/sfa/hms/Compliance_Guide/Careful_release_brochure.pdf

### 4.4.3 Code of Angling Ethics

NMFS developed a Code of Angling Ethics as part of the implementation of Executive Order 12962 – Recreational Fisheries. NMFS implemented a national plan to support, develop, and implement programs that were designed to enhance public awareness and understanding of marine conservation issues relevant to the wellbeing of fishery resources in the context of marine recreational fishing. This code is consistent with NS 9, Minimizing Bycatch and Bycatch Mortality, and is reproduced below. These guidelines are discretionary, not mandatory, and are intended to inform the angling public of NMFS' views regarding what constitutes appropriate angling behavior. Part of the code covers catch-and-release fishing and is directed towards minimizing bycatch mortality.

## Code of Angling Ethics

- Promotes, through education and practice, ethical behavior in the use of aquatic resources.
- Values and respects the aquatic environment and all living things in it.
- Avoids spilling, and never dumps any pollutants, such as gasoline and oil, into the aquatic environment.
- Disposes of all trash, including worn-out lines, leaders, and hooks, in appropriate containers, and helps to keep fishing sites litter-free.
- Takes all precautionary measures necessary to prevent the spread of exotic plants and animals, including live baitfish, into non-native habitats.
- Learns and obeys angling and boating regulations, and treats other anglers, boaters, and property owners with courtesy and respect.
- Respects property rights, and never trespasses on private lands or waters.
- Keeps no more fish than needed for consumption, and never wastefully discards fish that are retained.
- Practices conservation by carefully handling and releasing alive all fish that are unwanted or prohibited by regulation, as well as other animals that may become hooked or entangled accidentally. Uses tackle and techniques, which minimize harm to fish when engaging in “catch-and-release” angling.

**Table 4.28 Observed or reported number of HMS kept in the rod and reel fishery, Maine through Virginia, 2002-2010.** Source: Large Pelagic Survey (LPS) Data.

| Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| White marlin[2] | 8 | 12 | 6 | 5 | 8 | 4 | 13 | 8 | 9 |
| Blue marlin[2] | 0 | 4 | 5 | 3 | 2 | 2 | 3 | 3 | 3 |
| Sailfish[2] | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Swordfish | 5 | 9 | 9 | 22 | 27 | 42 | 30 | 7 | 9 |
| Giant bluefin tuna[3] | 176 | 58 | 50 | 48 | 15 | 15 | 20 | 46 | 54 |
| Large medium bluefin tuna[3] | 11 | 11 | 13 | 12 | 1 | 5 | 11 | 0 | 36 |
| Small medium bluefin tuna | 62 | 83 | 30 | 22 | 48 | 69 | 48 | 205 | 11 |
| Large school bluefin tuna | 391 | 287 | 291 | 179 | 171 | 298 | 398 | 107 | 174 |
| School bluefin | 556 | 509 | 927 | 638 | 84 | 314 | 228 | 180 | 201 |
| Young school bluefin | 7 | 4 | 16 | 25 | 0 | 3 | 4 | 1 | 2 |
| Bigeye tuna | 32 | 21 | 46 | 32 | 35 | 59 | 55 | 58 | 36 |
| Yellowfin tuna | 2,595 | 3,216 | 3,858 | 3,700 | 3,572 | 2,988 | 1,029 | 1,886 | 1906 |
| Skipjack tuna | 117 | 681 | 197 | 79 | 104 | 34 | 64 | 242 | 151 |
| Albacore | 534 | 546 | 1,458 | 835 | 542 | 934 | 168 | 67 | 154 |
| Thresher shark | 20 | 24 | 58 | 45 | 34 | 62 | 59 | 66 | 44 |
| Mako shark | 72 | 141 | 216 | 99 | 111 | 143 | 169 | 159 | 159 |
| Sandbar shark | 0 | 9 | 7 | 1 | 1 | 9 | 1 | 1 | 0 |
| Dusky shark | 1 | 1 | 0 | 0 | 3 | 6 | 1 | 0 | 1 |
| Tiger shark | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 3 | 1 |
| Porbeagle | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 |
| Blacktip shark | 0 | 1 | 0 | 1 | 1 | 0 | - | - | 0 |
| Atlantic sharpnose shark | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 10 |
| Blue shark | 36 | 65 | 74 | 67 | 61 | 109 | 43 | 54 | 26 |
| Hammerhead shark | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| Smooth hammerhead | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Scalloped hammerhead | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Unidentified hammerhead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wahoo | 49 | 68 | 110 | 112 | 85 | 190 | 172 | 69 | 111 |
| Dolphin | 2,509 | 4,209 | 3,050 | 6,366 | 3,921 | 2,536 | 5,739 | 3,317 | 6063 |
| King mackerel | 36 | 66 | 11 | 376 | 170 | 82 | 67 | 14 | 14 |
| Atlantic bonito | 704 | 315 | 410 | 96 | 262 | 283 | 51 | 138 | 57 |
| Little tunny | 240 | 121 | 231 | 181 | 90 | 195 | 93 | 175 | 239 |
| Amberjack | 7 | 44 | 0 | 2 | 1 | 5 | 31 | 81 | 99 |
| Spanish mackerel | 5 | 35 | 9 | 4 | 1 | 2 | 67 | 9 | 8 |

[1] NMFS typically expands these "raw" data to report discards of BFT 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.

**Table 4.29 Observed or Reported Number of HMS Released in the Rod and Reel Fishery, Maine through Virginia, 2002-2010.** Source: Large Pelagic Survey (LPS) Data.

| Species | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| White marlin[2] | 215 | 160 | 378 | 397 | 160 | 359 | 454 | 936 | 1070 |
| Blue marlin[2] | 30 | 39 | 80 | 52 | 42 | 69 | 69 | 60 | 86 |
| Sailfish[2] | 6 | 6 | 2 | 6 | 3 | 1 | 6 | 69 | 11 |
| Swordfish | 6 | 21 | 22 | 23 | 52 | 40 | 45 | 13 | 15 |
| Giant bluefin tuna[3] | 8 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 1 |
| Large medium bluefin tuna[3] | 2 | 0 | 36 | 4 | 1 | 3 | 11 | 7 | 22 |
| Small medium bluefin tuna | 8 | 13 | 21 | 30 | 18 | 32 | 23 | 93 | 46 |
| Large school bluefin tuna | 47 | 40 | 107 | 141 | 85 | 99 | 286 | 77 | 172 |
| School bluefin4 | 200 | 174 | 1,297 | 1,917 | 290 | 347 | 358 | 173 | 392 |
| Young school bluefin4 | 182 | 10 | 1,885 | 282 | 117 | 83 | 55 | 52 | 68 |
| Bigeye tuna | 1 | 3 | 2 | 2 | 2 | 1 | 0 | 13 | 0 |
| Yellowfin tuna[4] | 328 | 200 | 1,093 | 502 | 351 | 171 | 411 | 2,038 | 374 |
| Skipjack tuna[4] | 250 | 526 | 362 | 105 | 129 | 17 | 217 | 610 | 188 |
| Albacore | 95 | 31 | 66 | 67 | 41 | 40 | 14 | 5 | 10 |
| Thresher shark | 5 | 8 | 27 | 9 | 15 | 24 | 35 | 23 | 21 |
| Mako shark | 120 | 208 | 350 | 142 | 177 | 190 | 242 | 250 | 276 |
| Sandbar shark | 17 | 26 | 68 | 37 | 158 | 168 | 222 | 219 | 37 |
| Dusky shark | 9 | 44 | 60 | 49 | 73 | 87 | 128 | 152 | 116 |
| Tiger shark | 3 | 12 | 0 | 6 | 7 | 11 | 20 | 11 | 13 |
| Porbeagle | 14 | 3 | 1 | 6 | 8 | 2 | 2 | 6 | 11 |
| Blacktip shark | 6 | 0 | 1 | 19 | 9 | 31 | - | - | 34 |
| Atlantic sharpnose shark | 0 | 0 | 0 | 11 | 0 | 0 | - | - | 5 |
| Blue shark[4] | 505 | 2,060 | 2,242 | 920 | 884 | 1,978 | 2,735 | 4,185 | 3333 |
| Hammerhead shark | 6 | 38 | 2 | 5 | 0 | 0 | 0 | 0 | 0 |
| Smooth hammerhead | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 |
| Scalloped hammerhead | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 |
| Unidentified hammerhead | 0 | 0 | 0 | 0 | 11 | 14 | 27 | 31 | 32 |
| Wahoo | 6 | 3 | 5 | 7 | 6 | 9 | 4 | 4 | 6 |
| Dolphin | 111 | 677 | 192 | 375 | 394 | 227 | 372 | 222 | 344 |
| King mackerel | 5 | 5 | 1 | 7 | 20 | 3 | 5 | 5 | 1 |
| Atlantic bonito[4] | 176 | 282 | 389 | 231 | 114 | 60 | 36 | 124 | 55 |
| Little tunny | 585 | 443 | 1,130 | 505 | 102 | 387 | 614 | 1,028 | 886 |
| Amberjack | 57 | 111 | 1 | 2 | 13 | 33 | 145 | 101 | 119 |
| Spanish mackerel[4] | 0 | 1 | 0 | 0 | 0 | 2 | 37 | 1 | 8 |

[1] NMFS typically expands these "raw" data to report discards of BFT 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.
[4] Includes dead releases in 2010.

### 4.4.4 International Issues and Catch

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 and Brazil are the only countries that currently report 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, because total landings data (including recreational landings) are incomplete, HMS stock assessments are often hampered. For more information on some efforts by ICCAT to increase reporting of recreational landings, see previous SAFE reports.

The first meeting of the Working Group on Sport and Recreational Fishing occurred on Friday, November 6, 2009. The United States was the only party to provide information detailing its recreational fisheries as required by the Recommendation that established the Working Group. Discussions of the Recreational Working Group centered around two issues: the need to improve recreational monitoring, data collection, and reporting; and the development of a common understanding/definition of recreational and sport fishing. There was consensus within the working group regarding the need to improve recreational monitoring, data collection, and reporting. Regarding development of a common definition, the majority of Parties that commented expressed general agreement that it would be appropriate to include the concept of non-commercial activities as a key component of a definition. There was no consensus on this point, as some Parties indicated that there are instances where recreationally caught fish may legitimately enter the stream of commerce. The Working Group agreed that Parties should submit information similar to that provided by the United States to the ICCAT Secretariat, continue discussions intercessionally, seek to define common methodologies for data collection, and that the Commission should work to decide whether it would be helpful to develop a common definition of sport and recreational fisheries related to the non-commercial nature of these fisheries.

## 4.5 Bottom Longline (BLL)

Bottom longline gear is the primary commercial gear employed for targeting LCS in all regions. SCS are also caught on BLL. Gear characteristics vary by region and target species, but in general, BLL consists of a longline between 3 and 8 km (1.8 – 5 miles) long with 200-400 hooks attached and is set for 2 and 20 hours. Depending on the species being targeted, both circle and J hooks are used. Fishermen targeting sharks with BLL gear are opportunistic and often maintain permits for council-managed fisheries such as reef fish, snapper/grouper, tilefish, and other teleosts. Minor modifications to how and where the gear is deployed allow fishermen to harvest sharks and teleosts on the same trip. Seasons, quota availability, market prices, and other factors influence decisions concerning whether or not to target sharks, teleosts, or both on a given trip. 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 (Hale *et al.*, 2010).

### 4.5.1 Current Management

Regulations for the shark fishery in this section apply to all gear types. The 1993 FMP for Sharks of the Atlantic Ocean established the basis for subsequent shark management, including establishment of three management units (LCS, SCS, and pelagic sharks), commercial quotas, and authorized gears, among other measures. An FMP amendment was completed in 2003 because of updated stock assessments, litigation, and other public comments (December 24, 2003, 68 FR 74746). Management measures enacted in that amendment included: modifying the commercial quotas, eliminating the commercial minimum size restrictions, establishing regions and trimester seasons for LCS and SCS management units, imposing gear restrictions to reduce bycatch, and a time/area closure off the coast of North Carolina effective January 1, 2005.

Based on 2005 and 2006 stock assessments, NMFS further revised shark management measures and rebuilding periods in Amendment 2 to the 2006 Consolidated HMS FMP on June 24, 2008 (73 FR 35778; corrected on July 15, 2008, 73 FR 40658). In the final rule, NMFS removed sandbar sharks from the LCS complex and established a non-sandbar LCS complex that was split into two regions (Atlantic and Gulf of Mexico). A shark research fishery was established in order to collect data on sandbar sharks. Amendment 2 also implemented new annual adjusted quotas for sandbar sharks, non-sandbar LCS, and a porbeagle shark commercial quota. Amendment 2 also required that all sharks be landed with all fins attached to the carcass through landing and offloading. Stock assessments results from 2007 for blacknose and shortfin mako sharks required NMFS to publish Amendment 3 to the Consolidated HMS FMP (75 FR 30484; June 1, 2010). This amendment created a species specific quota for blacknose sharks, modified the quota for the non-blacknose SCS, added smooth dogfish to the management unit and established a quota, and would take action at the international level through international fishery management organizations to establish management measures to end overfishing of shortfin mako sharks.

Recently, NMFS updated the stock status determinations for blacknose, sandbar, and dusky sharks (76 FR 62331; October 7, 2011). The blacknose shark stock was split into two regions with the Atlantic stock being determined as overfished with overfishing occurring, and the Gulf of Mexico stock status was determined to be unknown. The status of sandbar sharks was determined to be overfished with no overfishing occurring, which is a change from the previous determination of overfished with overfishing occurring. The status of dusky sharks is unchanged and remains overfished with overfishing occurring. NMFS also determined that the status of the scalloped hammerhead shark stock is overfished with overfishing occurring (76 FR 23794; April 28, 2011). As a result of these stock assessments, NMFS is currently in the scoping phase for Amendment 5 to the Consolidated HMS FMP.

#### 4.5.2 Recent Catch, Landings, and Discards

This section provides information on shark landings, species composition, bycatch, and discards as reported in the shark BLL observer program. Since 2002, shark BLL vessels are required to take an observer if selected. Participants in the shark research fishery are required to take an observer when targeting sandbar sharks. Outside the research fishery and depending on the time of year and fishing season, vessels that target sharks, possessed current valid directed shark permit, and reported fishing with longline gear in the previous year were randomly selected for coverage with a target coverage level of 2-3% for shark directed (Hale *et al*., 2011).

In 2010, the shark BLL observer program selected 23 vessels with a total of 718 BLL hauls (defined as setting gear, soaking gear for some duration of time, and retrieving gear) were observed in a total of 138 trips (defined as from the time a vessel leaves the port until the vessel returns to port and lands catch, including multiple hauls therein). Gear characteristics of trips varied by area (Gulf of Mexico or the U.S. Atlantic Ocean) and target species (grouper/snapper (reef fish), non-sandbar LCS, or sandbar shark) (Hale *et al*., 2011). The data were grouped by targets into four groups: a) hauls targeting shallow water reef fish (70.5% of reef fish targeted sets were shallower than 50 fathoms (<91.4 m) depth), b) hauls targeting deep water reef fish (29.5% of reef fish targeted sets were deeper than 50 fathoms (>91.4 m) depth), c) hauls targeting sandbar shark, and d) hauls targeting non-sandbar LCS species. No trips were observed in the northern U.S. Atlantic Ocean; therefore subsequent references to the "U.S. Atlantic Ocean" refer to the coastal waters off the southern U.S. Atlantic states from North Carolina to Florida (Richards, 1999). Vessels targeting sandbar sharks participating in the shark research fishery are subject to unique retention limits (33 sandbar sharks and 33 non-LCS sandbar sharks/vessel/trip). These vessels averaged 2 trips per month in 2010. Table 4.29 through Table 4.32 summarize the shark catch composition and disposition for observed shark trips in 2010.

**Table 4.30 Shark species composition of observed BLL catch during 2010 for BLL trips targeting sandbar sharks in the Gulf of Mexico and South Atlantic.** Source: Hale *et al*., 2011.

| **Species** | **Total Number Caught** | **% Kept** | **% Discarded Dead** | **% Discarded Alive** | **% Unknown** |
|---|---|---|---|---|---|
| Sandbar shark | 4157 | 69.1 | 7.7 | 22.3 | 1.0 |
| Tiger shark | 998 | 34.9 | 5.0 | 58.8 | 1.3 |
| Atlantic sharpnose shark | 891 | 35.6 | 60.5 | 3.9 | 0.0 |
| Blacktip shark | 565 | 60.0 | 29.6 | 7.8 | 2.7 |
| Nurse shark | 335 | 0.9 | 1.5 | 96.1 | 1.5 |
| Blacknose shark | 239 | 16.7 | 76.2 | 6.3 | 0.8 |
| Bull shark | 219 | 76.3 | 0.5 | 21.0 | 2.3 |
| Scalloped hammerhead shark | 212 | 81.1 | 10.8 | 6.1 | 1.9 |
| Dusky shark | 192 | 0.0 | 67.2 | 32.3 | 0.5 |
| Great hammerhead shark | 149 | 81.9 | 18.1 | 0.0 | 0.0 |
| Lemon shark | 107 | 89.7 | 0.0 | 6.5 | 3.7 |
| Spinner shark | 61 | 80.3 | 14.8 | 3.3 | 1.6 |
| Sand tiger shark | 60 | 5.0 | 0.0 | 95.0 | 0.0 |
| Silky shark | 32 | 56.3 | 40.6 | 3.1 | 0.0 |
| Bonnethead shark | 15 | 40.0 | 60.0 | 0.0 | 0.0 |
| Sharks | 8 | 0.0 | 37.5 | 25.0 | 37.5 |
| Smooth dogfish | 6 | 33.3 | 33.3 | 33.3 | 0.0 |
| Great white shark | 5 | 0.0 | 40.0 | 60.0 | 0.0 |
| Smooth hammerhead shark | 5 | 100.0 | 0.0 | 0.0 | 0.0 |
| Caribbean reef shark | 4 | 0.0 | 50.0 | 50.0 | 0.0 |
| Common thresher shark | 2 | 100.0 | 0.0 | 0.0 | 0.0 |
| Finetooth shark | 2 | 0.0 | 100.0 | 0.0 | 0.0 |
| Hammerhead shark | 2 | 0.0 | 50.0 | 0.0 | 50.0 |
| Cuban dogfish | 1 | 0.0 | 0.0 | 100.0 | 0.0 |
| **Total** | **8,267** | | | | |

**Table 4.31 Shark species composition of observed BLL catch during 2010 for BLL trips targeting large coastal sharks in the Gulf of Mexico and South Atlantic.** Source: Hale et al., 2011.

| **Species** | **Total Number Caught** | **% Kept** | **% Discarded Dead** | **% Discarded Alive** | **% Unknown** |
|---|---|---|---|---|---|
| Atlantic sharpnose shark | 467 | 21.8 | 77.1 | 1.1 | 0.0 |
| Nurse shark | 196 | 0.0 | 0.5 | 99.5 | 0.0 |
| Tiger shark | 140 | 71.4 | 1.4 | 25.0 | 2.1 |
| Blacktip shark | 72 | 93.1 | 5.6 | 0.0 | 1.4 |
| Scalloped hammerhead shark | 50 | 88.0 | 12.0 | 0.0 | 0.0 |
| Sandbar shark | 44 | 0.0 | 20.5 | 79.5 | 0.0 |
| Lemon shark | 20 | 80.0 | 0.0 | 0.0 | 20.0 |
| Blacknose shark | 18 | 0.0 | 77.8 | 22.2 | 0.0 |
| Bull shark | 13 | 84.6 | 15.4 | 0.0 | 0.0 |
| Great hammerhead shark | 11 | 100.0 | 0.0 | 0.0 | 0.0 |
| Spinner sharks | 4 | 100.0 | 0.0 | 0.0 | 0.0 |
| Sharks | 3 | 0.0 | 100.0 | 0.0 | 0.0 |
| Smmoth dogfish | 2 | 0.0 | 50.0 | 50.0 | 0.0 |
| Hammerhead sharks | 1 | 0.0 | 100.0 | 0.0 | 0.0 |
| **Total** | **2,328** | | | | |

**Table 4.32 Shark species composition of observed BLL catch during 2010 for BLL trips targeting shallow water reef fish in the Gulf of Mexico.** Source: Hale *et al.*, 2011.

| **Species** | **Total Number Caught** | **% Kept** | **% Discarded Dead** | **% Discarded Alive** | **% Unknown** |
|---|---|---|---|---|---|
| Atlantic sharpnose shark | 837 | 1.7 | 9.7 | 88.5 | 0.1 |
| Blacknose shark | 347 | 2.9 | 7.2 | 89.9 | 0.0 |
| Sandbar shark | 206 | 1.9 | 1.0 | 96.1 | 1.0 |
| Tiger shark | 163 | 1.8 | 1.8 | 96.3 | 0.0 |
| Requiem shark family | 119 | 1.7 | 1.7 | 96.6 | 0.0 |
| Scalloped hammerhead shark | 55 | 9.1 | 9.1 | 80.0 | 1.8 |
| Sharks | 51 | 0.0 | 13.7 | 86.3 | 0.0 |
| Blacktip shark | 49 | 2.0 | 18.4 | 79.6 | 0.0 |
| Nurse shark | 47 | 0.0 | 0.0 | 100.0 | 0.0 |
| Smooth dogfish | 45 | 4.4 | 6.7 | 88.9 | 0.0 |
| Silky shark | 29 | 0.0 | 24.1 | 75.9 | 0.0 |
| Bull shark | 12 | 0.0 | 0.0 | 100.0 | 0.0 |
| Dusky shark | 6 | 0.0 | 33.3 | 66.7 | 0.0 |
| Hammerhead sharks | 5 | 0.0 | 20.0 | 80.0 | 0.0 |
| Sharks and rays | 3 | 0.0 | 0.0 | 100.0 | 0.0 |
| Spinner shark | 3 | 0.0 | 0.0 | 100.0 | 0.0 |
| Great hammerhead shark | 2 | 0.0 | 50.0 | 50.0 | 0.0 |
| Bonnethead shark | 1 | 0.0 | 0.0 | 100.0 | 0.0 |
| Lemon shark | 1 | 0.0 | 0.0 | 100.0 | 0.0 |
| Mako sharks | 1 | 0.0 | 0.0 | 100.0 | 0.0 |
| **Total** | **1,982** | | | | |

**Table 4.33 Shark species composition of observed BLL catch during 2010 for BLL trips targeting deep water reef fish in the Gulf of Mexico.** Source: Hale *et al.*, 2011.

| Species | Total Number Caught | % Kept | % Discarded Dead | % Discarded Alive | % Unknown |
|---|---|---|---|---|---|
| Cuban dogfish | 195 | 0.0 | 15.4 | 84.6 | 0.0 |
| Smooth dogfish | 98 | 2.0 | 2.0 | 94.9 | 1.0 |
| Bigeye sixgill shark | 31 | 0.0 | 19.4 | 80.6 | 0.0 |
| Requiem shark family | 18 | 0.0 | 11.1 | 88.9 | 0.0 |
| Scalloped hammerhead shark | 11 | 0.0 | 0.0 | 90.9 | 9.1 |
| Sharks | 11 | 0.0 | 9.1 | 81.8 | 9.1 |
| Silky shark | 8 | 0.0 | 25.0 | 75.0 | 0.0 |
| Sandbar shark | 6 | 0.0 | 0.0 | 100.0 | 0.0 |
| Atlantic sharpnose shark | 5 | 0.0 | 60.0 | 40.0 | 0.0 |
| Tiger shark | 5 | 0.0 | 0.0 | 100.0 | 0.0 |
| Night shark | 2 | 0.0 | 0.0 | 100.0 | 0.0 |
| Blacktip shark | 1 | 0.0 | 100.0 | 0.0 | 0.0 |
| Mako sharks | 1 | 0.0 | 100.0 | 0.0 | 0.0 |
| **Total** | **392** | | | | |

### 4.5.3 Bottom Longline Bycatch

Under the MMPA (16 U.S.C. 1361 *et seq*.) the Atlantic shark BLL is classified as Category III (remote likelihood or no known serious injuries or mortalities) (November 8, 2010; 75 FR 68468). As required by the ESA, the NMFS Southeast Regional Office’s Protected Resources Division prepared a Biological Opinion (BiOp) regarding the actions proposed under Amendment 2 to the 2006 Consolidated HMS FMP on May 20, 2008. The BiOp concluded, based on the best available scientific information, that Amendment 2 to the HMS FMP was 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. The actions implemented under Amendment 2 were not expected to jeopardize the continued existence of any endangered or threatened species. Furthermore, the BiOp concluded that the actions implemented under Amendment 2 were not likely to adversely affect any listed species of marine mammals, invertebrates (*i.e.*, listed species of coral) or other listed species of fishes (*i.e.*, Gulf sturgeon and Atlantic salmon) in the action area. NMFS is currently engaged in a formal Section 7 consultation in accordance with the ESA to determine the potential level of incremental effect on endangered species that may arise as a result of the measures in Amendment 3 to include smooth dogfish under the Secretary's authority. Once a BiOp is received from the Office of Protected Resources, it will be reviewed and a determination made concerning the need to consider potential impacts on protected resources as a result of fishing for smooth dogfish.

Table 4.33 provides information on observed interactions with protected resources for BLL vessels fishing in the Gulf of Mexico and South Atlantic regions targeting sandbar shark in 2010. Nine (9) smalltooth sawfish and three (3) loggerhead sea turtles were observed caught in BLL gear. Table 4.34 provides information on observed interactions with protected resources for BLL vessels fishing in the Gulf of Mexico and South Atlantic regions targeting LCS in 2010. One (1) smalltooth sawfish and one loggerhead sea turtle were observed caught in BLL gear. No interactions with protected resources (sea bird, sea turtle, sawfish, or marine mammal) were observed for BLL vessels fishing in the Gulf of Mexico region targeting shallow and deep water reef fish. No sea bird or marine mammal interactions were observed (Hale *et al.*, 2011).

**Table 4.34 Number of Protected Species Interactions for all Observed Hauls Targeting Sandbar Shark in the Gulf of Mexico and South Atlantic, 2010.** Disposition of Catch is Divided into Released Dead, Released Alive, and Unknown.

| Species | Total Number Caught | % Discarded Dead | % Discarded Alive | % Unknown |
|---|---|---|---|---|
| Smalltooth sawfish | 9 | 0.0 | 100.0 | 0.0 |
| Loggerhead seas turtle | 3 | 33.3 | 66.7 | 0.0 |

**Table 4.35 Number of Protected Species Interactions for all Observed Hauls Targeting Large Coastal Sharks in the Gulf of Mexico and South Atlantic, 2010.** Disposition of Catch is Divided into Released Dead, Released Alive, and Unknown.

| Species | Total Number Caught | % Discarded Dead | % Discarded Alive | % Unknown |
|---|---|---|---|---|
| Loggerhead sea turtle | 1 | 100.0 | 0.0 | 0.0 |
| Smalltooth sawfish | 1 | 0.0 | 100.0 | 0.0 |

### 4.6 Gillnet Fishery

Gillnet is the primary gear for vessels directing on SCS. Vessels participating in the shark gillnet fishery typically possess permits for other Council and/or state managed fisheries and will deploy nets in several configurations based on target species including drift, strike, and sink gillnets. In 2010, a total of 295 sets comprising of various gillnet fisheries were observed. In the drift gillnet fishery, 4 drift gillnet vessels were observed. These vessels made 14 sets on 8 trips. Using this gear configuration, the nets are 6.1-15.2 m (20-50 ft) deep (height), 183-1,097 m (600-3,600 ft) in length, with a stretched mesh size of 12.1-13.9 cm (4.75-5.50 in), with total set and haulback time averaging 4.07 hours. There were no vessels observed fishing gillnets in a strike fashion in 2010. A total of 53 trips making 281 sink net sets on 17 vessels were observed in 2010. These nets had a 6.4-17.1 cm (2.5-6.75 in) stretched mesh size, were 27.4-1,097 m (90-3,600 ft) in length, and 0.9-8.2 m (3-27 ft) in deep. The entire fishing process of net setting to haul back averaged 3.66 hours (Passerotti *et al*, 2011).

### 4.6.1 Current Management

Many of the regulations for the Atlantic shark fishery are the same for both the BLL and gillnet fishery, including, but not limited to: seasons, quotas, species complexes, permit requirements, authorized/prohibited species, and retention limits (see section 4.5.1 above for more information on shark fishery management). Examples of regulations that are specific to shark gillnet fishing, include: gillnet mesh size, requiring that gillnets remain attached to the vessel, and the need to conduct net checks every 2 hours when gear is deployed. Because the majority of the southeast shark gillnet fleet is based out of ports in northern and central Florida (South Atlantic region), regulations implementing the ALWTRP affect this fishery. In 2007, these regulations were amended, thus removing the requirement for 100 percent observer coverage for drift gillnet vessels during the right whale calving season and prohibiting all gillnets in an expanded southeast U.S. restricted area from Cape Canaveral, Florida to the North Carolina/South Carolina border during November 15 – April 15. The rule has limited exemptions, which allows shark strikenet fishing only in waters south of 29° N. latitude during this same period and for Spanish mackerel, *Scomberomorus maculates,* gillnet fishing in the months of December to March. Operations in this area during this time period require use of VMS and observer coverage, if selected. Based on these regulations, and on current funding levels, the shark gillnet observer program now covers all anchored (sink, stab, set), strike, or drift gillnets fishing by vessels that fish from Florida to North Carolina, year-round.

### 4.6.2 Recent Shark Catch, Landings, and Discards

The “Catch and Bycatch in U.S. Southeast Gillnet Fisheries, 2010” is a report published every year by the Southeast Fisheries Science Center’s Panama City Laboratory that describes, in detail, the target species, gear configuration, and soak time deployed by drift gillnet, strike gillnet, and sink gillnet fishermen (Passerotti *et al*, 2011). Summary information is provided in Section 4.6 above. Table 4.35 through Table 4.36 of this section outline shark species composition, disposition, and summary information for sharks caught during observed drift and sink gillnet trips with observers onboard in 2010.

**Table 4.36 Total Drift Gillnet Shark Catch by Species in order of Decreasing Abundance for all Observed Trips, 2010.** Source: Passerotti *et al*., 2011.

| Species | Total Number Caught | Kept (%) | Discarded Alive (%) | Discarded Dead |
|---|---|---|---|---|
| Atlantic sharpnose shark | 2006 | 99.7 | 0.2 | 0.1 |
| Spinner shark | 628 | 7.8 | 1.6 | 90.6 |
| Blacknose shark | 47 | 100.0 | 0.0 | 0.0 |
| Scalloped hammerhead shark | 33 | 78.8 | 0.0 | 21.2 |
| Bonnethead shark | 10 | 100.0 | 0.0 | 0.0 |
| Blacktip shark | 4 | 100.0 | 0.0 | 0.0 |
| **Total** | **2,728** | | | |

**Table4.37 Total Sink Gillnet Shark Catch by Species in Order of Decreasing Abundance for all Observed Trips, 2010.** Source: Passerotti *et al*., 2011.

| Species | Total Number Caught | Kept (%) | Discarded Alive (%) | Discarded Dead |
|---|---|---|---|---|
| Spiny dogfsh | 1436 | 0.6 | 96.2 | 3.1 |
| Smooth dogfish | 904 | 7.7 | 90.4 | 1.9 |
| Atlantic sharpnose shark | 485 | 13.2 | 65.6 | 21.2 |
| Sandbar shark | 144 | 0.0 | 100.0 | 0.0 |
| Blacktip shark | 60 | 88.3 | 11.7 | 0.0 |
| Bonnethead shark | 39 | 10.3 | 18.0 | 71.8 |
| Spinner shark | 35 | 85.7 | 11.4 | 2.9 |
| Scalloped hammerhead shark | 19 | 5.3 | 68.4 | 26.3 |
| Finetooth shark | 3 | 33.3 | 33.3 | 33.3 |
| Common thresher shark | 2 | 100.0 | 0.0 | 0.0 |
| Sand tiger shark | 1 | 0.0 | 100.0 | 0.0 |
| Blacknose shark | 1 | 0.0 | 100.0 | 0.0 |
| Dusky shark | 1 | 0.0 | 100.0 | 0.0 |
| Smooth hammerhead shark | 1 | 0.0 | 0.0 | 100.0 |
| **Total** | **3,131** | | | |

### 4.6.2.1 Gillnet Bycatch

This section describes the non-shark bycatch observed in the southeast shark gillnet fisheries by gear configuration (drift and sink gillnets) (Passerotti *et al*., 2011).

The most common non-shark species caught in the drift gillnet fishery were bluefish with a total of 1,647 caught (Table 4.36). There was a much wider range of fish species caught in the sink (Table 4.38) gillnet fisheries than in drift nets, which is likely due to the number of sets observed and gear deployment methods. Predominant species caught in sink gillnets included southern kingfish and Atlantic menhaden. All of the observed interactions with protected species between 2000-2010 in the shark gillnet fisheries are on Table 4.39.

### 4.6.2.2 Sea Turtles

There were no sea turtles observed caught in gillnet gear in 2010 (Passerotti *et al*., 2011).

#### 4.6.2.3 Sea Birds

There was one common loon (*Gavia immer*) observed caught in sink gillnet gear in 2010. The bird was discarded dead (Passerotti *et al*., 2011).

#### 4.6.2.4 Marine Mammals

Under the MMPA (16 U.S.C. 1361 *et seq*.) the Atlantic shark gillnet fishery is classified as Category II (occasional serious injuries and mortalities) (November 8, 2010; 75 FR 68468). In 2010, there were no marine mammals observed caught in gillnet gear (Passerotti *et al*. 2011).

#### 4.6.2.5 Smalltooth Sawfish

In 2010, there were no observed interactions with smalltooth sawfish in gillnet gear. The last observed interaction occurred in 2003 and the sawfish was released with no visible injuries. Given the high rate of observer coverage in for these gillnet fisheries consistent with ALWTRT requirements, NMFS believes that smalltooth sawfish interactions in this fishery are rare.

**Table 4.38 Total Bycatch by Species Observed in the Drift Gillnet Fishery from the 2010 Observer Data.** Source: Passerotti *et al*., 2011.

| Common Name | Total Number Caught | Kept (%) | D.A. (%) | D.D. (%) |
|---|---|---|---|---|
| Bluefish | 1,647 | 100.0 | 0.0 | 0.0 |
| Little tunny | 115 | 100.0 | 0.0 | 0.0 |
| King mackerel | 83 | 47.0 | 0.0 | 53.0 |
| Cobia | 28 | 32.1 | 14.3 | 53.6 |
| Remora family | 14 | 0.0 | 100.0 | 0.0 |
| Moonfish | 4 | 0.0 | 0.0 | 100.0 |
| Barracuda family | 4 | 100.0 | 0.0 | 0.0 |
| Sailfish | 2 | 0.0 | 0.0 | 100.0 |
| Cownose ray | 2 | 0.0 | 100.0 | 0.0 |
| **Total** | **1,899** | | | |

Note: Kept (%) – represents the percentage of the catch retained, D.A.(%) – percentage of the catch discarded alive, D.D (%) – percentage of the catch discarded dead

**Table 4.39 Total Bycatch by Species Observed in the Sink Gillnet Fishery in 2010.**
Source: Passerotti *et al.*, 2011.

| Common Name | Total Number Caught | Kept (#) | D.A. (#) | D.D. (#) |
|---|---|---|---|---|
| Southern kingfish | 12,890 | 99.1 | 0.0 | 0.9 |
| Atlantic menhaden | 10,071 | 42.5 | 1.2 | 56.3 |
| Atlantic butterfish | 6,408 | 99.5 | 0.1 | 0.5 |
| Spanish mackerel | 6,325 | 99.2 | 0.0 | 0.8 |
| Bluefish | 3,486 | 96.1 | 0.5 | 3.4 |
| Atlantic croaker | 3,224 | 71.2 | 21.4 | 7.5 |
| Spot | 2,083 | 68.6 | 1.9 | 29.5 |
| Weakfish seatrout | 583 | 41.2 | 14.1 | 44.8 |
| Sea stars | 361 | 0.0 | 100.0 | 0.0 |
| Atlantic bumper | 254 | 55.1 | 18.5 | 26.4 |
| Yellowfin menhaden | 237 | 89.9 | 2.1 | 8.0 |
| Bonito | 214 | 99.5 | 0.5 | 0.0 |
| Blue crab | 133 | 0.8 | 92.5 | 6.8 |
| Banded drum | 129 | 0.0 | 9.3 | 90.7 |
| King mackerel | 115 | 81.7 | 6.1 | 12.2 |
| Seatrouts | 102 | 19.6 | 35.3 | 45.1 |
| Spadefish | 70 | 4.3 | 51.4 | 44.3 |
| Cobia | 62 | 17.7 | 51.6 | 30.7 |
| Little tunny | 59 | 100.0 | 0.0 | 0.0 |
| Bluerunner jack | 53 | 100.0 | 0.0 | 0.0 |
| Atlantic cutlassfish | 53 | 100.0 | 0.0 | 0.0 |
| Gar family | 39 | 66.7 | 20.5 | 12.8 |
| Spiny puffer family | 30 | 0.0 | 100.0 | 0.0 |
| Cownose ray | 30 | 0.0 | 100.0 | 0.0 |
| Atlantic thread herring | 28 | 0.0 | 53.6 | 46.4 |
| Jonah crab | 23 | 0.0 | 100.0 | 0.0 |
| Flounders | 23 | 8.7 | 91.3 | 0.0 |
| Searobins | 21 | 0.0 | 33.3 | 66.7 |
| Herring family | 20 | 15.0 | 0.0 | 85.0 |
| Pigfish | 17 | 11.8 | 88.2 | 0.0 |
| Clearnose skate | 17 | 5.9 | 88.2 | 5.9 |
| Jellyfish | 17 | 0.0 | 100.0 | 0.0 |
| Lookdown | 16 | 0.0 | 68.8 | 31.3 |
| Moonfish | 12 | 0.0 | 0.0 | 100.0 |
| Crevalle jack | 10 | 100.0 | 0.0 | 0.0 |
| Spider crabs | 9 | 0.0 | 100.0 | 0.0 |
| Sea urchins | 8 | 0.0 | 0.0 | 100.0 |
| Ladyfish | 8 | 12.5 | 0.0 | 87.5 |
| Shrimp | 7 | 100.0 | 0.0 | 0.0 |
| Pinfish | 7 | 0.0 | 85.7 | 14.3 |
| Florida pompano | 6 | 50.0 | 0.0 | 50.0 |

| Common Name | Total Number Caught | Kept (#) | D.A. (#) | D.D. (#) |
|---|---|---|---|---|
| Atlantic stingray | 5 | 0.0 | 100.0 | 0.0 |
| Southern flounder | 5 | 0.0 | 100.0 | 0.0 |
| Hardhead catfish | 4 | 0.0 | 100.0 | 0.0 |
| Lizardfish family | 4 | 0.0 | 100.0 | 0.0 |
| Sheepshead | 3 | 100.0 | 0.0 | 0.0 |
| Blackdrum | 3 | 0.0 | 100.0 | 0.0 |
| Atlantic mackerel | 3 | 100.0 | 0.0 | 0.0 |
| Gafftopsail catfish | 2 | 0.0 | 0.0 | 100.0 |
| Silver mullet | 2 | 100.0 | 0.0 | 0.0 |
| Bullnose ray | 2 | 0.0 | 100.0 | 0.0 |
| Unicorn filefish | 1 | 0.0 | 100.0 | 0.0 |
| Common loon | 1 | 0.0 | 0.0 | 100.0 |
| Harvestfish | 1 | 0.0 | 0.0 | 100.0 |
| Dealfish family | 1 | 100.0 | 0.0 | 0.0 |
| Hogchocker | 1 | 0.0 | 100.0 | 0.0 |
| **Total** | **47,289** | | | |

**Table 4.40 Observed Interactions with Protected Species Between 2000-2010 in the Shark Gillnet Fishery. Letters in parentheses indicate whether the animal was released alive (A), dead (D), or unknown (U).**

| Year | Leatherback Sea Turtle | Loggerhead Sea Turtle | Kemp's Ridley Sea Turtle | Smalltooth Sawfish | Total |
|---|---|---|---|---|---|
| 2000 | | 1 (U) | | | 1 |
| 2001 | | 1 (U) | | | 1 |
| 2002 | | 1 (U) | | | 1 |
| 2003 | | | | 1(A) | 1 |
| 2004 | | | | | 0 |
| 2005 | 1(A) | 5 (4A, 1D) | | | 6 |
| 2006 | | 3 (2A, 1D) | | | 3 |
| 2007 | | 4 (3A, 1U) | | | 4 |
| 2008 | | | | | 0 |
| 2009 | | 1 (A) | 1(A) | | 2 |
| 2010 | | | | | 0 |
| **Total** | 1 | 16 | 1 | 1 | 19 |

## 4.7 Buoy Gear

### 4.7.1 Domestic History and Current Management

A detailed history of the buoy gear fishery may be found in the 2006 Consolidated HMS FMP. Commercial buoy gear was authorized in 2006 for Swordfish Directed and Handgear permit holders. Swordfish Directed permit holders may retain swordfish only if they have also been issued a Shark Directed or Incidental limited access permit and an Atlantic Tunas Longline permit. Swordfish Handgear permit holders are not required to be issued other permits to retain swordfish. HMS Charter/Headboat, Angling, and Swordfish Incidental permit holders may not fish with buoy gear.

Buoy gear means a fishing gear consisting of one or more floatation devices supporting a single mainline to which no more than two hooks or gangions are attached. The buoy gear fishery is usually prosecuted at night. Authorized permit holders may not possess or deploy more than 35 floatation devices, and may not deploy more than 35 individual buoy gears per vessel. Buoy gear must be constructed and deployed so that the hooks and/or gangions are attached to the vertical portion of the mainline. Floatation devices may be attached to one, but not both ends of the mainline, and no hooks or gangions may be attached to any floatation device or horizontal portion of the mainline. If more than one floatation device is attached to a buoy gear, no hook or gangion may be attached to the mainline between them. Individual buoy gears may not be linked, clipped, or connected together in any way. Buoy gears must be released and retrieved by hand. All deployed buoy gear must have some type of monitoring equipment affixed to it including, but not limited to, radar reflectors, beeper devices, lights, or reflective tape. If only reflective tape is affixed, the vessel deploying the buoy gear must possess on board an operable spotlight capable of illuminating deployed floatation devices. If a gear monitoring device is positively buoyant, and rigged to be attached to a fishing gear, it is included in the 35 floatation device vessel limit and must be marked appropriately.

### 4.7.2 Recent Catch, Landings, and Discards

Buoy gear effort and catch data are available for 2007 through 2010 (Table 4.40, Table 4.41, and Table 4.42). Prior to 2007, buoy gear catch data were included in handline catch data.

**Table 4.41 Buoy Gear Effort.** Source: NMFS Pelagic Logbook Program

| | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| **Number of Vessels** | 42 | 44 | 53 | 57 |
| **Number of Trips** | 745 | 598 | 708 | 632 |
| **Avg. Buoy Gears Deployed per Trip** | 11.0 | 11.2 | 11.9 | 11.9 |
| **Total Number of Hooks Set** | 11,742 | 8,922 | 11,595 | 8855 |
| **Avg. Number Hooks per Gear** | 1.4 | 1.3 | 1.4 | 1.2 |

**Table4.42 Buoy Gear Landings in Pounds Dressed Weight.** Source: NMFS Pelagic Logbook Program

| | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| **Swordfish** | 183,982 | 122,700 | 154,674 | 153,520 |
| **Dolphin** | 966 | 1,031 | 1,427 | 419 |
| **Oilfish** | 346 | 414 | 245 | 270 |
| **Shortfin mako shark** | 308 | 797 | 932 | 466 |
| **Wahoo** | 63 | 227 | 623 | 75 |
| **Bigeye tuna** | 150 | 0 | 0 | 0 |
| **Blacktip shark** | 9 | 0 | 0 | 0 |
| **King mackerel** | 0 | 194 | 67 | 576 |
| **Yellowfin tuna** | 0 | 0 | 350 | 0 |
| **Hammerhead Shark** | 0 | 0 | 350 | 1,190 |
| **Silky shark** | 0 | 0 | 20 | 48 |
| **Greater Amberjack** | 0 | 0 | 10 | 201 |
| **Bonito** | 0 | 0 | 86 | 120 |
| **Blackfin tuna** | 0 | 0 | 0 | 115 |

**Table 4.43 Buoy Gear Catches and Discards in Numbers of Fish.** Source: NMFS Pelagic Logbook Program

| | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| **Kept** | | | | |
| Swordfish | 2,849 | 1,843 | 2,085 | 1,950 |
| Dolphin | 63 | 103 | 113 | 29 |
| Oilfish | 7 | 10 | 5 | 10 |
| Bigeye tuna | 5 | 0 | 0 | 0 |
| Blackfin tuna | 3 | 7 | 2 | 7 |
| Wahoo | 2 | 6 | 44 | 2 |
| Bonito | 0 | 7 | 11 | 6 |
| King mackerel | 0 | 53 | 4 | 7 |
| Shortfin mako | 3 | 4 | 8 | 4 |
| Hammerhead shark | 1 | 0 | 1 | 6 |
| Blacktip shark | 1 | 0 | 0 | 0 |
| Silky shark | 0 | 1 | 1 | 1 |
| Yellowfin tuna | 0 | 0 | 9 | 0 |
| Greater amberjack | 0 | 0 | 1 | 7 |
| | | | | |
| **Released Alive** | | | | |
| Swordfish | 1,559 | 1,018 | 763 | 1,031 |
| Blue marlin | 1 | 0 | 1 | 1 |
| White marlin | 0 | 3 | 0 | 0 |
| Sailfish | 2 | 1 | 0 | 1 |
| Hammerhead shark | 14 | 7 | 35 | 52 |
| Blue shark | 0 | 2 | 1 | 0 |
| Thresher shark | 0 | 1 | 1 | 2 |
| Dusky shark | 4 | 0 | 0 | 12 |
| Night shark | 16 | 1 | 34 | 39 |
| Oceanic whitetip shark | 0 | 1 | 0 | 0 |
| Bigeye thresher shark | 4 | 0 | 0 | 0 |
| Tiger shark | 1 | 2 | 1 | 1 |
| Sandbar shark | 1 | 0 | 1 | 2 |
| Longfin mako shark | 4 | 3 | 2 | 7 |
| Shortfin mako shark | 0 | 1 | 2 | 6 |
| Blacktip shark | 0 | 0 | 8 | 4 |
| Silky shark | 0 | 0 | 13 | 12 |
| Oilfish | 0 | 0 | 1 | 0 |
| Greater amberjack | 0 | 0 | 1 | 0 |
| | | | | |
| **Discarded Dead** | | | | |
| Swordfish | 129 | 80 | 51 | 87 |
| Silky shark | 9 | 0 | 0 | 0 |
| Hammerhead shark | 1 | 0 | 0 | 1 |
| Blackfin tuna | 0 | 0 | 1 | 0 |
| Blue marlin | 0 | 0 | 1 | 0 |
| Night shark | 0 | 0 | 0 | 1 |

## 4.8 Green-Stick Gear

### 4.8.1 Current Management

Effective October 23, 2008, green-stick gear was specifically defined and authorized for the harvest of Atlantic tunas on Atlantic Tunas General, HMS CHB, and Atlantic Tunas Longline permitted vessels (73 FR 54721, September 23, 2008). Green-stick gear (Figure 4.9) is defined as "an actively trolled mainline attached to a vessel and elevated or suspended above the surface of the water with no more than 10 hooks or gangions attached to the mainline. The suspended line, attached gangions and/or hooks, and catch may be retrieved collectively by hand or mechanical means. Green-stick does not constitute a PLL or a BLL as defined in this section or as described at §635.21(c) or §635.21(d), respectively." Green-stick gear may be used to harvest bigeye, northern albacore, yellowfin, and skipjack tunas (collectively referred to as BAYS tunas) and BFT aboard Atlantic Tunas General, HMS Charter/Headboat, and Atlantic Tunas Longline permitted vessels.

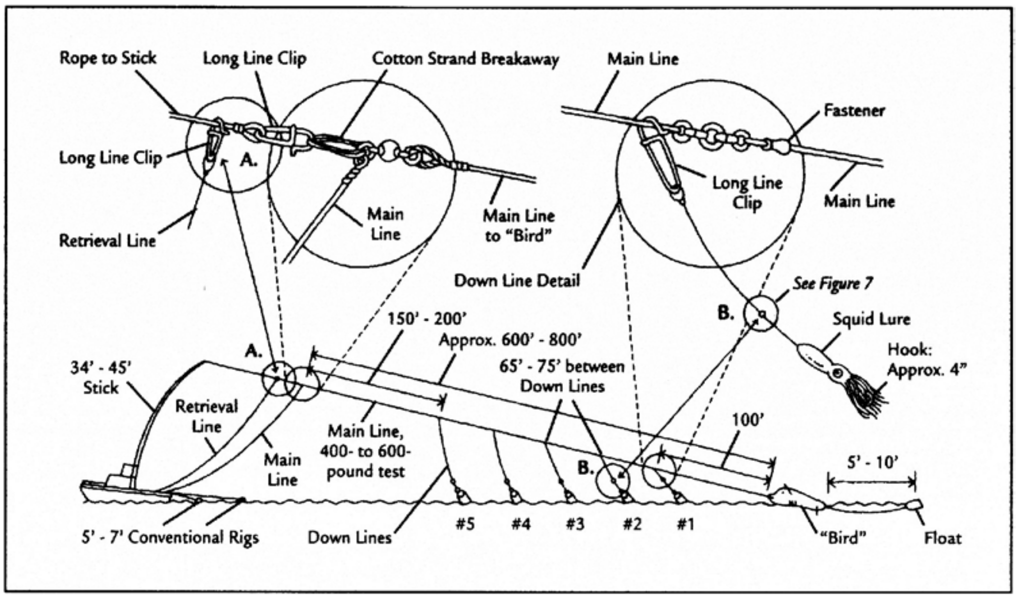


**Figure 4.9 A diagram of green-stick fishing gear.** Source: Wescott (1996).

Onboard Atlantic Tunas Longline permitted vessels, up to 20 J-hooks may be possessed for use with green-stick gear and no more than 10 J-hooks may be used with a single green-stick gear. J-hooks may not be used with PLL gear and no J-hooks may be possessed onboard a PLL vessel unless green-stick gear is also onboard. J-hooks possessed and used onboard PLL vessels may be no smaller than 1.5 inch (38.1 mm) when measured in a straight line over the longest distance from the eye to any other part of the hook.

Green-stick gear is used in Atlantic tuna fisheries. These 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 two hundred km from shore. Baits used with green-stick gear may be artificial or natural with the most common bait being artificial squid. The use of green-stick gear is most common off the mid and south Atlantic states of North Carolina and South Carolina with some use also occurring off the New England states. A few vessels use green-stick gear in the northern Gulf of Mexico as well.

Commercial Atlantic tunas permits authorized to use green-stick gear are Atlantic Tunas General, HMS Charter/Headboat, and Atlantic Tunas Longline. Atlantic Tunas General and HMS CHB are open access. The Atlantic Tunas Longline permit is limited access and, in order to be valid, a vessel must also hold a shark and swordfish limited access permit. 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. Atlantic tunas dealer permits are issued by the Northeast Region Permit Office and 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 the Atlantic Tunas General or HMS Charter/Headboat permits have the ability to retain a daily bag limit of one to five BFT, measuring 73 inches or greater curved fork length per vessel per day while the General category BFT fishery is open. NMFS sets the daily retention limit via an inseason action based on a variety of criteria and factors. 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. Each year the General category BFT fishery season is open January 1 – March 31 or until the quota (or subquota) is reached.

In order to characterize the catch and bycatch of green-stick gear, NMFS began a study in 2009 off North Carolina in partnership with the North Carolina Division of Marine Fisheries and with funding from the NOAA Bycatch Reduction Engineering Program. The purpose of the study is to investigate the potential feasibility of green-stick gear as an alternative to tuna fishing gear in some areas where bycatch is problematic for other gears. Preliminary information during 10 observed trips of 1-3 days in length showed that the catch included yellowfin tuna (47% by number), skipjack tuna (38%), blackfin tuna (10%), and dolphin (3%). Bycatch included one undersized BFT, one sailfish, and some undersized yellowfin tuna, all of which were released alive and in good condition. Data collection was completed in 2010 and a final report will be produced.

### 4.8.2 Recent Catch and Landings

Recent Atlantic tuna catches are presented earlier in Chapter 4 (See Table 4.1). An unknown portion of these landings were made with green-stick gear as the gear has been used in the Atlantic tuna fisheries since the mid-1990s. Reporting mechanisms that are in place do not enable the number of vessels using green-stick gear to be quantified; although, limited data allow the catch to be characterized and were presented in the 2008 SAFE Report (NMFS 2008). Data on landings specific to green-stick gear are expected to improve because a green-stick gear code was designated for use in dealer reporting systems such as trip tickets in the southeast and electronic reporting programs in the northeast. NMFS has also encouraged states to utilize the green-stick gear code in their trip ticket programs with some success. In 2009, the states of South Carolina, Louisiana, and Texas indicated that they would add a green-stick gear code to their trip ticket programs and Florida confirmed that the code has been added to their program.

A portion, but not all, of green-stick gear landings has been reported via the NMFS Southeast Region's Coastal Fisheries Logbook when Atlantic Tunas General, HMS Charter/Headboat, or Atlantic Tunas Longline category fishermen also hold a NMFS Southeast Region fishing permit that requires logbook reporting. Some green-stick gear landings from 1999-2007 that were designated by hand writing "green-stick gear" as an "other" gear in the Southeast Region's Coastal Logbook were reported in the 2008 SAFE Report (NMFS 2008). Also, commercial green-stick gear catches that were reported in the PLL Logbook Program from 1999–2002 were reported in the 2008 SAFE Report (NMFS 2008). From 1999-2002, the PLL logbook format included a green-stick gear data field; however, this data field was eliminated beginning in 2003 probably because green-stick gear was not an authorized gear at the time.

Neither the Southeast Region's Coastal Logbook nor the PLL Logbook currently have a green-stick gear data field on the forms; although, green-stick gear landings are sometimes recorded on the Coastal Fisheries Logbook form with "green-stick gear" hand written as an "other" gear. These data that are recorded with "green-stick gear" hand written as an "other" gear are very difficult to query in the logbook database. As a result, NMFS is unable to fully characterize the existing green-stick gear fishery with the data collection capability provided by the logbook program as it currently exists. NMFS is working to improve green-stick gear data collection in the future.

### 4.9 Safety Issues

The following section describes safety issues by fishery and gear type. More specific information regarding safety issues and statistics may be obtained from the following two U.S. Coast Guard (USCG) web pages.

- "Analysis of Fishing Vessel Casualties – A Review of Lost Fishing Vessels and Crew Fatalities 1992-2007": http://www.ntsb.gov/events/forum_fishing_vessel_safety/Background/USCG%20FV%20Casualty%20Analysis%20-%201992%20to%202007.pdf
- "Link to USCG Safety Program website: http://www.uscgboating.org/default.aspx

A summary of the key findings can be found in previous SAFE reports.

***Pelagic and Bottom Longline***

Like all offshore fisheries, pelagic longlining can be dangerous. Although frequently closer to shore, BLL fishing can be equally 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 PLL and BLL fishery. For example, all time/area closures are expected to be closed to fishing, but not transiting, in order to allow fishermen to take a more 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 fewer, possibly less experienced crew members or may not have the time or money to complete necessary maintenance tasks. NMFS encourages fishermen to be responsible in fishing and maintenance activities.

***Purse Seine***

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.

***Commercial Handgear***

The USCG conducts routine vessel safety inspections at sea on a variety of vessels throughout the year. During the 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. 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 (50 CFR Part 635.71 (b)(1)). 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).

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 pelagic species. 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 HMS Advisory Panel.

### *Recreational Handgear*

The USCG does not maintain statistics on boating accidents, rescue, or casualty data specifically pertaining to particular recreational fisheries as it does for the commercial industry. As a result, this document contains only minimal information regarding safety in recreational HMS fisheries. However, 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 4.43). Three common situations often place recreational HMS anglers 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, well-maintained 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 transits through areas utilized by the recreational swordfish fleet, which can lead to collisions if someone is not on watch at all times. Finally, another frequent safety concern of the USCG is the potential for someone to fall overboard when on the flying bridge.

## 4.10 Fishery Data: Landings by Species

The following tables (Table 4.44 through Table 4.52) of Atlantic HMS landings are taken from the 2011 National Report of the United States to ICCAT (ANN-045) (NMFS, 2011). The purpose of this section is to provide a summary of recent domestic landings of HMS by gear and species allowing for interannual comparisons. Landings for sharks were compiled from the most recent stock assessment documents and updates provided from the SEFSC.

**Table 4.44 U.S. Landings (mt) of Atlantic Bluefin Tuna by Gear and Area, 2003-2010.** Source: NMFS, 2011.

| **Area** | **Gear** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline** | 36.1 | 63.6 | 72.7 | 104.4 | 91.62 | 107.3 | 166.7 | 139.4 |
| | Handline | 2.5 | 1.5 | 2.3 | 0.3 | 0.0 | 0.6 | 0.1 | 2.7 |
| | Purse seine | 265.4 | 31.8 | 178.3 | 3.6 | 27.9 | 0.0 | 11.4 | 0.0 |
| | Harpoon | 87.9 | 41.2 | 31.5 | 30.3 | 22.5 | 30.2 | 65.7 | 29.0 |
| | *Rod and reel (>145 cm LJFL) | 676.4 | 348.0 | 170.4 | 217.2 | 235.4 | 305.7 | 717.1 | 570.8 |
| | *Rod and reel (<145 cm LJFL) | 314.6 | 370.2 | 254.4 | 158.2 | 398.6 | 352.2 | 143.3 | 111.4 |
| | Unclassified | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Gulf of Mexico | Longline | 80.0 | 102.8 | 118.5 | 88.1 | 81.3 | 111.7 | 111.6 | 54.6 |
| | *Rod and reel | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| NC Area 94a | Longline | 17.8 | 13.7 | 20.3 | 12.1 | 12.1 | 13.5 | 56.0 | 17.5 |
| **All Areas** | **All Gears** | **1,480.7** | **973.0** | **848.4** | **614.8** | **869.5** | **921.6** | **1,272** | **925.3** |

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

**Table 4.45 U.S. Landings (mt) of Atlantic Yellowfin Tuna by Gear and Area, 2003-2010.** Source: NMFS, 2011.

| Area | Gear | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 275.3 | 658.9 | 394.2 | 701.7 | 757.8 | 460.5 | 416.4 | 744.6 |
| | Rod and reel* | 4,672.1 | 3,433.7 | 3,504.8 | 4,649.2 | 2,726.0 | 657.1 | 742.6 | 1,807 |
| | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 6.9 | 2.4 | 5.4 | 1.2 |
| | Gillnet | 0.9 | 3.2 | 0.1 | 4.7 | 4.2 | 0.6 | 0.0 | 0.5 |
| | Trawl | 2.2 | 1.6 | 0.2 | 0.7 | 2.4 | 0.0 | 0.0 | 1.6 |
| | Handline | 149.1 | 213.2 | 105.1 | 105.1 | 113.2 | 30.1 | 58.7 | 44.2 |
| | Trap | 0.3 | 0.0 | 0.01 | 0.0 | 0.0 | 0.05 | 0.1 | 1.4 |
| | Unclassified | 0.1 | 10.6 | 3.8 | 3.9 | 7.0 | 1.4 | 2.2 | 10.2 |
| Gulf of Mexico | Longline | 1,835.8 | 1,811.9 | 1,210.9 | 1,128.5 | 1,379.5 | 756.5 | 1,147.0 | 506.4 |
| | Rod and reel* | 640.0 | 247.1 | 146.9 | 258.4 | 227.6 | 366.3 | 264.7 | 18 |
| | Handline | 39.9 | 28.3 | 45.5 | 49.9 | 26.2 | 11.2 | 21.6 | 13.7 |
| | Gillnet | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Unclassified | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Caribbean | Longline | 5.6 | 4.5 | 140.6 | 179.7 | 255.6 | 107.1 | 136.7 | 183.4 |
| | Handline | 9.0 | 7.0 | 9.7 | 7.8 | 9.1 | 3.7 | 3.3 | 1.9 |
| | Gillnet | 0.02 | 0.06 | ** | 0.0 | 0.0 | 0.04 | 0.04 | 0.0 |
| | Trap | 0.2 | 0.1 | ** | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Rod and reel* | | | 5.5 | 0.0 | 12.4 | 9.7 | 3.5 | 4.5 |
| NC Area 94a | Longline | 5.2 | 0.08 | 0.5 | 0.0 | 1.8 | 0.4 | 0.0 | 0.0 |
| SW Atlantic | Longline | 42.0 | 16.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28.7 |
| **All Areas** | **All Gears** | **7,677.7** | **6,515.7** | **5,568.1** | **7,090.0** | **5,529.5** | **2,407.2** | **2,802.3** | **2,648.1** |

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

**Table 4.46 U.S. Landings (mt) of Atlantic Skipjack Tuna by Gear and Area, 2003-2010.** Source: NMFS, 2011.

| Area | Gear | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 0.9 | 0.1 | 0.05 | 0.04 | 0.0 | 0.1 | 0.4 | 1.4 |
| | Rod and reel* | 34.1 | 27.3 | 8.1 | 34.6 | 27.4 | 21.0 | 75.7 | 28.9 |
| | Gillnet | 0.9 | 16.7 | 2.2 | 0.2 | 0.05 | 0.04 | 3.3 | 0.2 |
| | Trawl | 0.5 | 0.2 | 0.07 | 0.7 | 0.005 | 0.003 | 0.0 | 0.0 |
| | Handline | 0.2 | 0.6 | 0.9 | 0.2 | 0.3 | 0.4 | 2.8 | 1.7 |
| | Trap | 1.5 | 0.006 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Pound net | 0.1 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Unclassified | 0.1 | 0.2 | 0.01 | 0.06 | 0.6 | 0.5 | 1.2 | 0.1 |
| Gulf of Mexico | Longline | 0.05 | 0.3 | 0.3 | 0.0 | 0.0 | 0.05 | 0.05 | 0.05 |
| | Rod and reel* | 11.1 | 6.3 | 3.1 | 6.4 | 23.9 | 16.3 | 22.0 | 15.5 |
| | Handline | 0.04 | 0.2 | 0.02 | 0.0 | 0.2 | 0.06 | 0.2 | 0.1 |
| Caribbean | Longline | 0.4 | 0.3 | 0.2 | 0.2 | 0.02 | 1.3 | 0.05 | 0.0 |
| | Gillnet | 0.4 | 0.3 | 0.06 | 0.02 | 0.0 | 0.01 | 0.6 | 0.0 |
| | Rod and reel* | 15.7 | 40.4 | 3.9 | 7.7 | 0.2 | 11.3 | 4.3 | 0.4 |
| | Handline | 12.9 | 9.6 | 10.9 | 10.0 | 13.7 | 16.0 | 8.8 | 6.2 |
| | Trap | 0.2 | 0.02 | 0.1 | 0.05 | 0.0 | 0.0 | 0.0 | 0.0 |
| **All Areas** | **All Gears** | **79.1** | **102.5** | **29.9** | **61.0** | **66.5** | **67.1** | **119.4** | **54.7** |

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

**Table 4.47 U.S. Landings (mt) of Atlantic Bigeye Tuna by Area and Gear, 2003-2010.** Source: NMFS, 2011.

| Area | Gear | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 169.2 | 267.0 | 272.9 | 469.4 | 331.9 | 380.2 | 384.7 | 528.8 |
| | Rod and reel* | 188.5 | 94.6 | 165.0 | 422.3 | 126.8 | 70.9 | 77.6 | 115.5 |
| | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.8 | 0.6 | 0.0 |
| | Handline | 6.0 | 3.3 | 6.2 | 21.5 | 16.8 | 6.9 | 4.6 | 2.5 |
| | Trawl | 0.03 | 0.9 | 0.6 | 0.0 | 0.4 | 0.0 | 0.0 | 1.2 |
| | Unclassified | 0.0 | 0.5 | 0.6 | 0.8 | 0.9 | 2.1 | 1.9 | 6.7 |
| Gulf of Mexico | Longline | 26.2 | 20.2 | 25.2 | 37.7 | 37.0 | 14.0 | 19.5 | 8.1 |
| | Rod and reel* | 0.0 | 6.0 | 0.0 | 24.3 | 0.0 | 0.0 | 0.0 | 0.8 |
| | Handline | 0.3 | 0.2 | 0.1 | 1.5 | 0.01 | 0.0 | 0.07 | 0.06 |
| Caribbean | Longline | 7.0 | 3.5 | 6.9 | 10.5 | 3.4 | 8.9 | 22.2 | 5.1 |
| | Handline | 0.0 | 0.0 | 0.04 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NC Area 94a | Longline | 36.9 | 5.0 | 6.9 | 3.0 | 8.4 | 4.6 | 3.7 | 3.7 |
| SW Atlantic | Longline | 44.6 | 14.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| **All Areas** | **All Gears** | **478.8** | **416.0** | **484.4** | **991.4** | **527.3** | **488.5** | **515.2** | **673.4** |

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

**Table 4.48 U.S. Landings (mt) of Atlantic Albacore Tuna by Gear and Area, 2003-2010.** Source: NMFS, 2011.

| Area | Gear | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | Longline | 95.7 | 106.6 | 88.9 | 84.8 | 109.9 | 107.2 | 140.1 | 165.3 |
| | Gillnet | 0.1 | 4.9 | 6.0 | 2.1 | 1.0 | 2.1 | 5.6 | 0.5 |
| | Handline | 1.7 | 6.1 | 3.0 | 2.6 | 5.4 | 0.2 | 0.5 | 2.0 |
| | Trawl | 0.02 | 2.7 | 1.7 | 1.1 | 0.3 | 0.01 | 0.08 | 0.03 |
| | Trap | | | | 0.5 | 0.4 | 0.005 | 0.01 | 0.2 |
| | Troll | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.2 | 0.07 | 0.04 |
| | Rod and reel* | 333.8 | 500.5 | 356.0 | 284.2 | 393.6 | 125.2 | 22.8 | 46.3 |
| | Unclassified | 0.0 | 3.6 | 9.9 | 5.6 | 4.2 | 2.0 | 1.3 | 2.2 |
| Gulf of Mexico | Longline | 4.4 | 9.9 | 6.9 | 7.6 | 15.4 | 10.2 | 16.7 | 7.1 |
| | Rod and reel* | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 0.01 | 0.0 | 0.1 | 0.07 | 0.0 | 0.0 | 0.01 | 0.01 |
| Caribbean | Longline | 3.9 | 3.2 | 12.1 | 10.5 | 1.2 | 0.4 | 0.3 | 0.7 |
| | Gillnet | 0.04 | 0.005 | 0.002 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Rod and reel* | | | | 0.0 | 0.0 | 0.0 | 0.0 | 103.6 |
| | Trap | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Handline | 2.6 | 2.1 | 1.1 | 0.4 | 0.2 | 0.4 | 0.003 | 0.05 |
| NC Area 94a | Longline | 1.6 | 0.2 | 0.6 | 0.03 | 0.3 | 0.8 | 0.3 | 0.6 |
| SW Atlantic | Longline | 2.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **All Areas** | **All Gears** | **446.1** | **646.6** | **488.0** | **399.5** | **532.1** | **248.1** | **187.9** | **328.7** |

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

**Table 4.49 U.S. Catches and Landings (mt) of Atlantic Swordfish by Gear and Area, 2003-2010.** Source: NMFS, 2011.

| Area | Gear | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| NW Atlantic | *Longline | 1,341.3 | 1,169.7 | 1,096.2 | 1,165.2 | 1,649.6 | 1,622.5 | 1,696 | 1,897 |
| | Gillnet | 0.0 | 0.05 | 0.0 | 0.0 | 0.2 | 0.0 | 0.05 | 0.0 |
| | Handline | 10.8 | 18.7 | 34.4 | 32.5 | 125.2 | 83.2 | 123 | 220.6 |
| | Trawl | 5.6 | 8.3 | 8.2 | 3.5 | 6.5 | 7.6 | 23.7 | 21.1 |
| | Unclassified | 1.6 | 0.0 | 0.5 | 0.2 | 0.2 | 0.2 | 0.0 | 2.1 |
| | Unclassified discards | | 3.9 | 4.2 | 5.1 | 5.5 | 4.1 | 3.0 | 3.6 |
| | Harpoon | 0.0 | 0.5 | 0.0 | 0.3 | 0.0 | 0.0 | 0.05 | 0.6 |
| | **Rod and reel | 5.9 | 24.3 | 53.1 | 50.6 | 65.9 | 56.7 | 19.0 | 63.7 |
| | Trap | 0.06 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 |
| Gulf of Mexico | *Longline | 507.6 | 453.0 | 480.9 | 328.1 | 457.7 | 361.6 | 476.1 | 281.5 |
| | Handline | 9.8 | 4.0 | 0.3 | 0.1 | 0.2 | 1.2 | 1.9 | 2.6 |
| | **Rod and reel | 0.03 | 0.5 | 1.5 | 2.1 | 2.3 | 19.0 | 12.6 | 2.8 |
| | Unclassified | 3.4 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 2.9 | |
| | Unclassified discards | | 0.03 | 3.9 | 2.7 | 5.5 | 4.6 | 3.5 | 1.3 |
| Caribbean | *Longline | 274.5 | 295.9 | 143.5 | 88.9 | 27.8 | 57.9 | 22.6 | 41.4 |
| | Trap | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | |
| | **Rod and reel | 0.0 | 0.4 | 6.6 | 0.0 | 0.0 | 0.0 | 0.0 | |
| | Handline | 0.02 | 0.006 | 0.0 | 0.0 | 0.0 | 0.0 | 0.003 | 0.0 |
| | Unclassified discards | 0.2 | 0.08 | 0.7 | 0.0 | 0.0 | 0.0 | 0.2 | 0.04 |
| NC Atlantic | *Longline | 632.8 | 599.9 | 552.2 | 378.6 | 338.9 | 311.6 | 496.4 | 304.8 |
| SW Atlantic | *Longline | 20.5 | 15.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| **All Areas** | **All Gears** | **2,814.13** | **2,595.1** | **2,387.6** | **2,057.9** | **2,682.8** | **2,530.3** | **2,878** | **2,845.4** |

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

**Table 4.50 Commercial Landings of Atlantic Large Coastal Sharks in lb dw: 2003-2010**. Sources: Cortés 2003; Cortés and Neer 2002, 2005; Cortés pers. comm., 2011.

| Large Coastal Sharks | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| Basking** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bignose* | 318 | 0 | 98 | 46 | 0 | 104 | 0 | 0 |
| Bigeye sand tiger** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blacktip | 1,474,362 | 1,092,600 | 894,768 | 1,255,255 | 1,091,502 | 573,723 | 601,116 | 858,311 |
| Bull | 93,816 | 49,556 | 118,364 | 173,375 | 154,945 | 186,882 | 207,502 | 222,795 |
| Caribbean reef* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dusky* | 23,288 | 1,025 | 874 | 4,209 | 2,064 | 0 | 486 | 0 |
| Galapagos* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerhead, great | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerhead, scalloped | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hammerhead, smooth | 0 | 92 | 54 | 150 | 0 | 358 | 4,025 | 7,802 |
| Hammerhead, unclassified | 150,368 | 116,546 | 182,387 | 141,068 | 65,232 | 55,907 | 159,937 | 95,654 |
| Large coastal, unclassified | 51,433 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lemon | 80,688 | 67,810 | 74,436 | 65,097 | 72,583 | 53,427 | 82,311 | 46,397 |
| Narrowtooth* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Night* | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nurse | 70 | 317 | 152 | 2,258 | 15 | 58 | 147 | 71 |
| Sandbar | 1,425,628 | 1,223,241 | 1,246,966 | 1,501,277 | 691,928 | 86,640 | 167,958 | 129,332 |

| Large Coastal Sharks | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| Sand tiger** | 624 | 1,832 | 4,149 | 3,555 | 210 | 0 | 15 | 18 |
| Silky | 51,588 | 11,808 | 18,237 | 16,173 | 16,496 | 4,794 | 5,474 | 1,188 |
| Spinner | 12,133 | 14,806 | 47,670 | 96,259 | 17,888 | 123,660 | 37,047 | 91,087 |
| Tiger | 18,536 | 30,976 | 39,387 | 50,749 | 34,169 | 29,712 | 23,046 | 48,954 |
| Whale** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| White** | 1,454 | 58 | 0 | 122 | 0 | 117 | 0 | 0 |
| Unclassified, assigned to large coastal | 908,077 | 603,229 | 519,654 | 499,069 | 182,240 | 247,639 | 224,137 | 17,994 |
| Unclassified, fins | 181,431 | 137,375 | 135,774 | 152,111 | 98,010 | 55,482 | 79,849 | 73,513 |
| Total (excluding fins) | 4,292,403 (1,947 mt dw) | 3,213,896 (1,458 mt dw) | 3,147,196 (1,428 mt dw) | 3,808,662 (1,728 mt dw) | 2,329,272 (1,057 mt dw) | 1,363,021 (618 mt dw) | 1,513,201 (686 mt dw) | 1,519,603 (689 mt dw) |

* indicates species that were prohibited in the commercial fishery as of June 21, 2000.
** indicates species that were prohibited as of April 1997.

**Table 4.51 Commercial Landings of Atlantic Small Coastal Sharks in lb dw: 2003-2010.** Sources: Cortés and Neer, 2002, 2005; Cortés, 2003; Cortés pers. comm., 2011.

| Small coastal sharks | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| Atlantic angel* | 1,397 | 818 | 3,587 | 500 | 29 | 91 | 0 | 96 |
| Blacknose | 131,511 | 68,108 | 124,039 | 187,907 | 91,438 | 134,255 | 149,874 | 220,271 |
| Bonnethead | 38,614 | 29,402 | 33,295 | 33,408 | 53,638 | 60,970 | 55,319 | 11,741 |
| Finetooth | 163,407 | 121,036 | 109,774 | 80,536 | 138,542 | 80,833 | 150,932 | 92,698 |
| Sharpnose, Atlantic | 190,960 | 230,880 | 354,255 | 459,184 | 332,160 | 324,622 | 277,261 | 220,271 |
| Sharpnose, Caribbean* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unclassified, assigned to small coastal | 8,634 | 1,407 | 9,821 | 1,289 | 2,384 | 23,077 | 34,429 | 851 |
| Total (excluding fins) | 534,523 (242 mt dw) | 451,651 (205 mt dw) | 634,885 (288 mt dw) | 763,327 (346 mt dw) | 618,191 (280 mt dw) | 623,848 (283 mt dw) | 667,815 (303 mt dw) | 357,855 (162 mt dw) |

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

**Table 4.52 Commercial landings of Atlantic Pelagic Sharks in lb dw: 2003-2010.** Sources: Cortés and Neer 2002, 2005; Cortés 2003; Cortés pers. comm., 2011.

| Pelagic Sharks | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|
| Bigeye thresher* | 0 | 719 | 267 | 68 | 0 | 0 | 0 | 28 |
| Bigeye sixgill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue shark | 6,324 | 423 | 0 | 588 | 0 | 3,229 | 4,793 | 9,135 |
| Mako, longfin* | 1,831 | 1,827 | 403 | 2,198 | 2,042 | 1,896 | 25,264 | 289 |
| Mako, shortfin | 151,428 | 217,171 | 156,082 | 103,040 | 165,966 | 120,255 | 141,456 | 220,400 |
| Mako, unclassified | 33,203 | 50,978 | 35,241 | 28,557 | 38,170 | 39,661 | 9,383 | 0 |
| Oceanic whitetip | 2,559 | 1,082 | 713 | 354 | 787 | 1,899 | 933 | 796 |
| Porbeagle | 1,738 | 5,832 | 2,452 | 3,810 | 3,370 | 5,259 | 3,609 | 4,097 |
| Sevengill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sixgill* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thresher | 46,502 | 44,915 | 41,230 | 27,740 | 46,391 | 47,528 | 33,333 | 61,290 |
| Unclassified, pelagic | 79,439 | 0 | 0 | 571 | 0 | 0 | 154 | 0 |
| Unclassified, assigned to pelagic | 314,300 | 356,522 | 16,427 | 25,917 | 5,453 | 14,819 | 6,650 | 16,160 |
| Unclassified, pelagic, fins | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total (excluding fins) | 637,324 (289 mt dw) | 679,469 (308 mt dw) | 252,815 (115 mt dw) | 192,843 (87 mt dw) | 262,179 (119 mt dw) | 234,546 (106 mt dw) | 225,575 (102 mt dw) | 312,195 (142 mt dw) |

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

**Table 4.53 Total 2010 Reported Recreational Boating Accident Types.** Source: USCG Recreational Boating Statistics, 2010.

| 2009 Primary Accident Type | # Accidents | # Deaths | # Injuries | Total Property Damage |
|---|---|---|---|---|
| Total | 4604 | 672 | 3153 | $35,552,283 |
| Capsizing | 335 | 180 | 199 | $1,540,575 |
| Carbon Monoxide Exposure | 12 | 6 | 22 | $11,250 |
| Collision with Fixed Object | 456 | 38 | 332 | $4,030,139 |
| Collision with Floating Object | 52 | 8 | 27 | $438,259 |
| Collision with Submerged Object | 169 | 8 | 43 | $2,173,235 |
| Collision with Another Vessel | 1125 | 72 | 772 | $7,699,507 |
| Departed Vessel | 100 | 62 | 46 | $43,890 |
| Ejected from Vessel | 240 | 20 | 253 | $610,486 |
| Electrocution | 4 | 2 | 7 | $0 |
| Fall in Vessel | 207 | 6 | 215 | $63,710 |
| Falls Overboard | 291 | 161 | 144 | $107,585 |
| Fire/Explosion (fuel) | 159 | 2 | 91 | $4,392,022 |
| Fire/Explosion (non-fuel) | 81 | 0 | 11 | $5,228,051 |
| Fire/Explosion (unknown origin) | 6 | 0 | 0 | $749,079 |
| Flooding/Swamping | 448 | 72 | 158 | $4,952,030 |
| Grounding | 309 | 11 | 204 | $3,382,478 |
| Sinking | 2 | 0 | 3 | $0 |
| Skier Mishap | 447 | 15 | 471 | $39,345 |
| Struck by Vessel | 31 | 0 | 34 | $5,017 |
| Struck by Propeller | 49 | 1 | 51 | $0 |
| Other | 80 | 8 | 70 | $85,625 |
| Unknown | 1 | 0 | 0 | $0 |

### 4.11 Chapter 4 References


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## 5.0 ECONOMIC STATUS OF HMS FISHERIES

The review of each rule, and of Atlantic HMS fisheries as a whole, is facilitated when there is an economic baseline against which the rule or fishery may be evaluated. In this analysis, NMFS used the past ten years of data to facilitate the analysis of trends. It also should be noted that all dollar figures are reported in nominal dollars (*i.e.*, current dollars). If analysis of real dollar (*i.e.*, constant dollar) trends controlled for inflation is desired, price indexes for 2001 to 2010 are provided in Table 5.1. To determine the real price in base year dollars, divide the base year price index by the current year price index, and then multiply the result by the price that is being adjusted for inflation. From 2001 to 2010, the Consumer Price Index (CPI-U) indicates that prices have risen by 23.1 percent, the Gross Domestic Product (GDP) Implicit Price Deflator indicates that prices have risen 23.1 percent, and the Producer Price Index (PPI) for unprocessed finfish indicates a 116.6 percent rise in prices. From 2008 to 2009, the CPI, GDP Deflator, and the PPI for unprocessed finfish indicate prices changed by -0.4 percent, 0.9 percent, and 1.8 percent respectively. From 2009 to 2010, the CPI, GDP Deflator, and the PPI for unprocessed finfish indicate prices changed by 1.7 percent, 1.7 percent, and 24.3 percent respectively.

**Table 5.1 Inflation Price Indexes. The CPI-U is the standard Consumer Price Index for all urban consumers (1982-1984=100) produced by U.S. Department of Labor Bureau of Labor Statistics.** The source of the Producer Price Index (PPI) for unprocessed finfish (1982=100) is also the Bureau of Labor Statistics. The Gross Domestic Product Implicit Price Deflator (2005=100) is produced by the U.S. Department of Commerce Bureau of Economic Analysis and obtained from the Federal Reserve Bank of St. Louis (http://www.stlouisfed.org/).

| Year | CPI-U | GDP Deflator | PPI Unprocessed Finfish |
|---|---|---|---|
| 2001 | 177.1 | 90.6 | 176.1 |
| 2002 | 179.9 | 92.1 | 201.5 |
| 2003 | 184.0 | 94.1 | 195.8 |
| 2004 | 188.9 | 96.8 | 224.1 |
| 2005 | 195.3 | 100.0 | 253.1 |
| 2006 | 201.6 | 103.3 | 334.6 |
| 2007 | 207.3 | 106.3 | 318.1 |
| 2008 | 215.3 | 108.6 | 301.6 |
| 2009 | 214.5 | 109.6 | 306.9 |
| 2010 | 218.1 | 111.5 | 381.5 |

### 5.1 Commercial Fisheries[2]

In 2010, 8.2 billion pounds valued at $4.5 billion were landed for all fish species by U.S. fisherman at U.S. ports. In 2009, 7.9 billion pounds valued at $3.9 billion were landed for all fish species by U.S. fisherman at U.S. ports. The overall value of landings between 2009 and 2010 increased by 15.4 percent. The total value of commercial HMS landings in 2010 was $39.9 million (Table 5.3).

The estimated value of the 2010 domestic production of all fishery products was $9.0 billion. This is $757.3 million more than the estimated value in 2009. The total import value of fishery products was $27.4 billion in 2010. This is a increase of $3.8 billion from 2009. The total export value of fishery products was $22.4 billion in 2010. This is an increase of $2.7 billion from 2008. In comparison, the total export value in 1996 was only $8.7 billion.

#### 5.1.1 Ex-Vessel Prices

The average ex-vessel prices per pound dressed weight (dw) for 2002 to 2010 by species and area are summarized in Table 5.2. Prices are reported in nominal dollars. The ex-vessel price depends on a number of factors including the quality of the fish (*e.g.*, freshness, fat content, method of storage), the weight of the fish, the supply of fish, and consumer demand.

Table 5.2 and Table 5.3 indicate that the average ex-vessel prices for bigeye tuna have generally increased since 2003. Prices, however, declined from 2009 to 2010 across all regions.

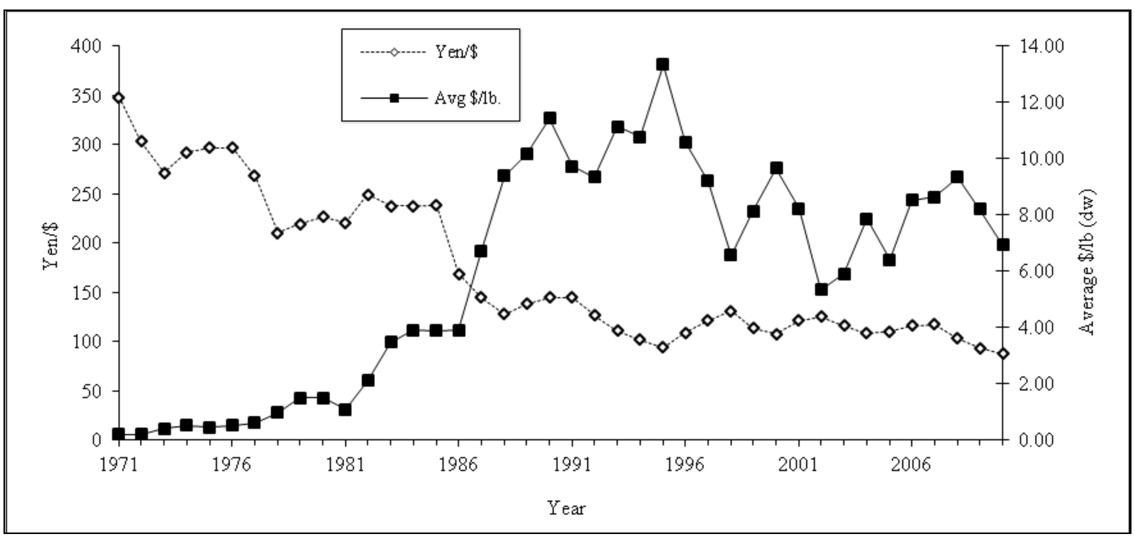


**Figure 5.1 Average Annual Yen/$ Exchange Rate and Average U.S. BFT Ex-vessel $/lb (dw) for All Gears: 1971-2010.** Source: Federal Reserve Bank (**www.stls.frb.org**) and Northeast Regional Office.

Average ex-vessel prices for BFT have risen 54 percent since 2003. The ex-vessel prices for BFT can be influenced by many factors, including market supply and the Japanese Yen/U.S.

[2] All the information and data presented in this section were obtained from NMFS 2010b.

Dollar (¥/$) exchange rate.  Figure 5.1 shows the average ¥/$ exchange rate, plotted with average ex-vessel BFT prices, from 1971 to 2010.

The average ex-vessel prices for yellowfin tuna have increased in 2010 in all regions except for the northeast region, which slightly decreased (Table 5.2).  From 2003 to 2010, the average ex-vessel price of yellowfin tuna increased 67.6 percent (Table 5.3).

The average ex-vessel price for albacore tuna increased in the South Atlantic and North Atlantic regions and decreased in the Mid-Atlantic and Gulf of Mexico in 2010 (Table 5.2). From 2003 to 2010, the average ex-vessel price of albacore tuna increased 53 percent (Table 5.3).

The average price of skipjack tuna increased in the South Atlantic from 2009 to 2010 (Table 5.2).  From 2003 to 2010, the average ex-vessel price of skipjack tuna decreased 11 percent (Table 5.3).

The average ex-vessel price LCS decreased in the Gulf of Mexico, but increased in the South Atlantic and Mid-Atlantic in 2010 (Table 5.2).  The average ex-vessel prices for pelagic sharks increased or remained the same in 2010 (Table 5.2).  The average ex-vessel prices for SCS decreased from 2009 to 2010 in the Mid-Atlantic and Gulf of Mexico regions, but increased in the South-Atlantic region (Table 5.2).  Shark fin prices increased in all regions except the North Atlantic in 2010 (Table 5.2).

**Table 5.2 Average Ex-vessel Prices per lb for Atlantic HMS by Area.** Source: Dealer weighout slips from the Southeast Fisheries Science Center, Northeast Fisheries Science Center, and BFT dealer reports from the Northeast Regional Office. Gulf of Mexico includes: TX, LA, MS, AL, and the west coast of FL. S. Atlantic includes: east coast of FL. GA, SC, and NC dealers reporting to Southeast Fisheries Science Center. Mid-Atlantic includes: NC dealers reporting to Northeast Fisheries Science Center, VA, MD, DE, NJ, NY, and CT. N. Atlantic includes: RI, MA, NH, and ME. For BFT, all NC landings are included in the Mid-Atlantic.

| Species | Area | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Bigeye tuna | Gulf of Mexico | $4.90 | $5.42 | $5.75 | $5.73 | $5.66 | $6.12 | $5.80 | $6.12 |
| | S. Atlantic | $3.21 | $3.10 | $3.61 | $3.94 | $4.34 | $4.34 | $4.11 | $4.35 |
| | Mid-Atlantic | $3.85 | $4.22 | $5.16 | $4.95 | $5.78 | $5.70 | $5.41 | $5.88 |
| | N. Atlantic | $3.68 | $4.60 | $4.65 | $4.54 | $5.31 | $5.60 | $5.18 | $4.79 |
| Bluefin tuna | Gulf of Mexico | $6.32 | $4.64 | $4.67 | $4.39 | $5.87 | $4.83 | $4.65 | $6.50 |
| | S. Atlantic | $4.11 | $4.91 | $4.60 | $6.36 | $7.07 | $6.00 | $14.43 | $7.03 |
| | Mid-Atlantic | $7.38 | $9.62 | $10.30 | $9.81 | $10.05 | $12.56 | $9.40 | $8.83 |
| | N. Atlantic | $5.71 | $7.42 | $5.57 | $7.92 | $8.31 | $8.33 | $7.09 | $9.29 |
| Yellowfin tuna | Gulf of Mexico | $2.79 | $3.21 | $3.32 | $2.89 | $3.02 | $3.51 | $3.04 | $5.79 |
| | S. Atlantic | $2.20 | $2.51 | $2.60 | $2.32 | $2.69 | $2.99 | $2.90 | $4.03 |
| | Mid-Atlantic | $1.74 | $1.98 | $2.74 | $2.44 | $2.99 | $3.30 | $2.49 | $3.43 |
| | N. Atlantic | $2.27 | $2.69 | $3.15 | $2.63 | $3.17 | $3.82 | $3.69 | $2.80 |
| Albacore tuna | Gulf of Mexico | $0.55 | $0.68 | $0.61 | $0.53 | $0.49 | $0.55 | $1.42 | $1.25 |
| | S. Atlantic | $0.86 | $0.76 | $0.94 | $0.93 | $1.24 | $1.21 | $1.29 | $1.49 |
| | Mid-Atlantic | $0.92 | $0.54 | $0.76 | $0.82 | $0.86 | $0.97 | $1.46 | $1.31 |
| | N. Atlantic | $0.93 | $0.74 | $0.91 | $0.97 | $1.37 | $2.00 | $1.26 | $1.56 |

| Species | Area | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Skipjack tuna | Gulf of Mexico | - | - | - | - | - | - | $0.50 | - |
| | S. Atlantic | $0.47 | $1.11 | $0.70 | $0.74 | $0.73 | $0.95 | $0.95 | $1.16 |
| | Mid-Atlantic | $1.20 | $0.84 | $1.13 | $0.79 | $2.22 | $4.50 | - | $2.50 |
| | N. Atlantic | $4.17 | $2.65 | - | - | - | - | - | - |
| Swordfish | Gulf of Mexico | $2.85 | $3.42 | $3.20 | $2.90 | $3.07 | $2.93 | $2.69 | $3.53 |
| | S. Atlantic | $3.37 | $3.88 | $4.00 | $3.86 | $4.24 | $4.11 | $4.12 | $4.63 |
| | Mid-Atlantic | $3.04 | $3.38 | $3.52 | $3.52 | $4.07 | $3.49 | $3.40 | $4.45 |
| | N. Atlantic | $3.08 | $3.96 | $3.69 | $3.64 | $4.11 | $4.20 | $3.49 | $4.61 |
| Large coastal sharks | Gulf of Mexico | $1.01 | $0.73 | $0.86 | $0.75 | $0.42 | $0.40 | $0.66 | $0.48 |
| | S. Atlantic | $0.44 | $0.46 | $0.50 | $0.47 | $0.40 | $0.72 | $0.55 | $0.78 |
| | Mid-Atlantic | $0.25 | $0.36 | $0.29 | $0.27 | $0.55 | $0.66 | $0.57 | $0.61 |
| | N. Atlantic | - | $0.66 | - | - | - | - | - | - |
| Pelagic sharks | Gulf of Mexico | $1.05 | $1.15 | $1.19 | $1.21 | $1.29 | $1.18 | $1.25 | $1.47 |
| | S. Atlantic | $1.24 | $1.26 | $1.26 | $1.26 | $1.36 | $1.36 | $1.34 | $1.34 |
| | Mid-Atlantic | $0.70 | $0.89 | $1.21 | $1.15 | $1.10 | $1.20 | $1.15 | $1.17 |
| | N. Atlantic | $1.29 | $1.08 | $0.92 | $0.73 | $0.85 | $0.93 | $1.23 | $1.28 |
| Small coastal sharks | Gulf of Mexico | $0.35 | $0.35 | $0.47 | $0.51 | $0.58 | $0.62 | $0.69 | $0.55 |
| | S. Atlantic | $0.54 | $0.67 | $0.71 | $0.68 | $0.80 | $0.78 | $0.71 | $0.79 |
| | Mid-Atlantic | $0.38 | $0.44 | $0.39 | $0.44 | $0.43 | $0.48 | $0.57 | $0.54 |
| | N. Atlantic | - | - | - | - | - | - | - | - |
| Shark fins | Gulf of Mexico | $14.70 | $15.76 | $16.22 | $16.40 | $13.22 | $14.94 | $15.09 | $16.48 |
| | S. Atlantic | $13.83 | $12.55 | $13.93 | $13.24 | $11.44 | $12.73 | $13.15 | $15.35 |
| | Mid-Atlantic | $10.09 | $7.72 | $10.55 | $9.72 | $6.12 | $3.74 | $3.60 | $5.70 |
| | N. Atlantic | $2.30 | $1.39 | $4.55 | $6.23 | $3.24 | $3.00 | $3.67 | $2.40 |

### 5.1.2 Revenues

Table 5.3 summarizes the average annual revenues of the Atlantic HMS fisheries based on average ex-vessel prices. Data for Atlantic HMS landings weight is as reported per the U.S. National Report (NMFS, 2011a), the information used in the shark stock assessments, information given to the ICCAT (Cortés pers. comm., 2010), as well as price and weight reported to the NMFS Northeast Regional Office by Atlantic BFT dealers. These values indicate that the estimated total annual revenue of Atlantic HMS fisheries has increased in 2010 to $39.9 million from $ 36.1 million in 2009. From 2009 to 2010, the Atlantic tuna fishery's total revenue increased by $2.5 million. A majority of that increase can be attributed to the increased commercial landings of bigeye tuna and increase in price for yellowfin tuna. From 2009 to 2010, the annual revenues for the shark fisheries increased by $410,000, mainly due to an increase in fin price. Finally, the annual revenues for swordfish increased by $1 million from 2009 to 2010 due to an increase in price.

**Table 5.3 Estimates of the Total Ex-vessel Annual Revenues of Atlantic HMS Fisheries.** Sources: CFDBS, QMS, and NMFS 2011a.

Note: Average ex-vessel prices may have some weighting errors, except for BFT which is based on a fleet-wide average. *Weight and fishery revenue data updated since 2009 SAFE Report

| Species | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|
| Bigeye tuna | Ex-vessel $/lb dw | $3.74 | $4.19 | $5.37 | $4.92 | $5.71 | $5.63 | $5.35 | $5.22 |
| | Weight lb dw | 512,002 | 556,270 | 563,325 | 960,863 | 706,361 | 736,520 | 774,087 | 982,476 |
| | Fishery Revenue | $1,914,887 | $2,330,771 | $3,025,055 | $4,727,446 | $4,033,321 | $4,146,608 | $4,141,365 | $5,128,523 |
| Bluefin tuna | Ex-vessel $/lb dw | $5.91 | $7.86 | $6.41 | $8.51 | $8.62 | $9.33 | $8.19 | $6.93 |
| | Weight lb dw | 1,963,172 | 1,010,599 | 772,500 | 528,404 | 515,176 | 720,823 | 899,477* | 1,119,937 |
| | Fishery Revenue | $11,602,347 | $7,943,308 | $4,951,725 | $4,496,718 | $4,440,817 | $6,725,279 | $7,366,716* | $7,761,163 |
| Yellowfin tuna | Ex-vessel $/lb dw | $2.07 | $4.62 | $2.92 | $2.47 | $2.98 | $3.31 | $2.68 | $3.47 |
| | Weight lb dw | 4,172,204 | 4,999,908 | 3,379,951 | 3,849,095 | 4,521,240 | 2,423,498 | 3,159,665 | 2,712,187 |
| | Fishery Revenue | $8,636,462 | $23,099,575 | $9,869,457 | $9,507,265 | $13,473,295 | $8,021,778 | $8,467,902 | $9,411,289 |
| Skipjack tuna | Ex-vessel $/lb dw | $1.31 | $0.93 | $1.15 | $0.80 | $1.21 | $1.36 | $0.97 | $1.17 |
| | Weight lb dw | 230,163 | 307,942 | 26,103 | 21,693 | 26,455 | 32,628 | 30,688 | 113,669 |
| | Fishery Revenue | $301,514 | $286,386 | $30,018 | $17,354 | $32,011 | $44,374 | $29,767 | $132,993 |
| Albacore tunas | Ex-vessel $/lb dw | $0.88 | $1.57 | $0.81 | $0.85 | $0.96 | $1.15 | $1.34 | $1.35 |
| | Weight lb dw | 230,163 | 307,942 | 232,808 | 203,354 | 244,272 | 216,759 | 291,187 | 315,223 |
| | Fishery Revenue | $202,543 | $483,469 | $188,574 | $172,851 | $234,501 | $249,273 | $390,191 | $425,550 |
| **Total tuna** | **Fishery Revenue** | $22,455,210 | $33,660,040 | $17,876,256 | $18,748,783 | $21,979,444 | $18,938,039 | $20,395,941* | $22,859,518 |
| Swordfish | Ex-vessel $/lb dw | $3.11 | $3.54 | $3.62 | $3.54 | $4.02 | $3.63 | $3.45 | $4.41 |
| | Weight lb dw | 4,658,997 | 4,301,003 | 3,466,728 | 3,002,597 | 3,643,926 | 3,414,513 | 3,762,280 | 3,173,739 |
| | Fishery Revenue | $14,489,481 | $15,225,551 | $12,549,555 | $10,629,193 | $14,648,583 | $12,394,682 | $12,979,866 | $13,996,189 |
| Large coastal sharks | Ex-vessel $/lb dw | $0.58 | $0.47 | $1.18 | $0.50 | $0.76 | $0.92 | $0.59 | $0.67 |
| | Weight lb dw | 4,292,403 | 3,213,896 | 3,147,196 | 3,808,662 | 2,329,272 | 1,363,021 | 1,513,201 | 1,543,644 |
| | Fishery Revenue | $2,489,594 | $1,510,531 | $3,713,691 | $1,904,331 | $1,770,247 | $1,253,979 | $892,789 | $1,034,241 |
| Pelagic sharks | Ex-vessel $/lb dw | $0.92 | $0.96 | $1.19 | $1.15 | $1.13 | $1.21 | $1.17 | $1.21 |
| | Weight lb dw | 637,324 | 679,469 | 252,815 | 192,843 | 262,179 | 234,546 | 225,575 | 299,366 |
| | Fishery Revenue | $586,338 | $652,290 | $300,850 | $221,769 | $296,262 | $283,801 | $263,923 | $362,233 |
| Small coastal sharks | Ex-vessel $/lb dw | $0.44 | $0.55 | $0.54 | $0.54 | $0.58 | $0.63 | $0.64 | $0.68 |
| | Weight lb dw | 534,523 | 451,651 | 634,885 | 763,327 | 618,191 | 623,848 | 667,815 | 367,768 |
| | Fishery Revenue | $235,190 | $248,408 | $342,838 | $412,197 | $358,551 | $393,024 | $427,402 | $250,082 |
| Shark fins (5% of all sharks landed) | Ex-vessel $/lb dw | $12.92 | $10.88 | $12.76 | $12.74 | $9.61 | $9.47 | $9.49 | $13.48 |
| | Weight lb dw | 273,213 | 217,251 | 201,745 | 238,242 | 160,482 | 111,071 | 120,330 | 110,539 |
| | Fishery Revenue | $3,529,906 | $2,363,689 | $2,574,264 | $3,035,198 | $1,542,233 | $1,051,840 | $1,141,927 | $1,490,066 |
| **Total sharks** | **Fishery Revenue** | $6,841,027 | $4,774,918 | $6,931,643 | $5,573,495 | $3,967,293 | $2,982,644 | $2,726,040 | $3,136,622 |
| Total HMS | Fishery Revenue | $43,785,718 | $53,660,509 | $37,357,454 | $34,951,471 | $40,595,319 | $34,315,365 | $36,101,847* | $39,992,329 |

## 5.2 Fish Processing and Wholesale Sectors

Consumers spent an estimated $80.2 billion for fishery products in 2010, including $54.0 billion at food service establishments, $25.8 billion in retail sales for home consumption, and $432 million for industrial fish products. The commercial marine fishing industry contributed $41.4 billion (in value added) to the U.S. Gross National Product in 2010 (NMFS, 2010b). For comparison, in 1996 consumers spent an estimated $41.2 billion, including $27.8 billion at food service establishments, $13.2 billion for home consumption, and $283.9 billion for industrial fish products. The commercial marine fishing industry contributed $21.0 billion to the U.S. Gross National Product in 1996.

### 5.2.1 Dealers

NMFS does not currently have information regarding the costs and revenues for Atlantic HMS dealers. In general, dealer costs include: purchasing fish; paying employees to process the fish; rent or mortgage on the appropriate building; and supplies to process the fish. Some dealers may provide loans to the vessel owner, money for vessel repairs, fuel, ice, bait, etc. In general, outlays and revenues of dealers are not as variable or unpredictable as those of a vessel owner; however, dealer costs may fluctuate depending upon supply of fish, labor costs, and equipment repair.

Although NMFS does not have specifics regarding HMS dealers, there is some information on the number of employees for processors and wholesalers in the United States provided in *Fisheries of the United States* (NMFS, 2010b) (http://www.st.nmfs.noaa.gov/st1/publications.html). Table 5.4 provides a summary of available information.

**Table 5.4 Processors and Wholesalers: Plants, and Employment, 2009**

| Area and State | Processing (1) | | Wholesale (2) | | Total | |
|---|---|---|---|---|---|---|
| | Plants | Employment | Plants | Employment | Plants | Employment |
| | --------Number-------- | | | | | |
| **New England:** | | | | | | |
| Maine | 36 | 804 | 172 | 936 | 208 | 1,740 |
| New Hampshire | 9 | 257 | 12 | (3) | 21 | 257 |
| Massachusetts | 55 | 2,774 | 165 | 2,001 | 220 | 4,775 |
| Rhode Island | 10 | (3) | 35 | (3) | 45 | (3) |
| Connecticut | 6 | 73 | 17 | 178 | 23 | 251 |
| **Total** | **116** | **3,908** | **401** | **3,115** | **517** | **7,023** |
| **Mid-Atlantic:** | | | | | | |
| New York | 19 | 380 | 274 | 1,898 | 293 | 2,278 |
| New Jersey | 15 | 494 | 94 | 1,066 | 109 | 1,560 |
| Pennsylvania | 4 | (3) | 30 | 554 | 34 | 554 |
| Delaware | 1 | (3) | 7 | 22 | 8 | 22 |
| District of Columbia | - | - | 4 | (3) | 4 | (3) |
| Maryland | 20 | 545 | 47 | 491 | 67 | 1,036 |
| Virginia | 45 | 1,551 | 60 | 494 | 105 | 2,045 |
| **Total** | **104** | **2,970** | **516** | **4,525** | **620** | **7,495** |
| **South Atlantic:** | | | | | | |
| North Carolina | 28 | 603 | 63 | 556 | 91 | 1,159 |
| South Carolina | 1 | (3) | 19 | 125 | 20 | 125 |
| Georgia | 5 | 493 | 31 | 462 | 36 | 955 |
| Florida | 34 | 1,385 | 274 | 2,564 | 308 | 3,910 |
| **Total** | **68** | **2,442** | **387** | **3,707** | **455** | **6,149** |
| **Gulf:** | | | | | | |
| Alabama | 34 | 1,591 | 15 | 176 | 49 | 1,767 |
| Mississippi | 24 | 2,853 | 22 | 101 | 46 | 2,954 |
| Louisiana | 71 | 2,113 | 103 | 520 | 174 | 2,241 |
| Texas | 31 | 1,385 | 91 | 856 | 122 | 2,241 |
| **Total** | **160** | **7,942** | **231** | **1,653** | **391** | **9,595** |
| **Inland States or Other Areas: (4), Total** | **60** | 1,945 | **221** | **2,847** | **281** | **4,792** |

(1) Data are based on North American Industry Classification System (NAICS) 3117 as reported to the Bureau of Labor Statistics.
(2) Data are based on North American Industry Classification System (NAICS) 42446 as reported to the Bureau of Labor Statistics.
(3) Included with Inland States.
(4) Includes Puerto Rico and Virgin Islands

### 5.2.2 Processing Sector

NMFS does not collect wholesale price information from dealers. The Agency did collect annual report information from the Fulton Fish Market, however that data series was discontinued in 2004.

NMFS has information regarding the mark-up percentage paid by consumers. A mark-up or margin is the difference between the price paid for the product by the consumer and the wholesale or dockside value for an equivalent weight of the product. This information is presented in Table 5.5. Primary wholesalers and processors on average received a 114.7 percent margin on sales in 2010, down from 126 percent in 2009.

**Table 5.5 Summary of the Mark-Up and Consumer Expenditures for the Primary Wholesale and Processing of Domestic Commercial Marine Fishery Products.** Source: NMFS 2010b.

| | 2009 | 2010 |
|---|---|---|
| Purchase of fishery inputs | $7,000,518,000 | $8,128,293,000 |
| Percent mark-up of fishery inputs | 126.0% | 114.7% |
| Total mark-up | $6,675,397,000 | $9,326,111,000 |
| Value added as percent of total mark-up | 60.2% | 60.2% |
| Value added within sector | $5,311,542,000 | $5,618,427,000 |
| **Total value of sales within sector** | **$15,822,199,000** | **$17,454,404,000** |

## 5.3 International Trade

### 5.3.1 Overview of International Trade for Atlantic HMS

Several RFMOs, including ICCAT, have taken steps to improve the collection of international trade data to further international conservation policy for the management of HMS. While RFMOs cannot re-create information about stock production based on trade data, this information can be used provisionally to estimate landings related to these fisheries, and to identify potential compliance problems with certain RFMO management measures. This section describes United States participation in HMS related international trade programs, a review of U.S. HMS export activity, import activity, and data use.

The United States collects general trade monitoring data through the U.S. Bureau of Customs and Border Protection (CBP; imports) and the U.S. Bureau of the Census (Census Bureau; exports and imports). These programs collect data on the amount and value of imports and exports categorized under the Harmonized Tariff Schedule (HTS). Many HMS have distinct HTS codes, and some species are further subdivided by product (*e.g.*, fresh or frozen, fillets, steaks, etc.). NMFS provides Census Bureau trade data for marine fish products online for the public at http://www.st.nmfs.gov/st1/trade/index.html. Some species are combined into groups (*e.g.*, sharks), which can limit the value of these data for fisheries management when species-specific information is required. Often the utility of these data are further limited if the ocean area of origin for each product is not distinguished. For example, the HTS code for Atlantic, Pacific, and Indian Ocean bigeye tuna is the same.

Trade data for Atlantic HMS are more useful as a conservation tool when they include more detailed information, such as the flag of the harvesting vessel, the ocean of origin, and the species for each transaction. Under the authority of ATCA and the Magnuson-Stevens Act, NMFS collects this more detailed information through catch and statistical document programs while monitoring international trade of BFT, swordfish, southern BFT, and frozen bigeye tuna.

These trade programs implement ICCAT recommendations and support rebuilding efforts by collecting data necessary to identify nations and individuals that may be fishing in a manner that diminishes the effectiveness of ICCAT fishery conservation and management measures (Section 1.1.3). In support of these programs, NMFS implemented the HMS International Trade Permit (ITP) in 2005 (69 FR 67268, November 17, 2004) to identify importers and exporters of HMS products that require trade monitoring documentation. Traders of shark fins must also be permitted. Copies of the ITP application and all trade monitoring documents associated with these programs are found on the NMFS HMS Management Division webpage at http://www.nmfs.noaa.gov/sfa/hms/. These and several other trade monitoring programs established by NMFS for HMS are described in greater detail below.

**Table 5.6 Number of International Trade Permits (ITP) by state as of November 2011.**

| State | Number of ITPs |
|---|---|
| CA | 68 |
| CT | 1 |
| DC | 1 |
| FL | 57 |
| GA | 2 |
| HI | 13 |
| IL | 1 |
| KS | 1 |
| LA | 2 |
| MA | 34 |
| MD | 2 |
| ME | 7 |
| MP | 1 |
| NC | 3 |
| NH | 1 |
| NJ | 11 |
| NY | 24 |
| OH | 1 |
| OR | 1 |
| PA | 0 |
| PR | 0 |
| RI | 5 |
| TX | 5 |
| VA | 3 |
| WA | 10 |
| **TOTAL** | **241** |

#### 5.3.1.1 Bluefin Tuna Catch Document

In 2007, ICCAT adopted a rigorous BFT catch document (BCD) program (Recommendation 07-10) which tracks BFT from capture, through farming operations, landing, and trade. NMFS implemented the program in July 2008 (73 CFR 31380; June 2, 2008). Updates to the program were included in ICCAT recommendations 08-12, 09-11, and 11-20. The intent of the program is to support the ICCAT rebuilding program by accounting for all BFT harvested and available in the marketplace, or held in cages. Previous to the BCD program, the trade of BFT was tracked internationally under ICCAT's BFT Statistical Document (BSD) program (Recommendation 92-01).

All CPCs to ICCAT are required to generate a BCD at the harvest of a BFT, including live BFT bound for capture related aquaculture. In the United States, BFT are tagged when landed, and landing data associated with the tag number is transmitted to NMFS within 24 hours. The tag stays on the fish until it is cut up into portions to be consumed, and the associated landings data can be retrieved at any time by referencing the tag number. If a BFT is exported, then a BCD document must accompany the export, and remains with the tagged fish until it is consumed abroad. All exporters must be permitted with a HMS ITP as described above.

BFT that are imported into the United States must also be accompanied by a BCD. Importers are first required to obtain an HMS ITP from NMFS, and must report any imports of BFT to NMFS. NMFS routinely consults import data generated by CBP to check against BCD data and ensure that importers are abiding by BCD and other NMFS regulations implementing ICCAT recommendations.

#### 5.3.1.2 Swordfish Statistical Document

On March 17, 2005, the ICCAT swordfish statistical document (SD) program was implemented by the United States (69 FR 67268, November 17, 2004) to replace the previously used Certificate of Eligibility. The swordfish SD program is based on a 2001 ICCAT recommendation (01-22), and ensures that all imported swordfish are greater than the minimum size of 14.9 kg (33 lb) dw, and identifies the flag of the harvesting vessel and ocean area of origin. Similar to the BCD program, CBP data on swordfish imports is used to obtain missing data and identify dealers that are not following the required reporting procedures.

#### 5.3.1.3 Bigeye Tuna Statistical Document

Like the two previous trade monitoring programs discussed above, the bigeye tuna SD program is used to track movement of internationally traded bigeye tuna to its final destination. ICCAT recommended the implementation of a bigeye tuna SD program in 2001 (Recommendation 01-21). The initial program was implemented in 2005 along with the swordfish SD, and applies only to frozen bigeye tuna. It may be expanded to cover fresh product in the future. Other RFMOs, including the Inter-American Tropical Tuna Commission and the Indian Ocean Tuna Commission, have also adopted frozen bigeye SD programs that have been implemented by the United States.

#### 5.3.1.4 Dolphin-safe Tuna Imports

For every shipment of frozen or processed tuna imported into the United States, a completed Fisheries Certificate of Origin (NOAA Form 370) is required to be submitted at the time of importation. In some cases, an additional certification signed by a representative of a nation participating in the International Dolphin Conservation Program or a Captain's Statement is required to accompany the NOAA Form 370. Since the late 1970s, NOAA Form 370 has been used to document imports of frozen or processed yellowfin tuna and other species of tuna for the purpose of protecting dolphins in the Eastern Tropical Pacific Ocean. Form 370 is filed with other documents necessary for entry of tuna into the United States. The form is *not* required for fresh tuna. Further information is available on the website http://dolphinsafe.gov/.

#### 5.3.1.5 Billfish Certificate of Eligibility

The Billfish Certificate of Eligibility is used to ensure that any billfish being imported or sold in the United States (outside of the Pacific states) is not of Atlantic origin. In the Pacific states, billfish involved in trade are presumed to be of Pacific origin. Any statement that contains the specified information is sufficient to meet the certificate of eligibility documentation requirements, and it needs to be available upon request throughout the entire commerce stream, including at time of consumption at a restaurant. It is not necessary to use the form available from NMFS or to submit the form to NMFS upon final disposition of the billfish

#### 5.3.1.6 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES is an international agreement that regulates the global trade in endangered plants and wildlife. The goal of CITES is to protect and regulate species of animals and plants to ensure that commercial demand does not threaten their survival in the wild. Countries cooperate through a system of permits and certificates to confirm that trade is legal. Species listed on Appendix II are those that are vulnerable to overexploitation, but not at risk of extinction. In every case of an import or export of an Appendix II species, an export/import permit may only be issued if, the export/import will not be detrimental to the survival of the species, the specimen was legally acquired (in accordance with the national wildlife protection laws) and any live specimen will be shipped in a manner which will not cause it any damage. Currently there are three species of sharks listed on Appendix II, whale, basking and great white sharks. Species listed on Appendix I are considered to be at risk of extinction, and are prohibited from international commercial trade, except in special circumstances.

The United States proposed that six shark species be listed in Appendix II, for consideration at the fifteenth meeting of the Conference of the Parties to CITES (CoP15) held during March 2010 in Doha, Qatar. The proposed species were oceanic whitetip shark (*Carcharhinus longimanus*) and scalloped hammerhead (*Sphyrna lewini*); along with "look alike" species great hammerhead (*S. mokarran*); smooth hammerhead (*S. zygaena*); dusky shark (*C. plumbeus*); and sandbar shark (*C. obscurus*). The United States submitted these proposals due to concerns that over-exploitation to supply the international fin trade is negatively impacting the population status of these sharks, as the fins of these six shark species are among the most valuable in trade. These proposals were defeated at CoP15.

In October 2009, Monaco submitted, and the U.S. supported, a proposal to list Atlantic BFT in Appendix I of CITES; however it was not adopted at CoP15. NMFS, in conjunction with the U.S. Fish and Wildlife Service, is in the process of evaluating which species proposals, if any, will be put forward and/or supported at CoP16.

### 5.3.2 U.S. Exports of HMS

"Exports" may include merchandise of both domestic and foreign origin. The Census Bureau defines exports of "domestic" merchandise to include commodities which are grown, produced, or manufactured in the United States (*e.g.*, fish caught by U.S. fishermen). For statistical purposes, domestic exports also include commodities of foreign origin which have been altered in the United States from the form in which they were imported, or which have been enhanced in value by further manufacture in the United States. The value of an export is the f.a.s. (free alongside ship) value defined as the value at the port of export based on a transaction price including inland freight, insurance, and other charges incurred in placing the merchandise alongside the carrier. It excludes the cost of loading the merchandise, freight, insurance, and other charges or transportation costs beyond the port of exportation.

#### 5.3.2.1 Atlantic and Pacific Bluefin Tuna Exports

As discussed in the previous section, NMFS collects detailed export data on BFT (Atlantic and Pacific) through the BCD program. Table 5.7 gives BFT export data for exports from the United States since 2000 and includes data from the NMFS BCD program, and Census Bureau data. Census Bureau data are consistently greater in value than data reported by the BCD program. This has been determined to be a result of NMFS' additional quality control measures that ensure data for other species (*e.g.*, Southern BFT) or other transaction types (*e.g.*, re-exports) are not erroneously included with BFT export data. BFT re-export data are listed separately later in this section (Table 5.8).

**Table 5.7 United States Exports of Atlantic and Pacific Bluefin Tuna (BFT), 2000-2010.** Sources: NMFS BCD Program, NERO, and Census Bureau.

| Year | Atlantic Commercial Landings (NERO, MT, DW) | Atlantic BFT Exports (BCD, MT, DW) | Pacific BFT Exports (BCD, MT, DW) | Total U.S. Exports (BCD, MT, DW) | Total U.S. Exports (Census Bureau, MT) | Value of U.S. Exports (Census Bureau, $ million) |
|---|---|---|---|---|---|---|
| 2000 | 903.9 | 758.0 | 76.0 | 834.0 | 1,044 | 11.20 |
| 2001 | 987.0 | 812.3 | 67.0 | 879.0 | 1,020 | 10.70 |
| 2002 | 964.0 | 730.4 | 0.1 | 730.5 | 922 | 10.74 |
| 2003 | 756.9 | 578.7 | 2.1 | 580.8 | 998 | 11.36 |
| 2004 | 428.6 | 247.3 | 0.0 | 247.3 | 370 | 4.50 |
| 2005 | 419.4 | 245.7 | 125.1 | 370.8 | 454 | 5.30 |
| 2006 | 204.6 | 93.1 | 0.0 | 93.1 | 281 | 3.60 |
| 2007 | 196.4 | 85.4 | 8.2 | 93.6 | 238 | 2.90 |
| 2008 | 266.4 | 146.5 | 0.0 | 146.5 | 177 | 2.49 |

| Year | Atlantic Commercial Landings (NERO, MT, DW) | Atlantic BFT Exports (BCD, MT, DW) | Pacific BFT Exports (BCD, MT, DW) | Total U.S. Exports (BCD, MT, DW) | Total U.S. Exports (Census Bureau, MT) | Value of U.S. Exports (Census Bureau, $ million) |
|---|---|---|---|---|---|---|
| 2009 | 408.5 | 236.2 | 0.0 | 236.2 | 300 | 4.05 |
| 2010 | 509.5 | 334.2 | 0.0 | 334.2 | 346 | 4.90 |

Note: most exports of Pacific BFT were in round (whole) form, although some exports were of dressed and gilled/gutted fish; Atlantic exports were almost entirely dressed, but also included whole and other product forms (dw); data are preliminary and subject to change.

In the time series shown in Table 5.7 and depicted in Figure 5.2, U.S. exports of Atlantic BFT generally increased when commercial landings increased, while domestic consumption of U.S. landings remained fairly constant from year to year. Most U.S. BFT exports are destined for the sushi markets in Japan. As shown in Figure 5.2 and Figure 5.3, the percentage of the commercial U.S. BFT catch that was exported was lowest when landings declined to their lowest point, from 2006 to 2008.

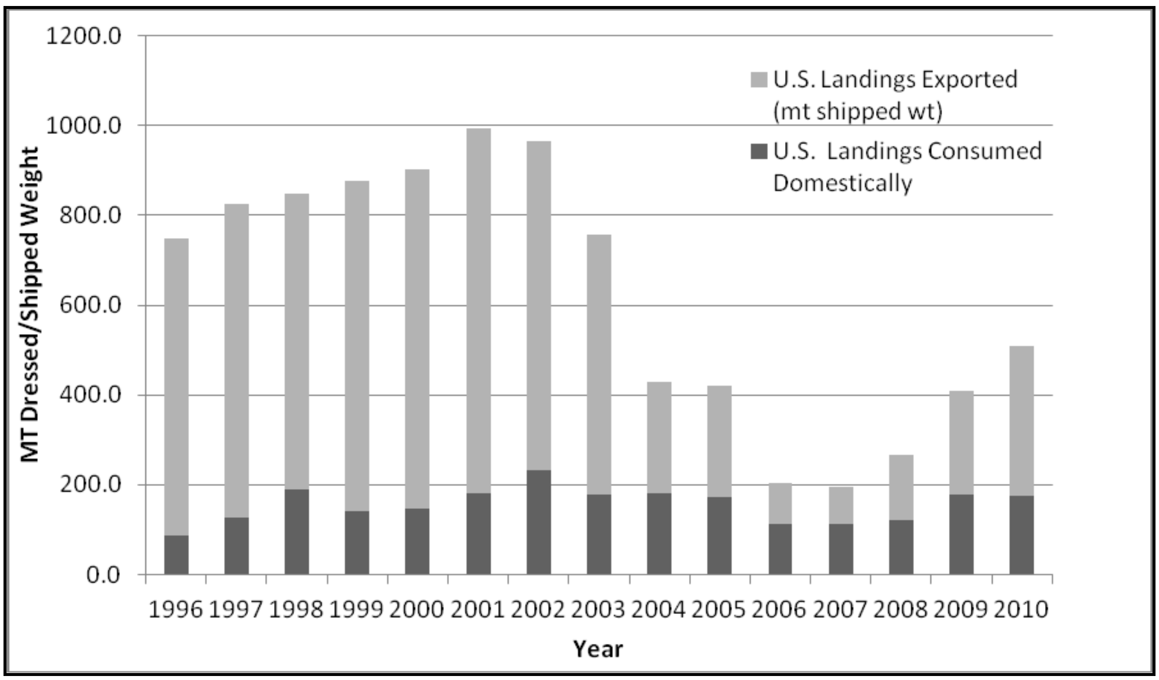


**Figure 5.2 Total Annual U.S. Domestic Landings (mt dressed weight) for Atlantic Bluefin Tuna Divided into U.S. Exports (mt shipped weight) and Domestic Consumption.**

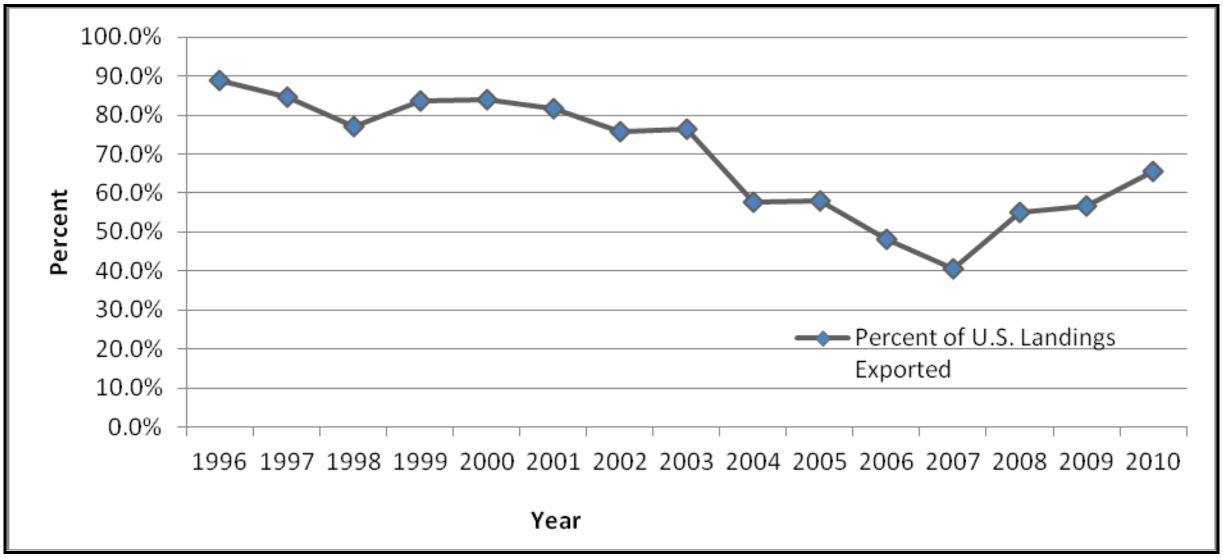


**Figure 5.3 Annual Percentage (by weight) of Commercially Landed U.S. Atlantic Bluefin Tuna that Was Exported.**

#### 5.3.2.2 Other Tuna Exports

Export data for other tunas is gathered by the Census Bureau, and includes trade data for albacore, yellowfin, bigeye, and skipjack tuna from all ocean areas of origin combined. In 2001, albacore tuna was the most valuable tuna export from the United States (Table 5.8), according to Census Bureau information.

The value of annual albacore exports has exceeded the value for any other tuna export for the same year since 2003. The total value of albacore exports has remained over $20 million per year for seven of the last eight years. Most albacore exports are Pacific in origin, as Atlantic landings have ranged between 188 mt and 640 mt during the time series in Table 5.8, but total U.S. exports has ranged from 12,097 mt to a low of 3,010 mt. Landings of Atlantic albacore over the last three years have been the lowest of the time series (except for 2001).

**Table 5.8 Amount and Value of U.S. Exports of Fresh or Frozen Albacore Tuna from All Ocean Areas, 2000 - 2010 (Census Bureau data) and U.S. Landings of North Atlantic Albacore Tuna** (2011 U.S. National Report to ICCAT).

| **Year** | **Atlantic Landings (mt ww)** | **U.S. Exports** (from all ocean areas) | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Fresh** | | **Frozen** | | **Total for all Exports** | |
| | | **MT** | **US$ (million)** | **MT** | **US$ (million)** | **MT** | **US$ (million)** |
| 2000 | 407 | 263 | 0.78 | 2,747 | 6.04 | 3,010 | 6.83 |
| 2001 | 324 | 1,542 | 3.62 | 4,609 | 9.83 | 6,151 | 13.45 |
| 2002 | 488 | 680 | 1.50 | 4,483 | 8.28 | 5,163 | 9.78 |
| 2003 | 448 | 894 | 1.86 | 9,731 | 18.85 | 10,624 | 20.71 |
| 2004 | 640 | 1,360 | 3.28 | 10,737 | 24.11 | 12,097 | 27.38 |
| 2005 | 486 | 549 | 1.61 | 7,402 | 16.99 | 7,951 | 18.60 |
| 2006 | 400 | 378 | 1.04 | 8,810 | 19.56 | 9,187 | 20.60 |

| Year | Atlantic Landings (mt ww) | U.S. Exports (from all ocean areas) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Fresh | | Frozen | | Total for all Exports | |
| | | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2007 | 532 | 275 | 0.84 | 11,731 | 25.52 | 12,006 | 26.35 |
| 2008 | 248 | 997 | 2.69 | 7,958 | 22.54 | 8,955 | 25.23 |
| 2009 | 188 | 417 | 1.02 | 9,903 | 22.58 | 9,510 | 23.60 |
| 2010 | 329 | 1269 | 3.25 | 8528 | 23.31 | 9,798 | 26.56 |

Note: Landings may be calculated on a calendar or fishing year basis; exports may be in whole (ww) or product weight (dw); data are preliminary and subject to change.

Table 5.9 and Table 5.10 show U.S. Atlantic landings and U.S. exports from all ocean areas combined for yellowfin and skipjack tuna, respectively. Yellowfin exports were greater and more valuable than exports for skipjack or bigeye tuna (Table 5.11). Yellowfin tuna exports were unusually high in 2008. The amount of fresh yellowfin product exported usually exceeds the amount of frozen yellowfin product annually. However, export of frozen product was much higher in 2008 than any other year included in Table 5.9. Table 5.10, the amount and value of exported fresh and frozen skipjack tuna has varied over the eleven year period with no discernable trends. Exports of skipjack in 2009 greatly exceeded values for any of the previous years in the time series.

**Table 5.9 Amount and Value of U.S. Exports of Fresh or Frozen Yellowfin Tuna from All Ocean Areas, 2000-2010 (Census Bureau data) and U.S. Landings of Atlantic Yellowfin Tuna (*2011 U.S. National Report to ICCAT).***

| Year | Atlantic Landings (mt ww) | U.S. Exports (from all ocean areas) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Fresh | | Frozen | | Total for all Exports | |
| | | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2000 | 7,051 | 412 | 1.12 | 406 | .76 | 819 | 1.89 |
| 2001 | 6,703 | 290 | .71 | 834 | 1.45 | 1,124 | 2.17 |
| 2002 | 5,646 | 1612 | 2.37 | 420 | .81 | 2,033 | 3.19 |
| 2003 | 7,685 | 1792 | 2.93 | 176 | .68 | 1,968 | 3.62 |
| 2004 | 6,437 | 306 | 1.54 | 242 | .31 | 549 | 1.86 |
| 2005 | 5,562 | 158 | 1.70 | 291 | .97 | 449 | 2.67 |
| 2006 | 7,090 | 183 | 1.96 | 108 | .37 | 291 | 2.32 |
| 2007 | 5,529 | 148 | 1.75 | 138 | .44 | 286 | 2.19 |
| 2008 | 2,407 | 198 | 2.09 | 4,140 | 9.06 | 4,338 | 11.16 |
| 2009 | 2,802 | 221 | 2.51 | 274 | .66 | 495 | 3.17 |
| 2010 | 2,648 | 211 | 2.31 | 70 | .33 | 281 | 2.64 |

Note: Landings may be calculated on a calendar or fishing year basis; exports may be in whole (ww) or product weight (dw); data are preliminary and subject to change.

**Table 5.10 Amount and Value of U.S. Exports of Fresh or Frozen Skipjack Tuna from All Ocean Areas, 2000-2010 (Census Bureau data) and U.S. Landings of West Atlantic Skipjack Tuna (*2011 U.S. National Report to ICCAT)*.**

| Year | Atlantic Landings (mt ww) | **U.S. Exports** (from all ocean areas) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Fresh | | Frozen | | Total for all Exports | |
| | | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2000 | 44 | 7 | .01 | 83 | .05 | 91 | .06 |
| 2001 | 69 | 82 | .15 | 34 | .04 | 117 | .20 |
| 2002 | 66 | 66 | .17 | 11 | .01 | 77 | .18 |
| 2003 | 77 | 81 | .22 | 0 | 0 | 81 | .22 |
| 2004 | 102 | 55 | .30 | 140 | .18 | 196 | .48 |
| 2005 | 30 | 35 | .14 | - | - | 35 | .14 |
| 2006 | 61 | 6 | .02 | 23 | .04 | 30 | .06 |
| 2007 | 66 | 17 | .06 | 77 | .12 | 94 | .18 |
| 2008 | 67 | 31 | .15 | 350 | .41 | 381 | .56 |
| 2009 | 119 | 206 | .54 | 530 | .71 | 737 | 1.25 |
| 2010 | 55 | 194 | .57 | 126 | .17 | 319 | .73 |

Note: Landings data may have been ported on either a fishing year or calendar year basis; exports may be in whole (ww) or product weight (dw); data are preliminary and subject to change.

Bigeye tuna exports and Atlantic landings are given in Table 5.11. No data were available for bigeye tuna exports in 2001, and prior to 2001 bigeye exports were included in the category of unspecified tuna. Annually, bigeye tuna exports include more fresh than frozen product, except in 2008 when export of frozen product increased dramatically. The value of bigeye exports in 2010 is tied with 2005 for the second highest in the time series.

**Table 5.11 Amount and Value of U.S. Exports of Fresh or Frozen Bigeye Tuna from All Ocean Areas, 2002-2010 (Census Bureau data) and U.S. Landings of Atlantic Bigeye Tuna (*2011 U.S. National Report to ICCAT*).**

| Year | Atlantic Landings (mt ww) | **U.S. Exports** (from all ocean areas) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Fresh | | Frozen | | Total for all Exports | |
| | | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2002 | 600 | 95 | .22 | 8 | .01 | 104 | .24 |
| 2003 | 480 | 255 | .47 | 40 | .08 | 295 | .56 |
| 2004 | 419 | 361 | 1.40 | 48 | .10 | 410 | 1.51 |
| 2005 | 484 | 431 | 1.95 | 50 | .12 | 481 | 2.07 |
| 2006 | 991 | 223 | 1.69 | 76 | .20 | 299 | 1.89 |
| 2007 | 523 | 128 | 1.38 | 65 | .14 | 193 | 1.52 |
| 2008 | 489 | 145 | 1.72 | 318 | .96 | 462 | 2.68 |
| 2009 | 516 | 121 | 1.53 | 78 | .19 | 199 | 1.72 |
| 2010 | 673 | 141 | 1.96 | 37 | .11 | 179 | 2.07 |

NOTE: Landings data may have been reported on either a fishing year or calendar year basis; exports may be in whole (ww) or product weight (dw); data are preliminary and subject to change.

#### 5.3.2.3 Shark Exports

Export data for sharks are gathered by the Census Bureau, and include trade data for sharks from any ocean area of origin. Shark exports are not categorized to the species level, with the exception of dogfish, and are not identified by specific product code other than fresh or frozen meat and fins. Due to the popular trade in shark fins and their high relative value compared to shark meat, a specific Harmonized Tariff Schedule code was assigned to shark fins in 1998. It should be noted that there is no tracking of other shark products besides meat and fins. Therefore, NMFS cannot track trade in shark leather, oil, or shark cartilage products.

Table 5.12 indicates the magnitude and value of shark exports by the United States from 2000 – 2010. The reduction in shark fin exports from 2000 to 2003 is of particular note, as is the increase in the unit value of shark fins during this time period. Decreases in shark fin trade were expected as a result of the Shark Finning Prohibition Act, which was enacted in December of 2000 and implemented by final rule on February 11, 2002 (67 FR 6194). Exports of shark fins were at a low in 2008 (11 mt) but have increased since then. Also of note is the dramatic increase in export of frozen shark products in 2008.

**Table 5.12 Amount and Value of U.S. Shark Product Exported from 2000-2010.** Source: Census Bureau.

| Yr | Shark Fins Dried | | | Non-specified Fresh Shark | | | Non-specified Frozen Shark | | | Total for all Exports | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MT | US$ (million) | $/KG | MT | US$ (million) | $/KG | MT | US$ (million) | $/KG | MT | US$ (million) |
| 2000 | 365 | 3.51 | 9.62 | 430 | .78 | 1.82 | 345 | .81 | 2.35 | 1,140 | 5.10 |
| 2001 | 335 | 3.16 | 9.44 | 332 | .54 | 1.64 | 634 | 2.34 | 3.69 | 1,301 | 6.04 |
| 2002 | 123 | 3.46 | 28.00 | 968 | 1.47 | 1.52 | 982 | 2.34 | 2.38 | 2,075 | 7.28 |
| 2003 | 45 | 4.03 | 87.79 | 837 | 1.31 | 1.57 | 592 | 1.34 | 2.28 | 1,476 | 6.70 |
| 2004 | 63 | 3.02 | 47.53 | 536 | 1.18 | 2.21 | 472 | .98 | 2.09 | 1,071 | 5.18 |
| 2005 | 31 | 2.37 | 76.93 | 377 | 1.03 | 2.73 | 494 | 1.06 | 2.15 | 902 | 4.46 |
| 2006 | 34 | 3.17 | 94.66 | 816 | 1.62 | 1.99 | 747 | 1.38 | 1.85 | 1,597 | 6.17 |
| 2007 | 19 | 1.78 | 93.68 | 502 | 1.05 | 2.09 | 695 | 1.35 | 1.94 | 1,216 | 4.18 |
| 2008 | 11 | 0.69 | 63.00 | 559 | 1.21 | 2.16 | 4122 | 7.21 | 1.75 | 4,692 | 9.11 |
| 2009 | 56 | 2.82 | 50.36 | 254 | .72 | 2.83 | 320 | 1.33 | 4.16 | 630 | 4.87 |
| 2010 | 36 | 2.89 | 80.28 | 222 | .67 | 3.02 | 244 | .52 | 2.11 | 502 | 4.08 |

Note: Exports may be in whole (ww) or product weight (dw); data are preliminary and subject to change.

#### 5.3.2.4 Swordfish Exports

U.S. Census data only report exports of swordfish for the last 4 years (2007 through 2010) (Table 5.13). The low cost and year round availability of swordfish imports into the United States are believed to have reduced the marketability of U.S. domestic swordfish, and created an export market for U.S. product in recent years.

**Table 5.13 Amount and Value of U.S. Swordfish Product Exported from 2007-2010.** Source: Census Bureau

| Yr | Swordfish Fillet Fresh | | Swordfish Fillet Frozen | | Swordfish Fresh | | Swordfish Frozen | | Swordfish Meat Frozen | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MT | US$ (mill.) | MT | US$ (mill.) | MT | US$ (mill.) | MT | US$ (mill.) | MT | US$ (mill.) | MT | US$ (mill.) |
| 2007 | 38 | .33 | 11 | .08 | 135 | .91 | 11 | .04 | 216 | .69 | 412 | 2.1 |
| 2008 | 24 | .25 | 48 | .34 | 121 | .89 | 1.2 | .01 | 154 | .88 | 349 | 2.4 |
| 2009 | 43 | .38 | 19 | .23 | 133 | .81 | 12.1 | .04 | 24 | .13 | 231 | 1.6 |
| 2010 | 98 | .71 | 16 | .15 | 134 | .78 | .60 | .01 | 3 | .02 | 252 | 1.7 |

### 5.3.2.5 Re-exports of Atlantic HMS

For purposes of international trade tracking of HMS, the term "re-export" refers to a product that has been entered for consumption into the United States and then exported to another country, with or without further processing in the United States (from 50 CFR Part 300, Subpart M, International Trade Documentation and Tracking Programs for HMS). For most HMS species for most years, re-export activity is a small fraction of export activity and well below relative reference points of 1000 mt and/or one million dollars annually. Annual re-export figures in excess of these relative reference points are given in Table 5.14

In previous editions of SAFE reports, BFT re-exports for 2003-2005 reflected a great deal of transshipment from Mexico through the United States to Japan. Implementation of the HMS ITP regulations in 2005 (69 FR 67268, November 17, 2004) changed the way re-exports and transshipments were distinguished. Table 5.15 shows re-exports of BFT since 2000, and is updated to reflect these changes for previous years. Re-exports of BFT in 2010 were particularly high.

**Table 5.14 Re-exports for HMS (see Table 5.15 for bluefin tuna) over the Reference Points of 1000 mt and/or One Million U.S. Dollars, Annually from 2000 - 2010.** (Census Bureau data).

| Year | Product | Amount (MT) | Value ($ mill.) |
|---|---|---|---|
| 2004 | Shark fins, dried | 29 | 1.84 |
| 2005 | Yellowfin tuna, fresh | 123 | 2.30 |
| 2005 | Shark fins, dried | 34 | 1.53 |
| 2006 | Yellowfin tuna, fresh | 208 | 2.62 |
| 2007 | Yellowfin tuna, fresh | 208 | 2.91 |
| 2007 | Yellowfin tuna, frozen | 506 | 1.80 |
| 2008 | Yellowfin tuna, fresh | 224 | 3.40 |
| 2008 | Shark fins, dried | 26 | 1.37 |
| 2009 | Yellowfin tuna, fresh | 162 | 2.18 |
| 2010 | Yellowfin tuna, fresh | 130 | 1.88 |
| 2010 | Yellowfin tuna, frozen | 340 | 1.12 |

#### 5.3.2.6 Summary of Atlantic HMS Exports

As indicated in the previous section, the value of HMS exports (from all ocean areas combined) is nationally dominated by tuna products. In 2010, fresh and frozen tuna products accounted for 17,391 mt dw or 1.7 percent of the 1,109,789 mt dw of fresh and frozen seafood products exported from the United States, as indicated in *Fisheries of the United States, 2010.* The value of these HMS products accounted for $61.5 million, out of a national total of $3.7 billion.

Data reflecting international trade of HMS species harvested from all ocean areas are of limited value for describing trade of HMS harvested from the Atlantic Ocean. For example, Atlantic landings of albacore tuna (commercial and recreational) for 2010 were reported in the 2011 U.S. National Report to ICCAT as 329 mt (Table 5.8). National trade data show that over 9,798 mt of albacore were exported in 2010 (Table 5.8), indicating the majority of albacore exports were Pacific Ocean product. Trade tracking programs such as the BFT, swordfish, and bigeye tuna consignment document programs are more accurate for tracking the international disposition of Atlantic HMS.

### 5.3.3 U.S. Imports of HMS

All import shipments must be reported to the CBP. “General” imports are reported when a commodity enters the country, and "consumption" imports consist of entries into the United States for immediate consumption combined with withdrawals from CBP bonded warehouses. “Consumption” import data reflect the actual entry of commodities originating outside the United States into U.S. channels of consumption. As discussed previously, CBP data for certain products are provided to NMFS for use in implementing consignment document programs. U.S. Census Bureau import data are used by NMFS as well.

#### 5.3.3.1 Atlantic and Pacific Bluefin Tuna Imports

United States imports and re-exports of BFT for 2000 through 2010, as reported through both CBP and BCD program data, are shown in Table 5.15. The difference in import numbers between the CBP and BCD data may be explained by imports of other species (e.g., Southern BFT) erroneously included under the BFT HTS code, or, a lack of knowledge and compliance with the BCD program by importers.

**Table 5.15 Imports of Atlantic and Pacific Bluefin Tuna into the United States: 2000 - 2010.** Sources: NMFS BCD program and CBP data.

| YEAR | NMFS BCD Program | | U.S. CBP Data | |
|---|---|---|---|---|
| | Imports (MT) | Re-exports (MT) | Imports (MT) | VALUE (US$ mill.) |
| 2000 | 431.5 | 29.7 | 453.4 | 7.67 |
| 2001 | 512.9 | 7.0 | 532.3 | 8.21 |
| 2002 | 529.8 | 9.9 | 605.0 | 9.75 |
| 2003 | 649.9 | 38.4 | 780.3 | 11.67 |
| 2004 | 823.4 | 17.1 | 886.1 | 15.25 |
| 2005 | 966.1 | 10.4 | 1,064.0 | 19.96 |
| 2006 | 791.5 | 18.5 | 865.2 | 17.05 |
| 2007 | 584.6 | 17.7 | 697.1 | 13.97 |
| 2008 | 412.7 | 16.8 | 487.1 | 11.91 |
| 2009 | 407.7 | 33.6 | 476.8 | 10.29 |
| 2010 | 569.5 | 61.6 | 682.5 | 15.75 |

Note: Most imports of BFT were in dressed form, and some were round and gilled/gutted fish, fillets or belly meat (dw); data are preliminary and subject to change. Southern BFT trade was included in figures for Atlantic and Pacific BFT trade prior to 2002.

The rise in popularity of sashimi in the United States may have generated the increase in imports of BFT seen in Table 5.15. Dealers have reported an expanded domestic market for both locally-caught and imported raw tuna during the early part of the current decade. U.S. consumption of BFT (landings + imports – exports – re-exports) generally increased from 1996 through 2005, and has generally declined since then (Figure 5.4). Consumption of domestic landings was fairly consistent and ranged between about 100 mt to 200 mt per year. Consumption of imported BFT is more variable and ranged from a low in 1997 of less than 50 mt to a high in 2006 of almost 700 mt.

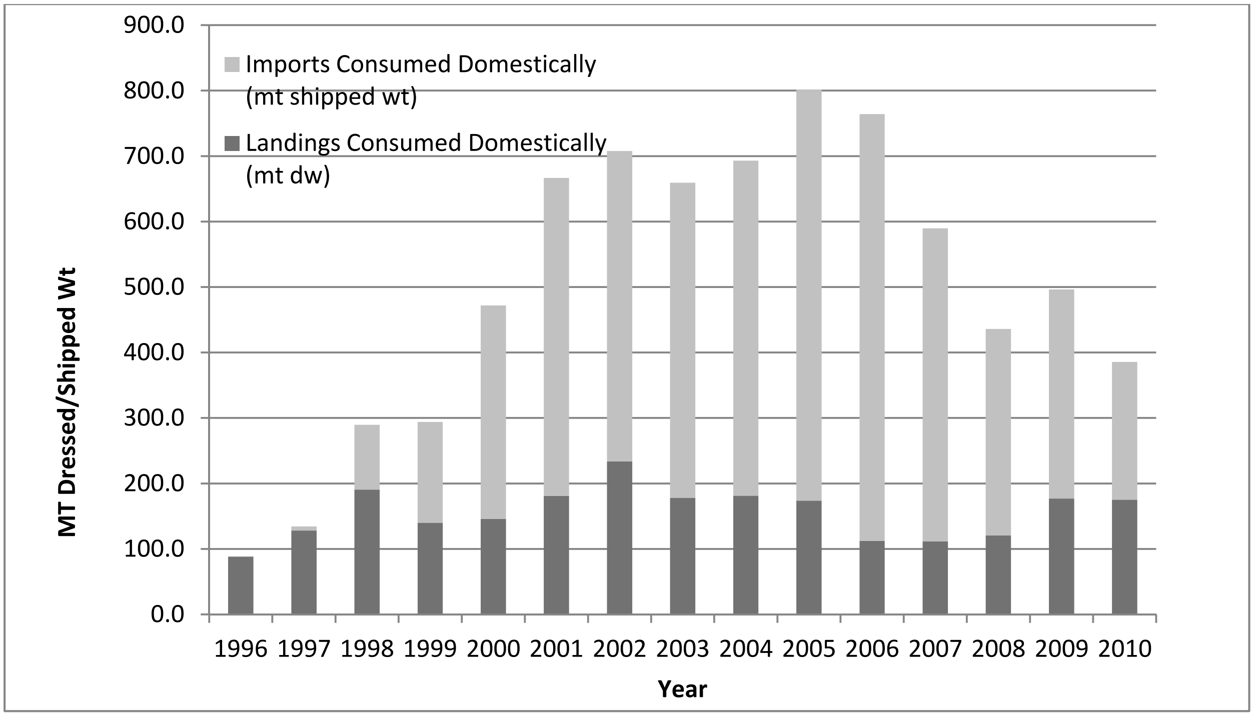


**Figure 5.4 United States annual consumption of bluefin tuna from 1996 through 2010.** Annual U.S. imports, re-exports, exports (mt shipped wt) and landings (mt dressed weight) are also depicted. Consumption equals landings + imports – exports – re-exports.

Figure 5.5 shows U.S. trade of BFT since 1996. From 2004 through 2009, the United States imported more BFT than it exported. This trade gap was greatest in 2006, but narrowed over the last several years and ended in 2010.

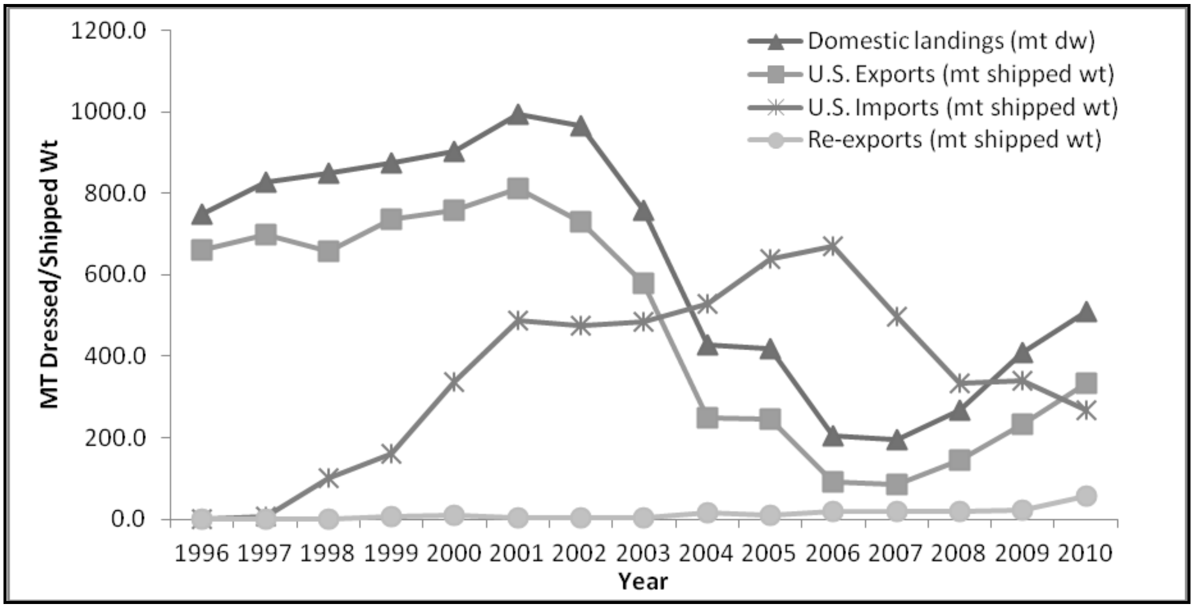


**Figure 5.5 United States trade of BFT (MT shipped wt) and domestic landings (MT dressed wt), from 1996 through 2010.**

#### 5.3.3.2 Other Tuna Imports

Since January 2001, CBP has been collecting species-specific import information for bigeye tuna (grouped to include all ocean areas). Previously, bigeye tuna had been grouped with other tuna under general tuna imports. The total amount of bigeye tuna imports has ranged between 4,340 and 8,059 mt over the last ten years, as shown in Table 5.16. Since 2000, imports of frozen bigeye tuna were greatest in 2008. Imports of all bigeye products in Table 5.16 were the lowest of the time series in 2010.

**Table 5.16 Imports of Fresh or Frozen Bigeye Tuna into the United States from All Ocean Areas Combined: 2001-2010.** Source: Census Bureau data.

| Year | Fresh | | Frozen | | Total for all Imports | |
|---|---|---|---|---|---|---|
| | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2001 | 4,684 | 25.70 | 135 | .32 | 4,820 | 26.02 |
| 2002 | 6,312 | 39.84 | 319 | .70 | 6,632 | 40.55 |
| 2003 | 7,312 | 51.01 | 560 | 1.48 | 7,872 | 52.49 |
| 2004 | 6,752 | 49.10 | 1,175 | 2.62 | 7,928 | 51.73 |
| 2005 | 5,040 | 38.18 | 1,539 | 3.33 | 6,579 | 41.51 |
| 2006 | 4,920 | 36.55 | 1,523 | 3.15 | 6,442 | 39.70 |

| Year | Fresh | | Frozen | | Total for all Imports | |
|---|---|---|---|---|---|---|
| | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2007 | 5,617 | 42.30 | 1,512 | 3.19 | 7,129 | 45.49 |
| 2008 | 5,462 | 41.43 | 2,597 | 5.31 | 8,059 | 46.74 |
| 2009 | 5,459 | 41.72 | 1,125 | 2.36 | 6,584 | 44.08 |
| 2010 | 4,024 | 32.39 | 315 | .73 | 4,340 | 33.11 |

Note: Imports may be whole weight (ww) or product weight (dw); data are preliminary and subject to change.

Annual yellowfin tuna imports into the United States for all ocean areas combined are given in Table 5.17. As indicated by the data in this section, yellowfin tuna are imported in the greatest quantity of all fresh and frozen tuna products. The annual value and total amount of yellowfin imports had generally increased from 2000 to 2007 and have been lower since then. Most imported yellowfin products are fresh. The least amount of frozen product during this time series was imported in 2010.

**Table 5.17 Imports of Fresh or Frozen Yellowfin Tuna into the United States from All Ocean Areas Combined: 2000 - 2010.** Source: Census Bureau data.

| Year | Fresh | | Frozen | | Total for all Imports | |
|---|---|---|---|---|---|---|
| | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2000 | 13,153 | 70.27 | 3,290 | 18.73 | 16,443 | 89.00 |
| 2001 | 15,563 | 85.50 | 3,967 | 23.45 | 19,530 | 108.95 |
| 2002 | 15,966 | 95.22 | 4,619 | 29.31 | 20,585 | 124.53 |
| 2003 | 15,299 | 94.03 | 5,579 | 39.67 | 20,878 | 133.71 |
| 2004 | 15,624 | 99.41 | 5,833 | 35.35 | 21,457 | 134.96 |
| 2005 | 17,064 | 116.58 | 6,002 | 46.89 | 23,066 | 163.47 |
| 2006 | 17,792 | 126.47 | 5,442 | 42.78 | 23,234 | 169.25 |
| 2007 | 17,985 | 137.42 | 5,506 | 44.26 | 23,492 | 181.69 |
| 2008 | 15,904 | 129.59 | 3,847 | 27.97 | 19,751 | 157.56 |
| 2009 | 14,199 | 112.34 | 2,868 | 24.73 | 17,067 | 137.07 |
| 2010 | 15,984 | 128.69 | 2,076 | 16.91 | 18,062 | 145.60 |

NOTE: Imports may be whole weight (ww) or product weight (dw); data are preliminary and subject to change.

The amount of albacore imports from all ocean areas generally declined from 2000 to 2005 (Table 5.18) and was relatively low since. In 2000, albacore imports were valued at $133 million while in 2005 the value dropped to approximately $5 million, and has remained fairly low. Import amounts and value have been fairly stable over the last several years. (Products in airtight containers (e.g., cans or foil pouches) are not included in these data.)

**Table 5.18 Imports of Fresh or Frozen Albacore Tuna into the United States From All Ocean Areas Combined: 2000-2010.** Source: Census Bureau data.

| Year | Fresh | | Frozen | | Total for all Imports | |
|---|---|---|---|---|---|---|
| | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2000 | 1,843 | 6.42 | 51,001 | 127.33 | 52,845 | 133.76 |
| 2001 | 1,107 | 3.85 | 40,428 | 105.58 | 41,536 | 109.43 |
| 2002 | 1,296 | 4.81 | 11,903 | 24.49 | 13,200 | 29.31 |
| 2003 | 1,062 | 4.11 | 12,569 | 25.90 | 13,632 | 30.02 |
| 2004 | 1,004 | 3.12 | 4,943 | 11.67 | 5,947 | 14.80 |
| 2005 | 706 | 2.38 | 1,016 | 2.96 | 1,722 | 5.34 |
| 2006 | 876 | 3.54 | 667 | 1.71 | 1,543 | 5.25 |
| 2007 | 945 | 3.86 | 718 | 1.98 | 1,664 | 5.86 |
| 2008 | 703 | 2.95 | 1,632 | 4.73 | 2,335 | 7.68 |
| 2009 | 718 | 3.07 | 1,493 | 3.46 | 2,211 | 6.53 |
| 2010 | 519 | 2.19 | 1,860 | 5.17 | 2,380 | 7.36 |

Note: Imports may be whole weight (ww) or product weight (dw); data are preliminary and subject to change.

Skipjack tuna imports into the United States are comprised mainly of frozen product (Table 5.19). The amount and value of skipjack imports is variable over this time series. (Products in airtight containers (e.g., cans or foil pouches) are not included in these data.)

**Table 5.19 Imports of Fresh or Frozen Skipjack Tuna from All Ocean Areas Combined into the United States: 2000 - 2010.** Source: U.S. Census Bureau data.

| Year | Fresh | | Frozen | | Total for all Imports | |
|---|---|---|---|---|---|---|
| | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2000 | 0 | 0 | 904 | 2.75 | 904 | 2.75 |
| 2001 | <1 | <0.01 | 377 | 0.61 | 378 | 0.62 |
| 2002 | <1 | 0.01 | 824 | 0.83 | 825 | 0.84 |
| 2003 | 0 | 0 | 224 | 0.43 | 224 | 0.43 |
| 2004 | <1 | <0.01 | 110 | 0.26 | 112 | 0.27 |
| 2005 | 0 | 0 | 652 | 0.67 | 652 | 0.67 |
| 2006 | 140 | 0.14 | 883 | 0.84 | 1,023 | 0.98 |
| 2007 | 31 | 0.06 | 835 | 0.73 | 866 | 0.79 |
| 2008 | 14 | 0.02 | 685 | 0.77 | 699 | 0.79 |
| 2009 | 20 | 0.04 | 498 | 0.63 | 519 | 0.67 |
| 2010 | 36 | 0.09 | 542 | 0.79 | 578 | 0.87 |

Note: Imports may be whole weight (ww) or product weight (dw); data are preliminary and subject to change.

#### 5.3.3.3 Swordfish Imports

Table 5.20 summarizes swordfish import data collected by NMFS' Swordfish Statistical Document Program for the 2010 calendar year.  According to these data, most swordfish imports were Pacific Ocean product.  For Atlantic product, most imports came from Canada, followed by Trinidad and Tobago. CBP data located at the bottom of the table reflect a larger amount of imports than reported by the import monitoring program, and may be used by NMFS staff to follow up with importers, collect statistical documents that have not been submitted, and enforce dealer reporting requirements.

**Table 5.20 Swordfish Import Data for the 2010 Calendar Year Collected Under the NMFS Swordfish Statistical Document Program. (np=not provided)**

| Swordfish Import Data for the 2010 Calendar Year Collected Under the NMFS Swordfish Statistical Document Program. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ocean Area of Origin | | | | | | | | |
| Flag of Harvesting Vessel | Atlantic (mt dw) | North Atlantic (mt dw) | South Atlantic (mt dw) | Med. (mt dw) | Pacific (mt dw) | Western Pacific (mt dw) | Indian (mt dw) | Not Provided (mt dw) | Total (mt dw) |
| Australia | | | | | | 75.7 | | 2.4 | 78.1 |
| Brazil | 4.8 | | 301.9 | | | | | 1.8 | 308.5 |
| Canada | | 1017.5 | 3.2 | | | | | 2.7 | 1023.4 |
| Chile | | | | | 668.4 | | | | 668.4 |
| China | | | | | 1.7 | | | | 1.7 |
| Costa Rica | | | | | 594.6 | | | | 594.6 |
| Ecuador | | 0.9 | | 0.8 | 543.7 | | | 5.3 | 550.7 |
| Fiji Islands | | | | | 4.0 | 7.1 | | 28.1 | 39.2 |
| Indonesia | | | | | | | 381.1 | 2.4 | 383.5 |
| Japan | | | | | 2.0 | | | | 2.0 |
| Korea | | | | | 15.1 | | | | 15.1 |
| Mexico | | 2.6 | | | 227.4 | | | 8.5 | 238.5 |
| Micronesia | | | | | 13.4 | | | | 13.4 |
| Nambia | | | 2.8 | | | | | 5.7 | 8.5 |
| New Zealand | | | | | 0.2 | 138.6 | | 7.5 | 146.3 |
| Nicaragua | | | | | 18.6 | | | | 18.6 |
| Panama | | | | | 918.9 | | | 192.0 | 1110.9 |
| Seychelles | | | | | | | 0.4 | | 0.4 |
| South Africa | 1.1 | | 129.3 | | | | 98.8 | | 229.2 |
| Trinidad & Tobago | 16.8 | | | | | | | 1.9 | 18.7 |
| Uruguay | | | 47.9 | | | | | | 47.9 |
| Vietnam | | | | | 150.3 | 0.6 | | 30.0 | 180.9 |
| np | 0.8 | | 6.3 | 2.8 | 388.2 | 1.4 | | 29.6 | 429.1 |
| Total Imports Reported by SDs | 23.5 | 1021.0 | 491.4 | 3.6 | 3546.5 | 223.4 | 480.3 | 317.9 | 6107.6 |
| Total Imports Reported by U.S. Customs & Border Protection | | | | | | | | | 9093.4 |
| Total Imports Not Reported by SDs | | | | | | | | | 2985.8 |

Table 5.21 indicates the amount and value of swordfish products imported by the United States from 2000 to 2010, as recorded by the U.S. Census Bureau, for all ocean areas combined. New import product categories were added in 2007. The amount of each product imported per

year and annual totals for product and value were fairly consistent over the past several years. Total imports have generally fallen since imports peaked in 2002.

**Table 5.21 Imported Swordfish Products by Year: 2000-2010.** Source: Census Bureau data.

<table>
<tr><th rowspan="2">Year</th><th colspan="3">Fresh (MT)</th><th colspan="5">Frozen (MT)</th><th colspan="2">Total for all Imports</th></tr>
<tr><th colspan="2">Steaks</th><th>Other</th><th>Fillets</th><th>Steaks</th><th colspan="3">Other</th><th>MT</th><th>US$ (million)</th></tr>
<tr><td>2000</td><td colspan="2">161</td><td>8626</td><td>4833</td><td>524</td><td colspan="3">167</td><td>14,314</td><td>85.57</td></tr>
<tr><td>2001</td><td colspan="2">71</td><td>8982</td><td>3814</td><td>710</td><td colspan="3">119</td><td>13,697</td><td>81.89</td></tr>
<tr><td>2002</td><td colspan="2">195</td><td>9726</td><td>4156</td><td>956</td><td colspan="3">677</td><td>15,711</td><td>88.26</td></tr>
<tr><td>2003</td><td colspan="2">147</td><td>8079</td><td>3929</td><td>433</td><td colspan="3">560</td><td>13,150</td><td>75.62</td></tr>
<tr><td>2004</td><td colspan="2">157</td><td>6568</td><td>3261</td><td>387</td><td colspan="3">351</td><td>10,726</td><td>70.95</td></tr>
<tr><td>2005</td><td colspan="2">172</td><td>6388</td><td>2957</td><td>367</td><td colspan="3">304</td><td>10,187</td><td>77.17</td></tr>
<tr><td>2006</td><td colspan="2">77</td><td>6830</td><td>2875</td><td>351</td><td colspan="3">201</td><td>10,334</td><td>75.63</td></tr>
<tr><th>*New Categories in 2007</th><th>*Fillets</th><th>Steaks</th><th>Other</th><th>Fillets</th><th>Steaks</th><th>*Meat >6.8 kg</th><th>*Meat <=6.8 kg</th><th>Other</th><th></th><th></th></tr>
<tr><td>2007</td><td>174</td><td>84</td><td>5412</td><td>2520</td><td>171</td><td>118</td><td>737</td><td>205</td><td>9,422</td><td>70.85</td></tr>
<tr><td>2008</td><td>96</td><td>13</td><td>5658</td><td>2673</td><td>170</td><td>55</td><td>207</td><td>88</td><td>8,962</td><td>68.98</td></tr>
<tr><td>2009</td><td>53</td><td>10</td><td>5312</td><td>1632</td><td>112</td><td>96</td><td>23</td><td>33</td><td>7272</td><td>55.85</td></tr>
<tr><td>2010</td><td>125</td><td>2</td><td>5228</td><td>2077</td><td>153</td><td>277</td><td>45</td><td>31</td><td>7939</td><td>68.33</td></tr>
</table>

NOTE: Imports may be whole weight (ww) or product weight (dw); data are preliminary and subject to change.

#### 5.3.3.4 Shark Imports

Similar to tuna imports other than BFT and frozen bigeye tuna, NMFS does not require shark importers to collect and submit information regarding the ocean area of catch. Shark imports are also not categorized by species, and lack specific product information on imported shark meat such as the proportion of fillets and steaks. The condition of shark fin imports*; e.g.*, wet, dried, or further processed products such as canned shark fin soup, is also not collected. There is no longer a separate tariff code for shark leather, so its trade is not tracked by CBP or Census Bureau data.

The United States may be an important trans-shipment port for shark fins, which may be imported wet, processed, and then exported dried. It is also probable that U.S.-caught shark fins are exported to Hong Kong or Singapore for processing, and then imported back into the United States for consumption by urban-dwelling Asian Americans (Rose, 1996).

Table 5.22 summarizes Census Bureau data on shark imports for 2000 through 2010. Imports of fresh shark products and shark fins have decreased significantly since 2000. As of July 2, 2008, shark fin importers, exporters, and re-exporters are required to be permitted under

NMFS' HMS ITP regulations (73 FR 31380). Permitting of shark fin traders was implemented to assist in enforcement and monitoring trade of this valuable commodity.

From 2000 to 2010, the overall annual amount of shark imports has generally decreased to a low in 2010, while the value during this time series has fluctuated with no apparent trend. Imports of dried shark fins have increased gradually since 2003, although imports are still less than the high of 66 mt in 2000.

**Table 5.22 U.S. Imports of Shark Products From All Ocean Areas Combined: 2000-2010.** Source: Census Bureau data.

| Year | Shark Fins Dried | | Non-specified Fresh Shark | | Non-specified Frozen Shark | | Total For All Imports | |
|---|---|---|---|---|---|---|---|---|
| | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) | MT | US$ (million) |
| 2000 | 66 | 2.35 | 1,066 | 1.85 | 90 | .57 | 1,222 | 4.79 |
| 2001 | 50 | 1.08 | 913 | 1.38 | 123 | 1.78 | 1,087 | 4.25 |
| 2002 | 39 | 1.02 | 797 | 1.24 | 91 | 1.09 | 928 | 3.35 |
| 2003 | 11 | 0.01 | 515 | 0.72 | 100 | 0.99 | 626 | 1.82 |
| 2004 | 14 | 0.34 | 650 | 1.00 | 156 | 2.35 | 821 | 3.70 |
| 2005 | 27 | 0.75 | 537 | 1.02 | 147 | 2.27 | 711 | 4.04 |
| 2006 | 28 | 1.38 | 338 | 0.68 | 93 | 1.35 | 459 | 3.41 |
| 2007 | 29 | 1.68 | 548 | 1.03 | 174 | 1.04 | 751 | 3.75 |
| 2008 | 29 | 1.74 | 348 | 0.72 | 189 | 1.88 | 566 | 4.34 |
| 2009 | 21 | 0.97 | 180 | 0.37 | 125 | 1.50 | 326 | 2.83 |
| 2010 | 34 | 1.18 | 114 | 0.33 | 34 | 1.16 | 182 | 2.66 |

NOTE: Imports may be whole weight (ww) or product weight (dw); data are preliminary and subject to change.

### 5.3.4 The Use of Trade Data for Management Purposes

Trade data has been used in a number of ways to support the international management of HMS. When appropriate, the SCRS uses trade data on BFT, swordfish, bigeye tuna, and yellowfin tuna that are submitted to ICCAT as an indication of landings trends. These data can then be used to augment estimates of fishing mortality of these species, which improves scientific stock assessments. For example, in 2009, the SCRS used BCD data to more precisely estimate BFT catch levels in the Mediterranean Sea and eastern Atlantic (SCRS, 2009). Previously, the SCRS had determined that reported catches of the eastern stock of BFT had been significantly under-reported for ten years, beginning in the mid 1990s.

Trade data can also be used to assist in assessing compliance with ICCAT recommendations and identify those countries whose fishing practices diminish the effectiveness of ICCAT conservation and management measures. On several occasions, ICCAT has adopted recommendations to address the lack of compliance with management programs for the BFT, bigeye tuna, and North and South Atlantic swordfish fisheries by ICCAT members. Penalties for non-compliance or fishing in a manner that diminishes the effectiveness of ICCAT conservation measures may include catch limit reductions and, if necessary, trade restrictive measures.

For example, an analysis of vessel sighting and Japanese BSD data led to the 1996 determination that fishing vessels from the countries of Panama, Honduras, and Belize were fishing in a manner that diminished the effectiveness of the BFT rebuilding program, and resulted in a 1996 ICCAT recommendation for sanctions against the import of BFT from these countries (Table 5.23). In 1999, ICCAT recommended this trade restriction on Panama be lifted as a result of the Government of Panama's efforts to substantially reduce fishing vessel activities deemed inconsistent with ICCAT measures. In 2001, Honduras became a member of ICCAT, and based on this change in status and Honduras' significant efforts to control its fleet and address ICCAT concerns, ICCAT recommended lifting trade sanctions for BFT. The BFT sanction for Belize was lifted by ICCAT in 2002.

In another example, import data from 1997–1999 revealed significant Atlantic BFT exports from Equatorial Guinea despite the fact that a zero catch limit was in effect for that country. The government of Equatorial Guinea had not responded to ICCAT inquiries and had reported no BFT catch data to ICCAT, and as a result ICCAT recommended trade restrictions as a penalty for non-compliance. Based on information regarding improved compliance presented by Equatorial Guinea at the 2004 ICCAT meeting, specifically, that Equatorial Guinea had canceled licenses and flags of large-scale longline vessels previously participating in IUU tuna fishing in the Convention area and guaranteed compliance with ICCAT conservation and management measures, the trade sanction was lifted by ICCAT. As indicated in Table 5.23 most of the trade sanctions recommended by ICCAT since 1996 have been lifted. In fact, only trade sanctions for Bolivia and Georgia remained until the 2011 ICCAT annual meeting where they were lifted, and no new sanctions have been recommended since 2003.

**Table 5.23 Summary and Current Status of ICCAT Recommended Trade Sanctions for BFT, Swordfish, and Bigeye Tuna Implemented by the United States.**

| Country | Species | ICCAT Recommended Sanction | U.S. Sanction Implemented | ICCAT Sanction Lifted | U.S. Sanction Lifted |
|---|---|---|---|---|---|
| **Panama** | Bluefin | 1996 | 1997 | 1999 | 2000 |
| **Honduras** | Bluefin | 1996 | 1997 | 2001 | 2004 |
| | Bigeye | 2000 | 2002 | 2002 | 2004 |
| | Swordfish | 1999 | 2000 | 2001 | 2004 |
| **Belize** | Bluefin | 1996 | 1997 | 2002 | 2004 |
| | Swordfish | 1999 | 2000 | 2002 | 2004 |
| | Bigeye | 2000 | 2002 | 2002 | 2004 |
| **Equatorial Guinea** | Bluefin | 1999 | 2000 | 2004 | 2005 |
| | Bigeye | 2000 | 2002 | 2004 | 2005 |
| **Cambodia** | Bigeye | 2000 | 2002 | 2004 | 2005 |
| **St. Vincent & the Grenadines** | Bigeye | 2000 | 2002 | 2002 | 2004 |
| **Bolivia** | Bigeye | 2002 | 2004 | 2011 | expected 2012 |
| **Sierra Leone** | Bluefin | 2002 | 2004 | 2004 | 2005 |
| | Bigeye | 2002 | 2004 | 2004 | 2005 |

| Country | Species | ICCAT Recommended Sanction | U.S. Sanction Implemented | ICCAT Sanction Lifted | U.S. Sanction Lifted |
|---|---|---|---|---|---|
| | Swordfish | 2002 | 2004 | 2004 | 2005 |
| **Georgia** | Bigeye | 2003 | 2004 | 2011 | expected 2012 |

## 5.4 Recreational Fisheries

A comprehensive understanding of the economic impacts of HMS recreational fishing is not currently available; however, existing studies indicate that HMS recreational fishing provides significant positive economic impacts to coastal communities. These positive economic impacts derive from individual angler expenditures, recreational charters, tournaments, and the shoreside businesses that support those activities. The net economic and social benefits of HMS recreational fishing in the United States are likely positive and some of the ecological impacts are mitigated by the strong catch-and-release ethic in this fishery.

The Deepwater Horizon/BP Oil Spill in the Gulf of Mexico affected recreational fisheries in the Gulf of Mexico due to a series of fishery closures of various sizes that began on May 2, 2010 and continued until April 19, 2011. More information about the Deepwater Horizon/BP Oil Spill is available at http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm. The impacts of the oil spill and related fishery closures continue to be investigated.

### 5.4.1 Recreational Angling

The 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation is currently underway. Data collection began throughout the country on April 1, 2011 and will be completed by March 31, 2012. This survey is conducted every five years and is designed to provide data on fishing, hunting, and other wildlife-related activities during calendar year 2011. National preliminary estimates will be available the end of June 2012. The final national report and the data CD-ROM will be available from the U.S. Fish and Wildlife Service (USFWS) in November of 2012. The 50 state reports will be available on a flow basis beginning in November 2012.

The most recent complete survey by the USFWS was conducted in 2006. The economic survey found that for the entire United States, 7.7 million saltwater anglers (including anglers in state waters) went on approximately 67 million fishing trips and spent approximately $8.9 billion (USFWS, 2006). These participation rates are down from the 2001 survey which found 9.1 million saltwater anglers (including anglers in state waters) went on approximately 72 million fishing trips and spent approximately $8.4 billion (USFWS, 2001). The 2006 survey found saltwater anglers spent $5.3 billion on trip-related costs and $3.6 billion on equipment (USFWS, 2006). Expenditures on trip-related costs increased 17 percent from 2001, but equipment expenditures declined by seven percent. These expenditures included lodging, transportation to and from the coastal community, vessel fees, equipment rental, bait, auxiliary purchases (e.g., binoculars, cameras, film, foul weather clothing, etc.), and fishing licenses. Approximately 79 percent of the saltwater anglers surveyed fished in their home state in 2006, compared to 76 percent in 2001 (USFWS, 2001).

Specific information regarding angler expenditures for trips targeting HMS species was extracted from the recreational fishing expenditure survey add-on (1998 in the Northeast, 1999 – 2000 in the Southeast) to the NMFS' MRFSS. These angler expenditure data were analyzed on a per person per trip-day level and reported in 2003 dollars. The expenditure data includes the costs of tackle, food, lodging, bait, ice, boat fuel, processing, transportation, party/charter fees, access/boat launching, and equipment rental. The overall average expenditure on HMS related trips is estimated to be $122 per person per day. Specifically, expenditures are estimated to be $686 per person per day on billfish directed trips (based on a low sample size), $85 on pelagic shark directed trips, $95 on LCS directed trips, $81 on SCS directed trips, and $106 on tuna directed trips.

The American Sportfishing Association (ASA) also has a report listing the 2006 economic impact of sportfishing on specific states. This report states that all sportfishing (in both federal and state waters) has an overall economic importance of $125 billion dollars. ASA estimates 8,528,000 anglers participate in saltwater fishing. These saltwater anglers spent $11 billion in retail sales, resulting in 263,000 jobs, and $9 billion in salaries, wages, and business earnings in 2006. Saltwater fishing contributed $30 billion of the overall economic impact estimated. Florida, Texas, South Carolina, and North Carolina are among the top ten states in terms of overall economic expenditures for both saltwater and freshwater fishing. Florida is also one of the top states in terms of economic impact of saltwater fishing with $3.0 billion in angler expenditures, $5.1 billion in overall economic impact, $1.6 billion in salaries and wages related to fishing, and 51,588 fishing related jobs (ASA, 2008).

In 2003, Ditton and Stoll published a paper that surveyed the literature regarding what is currently known about the social and economic aspects of recreational billfish fisheries. It was estimated that 230,000 anglers in the United States spent 2,136,899 days fishing for billfish in 1991. This is approximately 3.6 percent of all saltwater anglers over age 16. The states with the highest number of billfish anglers are Florida, California, North Carolina, Hawaii, and Texas, in descending order. Billfish anglers studied in the U.S. Atlantic, Puerto Rico, and Costa Rica fished between 39 and 43 days per year.

Billfish recreational anglers tend to spend a great deal of money on trips. Ditton and Stoll (2003) report that a 1990 study of U.S. total trip costs for a typical billfish angler estimated a mean expenditure of $2,105 per trip for the Atlantic and $1,052 per trip for Puerto Rico. The aggregate economic impact of billfish fishing trips in the U.S. Atlantic is conservatively estimated to be $22.7 million annually.

In addition to the economic impact of recreational billfish angling, Ditton and Stoll (2003), using a contingent valuation method, estimated consumer's surplus or net economic benefit to maintain current billfish populations in the U.S. Atlantic to be $497 per billfish angler per year in the U.S. Atlantic and $480 in Puerto Rico. They also estimate that the number of annual billfish anglers in the U.S. Atlantic to be 7,915 and 1,627 in Puerto Rico. The aggregate willingness-to-pay for maintaining current billfish populations is $3.93 million in the U.S.

Atlantic and 0.78 million in Puerto Rico. The aggregate direct impact of billfish expenditures is estimated to be $15.13 million for the U.S. Atlantic and $32.40 million for Puerto Rico. Thus, the total aggregate economic value of billfish angler fishing is $19.06 million per year for the U.S. Atlantic and $33.18 million per year for Puerto Rico.

### 5.4.2 Atlantic HMS Tournaments

Generally, HMS tournaments last from three to seven days, but lengths can range from one day to an entire fishing season. Similarly, average entry fees can range from approximately $0 to $5,000 per boat (average approximately $500/boat – $1,000/boat), depending largely upon the magnitude of the prize money that is being awarded. The entry fee would pay for a maximum of two to six anglers per team during the course of the tournament. Additional anglers can, in some tournaments, join the team at a reduced rate of between $50 and $450. The team entry fee did not appear to be directly proportional to the number of anglers per team, but rather with the amount of money available for prizes and, possibly, the species being targeted. Prizes may include citations, T-shirts, trophies, fishing tackle, automobiles, boats, or other similar items, but most often consists of cash awards. In general, it appears that billfish and tuna tournaments charge higher entry fees and award more prize money than shark and swordfish tournaments, although all species have a wide range. Prize money is often determined by the number of tournament participants. Compared to recent previous years, overall prize money and number of participants declined noticeably in 2011.

Cash awards distributed in HMS tournaments can be quite substantial. Several of the largest tournaments, some of which are described below, are part of the World Billfish Series Tournament Trail whereby regional winners are invited to compete in the World Billfish Series Grand Championship for a new automobile and a bronze sculpture. Other tournament series include the International Game Fish Association (IGFA) Rolex Tournament of Champions, and the South Carolina Governor’s Cup. White marlin is a top billfish species from Cape Hatteras, North Carolina to the eastern tip of Georges Bank from June through October each year. The White Marlin Open in Ocean City, Maryland, which is billed as the “world’s largest billfish tournament,” awarded $758,828.00 in 2011 to the vessel catching the largest white marlin and $379,677.00 to the vessel catching the largest blue marlin. The 28th Annual Pirate's Cove Billfish Tournament in North Carolina awarded over $500 thousand in prizes in 2011, with the top boat garnering over $297,296 for winning in three categories. Total prize money awarded in the Big Rock Tournament in North Carolina has exceeded $1 million since 1998. The 2011 winner of the Big Rock Blue Marlin Tournament won $524,375 from a total tournament purse of $1.46 million.

Blue marlin, sailfish, and tunas are often targeted in fishing tournaments, including those discussed above. In 2010, blue marlin was the HMS most frequently identified as a prize category in registered HMS tournaments. The 40th Annual Pensacola (Florida) International Billfish Tournament indicated that it would award over $565,000 in cash and prizes in 2011. The World Sailfish Championship in Key West, Florida had a $100,000 guaranteed first prize for 2011. In South Carolina, the Megadock Billfishing Tournament awarded a $90,185 prize in 2011 for the first place winner of this three-day tournament. The 2011 Mid-Atlantic Tuna

Tournament sponsored by the South Jersey Marina in Cape May, New Jersey, had 18 vessels competing for a share of approximately $80,000 in total prize money.

Several tournaments target sharks. Many shark tournaments occur in New England, New York, and New Jersey, although other regions hold shark tournaments as well. In 2011, the 31st Annual South Jersey Shark Tournament hosted 113 boats and awarded over $238,626 in prize money, with an entry fee of $545 per boat. In 2011, the 25th Annual Oak Bluffs Monster Shark Tournament in Martha's Vineyard hosted 104 boats.

While fishing tournaments are an important component of Atlantic HMS recreational fisheries and provide socioeconomic benefits to associated communities, there are some organizations that oppose these tournaments. For the past several years, for example, the Humane Society of the United States has petitioned NMFS to halt all shark tournaments.

Swordfish tournaments have gained increased popularity in recent years, especially on the east coast of Florida, as the swordfish population has recovered. Events include the Islamorada Swordfish Tournament that began in 2004, and the Miami Swordfish Tournament that began in 2003, which make up the Florida Swordfish Series. In 2011, the Islamorada Swordfish Tournament was relocated to Ft. Lauderdale, FL and then later cancelled. Therefore, the Florida Swordfish Series was cancelled for 2011, but is expected to resume again in 2012.

In addition to official prize money, many fishing tournaments may also conduct a "calcutta" whereby anglers pay from $200 to $5,000 to win more money than the advertised tournament prizes for a particular fish. Tournament participants do not have to enter calcuttas. Tournaments with calcuttas generally offer different levels depending upon the amount of money an angler is willing to put down. Calcutta prize money is distributed based on the percentage of the total amount entered into that Calcutta. Therefore, first place winner of a low level Calcutta (entry fee ~$200) could win less than a last place winner in a high level calcutta (entry fee ~$1000). On the tournament websites, it was not always clear if the total amount of prizes distributed by the tournament included prize money from the calcuttas or the estimated price of any equipment. As such, the range of prizes discussed above could be a combination of fish prize money, calcutta prize money, and equipment/trophies.

Fishing tournaments can sometimes generate a substantial amount of money for surrounding communities and local businesses. Ditton *et al*., (2000) estimated that the total expenditure (direct economic impact) associated with the 1999 Pirates Cove Billfish Tournament, not including registration fees, was approximately $2,072,518. The total expenditure (direct economic impact) associated with the 2000 Virginia Beach Red, White, and Blue Tournament was estimated at approximately $450,359 (Thailing *et al*., 2001). These estimated direct expenditures do not include economic effects that may ripple through the local economy leading to a total impact exceeding that of the original purchases by anglers (i.e., the multiplier effect). Less direct, but equally important, fishing tournaments may serve to generally promote the local tourist industry in coastal communities. In a survey of participants in the 1999 Pirates Cove Billfish Tournament, Ditton *et al*., (2000) found that almost 80 percent of tournament anglers were from outside of the tournament's county. For this reason, tourism bureaus, chambers of commerce, resorts, and state and local governments often sponsor fishing tournaments.

### 5.4.3 Atlantic HMS Charter and Party Boat Operations

At the end of 2004, NMFS collected market information regarding advertised charterboat rates. The analysis of this data focused on observations of advertised rates on the internet for full day charters. Full day charters vary from 6 to 14 hours long with a typical trip being 10 hours. Most vessels can accommodate six passengers, but this also varies from two to 12 passengers. The average price for a full day boat charter was $1,053 in 2004. Sutton *et al.*, (1999) surveyed charterboats throughout Alabama, Mississippi, Louisiana, and Texas in 1998 and found the average charterboat base fee to be $762 for a full day trip. Holland *et al.* (1999) conducted a similar study on charterboats in Florida, Georgia, South Carolina, and North Carolina and found the average fee for full day trips to be $554, $562, $661, and $701, respectively. Comparing these two studies conducted in the late 1990s to the average advertised daily HMS charterboat rate in 2004, it is apparent that there has been a significant gain in charterboat rates.

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# 6.0 COMMUNITY PROFILES

This Chapter identifies and describes the HMS fishing communities, as required under the Magnuson-Stevens Act and other laws, and consolidates all of the communities profiled in previous HMS FMPs or FMP amendments and updates the community information where possible. Of the communities profiled in this chapter, ten were originally selected due to the proportion of HMS landings in the town, the relationship between the geographic communities and the fishing fleets, the existence of other community studies, and input from the HMS and Billfish Advisory Panels (which preceded the combined HMS Advisory Panel that currently exists). The remaining 14 communities, although not selected initially, have been identified as communities that could be impacted by changes to the current HMS regulations because of the number of HMS permits associated with these communities, and their community profile information has been incorporated into the document.

## 6.1 Introduction

The Magnuson-Stevens Act requires, among other things, that all FMPs include a fishery impact statement intended to assess, specify, and describe the likely effects of the measures on fishermen and fishing communities (§303(a)(9)).

The National Environmental Policy Act (NEPA) also requires federal agencies to consider the interactions of natural and human environments by using a "systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences in planning and decision-making" (§102(2)(A)). Moreover, agencies need to address the aesthetic, historic, cultural, economic, social, or health effects, which may be direct, indirect, or cumulative. Consideration of social impacts is a growing concern as fisheries experience increased participation and/or declines in stocks. The consequences of management actions need to be examined to better ascertain and, if necessary and possible, mitigate regulatory impacts on affected constituents.

Social impacts are generally the consequences to human populations resulting from some type of public or private action. Those consequences may include alterations to the ways in which people live, work or play, relate to one another, and organize to meet their needs. In addition, cultural impacts, which may involve changes in values and beliefs that affect people's way of identifying themselves within their occupation, communities, and society in general are included under this interpretation. Social impacts analyses help determine the consequences of policy action in advance by comparing the status quo with the projected impacts. Community profiles are an initial step in the social impact assessment process. Although public hearings and scoping meetings provide input from those concerned with a particular action, they do not constitute a full overview of the fishery.

The Magnuson-Stevens Act outlines a set of National Standards (NS) that apply to all fishery management plans and the implementation of regulations. Specifically, NS 8 notes that:

> "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of

overfished stocks), take into account the importance of fishery resources to fishing communities in order to: (1) provide for the sustained participation of such communities; and, (2) to the extent practicable, minimize adverse economic impacts on such communities."

See also 50 CFR §600.345 for National Standard 8 Guidelines. "Sustained participation" is defined to mean continued access to the fishery within the constraints of the condition of the resource (50 CFR §600.345(b)(4)).

It should be clearly noted that NS 8 "does not constitute a basis for allocation of resources to a specific fishing community nor for providing preferential treatment based on residence in a fishing community" (50 CFR §600.345(b)(2)).

The Magnuson-Stevens Act further defines a "fishing community" as: "...a community that is substantially dependent upon or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew, and United States fish processors that are based in such community."

(§3(17)) The National Standard guidelines expand upon the definition of a fishing community, and state that, "A fishing community is a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries-dependent services and industries (for example, boatyards, ice suppliers, tackle shops)" (50 CFR §600.345(b)(2)).

NMFS (2001) guidelines for social impact assessments specify that the following elements are utilized in the development of FMPs and FMP amendments:

1. The size and demographic characteristics of the fishery-related work force residing in the area; these determine demographic, income, and employment effects in relation to the work force as a whole, by community and region.

2. The cultural issues of attitudes, beliefs, and values of fishermen, fishery-related workers, other stakeholders, and their communities.

3. The effects of proposed actions on social structure and organization; that is, on the ability to provide necessary social support and services to families and communities.

4. The non-economic social aspects of the proposed action or policy; these include life-style issues, health and safety issues, and the non-consumptive and recreational use of living marine resources and their habitats.

5. The historical dependence on and participation in the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution and rights.

## 6.2 Methodology

### 6.2.1 Previous community profiles and assessments

NMFS contracted with Dr. Doug Wilson, from the Ecopolicy Center for Agriculture, Environmental and Resource Issues at Rutgers, the State University of New Jersey, to help develop the community profiles and social impact assessments for the 1999 HMS FMP and Amendment 1 to the FMP for Atlantic Billfish. Dr. Wilson and his colleagues completed their fieldwork in July 1998. This study covered commercial and recreational Atlantic HMS fisheries extending along the Atlantic and Gulf coasts from Maine to Texas and in the Caribbean. The study investigated the social and cultural characteristics of fishing communities in five states and one U.S. territory: Massachusetts, New Jersey, North Carolina, Florida, Louisiana, and Puerto Rico. These areas were selected because they each had important fishing communities that could be affected by the 1999 FMP for Atlantic Tunas, Swordfish, and Sharks and the 1999 Atlantic Billfish FMP Amendment 1, and because they are fairly evenly spread along the Atlantic and Gulf coasts and the Caribbean. The study compiled basic sociological information from at least two coastal communities from each state or territory. For each state or territory, a profile of basic sociologic information was compiled, with at least two coastal communities visited for further analysis. Towns were selected based on HMS landings data, the relationship between the geographic communities and the fishing fleets, the existence of other community studies, and inputs from the Advisory Panels for HMS and Billfish. The information in this document incorporates by reference the Wilson *et al.*, (1998) study of the HMS fishery and the work of McCay and Cieri (2000) for the Mid-Atlantic Fishery Management Council, "The Fishing Ports of the Mid-Atlantic" (http://www.st.nmfs.noaa.gov/st1/econ/cia/McCay_Port_Study-Apr2000_Revised.pdf)

Additionally, NMFS contracted with the Virginia Institute of Marine Science (VIMS) at the College of William and Mary to re-evaluate several of the baseline HMS communities (Kirkley, 2005). The VIMS study gathered a profile of basic sociological information for the principal states involved with the Atlantic shark fishery. From the 255 communities identified as involved in the 2001 commercial fishery, Amendment 1 to the 1999 HMS FMP focused on specific towns based on shark landings data, the size of the shark fishing fleet, the relationship between the geographic communities and the fishing fleets, and the existence of other community studies. While the recreational fishery is an important component in the overall shark fishery, the VIMS study did not profile the shark recreational fishery because participation and landings were not documented in a manner that permits community identification. The Wilson *et al*., study selected for profile, only the recreational fisheries found within commercial fishing communities due to the lack of community-based data for the sport fishery. To the extent that it is available, the information on the HMS-related recreational fisheries has been incorporated into the community profiles.

Following the Consolidated HMS FMP, which published in 2006, NMFS contracted MRAG Americas, Inc. to create a report updating current HMS fishery community profiles. The report utilized HMS permit information and U.S. census data to rank communities according to the percentage of HMS permits, by permit category, and in relation to their overall population; based on a methodology described by Sepez *et al*. (2005). Communities that met the mean percentage for at least one permit category were included and community profile information was created or updated accordingly. The report identified 14 communities that were not previously included (Wakefield, Rhode Island; Montauk, New York; Cape May, New Jersey; Ocean City, Maryland; Atlantic Beach, Beaufort, and Morehead City, North Carolina; Apalachicola, Destin, and Port Salerno, Florida; Orange Beach, Alabama; Grand Isle, Louisiana; and Freeport and Port Aransas, Texas), along with 10 communities that had been included in previous SAFE reports (Gloucester and New Bedford, Massachusetts; Barnegat Light and Brielle, New Jersey; Hatteras Village and Wanchese, North Carolina; Islamorada and Madeira Beach, Florida; and Dulac and Venice, Louisiana). This list did not include four communities that had been included in assessments since the 1999 HMS FMP (Fort Pierce, Panama City Beach, and Pompano Beach, Florida; and Arecibo, Puerto Rico). All communities that were identified by MRAG Americas, Inc. and ones that were evaluated in the past are included in this chapter and have been updated with 2010 Bureau of the Census data (where available) to ensure continuity with the 1999 HMS FMP and subsequent amendments.

The list of communities profiled in the reports noted above is not intended to be an exhaustive record of every HMS-related community in the United States; rather the objective is to give a broad perspective of representative areas. The demographic profile tables found in this SAFE Report were modified from previous documents to include the same baseline information for each community profiled, and use 1990, 2000, and 2010 Bureau of the Census data for comparative purposes. **A profile for the U.S. Virgin Islands was not created because the 2010 Census data were not available at the time.** The descriptive community profiles in this chapter include information provided by Wilson, *et al.* (1998) and Kirkley (2005), Impact Assessment, Inc. (2004), and recent information obtained from MRAG Americas, Inc. (2008), along with 2010 Bureau of the Census data. In this chapter, the community descriptions are organized by state.

Several other chapters in this SAFE report include information that addresses the requirements described Section 6.1 and that is an integral part of any social impact assessment and fishery impact statement. Please refer to the summary of regulatory actions in Chapter 1, description of the fisheries in Chapter 4, the economic evaluation in Chapter 5, and the permit data in Chapter 8.

### 6.2.2 Community Impacts from Hurricanes

This section is an overview of the impacts on HMS communities caused by hurricanes during 2010. Please refer to prior SAFE reports for hurricane impact information prior to 2010.

The 2010 hurricane season had more storms than average with 19 named storms, of which 12 became hurricanes and 5 became major (Category 3-5) hurricanes. The number of storms could be largely attributed to climatological conditions, La Nina, and record warm Atlantic sea surface temperatures (Bell et al., 2011). However, none of these storms made initial landfall in the United States. This is attributed to 1) climatological conditions that steered hurricanes originating in the central Atlantic Ocean away from the United States; 2) climatological conditions that prevented storms originating in the Caribbean Sea from moving northward through the Gulf of Mexico; and 3) some storms remained in the eastern Atlantic and/or dissipated before reaching the western Atlantic (Bell et al., 2011). Five named storms may have produced localized impacts to U.S. HMS fleets and communities. Tropical Storm

Bonnie, Tropical Depression Five, and Tropical Storm Hermine moved over coastal areas of Louisiana, Louisiana and Mississippi, and Texas, respectively. Puerto Rico and the U.S. Virgin Islands were affected by Hurricane Earl and Tropical Storm Gaston.

### 6.2.3 Community Impacts from 2010 Deepwater Horizon/BP Oil Spill

On April 20, 2010, an explosion and subsequent fire damaged the Deepwater Horizon MC252 oil rig, which capsized and sank approximately 50 miles southeast of Venice, Louisiana. Oil flowed for 86 days into the Gulf of Mexico from a damaged well head on the sea floor. In response to the Deepwater Horizon MC252 oil spill, NMFS issued a series of emergency rules (75 FR 24822, May 6, 2010; 75 FR 26679, May 12, 2010; 75 FR 27217, May 14, 2010) closing a portion of the Gulf of Mexico exclusive economic zone (EEZ) to all fishing and analyzed the environmental impacts of these closures in an Environmental Assessment. Between May and November 2010, NMFS closed additional portions of the Gulf of Mexico to fishing. The maximum closure was implemented on June 2, 2010, when fishing was prohibited in approximately 37 percent of the Gulf of Mexico EEZ (Table 6.1; Figure 6.1). Significant portions of state territorial waters in Alabama (40%), Florida (2%), Louisiana (55%), and Mississippi (95%) were closed to fishing (Upton, 2011). After November 15, 2010, approximately 0.4 percent (1,041 square miles) of the federal fishing area was kept closed immediately around the Deepwater Horizon wellhead through the end of 2010. NMFS is continuing to evaluate the impacts of the Deepwater Horizon Spill on HMS stocks and fishermen and will include updated information in future SAFE reports. For more information see: http://sero.nmfs.noaa.gov/ClosureSizeandPercentCoverage.htm

**Table 6.1. Deepwater Horizon closures by date, size, and percent coverage of the U.S. Gulf of Mexico EEZ in 2010. The largest percent closure area is designated in bold.**

| Date of Closure | Area (sq mi) | Area (sq km) | Percent Coverage of Gulf EEZ | | Date of Closure | Area (sq mi) | Area (sq km) | Percent Coverage of Gulf EEZ |
|---|---|---|---|---|---|---|---|---|
| 2-May | 6,817 | 17,648 | 2.8 | | 21-Jun | 86,985 | 225,290 | 35.9 |
| 7-May | 10,807 | 27,989 | 4.5 | | 23-Jun | 78,597 | 203,564 | 32.5 |
| 11-May | 16,027 | 41,511 | 6.6 | | 28-Jun | 80,228 | 207,790 | 33.2 |
| 12-May | 17,651 | 45,717 | 7.3 | | 4-Jul | 81,181 | 210,259 | 33.5 |
| 14-May | 19,377 | 50,187 | 8 | | 12-Jul | 84,101 | 217,821 | 34.8 |
| 17-May | 24,241 | 62,784 | 10 | | 13-Jul | 83,927 | 217,371 | 34.7 |
| 18-May | 45,728 | 118,435 | 18.9 | | 22-Jul | 57,539 | 149,026 | 23.8 |
| 21-May | 48,005 | 124,333 | 19.8 | | 10-Aug | 52,395 | 135,703 | 21.7 |
| 25-May | 54,096 | 140,109 | 22.4 | | 27-Aug | 48,114 | 124,614 | 19.9 |
| 28-May | 60,683 | 157,169 | 25.1 | | 2-Sep | 43,000 | 111,369 | 17.8 |
| 31-May | 61,854 | 160,200 | 25.6 | | 3-Sep | 39,885 | 103,303 | 16.5 |
| 1-Jun | 75,920 | 196,633 | 31.4 | | 21-Sep | 31,915 | 82,659 | 13.2 |
| **2-Jun** | **88,522** | **229,270** | **36.6** | | 1-Oct | 26,287 | 68,083 | 10.9 |
| 4-Jun | 78,182 | 202,491 | 32.3 | | 5-Oct | 23,360 | 60,502 | 9.7 |
| 5-Jun | 78,603 | 203,582 | 32.5 | | 15-Oct | 16,481 | 42,686 | 6.8 |
| 7-Jun | 78,264 | 202,703 | 32.3 | | 22-Oct | 9,444 | 24,461 | 3.9 |
| 16-Jun | 80,806 | 209,286 | 33.4 | | 15-Nov | 1,041 | 2,697 | 0.4 |

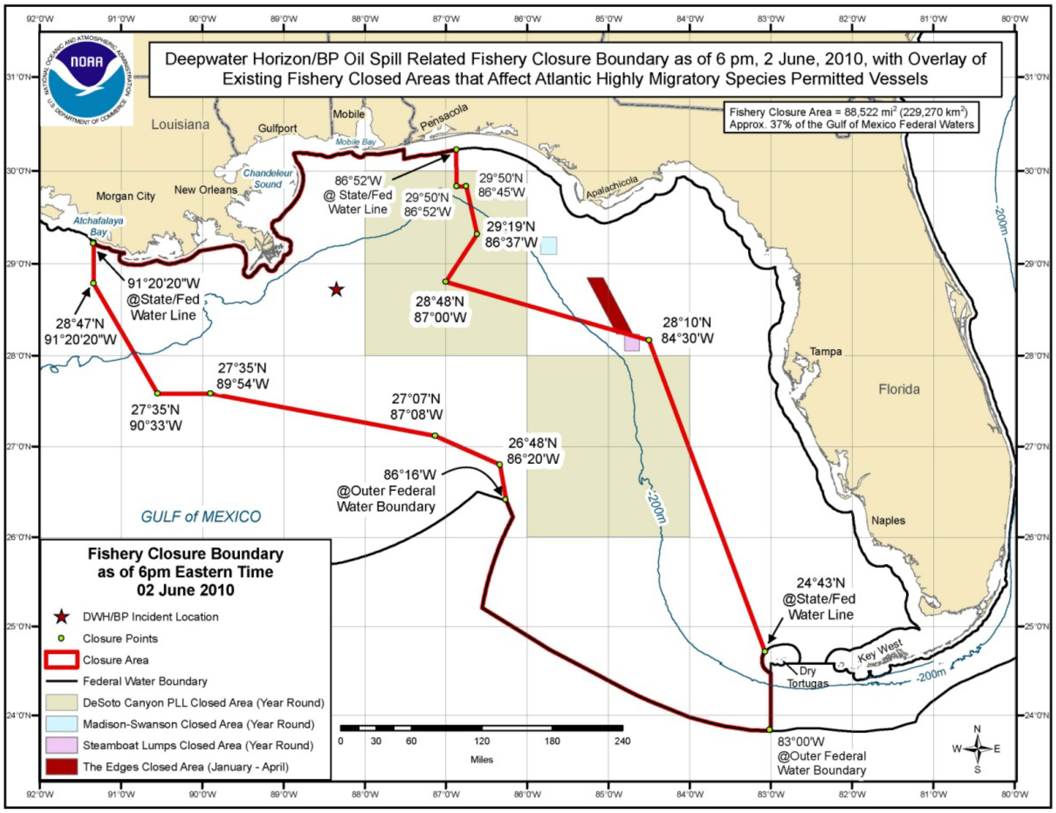


**Figure 6.1. Extent of the maximum area closed by NMFS (37% of the Gulf of Mexico EEZ) in response to the Deepwater Horizon oil spill; June 2, 2010 and HMS time area closures in the Gulf of Mexico.**

## 6.3 United States Demographic Profile

In 2000, the United States had a total population of 281.4 million (Table 6.2). The population increased to 308.7 million by 2010. Throughout the previous decade, the population was roughly half female and half male. Individuals between 20 and 44 years of age comprised the largest proportion of the population in both 2000 and 2010. The dominant race was white. The number of households grew from 105.5 million in 2000 to 116.7 million households in 2010. The average household and family size remained about the same between the two decades. The number of high school graduates, ages 25 and older, increased between 2000 and 2010 by over five percent (Table 6.2). The unemployment rate increased by over seven percent between 2000 and 2010; and individuals considered below the poverty line increased by almost three percent. In 2000, employment in farming, fishing, forestry, and mining industries accounted for 1.9 percent collectively, and that rate remained the same in 2010.

**Table 6.2** **Demographic Profile of the United States.** Source: U.S. Census, 1990, 2000, and 2010

| United States | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **248,709,873** | **281,421,906** | **308,745,538** |
| **Sex** | | | |
| Male | 48.7% | 49.1% | 49.2% |
| Female | 51.3% | 50.9% | 50.8% |
| **Age** | | | |
| <20 | 25.6% | 28.6% | 26.9% |
| 20-44 | 43.2% | 36.9% | 33.6% |
| 45-64 | 18.6% | 22.0% | 26.4% |
| >65 | 12.6% | 12.4% | 13.1% |
| **Race** | | | |
| White | 80.3% | 75.1% | 72.4% |
| Black or African American | 12.1% | 12.3% | 12.6% |
| American Indian & Alaska Native | 0.8% | 0.9% | 0.9% |
| Asian | 2.8% | 3.6% | 4.8% |
| Other | 3.9% | 5.5% | 9.3% |
| **Household** | | | |
| Total | 91,947,410 | 105,480,101 | 116,716,292 |
| Family households | 70.2% | 68.0% | 66.4% |
| Nonfamily households | 29.8% | 32.0% | 33.6% |
| Average household size | 3 | 2.59 | 2.58 |
| Average family size | 3.16 | 3.14 | 3.14 |
| **Housing Occupancy** | | | |
| Total housing units | 102,263,678 | 115,904,641 | 116,716,292 |
| Vacant housing units | 10.1% | 9.0% | 11.4% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 64.2% | 66.2% | 65.1% |
| Renter-occupied housing units | 35.8% | 33.8% | 34.9% |
| Education: | | | |
| High school graduates (25 years or older) | 75.2% | 80.4% | 85.6% |
| Employment: | | | |
| Labor force (16 years and over) | 65.3% | 63.9% | 64.4% |
| Unemployment Rate | 6.3% | 3.7% | 10.8% |
| Median Household Income | $30,056 | $41,994 | $50,046 |
| Individuals below the poverty line* | 13.1% | 12.4% | 15.3% |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 3.3% | 1.9% | 1.9% |
| Construction | 6.2% | 6.8% | 6.2% |
| Manufacturing | 17.7% | 14.1% | 10.4% |

| | | | |
|---|---|---|---|
| Wholesale trade | 4.4% | 3.6% | 2.8% |
| Retail trade | 16.8% | 11.7% | 11.7% |
| Education, health & social services | 23.3% | 19.9% | 23.2% |
| Arts, recreation, lodging & food services | 1.4% | 7.9% | 9.2% |

## 6.4 State and Community Profiles

### 6.4.1 Maine

Between 2000 and 2010, the population in the state of Maine increased by about 4.2 percent (Table 6.3). The number of high school graduates, ages 25 years and older, increased almost 5 percent over the past decade. The unemployment rate nearly doubled, from 4.8 to 8.3 percent, and the percentage of individuals below the poverty line increased by two percent. Employment in the farming, fishing, forestry, and mining industries has slightly declined over the last three decades, while education, health, and social services industries have provided the greatest source of employment for the state's residents.

As of October 2011, seven commercial shark and six commercial swordfish fishing permits were issued in Maine (Table 6.53 and Table 6.54), along with 616 commercial tuna permits (Table 6.51). Maine has the second greatest number of commercial tuna permit holders with 15.3 percent of the total (Table 6.50). Maine also has 30 licensed dealers for tunas, sharks, and swordfish (Table 6.51).

Vessels homeported in Maine sometimes participate in shark fisheries in southern waters and make landings in Florida and other states; therefore, landings are not always indicative of a community's involvement in a fishery. Sharks are often taken incidentally during tuna fishing trips. The incidental nature of shark catches off Maine in the commercial fishery is also true for the recreational fishery. There is, however, a small group of anglers who fish with light tackle for blue, mako, and porbeagle sharks in the Gulf of Maine. To date, no HMS-related community profiles have been developed for the State of Maine, as there are no significant concentrations of HMS-related fisheries in any particular community.

In 2010, an estimated 290,000 sport fishermen made 750,000 fishing trips in marine waters off Maine (NMFS, 2011b). Of these anglers, about 55 percent were from out of state. Just over two percent of the HMS angling category permit holders live in the state of Maine (Table 6.49). Recreational fishing activities in Maine in 2009 generated almost $167 million in direct sales and $88 million in value added economic impacts. Employment in marine recreational fishing services was estimated to be 2,039 full and part time jobs in 2009 (NMFS, 2011a). An indication of recreational interest in shark fishing is that charterboats advertise for shark fishing trips from York Harbor, Sheepscot, Casco Bay, Saco Bay, Bath, Damariscotta, and Old Orchard Beach. One hundred thirty charter/headboats in Maine held HMS permits as of October 2011 (Table 6.50). These Maine charter operations are seasonal, typically from Memorial Day to Labor Day, and some of the operators advertise that they move to Florida, or the Caribbean, to run charters during the Florida season from November to May.

**Table 6.3 Maine Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010.

| Maine | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **1,227,928** | **1,274,923** | **1,328,361** |
| **Education:** | | | |
| High school graduates (25 years or older) | 78.8% | 85.4% | 90.3% |
| **Employment:** | | | |
| Labor force (16 years and over) | 65.6% | 65.3% | 64.5% |
| Unemployment Rate | 6.6% | 4.8% | 8.3% |
| Median Household Income | $27,854 | $37,240 | $45,815 |
| Individuals below the poverty line* | 10.8% | 10.9% | 12.9% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 2.8% | 2.6% | 2.4% |
| Construction | 7.3% | 6.9% | 6.7% |
| Manufacturing | 19.7% | 14.2% | 9.2% |
| Wholesale trade | 3.6% | 3.4% | 2.7% |
| Retail | 18.4% | 13.5% | 13.1% |
| Education, health & social services | 24.8% | 23.2% | 28.2% |
| Arts, recreation, lodging & food services | 0.9% | 7.1% | 8.3% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.2 New Hampshire

New Hampshire's population increased by about 6.5 percent between 2000 and 2010 (Table 6.4). The number of high school graduates, ages 25 years and older, increased slightly. The unemployment rate doubled and the percentage of individuals below the poverty line increased by almost 2 percent. Employment in the farming, fishing, forestry, and mining industries remained the same, while education, health, and social services industries increased by almost 5 percent and continued to provide the greatest source of employment for the state's residents.

New Hampshire's commercial shark fishery is very small, with only 1 commercial permit issued in 2011 (Table 6.53). No commercial swordfish permits were issued in New Hampshire in 2011 (Table 6.54). There are 5 HMS dealers in the state of New Hampshire (Table 6.52). New Hampshire has the fifth (tied with New Jersey) greatest number of commercial tuna permit holders (Table 6.51). Slightly less than two percent of the angling category permit holders reside in New Hampshire (Table 6.49).

The recreational fishery for sharks in New Hampshire waters is largely incidental, on a very small scale, and similar to that of Maine. Occasionally caught close to shore, shortfin mako sharks are taken in water reaching depths over 20 fathoms. There are 96 charterboat operators in Portsmouth, Rye, Seabrook, Hampton, as well as a few other towns, that held HMS permits in 2011 (Table 6.50). Many of these charterboats advertise shark fishing trips offshore from June through September, with the best fishing in June and July. Target species for these trips are shortfin mako, blue, thresher and porbeagle sharks.

In 2010, approximately 86,000 anglers made 252,000 fishing trips to the marine waters off New Hampshire (NMFS, 2011b). Of these saltwater anglers, approximately 38 percent were visitors from out-of-state. In 2009 recreational trips generated over approximately $18 million in angler trip expenses and $48 million in durable equipment expenditures, and the marine recreational fishing service sector provided 418 jobs in New Hampshire (NMFS, 2011a).

**Table 6.4 New Hampshire Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| New Hampshire | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **1,109,252** | **1,235,786** | **1,316,470** |
| **Education:** | | | |
| High school graduates (25 years or older) | 82.2% | 87.4% | 91.5% |
| **Employment:** | | | |
| Labor force (16 years and over) | 71.9% | 70.5% | 69.7% |
| Unemployment Rate | 6.2% | 3.8% | 7.8% |
| Median Household Income | $36,329 | $49,467 | $61,042 |
| Individuals below the poverty line* | 6.4% | 6.5% | 8.3% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 1.5% | 0.9% | 0.9% |
| Construction | 7.1% | 6.8% | 7.0% |
| Manufacturing | 22.5% | 18.1% | 12.5% |
| Wholesale trade | 4.0% | 3.6% | 3.2% |
| Retail | 17.6% | 13.7% | 13.6% |
| Education, health & social services | 22.6% | 20.0% | 24.8% |
| Arts, recreation, lodging & food services | 1.2% | 6.9% | 8.1% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.3 Massachusetts

Commercial fisheries in the Commonwealth of Massachusetts are diverse, and range from small-scale inshore small-boat fisheries for lobster and clams, to offshore scallops, groundfish dragging, and longline fishing for HMS species. In 2010, New Bedford, Massachusetts ranked ninth in the United States for the weight of fish landed, and first for value with ex-vessel sales, bringing in 306 million dollars (NMFS, 2011b). In the same year, Gloucester ranked fifteenth in weight of fish landed and twelfth in ex-vessel value. Due to the number of HMS permit holders and the relative importance of commercial and recreational fisheries to the Commonwealth, community profiles for both New Bedford and Gloucester were originally developed for the 1999 HMS FMP and have been included below.

The population in the Commonwealth of Massachusetts increased by almost 200,000 people from 2000-2010 (Table 6.5). Approximately 90 percent of individuals 25 years and older have a high school diploma. The percentage of employed individuals and individuals below the poverty line increased over two percent from 2000 to 2010, coinciding with an over five percent increase in the unemployment rate. Employment in the farming, fishing, forestry, and mining industries remained the same over this time period. The education, health and social services, along with the arts, recreation, lodging, and food services are the only industries that expanded.

Massachusetts holds the greatest number of commercial tuna permits with 1,341 vessels permitted in 2011 (Table 6.51). Massachusetts is ranked fifth (tied with North Carolina) in the greatest number of swordfish permit holders, with over seventeen percent of the total swordfish permit holders residing in Massachusetts in 2011 (Table 6.54). In addition to swordfish, there are 12 directed and incidental shark permit holders (Table 6.53).

**Table 6.5 Massachusetts Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| Massachusetts | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **6,016,425** | **6,349,097** | **6,547,629** |
| **Education:** | | | |
| High school graduates (25 years or older) | 80.0% | 84.8% | 89.1% |
| **Employment:** | | | |
| Labor force (16 years and over) | 67.8% | 66.2% | 67.7% |
| Unemployment Rate | 6.7% | 4.6% | 10.2% |
| Median Household Income | $36,952 | $50,502 | $62,072 |
| Individuals below the poverty line* | 8.9% | 9.3% | 11.4% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 1.2% | 0.4% | 0.4% |
| Construction | 5.5% | 5.5% | 5.3% |
| Manufacturing | 18.1% | 12.8% | 9.3% |
| Wholesale trade | 4.1% | 3.3% | 2.5% |
| Retail | 16.2% | 11.0% | 10.9% |
| Education, health & social services | 28.0% | 23.7% | 27.7% |
| Arts, recreation, lodging & food services | 1.1% | 6.8% | 8.3% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

In 2010, marine recreational fishing in Massachusetts attracted an estimated 1,171,000 anglers making 3,692,000 fishing trips in both state and Federal waters (NMFS, 2011b). Approximately, 37 percent of the anglers were from out of state. In 2009, recreational trips generated over approximately $200 million in angler trip expenses and $630 million in durable equipment expenditures, and the marine recreational fishing service sector provided 4,987 jobs in Massachusetts (NMFS, 2011a). Recreational shark fishing, largely catch-and-release using light tackle, takes place in offshore waters (NMFS, 2003). These vessels often travel 50-100 miles out to their fishing grounds and most shark trips are 10-12 hours in duration, with some trips extending to up to three days. Massachusetts residents held 838 charter/headboat permits in 2011 (Table 6.50), the most in the country. Sharks are most often taken incidentally in the recreational bluefin tuna fishery, but a number of charterboat operators advertise directed shark fishing trips. The target shark species South and East of Cape Cod are shortfin mako, blue, and porbeagle sharks.

HMS fishing tournaments are promoted, and participated in, by some charterboat operators (NMFS 2003). Examples of these tournaments include the Big Game Battle (Nantucket); Nantucket Bluefin Blast (Nantucket); GHTC WWP Tournament (Green Harbor); and the Oak Bluffs Monster Shark Tournament (Oak Bluffs) Charterboat operations advertising shark fishing trips are based in areas such as Newburyport, Rockport, Gloucester, Boston, Quincy, Chatham, Harwich Port, South Yarmouth, Hyannis, Mashpee, East Falmouth, Oak Bluffs, Edgartown, Vineyard Haven, Menemsha, Mattapoisett, Fairhaven, New Bedford, and Westport Point.

#### 6.4.3.1 Gloucester, Massachusetts

Gloucester is a community which has one of the richest fishing traditions in the United States. Established in 1623, it is the oldest functioning fishing community in the country, is home to Gorton's, the largest frozen seafood company in the United States, and has many community landmarks based around fishing (MRAG Americas, Inc., 2008). In 2010 for all seafood commercially landed in the United States, Gloucester ranked 15$^{th}$ in weight (88.8 million pounds), and first in value with ex-vessel sales bringing in $56.6 million (NMFS, 2011b). Commercial and recreational fishermen both target HMS, mainly focusing on swordfish and tunas.

In 2000, the population of Gloucester was 30,273. There was a minimal population decrease of approximately 1,500 individuals between 2000 and 2010 (Table 6.6). Forty-six percent of the population was between the ages 20 to 44 years old in 2010, increasing the median age of the Gloucester population by six years, rising to 46 years old in 2010. There is a slightly larger percentage of females in the Gloucester population, 48 percent males to 52 percent females. In 2010, the percentage of family and nonfamily households, along with average household and family size, basically remained the same.

The percentage of the population in the 16 years and older labor force decreased by 1.3 percent from 2000 to 2010 (Table 6.6). The unemployment more than doubled, but the percentage of individuals below the poverty line decreased slightly over the time period. The number of businesses engaged in the forestry, fishing, hunting, mining, and agriculture industries increased over the last decade from 2.5 percent to 3.2 percent. The education, health, and social services industries saw an increase of over 6 percent and continued to employ the largest percentage of individuals.

**Table 6.6 Demographic Profile of Gloucester, Massachusetts.** Source: U.S. Census, 1990, 2000, and 2011.

| Gloucester, MA | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **28,716** | **30,273** | **28,789** |
| **Sex** | | | |
| Male | 48.2% | 47.9% | 48.1% |
| Female | 51.8% | 52.1% | 51.9% |
| **Age** | | | |
| Median Age | 35.5 | 40.2 | 46.4 |
| <20 | 25.2% | 23.9% | 20.7% |

| | | | |
|---|---|---|---|
| 20-44 | 39.3% | 34.4% | 27.0% |
| 45-64 | 20.2% | 26.1% | 34.5% |
| >65 | 15.4% | 15.6% | 17.7% |
| **Race** | | | |
| White | 99.4% | 97.0% | 95.7% |
| Black or African American | 0.2% | 0.6% | 0.8% |
| American Indian & Alaska Native | 0.1% | 0.1% | 0.1% |
| Asian | 0.2% | 0.7% | 0.9% |
| Other | 0.1% | 0.5% | 2.7% |
| **Household** | | | |
| Total | 11,550 | 29,913 | 12,486 |
| Family households | 66.1% | 62.7% | 60.2% |
| Nonfamily households | 33.9% | 37.3% | 39.8% |
| Average household size | 2.49 | 2.38 | 2.27 |
| Average family size | 3.11 | 3.00 | 2.90 |
| **Housing Occupancy** | | | |
| Total housing units | 13,125 | 13,958 | 14,557 |
| Vacant housing units | 11.8% | 9.8% | 14.2% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 57.8% | 59.7% | 62.0% |
| Renter-occupied housing units | 42.2% | 40.3% | 38.0% |
| Education: | | | |
| High school graduates (25 years or older) | 75.6% | 85.7% | 89.9% |
| Employment: | | | |
| Labor force (16 years and over) | 62.6% | 66.1% | 64.8% |
| Unemployment Rate | 4.5% | 3.2% | 8.0% |
| Median Household Income | $32,690 | $47,722 | $61,407 |
| Individuals below the poverty line* | 7.5% | 8.8% | 8.2% |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 3.9% | 2.5% | 3.2% |
| Construction | 5.5% | 7.1% | 6.4% |
| Manufacturing | 22.1% | 16.7% | 10.3% |
| Wholesale trade | 4.7% | 3.6% | 2.6% |
| Retail trade | 16.2% | 10.8% | 10.8% |
| Education, health & social services | 14.1% | 20.2% | 26.8% |
| Arts, recreation, lodging & food services | 1.4% | 9.2% | 11.2% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

#### 6.4.3.2 New Bedford, Massachusetts

New Bedford ranked ninth in the United States for the weight of seafood landed in 2010 (133.4 million pounds), and first in value with ex-vessel sales bringing in 306 million dollars

(NMFS, 2011b). Ex-vessel sales have been driven by the scallop industry, where landings and prices have been high over the last several years (NMFS, 2010 FUS).

Between 2000 and 2010, New Bedford experienced a small increase in its population of 1,304 individuals, from 93,768 in 2000 to 95,072in 2010 (Table 6.7). The median age of the population basically remained the same, only increasing 0.7 years (Table 6.7). The 2010 age distribution was relatively similar to the age distribution in 2000 with the greatest percentage of individuals in the 20 to 44 years age group. The percentage of females in the population is larger than the percentage of males in both 2000 and 2010.

The number of high school graduates increased by almost 13 percent from 2000 to 2010 (Table 6.7). The size of the 16 year and older labor force increased, but the unemployment more than doubled and the percentage of individuals below the poverty line increased by almost 4 percent. The percentage of businesses engaged in the forestry, fishing, hunting, and agriculture industries declined by almost half from 2000 to 2010, and the education, health, and social services industry increased by seven percent.

**Table 6.7 Demographic Profile of New Bedford, Massachusetts.** Source: U.S. Census, 1990, 2000, and 2010.

| New Bedford | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **99,922** | **93,768** | **95,072** |
| **Sex** | | | |
| Male | 46.7% | 47.1% | 48.0% |
| Female | 53.3% | 52.9% | 52.0% |
| **Age** | | | |
| Median Age | 32.6 | 35.9 | 36.6 |
| <20 | 29.1% | 27.4% | 25.9% |
| 20-44 | 35.4% | 35.6% | 34.9% |
| 45-64 | 18.0% | 20.1% | 24.6% |
| >65 | 17.4% | 16.7% | 14.6% |
| **Race** | | | |
| White | 87.8% | 79.8% | 74.5% |
| Black or African American | 3.8% | 4.4% | 6.4% |
| American Indian & Alaska Native | 0.4% | 0.6% | 1.3% |
| Asian | 0.3% | 0.7% | 0.9 |
| Other | 7.6% | 9.5% | 16.9% |
| **Household** | | | |
| Total | 38,646 | 91,782 | 38,761 |
| Family households | 69.0% | 63.1% | 60.2% |
| Nonfamily households | 31.0% | 39.9% | 39.8% |
| Average household size | 2.59 | 2.40 | 2.40 |
| Average family size | 3.15 | 3.01 | 3.02 |
| **Housing Occupancy** | | | |
| Total housing units | 41,760 | 41,511 | 42,933 |

| New Bedford | 1990 | 2000 | 2010 |
|---|---|---|---|
| Vacant housing units | 7.1% | 8.0% | 4,172 |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 43.8% | 43.8% | 42.1% |
| Renter-occupied housing units | 56.2% | 56.2% | 57.9% |
| Education: | | | |
| High school graduates (25 years or older) | 49.7% | 57.6% | 70.0% |
| Employment: | | | |
| Labor force (16 years and over) | 52.1% | 57.7% | 61.3% |
| Unemployment Rate | 7.2% | 5.0% | 12.6% |
| Median Household Income | $22,647 | $27,569 | $31,616 |
| Individuals below the poverty line* | 16.8% | 20.2% | 24.0% |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 3.16% | 1.1% | 0.6% |
| Construction | 6.1% | 7.1% | 6.5% |
| Manufacturing | 27.8% | 20.7% | 9.5% |
| Wholesale trade | 4.3% | 4.4% | 3.6% |
| Retail trade | 17.0% | 12.1% | 14.0% |
| Education, health & social services | 15.4% | 20.9% | 27.6% |
| Arts, recreation, lodging & food services | 0.7% | 7.4% | 9.6% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.4 Rhode Island

Rhode Island's population increased slightly from 2000 to 2010 (Table 6.8); the percentage of individuals 25 years and older with a high school diploma increased by over five percent during that time period. By 2010 the unemployment rate nearly doubled and the number of individuals below the poverty line increased by over two percent. Employment in the farming, fishing, forestry, and mining industries has declined, while the education, health, and social services industries provided the greatest employment opportunities in 2010. Due to the relatively low involvement in HMS fisheries in the past, there are no community profiles describing the relationship of HMS fisheries to any Rhode Island communities.

Four percent of the commercial tuna permit holders in 2011 reside in Rhode Island (Table 6.51), and three shark permit holders and 12 swordfish permit holders are located in the state (Table 6.53 and Table 6.54). Communities involved with the commercial fisheries are Warwick, Little Compton, Newport, Tiverton, Block Island, Narragansett, Peace Dale, Point Judith, South Kingstown, Wakefield and West Kingstown. Rhode Island also has 49 HMS dealers, operating in places such as Newport, Point Judith, Middletown, Wakefield, Narragansett, Peace Dale, South Kingstown, and Block Island (Table 6.52).

**Table 6.8 Rhode Island Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| Rhode Island | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **1,003,464** | **1,048,319** | **1,052,567** |
| **Education:** | | | |
| High school graduates (25 years or older) | 72.0% | 78.0% | 83.5% |
| **Employment:** | | | |
| Labor force (16 years and over) | 66.1% | 64.6% | 64.6% |
| Unemployment Rate | 6.6% | 5.6% | 10.9% |
| Median Household Income | $32,181 | $42,090 | $52,254 |
| Individuals below the poverty line* | 9.6% | 11.9% | 14.0% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 1.3% | 0.5% | 0.3% |
| Construction | 5.7% | 5.4% | 4.9% |
| Manufacturing | 22.7% | 16.4% | 11.6% |
| Wholesale trade | 3.7% | 3.4% | 2.7% |
| Retail | 17.5% | 12.1% | 12.8% |
| Education, health & social services | 25.0% | 23.0% | 26.0% |
| Arts, recreation, lodging & food services | 1.2% | 8.6% | 11.0% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

In 2010, approximately 386,000 anglers took 1,283,000 saltwater fishing trips for all species in Rhode Island (NMFS, 2011b). In 2009, recreational trips generated over approximately $40 million in angler trip expenses and $124 million in durable equipment expenditures, and the marine recreational fishing service sector provided 1,005 jobs in Rhode Island (NMFS, 2011a). Of these marine anglers, about 65 percent were from out-of-state (NMFS, 2011a). As of October 2011, 629 Rhode Island residents held an HMS angling category permit (Table 6.49). The number of charter/headboat permit holders increased from 142 in 2008 to 172 in 2011 (Table 6.50). Recreational shark fishing from Rhode Island is seasonal between late June and October, with a peak in late August (NMFS 2003). A variety of shark species are available with the most common being shortfin mako sharks between 60-100 pounds. After shortfin mako, thresher, blue, dusky and sandbar sharks are the most common species caught by anglers. Light tackle is the gear preferred for shark fishing by the charter operators and most private boat fishermen, and catch-and-release is normal in the fishery.

#### 6.4.4.1 Wakefield, Rhode Island

Wakefield, RI was considered a Census Designated Place (CDP), and was combined with several other small villages for the 2010 census. The community had 8,487 people in 2010 (Table 6.9), an increase of 19 people from the 2000 Census. The area lacks any substantial commercial fishing infrastructure; therefore, commercial fishing generally takes place in neighboring Narragansett and Point Judith (MRAG Americas, Inc., 2008). The charter fishing fleet is based at the Snug Harbor Marina, and there are several marinas that cater to the recreational fishing industry in the area (MRAG Americas, Inc., 2008). The age distribution of the Wakefield population is trending older, as the percentage of individuals under the age of 18 decreased by eight percent while the number of individuals 18 to 64 years of age increased by seven percent between 2000 and 2010 (Table 6.9).

**Table 6.9 Demographic Profile of Wakefield, Rhode Island.** Source: U.S. Census, 1990, 2000, and 2010

| Wakefield, RI | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 7134 | 8468 | 8,487 |
| **Gender Ratio M/F (Number)** | 3368 / 3766 | 3958 / 4510 | 4,024 / 4,463 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | 25.1 | 28.4 | 20.1 |
| 18 to 64 years of age | 59.9 | 58.4 | 65.5 |
| 65 years and over | 15.0 | 13.2 | 14.4 |
| **Ethnicity or Race (Percent)** | | | |
| White | 6631 | 90.3 | 90.3 |
| Black or African American | 182 | 2 | 1.8 |
| American Indian and Alaskan Native | 257 | 3.1 | 2.6 |
| Asian | 64 | 1.2 | 1.4 |
| Native Hawaiian and other Pacific Islander | | <0.1 | 0.0 |
| Some other race | 0 | 0.6 | 0.7 |
| Two or more races | | 2.8 | 3.2 |
| Hispanic or Latino (any race) | | 1.6 | 2.5 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 3.9 | 3 | N/A |
| Percent high school graduate or higher | 62.6 | 89.8 | N/A |
| Percent with a Bachelor's degree or higher | 22.7 | 41.9 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |
| Percent who speak a language other than English at home | 3.7 | 5.9 | N/A |
| And Percent who speak English less than very well | | 1.2 | N/A |
| **Household income (Median $)** | 39,500 | 50,313 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 5.4 | N/A |
| **Percent female headed household** | 4.3 | 13.1 | N/A |
| **Home Ownership (Percent)** | | | |
| Owner occupied | | 71.3 | 69.7 |
| Renter occupied | | 28.7 | 30.3 |
| **Value Owner-occupied Housing (Median $)** | 143400 | 151,700 | N/A |
| **Monthly Contract Rent (Median $)** | 530 | 427 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | |
| Percent in the labor force | | 70.4 | N/A |
| Percent of civilian labor force unemployed | | 3.2 | N/A |
| **Occupation (Percent in workforce)** | | | |
| Management, professional, and related occupations | | 42.2 | N/A |
| Service occupations | | 23.3 | N/A |
| Sales and office occupations | | 21.2 | N/A |
| Farming, fishing, and forestry occupations | | 0.7 | N/A |
| Construction, extraction, and maintenance occupations | | 5.6 | N/A |
| Production, transportation, and material moving occupations | | 6.9 | N/A |
| **Industry (Percent in workforce)** | | | |
| Agriculture, forestry, fishing, hunting and mining | | 1.2 | N/A |
| Manufacturing | | 9.4 | N/A |
| Percent government workers | | 23.9 | N/A |

### 6.4.5 Connecticut

Connecticut's population has increased by almost 5 percent between 2000 and 2010 (Table 6.10). The percentage of individuals 25 years and older with a high school diploma has increased by over four percent. The unemployment rate almost doubled in that time, and the number individuals below the poverty line increased by over two percent. Employment in the farming, fishing, forestry, and mining remained steady, while education, health, and social services industries continued to provide the greatest employment opportunities in 2010.

In general, Connecticut's involvement in HMS commercial fisheries has been minimal. There are 74 commercial tuna permit holders living in the state in 2011 (Table 6.51), along with one shark and one swordfish permit holder (Table 6.53 and Table 6.54). Only five HMS permitted dealers were located in Connecticut in 2011 (Table 6.52), which makes up 0.7 percent of the total permitted HMS dealers. The communities involved in the commercial shark fishery are New London and Old Lyme. Due to the relatively minimal involvement with HMS fisheries, there are no community profiles for the state of Connecticut.

In 2010, approximately 514,000 anglers took 1,505,000 saltwater fishing trips for all species in Connecticut (NMFS, 2011b). In 2009, recreational trips generated over approximately $35 million in angler trip expenses and $762 million in durable equipment expenditures, and the marine recreational fishing service sector provided 5,212 jobs in Connecticut (NMFS, 2011a). Of these marine anglers, about 17.5 percent were from out-of-state. In 2011, 604 Connecticut residents held an HMS angling category permit (Table 6.49). Recreational shark fishing is conducted throughout Long Island Sound, but primarily from the eastern ports in the state from which offshore waters can be easily reached. The number of charter/headboats permit holders in Connecticut has decreased from 114 in 2008 to 83 in 2011 (Table 6.50). Charterboats advertising shark fishing trips operate from Milford, New London, Norwalk, Old Lyme, Saybrook, Stonington and Westport. The recreational fishery is principally a catch-and-release fishery using light tackle.

**Table 6.10 Connecticut Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2011

| Connecticut | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **3,287,116** | **3,405,565** | **3,574,097** |
| **Education:** | | | |
| High school graduates (25 years or older) | 79.2% | 84.0% | 88.6% |
| **Employment:** | | | |
| Labor force (16 years and over) | 69.0% | 66.6% | 68.0% |
| Unemployment Rate | 5.4% | 5.3% | 10.5% |
| Median Household Income | $41,721 | $53,935 | $64,032 |
| Individuals below the poverty line* | 6.8% | 7.9% | 10.1% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 1.3% | 0.4% | 0.4% |
| Construction | 5.9% | 6.0% | 5.5% |
| Manufacturing | 20.5% | 14.8% | 10.9% |
| Wholesale trade | 4.2% | 3.2% | 2.5% |
| Retail | 15.4% | 11.2% | 10.8% |

| | | | |
|---|---|---|---|
| Education, health & social services | 24.8% | 22.0% | 26.2% |
| Arts, recreation, lodging & food services | 1.1% | 6.7% | 8.7% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.6 New York

Between 2000 and 2010 the state of New York's population increased by over 400,000 people (Table 6.11); the percentage of individuals 25 years and older with a high school diploma increased by over five percent; and the unemployment rate increased by almost three percent, which coincided with a slight increase in the percentage of individuals below the poverty line. Employment in the farming, fishing, forestry, and mining industries remained steady, while the education, health, and social services industries continued to provide the greatest percentage of employment opportunities.

Twenty one and twenty two HMS shark and swordfish permits were issued to New York addresses in 2011, respectively (Table 6.53 and Table 6.54). In addition to the shark and swordfish permit holders, there are also 231 commercial tuna permit holders in New York (Table 6.51), and New York had the third greatest number of HMS dealer permit holders (94) (Table 6.52). Communities participating in the shark commercial and recreational fisheries include Freeport, Lawrence, Amagansett, Brightwaters, East Hampton, East Quogue, Greenport, Hampton Bays, Islip, Montauk, Oakdale, Brooklyn, Riverhead, Seaford, Port Jefferson, Babylon, Hauppauge, Staten Island, Southold, and Wantagh.

**Table 6.11 New York Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2011

| New York | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **17,990,455** | **18,976,457** | **19,378,102** |
| **Education:** | | | |
| High school graduates (25 years or older) | 74.8% | 79.1% | 84.9% |
| **Employment:** | | | |
| Labor force (16 years and over) | 63.6% | 61.1% | 63.5% |
| Unemployment Rate | 6.9% | 7.1% | 9.9% |
| Median Household Income | $40,927 | $43,393 | $54,148 |
| Individuals below the poverty line* | 13.0% | 14.6% | 14.9% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 1.3% | 0.6% | 0.6% |
| Construction | 5.2% | 5.2% | 5.6% |
| Manufacturing | 14.7% | 10.0% | 6.7% |
| Wholesale trade | 4.2% | 3.4% | 2.6% |
| Retail | 14.9% | 10.5% | 10.7% |
| Education, health & social services | 27.9% | 24.3% | 27.6% |
| Arts, recreation, lodging & food services | 1.5% | 7.3% | 8.7% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

In 2010 an estimated 739,000 anglers took 4,470,000 saltwater fishing trips for all species of fish in both state and Federal waters off of New York (NMFS, 2011b). Residents of New York State made up approximately 91 percent of the recreational marine anglers during that time. In 2009, recreational trips generated over approximately $145 million in angler trip expenses and $640 million in durable equipment expenditures, and the marine recreational fishing service sector provided 4,568 jobs in New York (NMFS, 2011a). In 2011, New York had the fourth (tied with North Carolina) greatest number of HMS angling category permits with 1,688 permitted vessels (Table 6.49). Shark fishing by anglers appears to be largely catch-and-release, using light tackle, and tends to be incidental to tuna and billfish fishing offshore. In New York State, 335 charter/headboats were permitted for HMS fishing in 2011 (Table 6.50). A number of charterboat operators advertise shark fishing as part of their offerings. Charterboats operating out of Montauk advertised shark fishing either as an occasional exciting catch or offered shark fishing trips offshore. Montauk is positioned well for offshore trips as it lies only 20-40 miles from the edge of deep water and Gulf Stream eddies. Connecticut and Rhode Island boats on the other hand have to travel at least 60-100 miles to reach the prime fishing waters for tunas and sharks.

#### 6.4.6.1 Montauk, New York

The village of Montauk is the largest commercial fishing port in New York, mainly due to its location to important commercial and recreational fishing grounds, along with its harbor that provides a large natural protective barrier (MRAG Americas, Inc., 2008). The population decreased between 2000 and 2010, and 16 percent of the Montauk population of 3,326 residents in 2010 were of Hispanic decent. The overall age of the population in Montauk seems to be increasing, as the percentage of individuals under 18 years of age decreased by 3 percent while the number of individuals over the age of 65 increased by 5 percent (Table 6.12). Fishing is closely tied to the community, which holds a number of fishing-related events such as the blessing of the fleet and multiple fishing tournaments. Shark tournaments primarily target blue, shortfin mako, and thresher sharks. There are a number of commercial pelagic longline vessels that fish for tuna and swordfish, but the commercial HMS fishery in Montauk is limited by dock space, which is increasingly utilized for recreational purposes.

**Table 6.12 Demographic Profile of Montauk, New York.** Source: U.S. Census, 1990, 2000, and 2011

| Montauk, NY | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 3,001 | 3,851 | 3,326 |
| **Gender Ratio M/F (Number)** | | 1976/1875 | 1,661 / 1,665 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | | 20 | 16.9 |
| 18 to 64 years of age | | 65.5 | 62.6 |
| 65 years and over | 14.9 | 14.5 | 20.5 |
| **Ethnicity or Race (Percent)** | | | |
| White | | 87 | 90.3 |
| Black or African American | | 0.9 | 2.8 |
| American Indian and Alaskan Native | | 0.1 | 0.2 |
| Asian | | 0.8 | 0.9 |
| Native Hawaiian and other Pacific Islander | | <0.1 | 0.1 |
| Some other race | | 9.8 | 4.4 |

| Montauk, NY | 1990 | 2000 | 2010 |
|---|---|---|---|
| Two or more races | | 1.4 | 1.3 |
| Hispanic or Latino (any race) | | 23.9 | 16.1 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 7 | 7.6 | N/A |
| Percent high school graduate or higher | 88.5 | 84 | N/A |
| Percent with a Bachelor's degree or higher | 25.7 | 24.8 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |
| Percent who speak a language other than English at home | 17.6 | 30.3 | N/A |
| And Percent who speak English less than very well | 8.2 | 15.6 | N/A |
| **Household income (Median $)** | 31,849 | 42,329 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | 2.9 | 7.7 | N/A |
| **Percent female headed household** | 6.7 | 8.7 | N/A |
| **Home Ownership (Percent)** | | | |
| Owner occupied | | 65.7 | 73.3 |
| Renter occupied | | 34.3 | 26.7 |
| **Value Owner-occupied Housing (Median $)** | | 290,400 | N/A |
| **Monthly Contract Rent (Median $)** | 804 | 863 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | |
| Percent in the labor force | 70.1 | 61.5 | N/A |
| Percent of civilian labor force unemployed | 5 | 7.7 | N/A |
| **Occupation (Percent in workforce)** | | | |
| Management, professional, and related occupations | 23.5 | 20.3 | N/A |
| Service occupations | | 23.3 | N/A |
| Sales and office occupations | 25.7 | 27.9 | N/A |
| Farming, fishing, and forestry occupations | 9 | 5.8 | N/A |
| Construction, extraction, and maintenance occupations | | 19 | N/A |
| Production, transportation, and material moving occupations | | 3.6 | N/A |
| **Industry (Percent in workforce)** | | | |
| Agriculture, forestry, fishing, hunting and mining | 8 | 6.1 | N/A |
| Manufacturing | 1.8 | 2 | N/A |
| Percent government workers | 8.4 | 11.8 | N/A |

### 6.4.7 New Jersey

Between the 2000 Census and the 2010 Census, New Jersey's population increased by over 375,000 people (Table 6.13); the percentage of individuals 25 years and older with a high school diploma increased by about six percent; the unemployment rate increased by five percent; and individuals below the poverty line increased by two percent. As with many of the other states, employment in the farming, fishing, forestry, and mining industries remained steady, whereas the education, health, and social services industries provided the greatest percentage of employment opportunities in 2010.

In 2011, there were 231 commercial tuna permit holders in the state of New Jersey (Table 6.51). New Jersey has the second greatest number of shark permit holders living within the state, second to Florida (Table 6.53). New Jersey is also home to 41 swordfish permit holders (Table 6.54). Sixty-seven HMS dealer permits were also issued in New Jersey in 2011(Table 6.52).

In 2010, an estimated 1,261,000 anglers took 5,988,000 marine recreational fishing trips in New Jersey, and approximately 40 percent of those anglers were from out-of-state (NMFS 2011b). In 2009, recreational trips generated over approximately $280 million in angler trip expenses and $1.2 billion in durable equipment expenditures, and the marine recreational fishing service sector provided 8,513 jobs in New Jersey (NMFS, 2011a). In 2011, New Jersey had the second highest number of HMS angling category permit holders at 3,397 (Table 6.49).

**Table 6.13 New Jersey Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| New Jersey | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **7,730,188** | **8,414,350** | **8,791,894** |
| **Education:** | | | |
| High school graduates (25 years or older) | 76.9% | 82.1% | 88.0% |
| **Employment:** | | | |
| Labor force (16 years and over) | 67.4% | 64.1% | 66.6% |
| Unemployment Rate | 5.7% | 5.8% | 10.8% |
| Median Household Income | $40,927 | $55,146 | $67,681 |
| Individuals below the poverty line* | 7.6% | 8.5% | 10.5% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 1.2% | 0.3% | 0.3% |
| Construction | 6.0% | 5.6% | 5.7% |
| Manufacturing | 16.9% | 12.0% | 9.0% |
| Wholesale trade | 5.4% | 4.4% | 3.5% |
| Retail | 15.2% | 11.3% | 10.9% |
| Education, health & social services | 23.4% | 19.8% | 23.4% |
| Arts, recreation, lodging & food services | 1.7% | 6.9% | 8.0% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

The recreational fishery for sharks is primarily incidental to fishing for tuna and billfish. New Jersey ranks third in the number of HMS charter/headboats permit holders with 550 permitted vessels in 2011 (Table 6.50). Of these party and charterboats, some advertise shark trips using light tackle during the summer and early fall (July-October) (NMFS, 2003). These trips go offshore between 25 and 60 miles to the heads of the canyons, and thus are full-day or overnight trips.

#### 6.4.7.1 Barnegat Light, New Jersey

Barnegat Light is one of eleven municipalities on Long Beach Island, a large “barrier beach” island that helps form the seaward boundary of Barnegat Bay. This small town measures less than one square mile and is located on the northern end of the barrier island. The town is named after its famous lighthouse that guided ships for generations along the New Jersey coast. This lighthouse was replaced in 1855 with the second-tallest lighthouse in the United States operating until 1927 (NMFS, 2003). The building continues as both a community landmark and a navigation mark. The name Barnegat originates from “Barende-gat,” a Dutch name meaning “inlet of breakers” (NMFS, 1999). Prior to 1820, fishing operations and maritime trade were conducted in the small settlements on the mainland inside the chain of islands and sand bars fringing the New Jersey coast (NMFS, 2003). Barnegat Inlet was one of the important channels to the open ocean, with a sheltered anchorage immediately inside the inlet, and ample resource for a fishing community. A lighthouse was built in 1824 to mark the entrance to the inlet. In

1995, the infamous inlet's fierce currents were tamed by a $45 million Army Corps of Engineers project that constructed a South jetty along with a three-quarter-mile beach and a fishing pier (NMFS, 1999).

Barnegat Light has continued to shift to an older, retired population in the time between the 2000 and 2010 Censuses. Population declined by 25 percent and the median age increased from 50.9 to 60.3 years (Table 6.14). The change in age structure and population also led to a decrease in the total number of households, down 26 percent from 2000. The percentage of high school graduates over 25 years of age declined by 6.5 percent, while the unemployment rate in the area increased by almost 10 percent over the time period (Table 6.14).

**Table 6.14 Demographic Profile of Barnegat Light.** Source: U.S. Census, 1990, 2000, and 2010.

| **Barnegat Light, NJ** | **1990** | **2000** | **2010** |
|---|---|---|---|
| **Total Population:** | **681** | **764** | **574** |
| **Sex** | | | |
| Male | 52.0% | 50.9% | 49.7% |
| Female | 48.0% | 49.1% | 50.3% |
| **Age** | | | |
| Median Age | 50.9 | 54.9 | 60.3 |
| <20 | 12.8% | 15.4% | 8.8% |
| 20-44 | 29.8% | 20.9% | 15.3% |
| 45-64 | 27.0% | 29.4% | 34.5% |
| >65 | 30.4% | 34.3% | 41.2% |
| **Race** | | | |
| White | 99.6% | 98.3% | 97.7% |
| Black or African American | 0.4% | 0.5% | 1.0% |
| American Indian & Alaska Native | 0.0% | 0.0% | 0.0% |
| Asian | 0.0% | 0.6% | 0.0% |
| Other | 0.0% | 0.4% | 1.3% |
| **Household** | | | |
| Total | 342 | 371 | 274 |
| Family households | 62.0% | 62.0% | 184 |
| Nonfamily households | 38.0% | 38.0% | 90 |
| Average household size | 1.99 | 2.05 | 2.06 |
| Average family size | 2.42 | 2.60 | 2.48 |
| **Housing Occupancy** | | | |
| Total housing units | 1,167 | 1,207 | 1,282 |
| Vacant housing units | 71.0% | 69.3% | 1,008 |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 82.6% | 87.9% | 86.5% |
| Renter-occupied housing units | 17.4% | 12.1% | 13.5% |
| Education: | | | |
| High school graduates (25 years or older) | 84.9% | 92.1% | 85.6% |

| Barnegat Light, NJ | 1990 | 2000 | 2010 |
|---|---|---|---|
| Employment: | | | |
| Labor force (16 years and over) | 52.6% | 46.9% | 64.4% |
| Unemployment Rate | 0.5% | 1.2% | 10.8% |
| Median Household Income | $37,955 | $52,361 | NA |
| Individuals below the poverty line* | 7.2% | 4.7% | NA |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 12.6% | 8.2% | NA |
| Construction | 12.6% | 10.3% | NA |
| Manufacturing | 7.4% | 4.8% | NA |
| Wholesale trade | 1.3% | 1.7% | NA |
| Retail trade | 21.0% | 9.2% | NA |
| Education, health & social services | 7.4% | 16.8% | NA |
| Arts, recreation, lodging & food services | 2.9% | 11.0% | NA |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

#### 6.4.7.2 Brielle, New Jersey

Brielle is located in the southernmost region of Monmouth County, and borders the Manasquan River of central New Jersey. For the purposes of this document, the community will include Brielle/Point Pleasant. This is an area where recreational fishermen are as traditional as commercial fishermen, and recreational fishermen have been distressed about the management of tunas and sharks.

Brielle experienced a modest population decrease between 2000 and 2010 from 4,893 to 4,744 individuals (Table 6.15). The percent of males and females remained virtually unchanged between 2000 and 2010 with 49 percent of the population comprised of males and 51 percent females. The age distribution of the Brielle population remained virtually the same for the past decade, but the median age trended slightly older at 44.8 years. The age distribution is fairly even between those under 20 years old, 20-44 years old, and 45-64 years old. Those over 65 years old are the smallest age group, comprising approximately 17 percent of the total population. Whites accounted for over 94 percent of the population in 2010, increasing slightly from 2000. The number of total households decreased slightly, while the average household size increased slightly (Table 6.15).

**Table 6.15 Demographic Profile of Brielle, New Jersey**. Source: U.S. Census, 1990, 2000, and 2010.

| Brielle, NJ | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **4,406** | **4,893** | **4,744** |
| **Sex** | | | |
| Male | 48.2% | 47.4% | 49.3% |
| Female | 51.8% | 52.6% | 50.7% |
| **Age** | | | |

| Brielle, NJ | 1990 | 2000 | 2010 |
|---|---|---|---|
| Median Age | 42.7 | 42.9 | 44.9 |
| <20 | 23.2% | 25.2% | 28.0% |
| 20-44 | 28.6% | 27.9%` | 22.3% |
| 45-64 | 29.1% | 29.1% | 32.8% |
| >65 | 19.2% | 17.8% | 16.8% |
| **Race** | | | |
| White | 93.8% | 93.1% | 94.6% |
| Black or African American | 5.4% | 3.5% | 2.5% |
| American Indian & Alaska Native | 0.8% | 0.1% | 0.1% |
| Asian | 0.0% | 0.7% | 0.9% |
| Other | 0.0% | 2.7% | 1.9% |
| **Household** | | | |
| Total | 1,735 | 1,938 | 1,805 |
| Family households | 74.6% | 73.0% | 74.0% |
| Nonfamily households | 25.4% | 27.0% | 26.0% |
| Average household size | 2.54 | 2.52 | 2.64 |
| Average family size | 3.00 | 3.00 | 3.13 |
| **Housing Occupancy** | | | |
| Total housing units | 1,986 | 2,123 | 2,034 |
| Vacant housing units | 12.6% | 8.7% | 11.3% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 82.3% | 83.4% | 87.8% |
| Renter-occupied housing units | 17.7% | 16.6% | 12.2% |
| Education: | | | |
| High school graduates (25 years or older) | 91.3% | 94.8% | NA |
| Employment: | | | |
| Labor force (16 years and over) | 58.6% | 59.4% | NA |
| Unemployment Rate | 4.4% | 2.1% | NA |
| Median Household Income | $53,485 | $68,368 | NA |
| Individuals below the poverty line* | 2.3% | 3.9% | NA |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 1.6% | 0.7% | NA |
| Construction | 5.9% | 7.4% | NA |
| Manufacturing | 11.7% | 8.4% | NA |
| Wholesale trade | 6.7% | 2.5% | NA |
| Retail trade | 21.4% | 7.3% | NA |
| Education, health & social services | 18.7% | 23.1% | NA |
| Arts, recreation, lodging & food services | 2.1% | 7.8% | NA |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.7.3 Cape May, New Jersey

Commercial fishing is the second largest industry behind seasonal tourism in Cape May (MRAG Americas, Inc., 2008). It is the largest commercial fishing port in New Jersey, and one of the largest on the East Coast (MRAG Americas, Inc., 2008). The 2010 U.S. census recorded the Cape May population at 3,607 residents, which is 10.5 percent lower than the 2000 population (Table 6.16). The ratio of males to females flipped from a majority of females to a majority of males in the population between 2000 and 2010, but was close to 50/50 split in both Censuses. The population also seems to be getting older, as there was a decrease of approximately 4 percent in the number of individuals under the age of 18 in 2010 (Table 6.16).

**Table 6.16 Demographic Profile of Cape May, New Jersey.** Source: U.S. Census, 1990, 2000, and 2010

| Cape May, NJ | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 4,668 | 4,034 | 3,607 |
| **Gender Ratio M/F (Number)** | | 1,987/2,047 | 1,845 / 1,762 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | | 16.3 | 12.8 |
| 18 to 64 years of age | | 55.2 | 59.6 |
| 65 years and over | 25 | 28.5 | 27.6 |
| **Ethnicity or Race (Percent)** | | | |
| White | | 91.3 | 89.0 |
| Black or African American | | 5.3 | 4.9 |
| American Indian and Alaskan Native | | 0.2 | 0.3 |
| Asian | | 0.4 | 0.7 |
| Native Hawaiian and other Pacific Islander | | <0.1 | 0.1 |
| Some other race | | 1.3 | 2.3 |
| Two or more races | | 1.5 | 2.7 |
| Hispanic or Latino (any race) | | 3.8 | 8.6 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 3.8 | 2.6 | N/A |
| Percent high school graduate or higher | 84.4 | 87.6 | N/A |
| Percent with a Bachelor’s degree or higher | 25.2 | 30.8 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |
| Percent who speak a language other than English at home | 4.7 | 8.9 | N/A |
| And Percent who speak English less than very well | 0.7 | 2.9 | N/A |
| **Household income (Median $)** | | 33,462 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 9.1 | N/A |
| **Percent female headed household** | | 7 | N/A |
| **Home Ownership (Percent)** | | | |
| Owner occupied | | 56.8 | 54.3 |
| Renter occupied | | 43.2 | 45.7 |
| **Value Owner-occupied Housing (Median $)** | | 212,900 | N/A |
| **Monthly Contract Rent (Median $)** | | 564 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | |
| Percent in the labor force | 63.8 | 57.5 | N/A |
| Percent of civilian labor force unemployed | 2.7 | 3.8 | N/A |
| **Occupation (Percent in workforce)** | | | |

| Cape May, NJ | 1990 | 2000 | 2010 |
|---|---|---|---|
| Management, professional, and related occupations | 40.9 | 33.7 | N/A |
| Service occupations | 16.9 | 21 | N/A |
| Sales and office occupations | 26 | 33.3 | N/A |
| Farming, fishing, and forestry occupations | 2.1 | 0.9 | N/A |
| Construction, extraction, and maintenance occupations | | 5.9 | N/A |
| Production, transportation, and material moving occupations | | 5.2 | N/A |
| **Industry (Percent in workforce)** | | | |
| Agriculture, forestry, fishing, hunting and mining | 1.7 | 0.4 | N/A |
| Manufacturing | 5.5 | 2.4 | N/A |
| Percent government workers | 26.5 | 20.2 | N/A |

### 6.4.8 Delaware

Between 2000 and 2010, Delaware's population increased by almost 15 percent (Table 6.17) and the percentage of individuals 25 years and older with a high school diploma increased by about five percent. The percentage of employed individuals has declined slightly, and both the unemployment rate and individuals below the poverty line increased over the past decade. As with many of the other states, employment in the farming, fishing, forestry, and mining industries has remained steady, whereas the education, health, and social services industries provided the greatest employment opportunities in 2010.

**Table 6.17 Delaware Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| Delaware | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **666,168** | **783,600** | **897,934** |
| **Education:** | | | |
| High school graduates (25 years or older) | 77.50% | 82.60% | 87.7% |
| **Employment:** | | | |
| Labor force (16 years and over) | 68.3% | 65.7% | 63.6% |
| Unemployment Rate | 4.0% | 5.2% | 9.3% |
| Median Household Income | $34,875 | $47,381 | $55,847 |
| Individuals below the poverty line* | 8.7% | 9.2% | 11.8% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 2.3% | 1.1% | 1.1% |
| Construction | 8.0% | 7.4% | 6.9% |
| Manufacturing | 18.8% | 13.2% | 9.0% |
| Wholesale trade | 3.5% | 2.6% | 2.2% |
| Retail | 2.1% | 11.6% | 12.0% |
| Education, health & social services | 23.0% | 19.4% | 23.6% |
| Arts, recreation, lodging & food services | 10.4% | 7.7% | 8.7% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

Thirty-one commercial tuna permit holders lived in Delaware during 2011 (Table 6.51). There was one HMS dealer permit issued in Delaware during 2011 (Table 6.52). There were no commercial shark or swordfish permits issued in the state of Delaware during 2011 (Table 6.53 and Table 6.54).

The recreational fishery in Delaware Bay and offshore is popular because of the diversity of species and habitats available to anglers. In 2010, an estimated total of 293,000 anglers made 920,000 recreational trips in Delaware (NMFS 2011b). In 2009, recreational fishing trips generated over approximately $57 million in angler trip expenses and $211 million in durable equipment expenditures, and the marine recreational fishing service sector provided 1,270 jobs in Delaware (NMFS, 2011a). In 2011, Delaware was home to 865 HMS angling permit holders (Table 6.49). One hundred and eight HMS charter/headboats permits were issued to Delaware addresses in 2011 (Table 6.50). To date, no HMS community profiles have been developed for any Delaware communities due to the relatively low level of involvement with HMS fisheries.

### 6.4.9 Maryland

Maryland's population increased from 5.3 million people in 2000 to 5.8 million people in 2010 (Table 6.18). The percentage of individuals 25 years and older with a high school diploma and/or some graduate level degree has increased by 4.3 percent. The percentage of employed individuals, ages 16 and older, has declined slightly. The unemployment rate has doubled and the percentage of individuals below the poverty line has increased slightly over the past decade. As with many of the other states, employment in the farming, fishing, forestry, and mining industries has declined, whereas the education, health, and social services and the arts, recreation, lodging and food services industries provided slightly more employment opportunities in 2010.

As of October 2011, in Maryland, there are 38 commercial tuna permit holders (Table 6.51). In addition, five shark permit holders and four swordfish permit holders reside in Maryland (Table 6.53 and Table 6.54). To support these HMS fisheries, there are 15 dealers permitted for tuna, sharks and swordfish (Table 6.52).

**Table 6.18 Maryland Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| Maryland | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **4,781,468** | **5,296,486** | **5,773,552** |
| **Education:** | | | |
| High school graduates (25 years or older) | 78.4% | 83.8% | 88.1% |
| **Employment:** | | | |
| Labor force (16 years and over) | 70.6% | 67.8% | 69.5% |
| Unemployment Rate | 4.3% | 4.7% | 8.8% |
| Median Household Income | $39,386 | $52,868 | $68,854 |
| Individuals below the poverty line* | 8.3% | 8.5% | 9.9% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 1.7% | 0.6% | 0.5% |
| Construction | 7.9% | 6.9% | 6.8% |
| Wholesale trade | 3.8% | 2.8% | 2.0% |
| Retail | 15.0% | 10.5% | 9.6% |
| Manufacturing | 10.3% | 7.7% | 5.3% |
| Education, health & social services | 25.8% | 20.6% | 23.3% |
| Arts, recreation, lodging & food services | 1.2% | 6.8% | 7.8% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

In 2009, 844,000 anglers took a total of 2,811,000 recreational fishing trips in the marine waters off of Maryland, with approximately 37 percent of these anglers originating from out-of-state (NMFS 2011a). Total recreational fishing trip expenditures in 2009 are estimated at $792 million by the NMFS Office of Science and Technology (NMFS 2011a). The recreational fishing sector provided 5,714 jobs and $256 million in income from an estimated $770 million in sales. As of October 2011, Maryland was home to 1,187 HMS angling permit holders (Table 6.48)

The recreational fishery for sharks is largely offshore, although sharks are found in the lower reaches of the Chesapeake Bay. The offshore fishery takes place at least 15 miles out to sea and charterboats often run 60 to 70 miles offshore to areas of deep water. In Maryland, the number of HMS charter/headboat permit holders decreased from 151 in 2010 to 125 in 2011 (Table 6.50). Most of these vessels are registered in Ocean City, which is known as the “White Marlin Capital of the World”. This hotspot for recreational fishing industry is home to the Annual White Marlin Open, which brings close to $1 million as the top prize for the tournament. Other communities involved with the HMS charter/headboat industry include Annapolis, Baltimore, Cambridge, Chesapeake City, Chester, Conowingo, Edgewater, Glen Burnie, Ocean Pines, Pasadena, Pocomoke, Salisbury, Severna, St. Michaels, Stevensville, Tilghman, White Hall, and White Haven (MRAG Americas, Inc., 2008).

#### 6.4.9.1 Ocean City, Maryland

Ocean City is a major tourist destination and is generally considered the only substantial fishing community left in Maryland. There is a large charter boat presence at a variety of marinas, while most of the commercial activity takes place in West Ocean City on the mainland (MRAG Americas, Inc., 2008). Known as the “white marlin capitol of the world”, Ocean City is a popular destination for recreational anglers targeting HMS. Recreational anglers also target tunas and sharks, and there are a variety of annual tournaments that target white marlin, tunas, and sharks (MRAG Americas, Inc., 2008). Ocean City, MD ranked within the top 50 ports in terms of quantity of seafood landed in the United States in 2010, when 16.7 million pounds of seafood were landed. Between 2009 and 2010, total seafood landings within this port doubled (NMFS 2011b).

The 2010 census recorded the Ocean City population at 7,102, which was slightly lower than the 2000 census (Table 6.19). Changes in the population age structure were most pronounced through a decline in the proportion of individuals under 18 years of age. The population is largely Caucasian; however there was a sizable increase in the proportion of Hispanic and Latino individuals in the population. The percentage of owner-occupied households has not changed significantly between 2000 and 2010.

**Table 6.19 Demographic Profile of Ocean City, Maryland.** Source: U.S. Census, 1990, 2000, and 2010

| Ocean City, MD | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| **Total population** | | 5,074 | 7,173 | 7,102 |
| **Gender Ratio M/F (Number)** | | 2415 / 2659 | 3,680 / 3,493 | 3,652 / 3,450 |
| **Age (Percent of total population)** | | | | |
| | Under 18 years of age | | 21.3 | 9.1 |
| | 18 to 64 years of age | | 63.5 | 61.3 |
| | 65 years and over | | 25.2 | 29.6 |
| **Ethnicity or Race (Percent)** | | | | |
| | White | 4852 | 95.3 | 92.2 |
| | Black or African American | 143 | 2.5 | 2.7 |
| | American Indian and Alaskan Native | 33 | 0.1 | 0.2 |
| | Asian | 46 | 0.7 | 1.3 |
| | Native Hawaiian and other Pacific Islander | | <0.1 | 0.0 |
| | Some other race | 0 | 0.3 | 2.2 |
| | Two or more races | | 0.9 | 1.4 |
| | Hispanic or Latino (any race) | | 1.2 | 5.9 |
| **Educational Attainment ( Population 25 and over)** | | | | |
| | Percent with less than 9th grade | 4.8 | 2.6 | N/A |
| | Percent high school graduate or higher | 61 | 87.1 | N/A |
| | Percent with a Bachelor's degree or higher | 13.4 | 28 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | | |
| | Percent who speak a language other than English at home | 4.1 | 7 | N/A |
| | And Percent who speak English less than very well | | 2.9 | N/A |
| **Household income (Median $)** | | 33350 | 35,772 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | | 8.4 | N/A |
| **Percent female headed household** | | 3.7 | 6.4 | N/A |
| **Home Ownership (Percent)** | | | | |
| | Owner occupied | | 67.4 | 68.4 |
| | Renter occupied | | 32.6 | 31.6 |
| **Value Owner-occupied Housing (Median $)** | | 136100 | 152,200 | N/A |
| **Monthly Contract Rent (Median $)** | | 517 | 640 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | | |
| | Percent in the labor force | | 60.4 | N/A |
| | Percent of civilian labor force unemployed | | 9.3 | N/A |
| **Occupation (Percent in workforce)** | | | | |
| | Management, professional, and related occupations | | 31.6 | N/A |
| | Service occupations | 18 | 24.1 | N/A |
| | Sales and office occupations | | 29.2 | N/A |
| | Farming, fishing, and forestry occupations | | 0.3 | N/A |
| | Construction, extraction, and maintenance occupations | | 9.5 | N/A |
| | Production, transportation, and material moving occupations | | 5.2 | N/A |
| **Industry (Percent in workforce)** | | | | |
| | Agriculture, forestry, fishing, hunting and mining | | 0.5 | N/A |
| | Manufacturing | | 2.4 | N/A |
| | Percent government workers | | 11.3 | N/A |

### 6.4.10 Virginia

Virginia's population increased from 7.1 million people in 2000 to 8.0 million people in 2010 (Table 6.20). The percentage of individuals 25 years and older with a high school diploma has increased by five percent. The percentage of employed individuals, ages 16 and older, was approximately the same between 2000 and 2010; both the unemployment rate and individuals identified below the poverty line have increased over the past decade. Employment in the farming, fishing, forestry, and mining industries has declined slightly, whereas the education, health, and social services industries provided increased employment opportunities in 2010.

The Virginia seafood industry provided 19,064 jobs in 2010 in the harvester, processor/dealer, importer, wholesaler/distributor, and retail sectors, providing over $168 million in income and $380 million in sales. In 2010, the Hampton Roads port ranked seventh and the Reedville port ranked twenty-fourth in the nation with respect to value of commercial fishing landings (NMFS 2011b). The Reedville port ranked second in poundage of commercial fishing landings, largely due to a prolific menhaden fishery (NMFS 2011b); 426.1 million pounds of seafood valued at $34.2 million were landed in 2010.

Virginia has 43 commercial tuna permit holders (Table 6.51). The Virginia commercial HMS fisheries have 26 licensed dealers, and two shark and one swordfish permit holder live in the Commonwealth of Virginia (Table 6.52, Table 6.53, and Table 6.54). The commercial landings of tuna, sharks, and swordfish are not as significant as the total commercial landings coming into the state; therefore, HMS fisheries are not significantly tied to any particular Virginia community and no HMS-specific community profiles have been developed for Virginia.

In 2010, the Virginia recreational saltwater fishery attracted 907,000 anglers, of whom approximately 34 percent were from out-of-state (NMFS, 2011b). Collectively, these anglers made 2,984,000 recreational fishing trips in 2009. As of October 2011, Virginia was home to 949 HMS angling category permit holders (Table 6.49). It is estimated that these saltwater anglers generated almost $580 million in retail sales in Virginia in 2009 and their activity provided 5,167 jobs in the marine recreational fishing industry (NMFS 2011a). Principal species sought in the 2010 recreational fishery included black seabass, cobia, croaker, spot, spotted sea trout, weakfish, red drum, striped bass, flounder and tautog.

The Virginia recreational fishery for sharks is similar to that of Delaware and Maryland. There is a very small directed shark fishery in the private boat sector, but most sharks are taken incidentally to the catch of other species. There are 101 charter/headboats in Virginia with HMS permits as of October 2011 (Table 6.50). The communities with the greatest number of charterboats with HMS permits in 2006 were Virginia Beach, Norfolk, Chincoteague, Wachapreague, and Portsmouth. The principal shark fishing season for recreational anglers is June through October.

**Table 6.20 Virginia Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| **Virginia** | **1990** | **2000** | **2010** |
|---|---|---|---|
| **Population:** | **6,187,358** | **7,078,515** | **8,001,024** |
| **Education:** | | | |
| High school graduates (25 years or older) | 75.2% | 81.5% | 86.5% |
| **Employment:** | | | |
| Labor force (16 years and over) | 68.9% | 66.8% | 66.7% |
| Unemployment Rate | 4.5% | 4.2% | 7.9% |

| Virginia | 1990 | 2000 | 2010 |
|---|---|---|---|
| Median Household Income | $33,328 | $46,677 | $60,674 |
| Individuals below the poverty line* | 10.2% | 9.6% | 11.1% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 2.6% | 1.3% | 1.1% |
| Construction | 7.8% | 7.3% | 6.6% |
| Wholesale trade | 3.4% | 2.7% | 2.0% |
| Retail | 16.1% | 11.4% | 10.8% |
| Manufacturing | 15.1% | 11.3% | 7.7% |
| Education, health & social services | 23.2% | 18.3% | 21.1% |
| Arts, recreation, lodging & food services | 1.1% | 7.2% | 8.5% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.11 North Carolina

Between 2000 and 2010 the population in North Carolina increased by nearly 16 percent (Table 6.21). The percentage of individuals 25 years and older with a high school diploma and/or some graduate level degree has increased by 5 percent. The percentage of employed individuals, ages 16 and older, has remained roughly the same. The unemployment rate increased by 3.7 percent and the individuals below the poverty line increased slightly over the past decade. As with many of the other states, employment in the farming, fishing, forestry, and mining industries has declined, but employment within the education, health and social services sectors increased by 2.4 percent (Table 6.21).

North Carolina's commercial fishery has a distinctive split between the North and South with Cape Hatteras as the dividing point as a result of the local oceanographic conditions. The Gulf Stream, as it skirts the Cape Hatteras shoals, is twenty miles offshore. This is the closest it approaches land after leaving the Cape Canaveral area. The cold Labrador Current influences the waters North of Cape Hatteras. The area off Dare and Hyde Counties, North Carolina is where these two water bodies mix and provides very rich fishing grounds. South and West of Cape Hatteras, the coast curves away to the West forming the relatively shallow Carolina Bight. Vessels operating in this area have further to travel from shore to the Gulf Stream and do not have the same diversity and richness found in the fisheries immediately to the North of Cape Hatteras.

Commercial and recreational fishing is important to the North Carolina economy. North Carolina has the fifth largest number of HMS angling permit holders with 1,628 permits issued to its residents in 2011 (Table 6.49). In 2009, NMFS estimated that 1,681,000 anglers fished in North Carolina's marine waters making a total of 5,698,000 recreational fishing trips (NMFS, 2011a). Of these fishermen, approximately 58 percent were from out-of-state and approximately 15 percent were from non-coastal counties in North Carolina (NMFS, 2011a). Marine recreational fishing is thus an important element in the life and economies of coastal counties. NMFS (2011a) found that in 2009, total expenditures by marine recreational fishermen in North Carolina exceeded $466 million, and the North Carolina marine recreational industry provided 5,035 jobs.

**Table 6.21 Demographic Profile of North Carolina.** Source: U.S. Census, 1990, 2000, and 2010

| North Carolina | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **6,628,637** | **8,049,313** | **9,535,483** |
| **Education:** | | | |
| High school graduates (25 years or older) | 70.0% | 78.1% | 84.7% |
| **Employment:** | | | |
| Labor force (16 years and over) | 67.6% | 65.7% | 64.0% |
| Unemployment Rate | 4.8% | 5.3% | 12.7% |
| Median Household Income | $26,647 | $39,184 | $43,326 |
| Individuals below the poverty line* | 13.0% | 12.3% | 17.5% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 2.9% | 1.6% | 1.4% |
| Construction | 7.0% | 8.2% | 6.9% |
| Wholesale trade | 4.2% | 3.4% | 3.0% |
| Retail | 16.1% | 11.5% | 12.0% |
| Manufacturing | 26.7% | 19.7% | 12.4% |
| Education, health & social services | 20.3% | 19.2% | 23.4% |
| Arts, recreation, lodging & food services | 1.0% | 6.9% | 9.2% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

The marine recreational fisheries in North Carolina fall into three groups by species, gear and access. First, the recreational fishery in the Sounds and behind the barrier islands is typically a small, open boat fishery for flounder, croaker and drum, spot and sea trout. Striped bass (rockfish) forms an important fishery in Albemarle Sound and around the northern inlets. Second, the inshore and ocean beach fisheries target the same species but also include striped bass, bluefish, and king and Spanish mackerel. These inshore fisheries require larger boats and heavier gear, but the boats operate within sight of land. Third, the offshore recreational fisheries target billfish, tunas (bluefin, yellowfin and blackfin), mackerels, dolphin fish (mahi mahi), wahoo, and, in the southwestern area, shark. In the area north of Hatteras and around Cape Lookout, recreational fishermen view sharks as a nuisance in their pursuit of other fish, particularly tuna, marlin, and swordfish. Typically, the boats are 22 feet long or longer, have electronic navigation systems, and are powered by an inboard engine. Generally, heavy tackle is used, and fighting chairs are usually installed for the billfish and giant tuna fishing. The offshore boats normally fish 15 to 60 miles offshore. North Carolina marine recreational fisheries are seasonal, but fishing is year-round as fish species move through the area. The North Carolina marine recreational industry provided over 17, 221 jobs in the for-hire, private boat, shore-based and supporting industry sectors, generated over 1.785 billion dollars in sales, and provided over $555 million in income to the individuals employed in the recreational fishery or in supporting sectors (NMFS, 2011a).

As of October 2011, North Carolina had the fourth largest fleet of charter/headboats holding HMS permits with 420 vessels, behind Massachusetts, Florida, and New Jersey (Table 6.50). In addition to recreational and for-hire industries, North Carolina residents hold the third largest number of commercial tuna permits by state with 424 permitted vessels as of October 2011 (Table 6.50). In 2011, 27 North Carolina residents held shark permits and 17 residents held swordfish permits (Table 6.53 and Table 6.54). There are 63 dealers authorized to purchase and sell tunas, sharks, and swordfish in the area, ranking North Carolina as fifth in the number of HMS dealers behind Florida, Massachusetts, New York, and New Jersey (Table 6.52). As of 2006, there were approximately 78 fish houses (locations where seafood are landed and distributed into the market) in operation in North Carolina (Garrity-Blake and Nash, 2007).

#### 6.4.11.1 Atlantic Beach, North Carolina

Fishing effort for HMS in Atlantic Beach is primarily recreational in nature, as no commercial HMS vessels homeport in the area (MRAG Americas, Inc., 2008). There are various charter boat operations that fish for HMS, which cater to seasonal tourists. They mainly target bluefin tuna from November–February, and yellowfin tuna and marlin the rest of the year (MRAG Americas, Inc., 2008). Census data for the year 2010 recorded 1,495 residents in Atlantic Beach, with an increasing trend in people aged 65 and up (Table 6.22). This increasing trend in the senior population may indicate that the area is becoming a destination for retirees with disposable incomes, which may have led to recent growth in the charter fishing sector and may bode well for the charter fishing industry in the future (MRAG Americas, Inc., 2008).

**Table 6.22 Demographic Profile of Atlantic Beach, North Carolina.** Source: U.S. Census, 1990, 2000, and 2010

| Atlantic Beach, NC | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 1,938 | 1,781 | 1,495 |
| **Gender Ratio M/F (Number)** | | 941 / 840 | 800 / 695 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | | 9.8 | 10.2 |
| 18 to 64 years of age | | 72 | 70.1 |
| 65 years and over | 12.5 | 18.2 | 19.7 |
| **Ethnicity or Race (Percent)** | | | |
| White | | 98 | 94.4 |
| Black or African American | | 0.6 | 0.7 |
| American Indian and Alaskan Native | | 0.2 | 0.5 |
| Asian | | 0.7 | 0.9 |
| Native Hawaiian and other Pacific Islander | | <0.1 | 0.1 |
| Some other race | | <0.1 | 1.1 |
| Two or more races | | 0.4 | 2.1 |
| Hispanic or Latino (any race) | | 0.7 | 1.5 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 3 | 2.8 | N/A |
| Percent high school graduate or higher | 85.1 | 90 | N/A |
| Percent with a Bachelor's degree or higher | 24.1 | 30.7 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |
| Percent who speak a language other than English at home | 2.6 | 3.9 | N/A |
| And Percent who speak English less than very well | 1 | 1 | N/A |
| **Household income (Median $)** | | 38,312 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 7.3 | N/A |
| **Percent female headed household** | | 5 | N/A |
| **Home Ownership (Percent)** | | | |
| Owner occupied | | 64.7 | 51.2 |
| Renter occupied | | 35.3 | 48.8 |

| Atlantic Beach, NC | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| **Value Owner-occupied Housing (Median $)** | | | 207,800 | N/A |
| **Monthly Contract Rent (Median $)** | | | 582 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | | |
| | Percent in the labor force | 69.8 | 63.3 | N/A |
| | Percent of civilian labor force unemployed | 2.9 | 3.2 | N/A |
| **Occupation (Percent in workforce)** | | | | |
| | Management, professional, and related occupations | 27 | 36.6 | N/A |
| | Service occupations | 11.1 | 8.8 | N/A |
| | Sales and office occupations | 23.7 | 35.4 | N/A |
| | Farming, fishing, and forestry occupations | 2.6 | 0.5 | N/A |
| | Construction, extraction, and maintenance occupations | | 14.8 | N/A |
| | Production, transportation, and material moving occupations | | 3.8 | N/A |
| **Industry (Percent in workforce)** | | | | |
| | Agriculture, forestry, fishing, hunting and mining | 2.7 | 0.7 | N/A |
| | Manufacturing | 7.6 | 2.2 | N/A |
| | Percent government workers | 17.6 | 17.6 | N/A |

### 6.4.11.1 Beaufort, North Carolina

Beaufort is located near Morehead City and Atlantic Beach on the North Carolina outer banks, and is home to both commercial and recreational HMS fishing activities. Commercial vessels can be found on Radio Island, which is located between Beaufort and Morehead City, along with three fish house and other commercial docking facilities in Beaufort. Charter fishing is becoming increasingly popular, as the industry is fueled by seasonal visitors and increasing numbers of retirees in the area (MRAG Americas, Inc., 2008). The area is also home to recreational fishing tournaments that target HMS. Census data for the year 2010 recorded 4,039 residents in Beaufort, an increase in population from 2000 (Table 6.23). The racial composition of the community has not changed significantly over the last decade.

**Table 6.23 Demographic Profile of Beaufort, North Carolina.** Source: U.S. Census, 1990, 2000, and 2010

| Beaufort, NC | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| **Total population** | | 3,808 | 3,771 | 4,039 |
| **Gender Ratio M/F (Number)** | | | 1,755 / 2,016 | 1,916 / 2,123 |
| **Age (Percent of total population)** | | | | |
| | Under 18 years of age | | 18.3 | 16.1 |
| | 18 to 64 years of age | | 61.9 | 63.2 |
| | 65 years and over | 19.1 | 19.8 | 20.7 |
| **Ethnicity or Race (Percent)** | | | | |
| | White | | 75.9 | 79.0 |
| | Black or African American | | 20 | 17.0 |
| | American Indian and Alaskan Native | | 0.1 | 0.2 |
| | Asian | | 0.4 | 0.7 |
| | Native Hawaiian and other Pacific Islander | | 0.1 | 0.0 |
| | Some other race | | 2.4 | 0.6 |
| | Two or more races | | 1.2 | 2.4 |
| | Hispanic or Latino (any race) | | 3.8 | 2.6 |
| **Educational Attainment ( Population 25 and over)** | | | | |
| | Percent with less than 9th grade | 45 | 6.2 | N/A |
| | Percent high school graduate or higher | 85.1 | 78.9 | N/A |

| Beaufort, NC | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| | Percent with a Bachelor's degree or higher | 24.1 | 21.7 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | | |
| | Percent who speak a language other than English at home | 2.6 | 7 | N/A |
| | And Percent who speak English less than very well | 1.1 | 2.7 | N/A |
| **Household income (Median $)** | | 21,532 | 28,763 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 17.4 | 16.6 | N/A |
| **Percent female headed household** | | 23.8 | 15.3 | N/A |
| **Home Ownership (Percent)** | | | | |
| | Owner occupied | | 56.1 | 47.8 |
| | Renter occupied | | 43.9 | 52.2 |
| **Value Owner-occupied Housing (Median $)** | | | 119,200 | N/A |
| **Monthly Contract Rent (Median $)** | | 373 | 502 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | | |
| | Percent in the labor force | 60 | 56.3 | N/A |
| | Percent of civilian labor force unemployed | 8.1 | 4.7 | N/A |
| **Occupation (Percent in workforce)** | | | | |
| | Management, professional, and related occupations | 22 | 26.9 | N/A |
| | Service occupations | 14.1 | 18.6 | N/A |
| | Sales and office occupations | 15.8 | 28.7 | N/A |
| | Farming, fishing, and forestry occupations | 0.9 | 1.2 | N/A |
| | Construction, extraction, and maintenance occupations | | 14.9 | N/A |
| | Production, transportation, and material moving occupations | | 9.7 | N/A |
| **Industry (Percent in workforce)** | | | | |
| | Agriculture, forestry, fishing, hunting and mining | 3 | 2.4 | N/A |
| | Manufacturing | 10.9 | 7.6 | N/A |
| | Percent government workers | 25.3 | 13.5 | N/A |

### 6.4.11.2 Hatteras, North Carolina

Hatteras Township is located on the Outer Banks of North Carolina, and includes the villages of Avon, Buxton, Frisco and Hatteras. Hatteras Village is a rural community at the southern end of Hatteras Island on North Carolina's Outer Banks. Hatteras Island is a dynamic barrier island, bordered by the Atlantic on the East and Pamlico Sound on the West. In the 18$^{th}$ century, Hatteras established itself as a seaport community, where activities included whaling and exporting/importing. Since World War II, the economy of the Hatteras community has depended on charter and commercial fishing (Wilson *et al*., 1998).

According to the 2000 and 2010 Census data, the population increased from 2,596 in 2000 to 2,921 in 2010 (Table 6.24). The number of males and females were approximately equal in 2000 and 2010. The age structure of the population has changed; the median age of the population increased from 42 years to 44 years, and the greatest percentage of the population is between 45 to 64 years of age. However, the number of people younger than age 20 has increased, and the number of people older than age 65 decreased between 2000 and 2010. The racial composition of the township has not changed significantly between the 2000 and 2010 censuses with the majority of the township predominantly of Caucasian and European ancestry. There has been a very slight increase in the percentages of the population that are African American and American Indian/Alaska Native. The number of households has increased from 1,171 in 2000 to 1,259 in 2010, while the average size of households has increased from 2.2 persons to 2.32 persons per household. These trends are consistent with an aging and declining population as “empty-nesters” and retirement couples and widows/widowers make up a higher proportion of households. In 2000, the farming, fishing, forestry, and mining industries employed about 34 percent of the Hatteras population, a significant increase from 1990, and the greatest sources of employment (Table 6.24). Employment and industry statistics for 2010 are not yet available through the U.S. Census webpage, and will be updated in future versions of the SAFE report.

**Table 6.24 Demographic Profile of Hatteras, North Carolina.** Source: U.S. Census, 1990, 2000, and 2010

| Hatteras, NC | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **2,675** | **2,596** | **2,921** |
| **Sex** | | | |
| Male | 51.6% | 49.2% | 50.8% |
| Female | 48.4% | 50.8% | 49.2% |
| **Age** | | | |
| Median Age | 35.1 | 42.1 | 44 |
| <20 | 23.9% | 20.4% | 21.77% |
| 20-44 | 39.6% | 33.7% | 29.8% |
| 45-64 | 25.4% | 39.6% | 33.8% |
| >65 | 11.1% | 17.2% | 14.7% |
| **Race** | | | |
| White | 98.8% | 97.1% | 96.6% |
| Black or African American | 0.4% | 0.0% | 0.3% |
| American Indian & Alaska Native | 0.8% | 0.0% | 0.1% |
| Asian | 0.3% | 0.0% | 0.0% |
| Other | 0.9% | 2.3% | 3.0% |
| **Household** | | | |
| Total | 1,078 | 1,171 | 1,259 |
| Family households | 69.7% | 78.1% | 65.0% |
| Nonfamily households | 30.3% | 21.4% | 35.0% |
| Average household size | 2.46 | 2.2 | 2.32 |
| Average family size | 2.97 | 2.73 | 2.78 |
| **Housing Occupancy** | | | |
| Total housing units | 1,919 | 2,156 | 2,824 |
| Vacant housing units | 43.4% | 45.7% | 55.4% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 72.3% | 79.1% | 70.3% |
| Renter-occupied housing units | 27.7% | 20.9% | 29.7% |
| Education: | | | |
| High school graduates (25 years or older) | 74.4% | 68.1% | N/A |
| Employment: | | | |
| Labor force (16 years and over) | 67.3% | 83.1% | 64.4% |
| Unemployment Rate | 2.8% | 4.6% | N/A |

| | | | |
|---|---|---|---|
| Median Household Income | $24,667 | $39,881 | NA |
| Individuals below the poverty line* | 6.4% | 4.7% | NA |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 6.4% | 10.4% | NA |
| Construction | 16.2% | 15.5% | NA |
| Manufacturing | 3.4% | 2.4% | NA |
| Wholesale trade | 2.7% | 4.0% | NA |
| Retail trade | 26.1% | 14.9% | NA |
| Education, health & social services | 11.3% | 14.0% | NA |
| Arts, recreation, lodging & food services | 1.2% | 13.4% | NA |

#### 6.4.11.3 Morehead City, North Carolina

Although there are commercial docks in the area, recreational fishing is more prominent in Morehead City, similar to fishing activities in neighboring Atlantic Beach and Beaufort. The recreational fishing industry has grown as the town's economy has become more reliant on tourism in recent years (MRAG Americas, Inc., 2008). Charter vessels target HMS seasonally, similarly to Atlantic Beach and Beaufort, and there are also large billfish tournaments held in the area from June-August (MRAG Americas, Inc., 2008). The population in Morehead City increased 21.4 percent between 1990 and 2000, and by 11.2 percent between 2000 and 2010. The population of Beaufort is predominantly Caucasian, although a small overall percentage of the overall population. The proportion of Asian individuals has doubled and the proportion of Hispanic or Latino individuals in the population has tripled over the past decade (Table 6.25).

**Table 6.25 Demographic Profile of Morehead City, North Carolina.** Source: U.S. Census, 1990, 2000, and 2010

| Morehead City, NC | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 6,046 | 7,691 | 8,661 |
| **Gender Ratio M/F (Number)** | | 3,507 / 4,184 | 4,029 / 4,632 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | | 20.2 | 19.4 |
| 18 to 64 years of age | | 59 | 61.3 |
| 65 years and over | 16.7 | 20.8 | 19.3 |
| **Ethnicity or Race (Percent)** | | | |
| White | | 81.7 | 82.0 |
| Black or African American | | 14 | 10.7 |
| American Indian and Alaskan Native | | 0.7 | 0.5 |
| Asian | | 0.8 | 1.6 |
| Native Hawaiian and other Pacific Islander | | <0.1 | 0.2 |
| Some other race | | 1.1 | 2.4 |
| Two or more races | | 1.7 | 2.5 |
| Hispanic or Latino (any race) | | 2.3 | 6.9 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 11.9 | 8.1 | N/A |
| Percent high school graduate or higher | 70.6 | 80.1 | N/A |
| Percent with a Bachelor's degree or higher | 13.2 | 20.8 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |

| Morehead City, NC | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| | Percent who speak a language other than English at home | 3.9 | 4.7 | N/A |
| | And Percent who speak English less than very well | 1.4 | 1.4 | N/A |
| **Household income (Median $)** | | 20,041 | 28,737 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 19.1 | 14.6 | N/A |
| **Percent female headed household** | | 25.4 | 13.7 | N/A |
| **Home Ownership (Percent)** | | | | |
| | Owner occupied | | 55.5 | 50.2 |
| | Renter occupied | | 44.5 | 49.8 |
| **Value Owner-occupied Housing (Median $)** | | | 106,400 | N/A |
| **Monthly Contract Rent (Median $)** | | 376 | 507 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | | |
| | Percent in the labor force | 59.4 | 60.2 | N/A |
| | Percent of civilian labor force unemployed | 3.6 | 4.6 | N/A |
| **Occupation (Percent in workforce)** | | | | |
| | Management, professional, and related occupations | 21.3 | 33.1 | N/A |
| | Service occupations | 17.4 | 19.7 | N/A |
| | Sales and office occupations | 27.1 | 21 | N/A |
| | Farming, fishing, and forestry occupations | 3.4 | 1.1 | N/A |
| | Construction, extraction, and maintenance occupations | | 14.4 | N/A |
| | Production, transportation, and material moving occupations | | 10.7 | N/A |
| **Industry (Percent in workforce)** | | | | |
| | Agriculture, forestry, fishing, hunting and mining | 3 | 1.1 | N/A |
| | Manufacturing | 8.9 | 7.4 | N/A |
| | Percent government workers | 15.7 | 18.1 | N/A |

#### 6.4.11.4 Wanchese, North Carolina

Wanchese is located on the southern part of Roanoke Island, in the northern Outer Banks. The village continues to revolve around fishing and fish processing. The first seafood dealership in Wanchese was opened in 1936 by a family that still operates two seafood businesses in the community. The Wanchese Seafood Industrial Park was constructed in 1980 by the state. It has 30 acres of leasable land, a 15-acre deep-water harbor, and 1,500 feet of commercial-style concrete docks. The industrial park is also the scene of the annual blessing of the fleet, which is organized by the Oregon Inlet Users Association. Although commercial fishing has historically been a major industry, there has been an increasing emphasis on recreational angling and tourism.

Between 2000 and 2010, the population increased from 1,527 to 1,642 individuals (Table 6.26). The population is roughly divided between males and females, however over the last decade the predominant sex shifted from male to female. The population of Wanchese is about 95 percent Caucasian, which is a slight decline from 2000. The largest age group over the past three decades is the 18-44 year old individuals; however, in 2010 there were almost as many individuals in the 45-64 year age group. In 2000, there were 614 households in Wanchese, with an average of 2.49 persons per household. The number of households had grown to 680 in 2010, with an average of 2.41 persons per household. Interestingly, the average household size has decreased while the average family size has increased between 2000 and 2010. There was also a significant increase in the percentage of renter-occupied homes in Wanchese between 2000 and 2010.

**Table 6.26** **Demographic Profile of Wanchese, North Carolina** Source: U.S. Census 1990, 2000, and 2010

| Wanchese, NC | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **1,374** | **1,527** | **1,642** |
| **Sex** | | | |
| Male | 51.2% | 50.7% | 48.8% |
| Female | 48.8% | 49.3% | 51.2% |
| **Age** | | | |
| Median Age | 27.7 | 37.2 | 40.9 |
| <20 | 36.8% | 25.9% | 24.2% |
| 20-44 | 35.7% | 37.9% | 31.0% |
| 45-64 | 20.2% | 24.1% | 30.0% |
| >65 | 7.2% | 12.0% | 14.6% |
| **Race** | | | |
| White | 98.5% | 98.1% | 95.9% |
| Black or African American | 0.0% | 0.3% | 0.2% |
| American Indian & Alaska Native | 1.5% | 0.6% | 0.2% |
| Asian | 0.0% | 0.1% | 0.2% |
| Other | 0.0% | 0.5% | 3.5% |
| **Household** | | | |
| Total | 503 | 614 | 680 |
| Family households | 76.1% | 70.5% | 69.1% |
| Nonfamily households | 23.9% | 29.5% | 30.9% |
| Average household size | 2.73 | 2.49 | 2.41 |
| Average family size | 3.25 | 2.96 | 2.88 |
| **Housing Occupancy** | | | |
| Total housing units | 574 | 614 | 680 |
| Vacant housing units | 10.8% | 11.0% | 13.8% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 72.0% | 89.0% | 69.7% |
| Renter-occupied housing units | 27.9% | 11.0% | 30.3% |
| Education: | | | |
| High school graduates (25 years or older) | 74.4% | 68.1% | N/A |
| Employment: | | | |
| Labor force (16 years and over) | 67.3% | 83.1% | 64.4% |
| Unemployment Rate | 2.8% | 4.6% | N/A |
| Median Household Income | $24,667 | $39,881 | NA |
| Individuals below the poverty line* | 6.4% | 4.7% | NA |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 6.4% | 10.4% | NA |
| Construction | 16.2% | 15.5% | NA |
| Manufacturing | 3.4% | 2.4% | NA |
| Wholesale trade | 2.7% | 4.0% | NA |

| Wanchese, NC | 1990 | 2000 | 2010 |
|---|---|---|---|
| Retail trade | 26.1% | 14.9% | NA |
| Education, health & social services | 11.3% | 14.0% | NA |
| Arts, recreation, lodging & food services | 1.2% | 13.4% | NA |

Wanchese has remained a commercial fishing community, largely due to the Wanchese Industrial Seafood Park, a working waterfront complex built by the state of North Carolina in 1980. Tenets over the past decade have included the North Carolina Division of Marine Fisheries, seafood distributors and processors, boat builders, mechanic and repair shops, marine and fishing supply stores, hardware stores, broadcasting, and other marine-related businesses (Miley et al., 2005). Miley et al. (2005) found that in 2005 there were approximately 390 full-time employees that make an average annual wage of $25,498.

### 6.4.12 South Carolina

The population in South Carolina increased by 13.3 percent between 2000 and 2010 (Table 6.27). The number of individuals with a high school diploma or greater increased from 76.3 percent in 2000 to 84.1 percent in 2010. The unemployment rate has increased by 6.9 percent and the number of individuals below the poverty line increased by 4.1 percent. Employment in the farming, fishing, forestry, and mining industries remained the same between 2000 and 2010. Increases in employment occurred in the arts, recreation, lodging, and food services industries (from 8.3 percent in 2000 to 9.9 percent in 2010), the retail industries (from 11.9 percent in 2000 to 12.4 percent in 2010) and the education, health and social services industries (from 18.6 percent in 2000 to 22.4 percent in 2010). In 2009, the seafood industry supported approximately 1,169 jobs in the harvesting, processor/dealer, importer, wholesaler/distributor and retail sectors (NMFS, 2011a).

**Table 6.27 South Carolina Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| South Carolina | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **3,486,703** | **4,012,012** | **4,625,364** |
| **Education:** | | | |
| High school graduates (25 years or older) | 68.3% | 76.3% | 84.1% |
| **Employment:** | | | |
| Labor force (16 years and over) | 66.0% | 63.4% | 61.9% |
| Unemployment Rate | 5.6% | 5.9% | 12.8% |
| Median Household Income | $26,256 | $37,082 | $42,018 |
| Individuals below the poverty line* | 15.4% | 14.1% | 18.2% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 2.3% | 1.1% | 1.1% |
| Construction | 7.9% | 8.3% | 6.9% |
| Wholesale trade | 3.6% | 3.3% | 2.8% |
| Retail | 16.6% | 11.9% | 12.4% |
| Manufacturing | 25.7% | 19.4% | 13.1% |
| Education, health & social services | 19.9% | 18.6% | 22.4% |
| Arts, recreation, lodging & food services | 1.1% | 8.3% | 9.9% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

As of October 2011, South Carolina has 42 commercial tuna permit holders, holding one percent of the total commercial tuna permits (Table 6.51). Additionally, there are 26 dealers for tunas, shark, and swordfish in the state of South Carolina (Table 6.52). With 19 shark permits (directed and incidental), South Carolina holds the sixth greatest number of shark permits (Table 6.53). Due to the relatively small number of HMS permit holders and landings in South Carolina, no community profiles have been developed at this time. However, one port, Wadmalaw Island, has ranked high in terms of the number of swordfish commercially landed by port within the last several years (Figure 6.2), which could suggest an increased importance of swordfish to the South Carolina fishing industry.

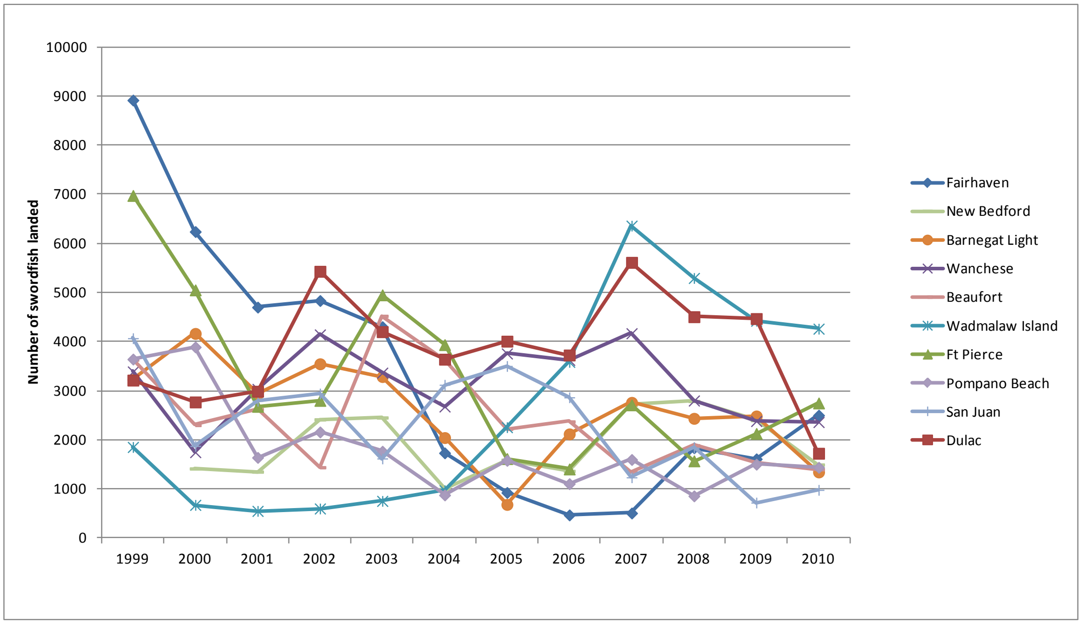


**Figure 6.2. Ports landing the highest number of swordfish between 1999-2010 according to HMS Commercial Logbook Data.**

As of October 2011, South Carolina was home to 714 HMS angling category permit holders (Table 6.49). About 898,000 marine anglers fished in South Carolina's waters making 2,391,000 recreational fishing trips in 2009 (NMFS, 2011a). Of these recreational fishermen, approximately 62 percent were from out-of-state and 12.5 percent were from non-coastal counties within South Carolina. The 2009 recreational marine fishery in South Carolina generated over $441 million in retail sales and created 5,035 jobs (NMFS, 2011a). Anecdotal information suggests that the shark fishery is incidental to other fisheries, and is primarily catch-and-release.

As of October 2011, South Carolina had a fleet of 141 charter/headboats with HMS permits, many of which fish the Gulf Stream for tuna and billfish, dolphin and wahoo, and take shark as incidental catch (Table 6.50). There is a directed fishery by charter/headboats for sharks in South Carolina. Shark fishing trips, including night fishing, are offered by a number of charter operators. Sharks are taken, in the directed fishery, from near-shore waters, inlets, and from around breakwaters and jetties. Shark fishing is said to be particularly good from May to December, but sharks are available year-round. Principal species targeted are blacktip, hammerhead, lemon, and tiger shark. The International Game Fish Association (IGFA) world-record tiger shark was caught off Cherry Grove Beach, SC, near Myrtle Beach in 1964; this record was held until 2004 when a tiger shark weighing only 2.6 kg more was captured in a fishing tournament held off Ulladulla, Australia. Charterboat operators advertising shark fishing as special trips or part of general near-shore fishing are found in the communities of Myrtle Beach, North Myrtle Bea, Hilton Head, Georgetown, Pawley's Island, Murrell Inlet, Edisto Beach, Isle of Palms, Seabrook Island, Charleston, Mount Pleasant, Beaufort, and Little River.

### 6.4.13 Georgia

The population in Georgia has increased quite a bit in the last decade, from 8.2 million people in 2000 to 9.7 million people in 2010 (Table 6.28). The labor force (ages 16 and older) and unemployment has decreased slightly over the past decade, and there was a slight decline in the percentage of individuals below the poverty line. Employment in the farming, fishing, forestry, and mining industries has declined since 2000; employment increases have continued in the art, recreation, lodging, and food services industries, from one percent to seven percent. Approximately 7,390 jobs (commercial harvesters, processors, dealers, importers, wholesalers, distributors, and associated retail) were supported by the Georgia seafood industry in 2009, providing an estimated $224,956,000 in income (NMFS, 2011a).

**Table 6.28 Georgia Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| Georgia | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **6,478,216** | **8,186,453** | **9,687,653** |
| **Education:** | | | |
| High school graduates (25 years or older) | 70.9% | 78.6% | 84.3% |
| **Employment:** | | | |
| Labor force (16 years and over) | 66.1% | 66.1% | 62.4% |
| Unemployment Rate | 5.5% | 5.5% | 12.6% |
| Median Household Income | $29,021 | $42,433 | $46,430 |
| Individuals below the poverty line* | 14.7% | 13.0% | 17.9% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 2.7% | 1.4% | 1.1% |
| Construction | 6.9% | 7.9% | 6.8% |
| Wholesale trade | 5.1% | 3.9% | 3.2% |
| Retail | 16.5% | 12.0% | 12.1% |
| Manufacturing | 18.9% | 14.8% | 10.5% |
| Education, health & social services | 20.4% | 17.6% | 21.3% |
| Arts, recreation, lodging & food services | 1.0% | 7.1% | 8.8% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

Commercial shark fishing in Georgia has traditionally been only a very small segment of the commercial fisheries in the state. In 2010, only three vessels held shark permits in Georgia (Table 6.53). Both Darien and Townsend, in McIntosh County, have been involved with the commercial shark fishery within the last three decades. There are four dealers permitted to sell

HMS such as tunas, sharks, and swordfish in Georgia (Table 6.52). As of October 2011, four vessels were permitted to participate in the commercial tuna fisheries (Table 6.51). The number of HMS charter/headboat permits operating in Georgia decreased from 24 in 2010 to 20 in 2011 (Table 6.50). Some of the active charter/headboat communities are Columbus, Brunswick, Marietta, Savannah, Atlanta, Alpharetta, and St. Simons Island.

The number of Georgia residents that held HMS angling category permits declined from196 in 2010 to 132 in 2011 (Table 6.49). In 2009, marine recreational fishing in Georgia attracted 282,000 anglers, of whom approximately 16 percent were from out-of-state and approximately 32 percent from non-coastal counties (NMFS, 2011a). Collectively, these anglers made 851,000 recreational fishing trips in 2009. The 2009 recreational marine fishery in Georgia generated over $197 million in retail sales and created 1,613 jobs (NMFS, 2011a). Principal recreational fisheries are for croaker, drum, and southern kingfish in inshore areas, and billfish and tunas offshore. Sharks are taken incidental to these fisheries but there are targeted shark fisheries inshore on spinner, sandbar, blacktip and lemon sharks.

### 6.4.14 Florida

Florida’s population increased by more than 3 million people between 2000 and 2010 (Table 6.29). The percentage of individuals 25 years and older with a high school diploma has increased by almost five percent in the last decade. The percentage of employed individuals has increased slightly, whereas the unemployment rate and percentage of individuals below the poverty line has increased by almost four and seven percent, respectively. As with many of the other states, employment in the farming, fishing, forestry, and mining industries has declined, whereas the education, health, and social services industries provided the greatest employment opportunities in 2010. Employment in the arts, recreation, lodging, and food services industries has increased slightly in the last decade.

Florida’s fishing industry is one of the largest and most diverse in the region. Florida residents hold more than half of the commercial shark permits with 268 permit holders residing in the state (Table 6.53). Florida is also home to the greatest number of swordfish permit holders with 157 permitted vessels (Table 6.54), and Florida residents hold about eight percent of the commercial tuna permits (Table 6.51). Since the East Florida Coast pelagic longline closure was implemented in 2001, there has been a shift in commercial swordfishing effort in this area to the commercial handgear sector. In 2006, NOAA Fisheries defined and authorized buoy gear for the commercial swordfish handgear fishery. Prior to buoy gear being authorized, the swordfish handgear fishery fished free-floating handlines allowed under the NMFS definition of handline. Currently, the swordfish buoy gear fishery consists of approximately 40 vessels that generally fish on night trips out of ports ranging from Fort Pierce to the upper Florida Keys. For information on buoy gear regulations and recent catches, please see Section 4.7. Florida residents also have the greatest number of HMS dealer permits with 136 dealers permitted to purchase and sell tunas, sharks, and swordfish (Table 6.51).

Florida has the largest marine recreational fisheries in the United States. In 2010, approximately 4,669 recreational anglers fished in the waters off Florida and made 24,152 fishing trips during that year (NMFS, 2011b). Of these fishermen, approximately 75 percent were from out-of-state. More specifically to recreational HMS fisheries, Florida has the greatest number of HMS angling permits in the United States, with 4,035 permitted individuals in 2011 (Table 6.49). The recreational fishing activities in Florida generated almost $7 million in retail sales and created 69,759 jobs (NMFS, 2011a). The recreational swordfish fishery in Florida has grown since 2003 and is discussed in greater detail in Section 4.4.2. Sharks are an incidental catch for many fishermen, but some private boat fishermen have a directed fishery for sharks, including lemon, hammerhead, blacktip and tiger sharks.

Florida has the second highest number of HMS charter/headboat permit holders with 639 permitted vessels, following Massachusetts with 838 permitted vessels (Table 6.50). It should be noted that these 639 charterboats/headboats permit holders refer to Florida residents and do not account for the transient vessels traveling to Florida for the winter and spring fishing seasons.

**Table 6.29 Florida Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010

| Florida | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **12,937,926** | **15,982,378** | **18,801,310** |
| **Education:** | | | |
| High school graduates (25 years or older) | 74.0% | 79.9% | 85.5% |
| **Employment:** | | | |
| Labor force (16 years and over) | 60.4% | 58.6% | 60.4% |
| Unemployment Rate | 5.8% | 5.6% | 13.3% |
| Median Household Income | $27,483 | $38,819 | $44,409 |
| Individuals below the poverty line* | 12.7% | 12.5% | 16.5% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 3.1% | 1.3% | 1.2% |
| Construction | 7.8% | 8.0% | 6.6% |
| Wholesale trade | 4.6% | 3.9% | 2.9% |
| Retail | 19.6% | 13.5% | 13.5% |
| Manufacturing | 10.5% | 7.3% | 5.5% |
| Education, health & social services | 21.4% | 18.1% | 21.4% |
| Arts, recreation, lodging & food services | 2.3% | 10.5% | 11.5% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

#### 6.4.14.1 Apalachicola, Florida

Apalachicola is located at the mouth of the Apalachicola River and East Bay in Florida, and is home to 2,231 residents according to 2010 census data (Table 6.30). Individuals between 18 and 64 years old make up the greatest proportion of the population in 2010. White individuals comprise the largest proportion of race--63 and 67 percent in 2000 and 2010, respectively. Individuals of Black or African American race accounted for 34.9 and 26.4 percent of the total population in 2000 and 2010, respectively.

**Table 6.30 Demographic Profile of Apalachicola, Florida.** Source: U.S. Census 1990, 2000, and 2010

| Apalachicola, FL | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| **Total population** | | 2,707 | 2,334 | 2,231 |
| **Gender Ratio M/F (Number)** | | | 1,107 / 1,227 | 1,057 / 1,174 |
| **Age (Percent of total population)** | | | | |
| | Under 18 years of age | | 21.9 | 21.1 |
| | 18 to 64 years of age | | 57.6 | 59.9 |
| | 65 years and over | 16.3 | 20.5 | 19.0 |
| **Ethnicity or Race (Percent)** | | | | |
| | White | | 63.4 | 66.9 |
| | Black or African American | | 34.9 | 26.4 |
| | American Indian and Alaskan Native | | 0.2 | 0.6 |
| | Asian | | 0.4 | 0.3 |
| | Native Hawaiian and other Pacific Islander | | <0.1 | 0.3 |
| | Some other race | | 0.5 | 3.0 |
| | Two or more races | | 0.6 | 2.4 |
| | Hispanic or Latino (any race) | | 1.7 | 6.6 |
| **Educational Attainment ( Population 25 and over)** | | | | |
| | Percent with less than 9th grade | 21.9 | 9.1 | N/A |
| | Percent high school graduate or higher | 52.9 | 69.2 | N/A |
| | Percent with a Bachelor's degree or higher | 12 | 15.3 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | | |
| | Percent who speak a language other than English at home | 2.3 | 2.6 | N/A |
| | And Percent who speak English less than very well | 1.2 | 1 | N/A |
| **Household income (Median $)** | | 12,813 | 23,073 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 34.6 | 25.3 | N/A |
| **Percent female headed household** | | 23.3 | 15 | N/A |
| **Home Ownership (Percent)** | | | | |
| | Owner occupied | | 69 | 62.0 |
| | Renter occupied | | 31 | 38.0 |
| **Value Owner-occupied Housing (Median $)** | | | 83,800 | N/A |
| **Monthly Contract Rent (Median $)** | | 285 | 393 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | | |
| | Percent in the labor force | 48.7 | 50.5 | N/A |
| | Percent of civilian labor force unemployed | 3.8 | 3.6 | N/A |
| **Occupation (Percent in workforce)** | | | | |
| | Management, professional, and related occupations | 16.8 | 25.4 | N/A |
| | Service occupations | 21.6 | 27.5 | N/A |
| | Sales and office occupations | 24.7 | 21.2 | N/A |
| | Farming, fishing, and forestry occupations | 4.6 | 5.9 | N/A |
| | Construction, extraction, and maintenance occupations | | 5.6 | N/A |
| | Production, transportation, and material moving occupations | | 14.4 | N/A |
| **Industry (Percent in workforce)** | | | | |
| | Agriculture, forestry, fishing, hunting and mining | 5.4 | 4 | N/A |
| | Manufacturing | 5 | 2.9 | N/A |
| | Percent government workers | 22.5 | 20.3 | N/A |

### 6.4.14.2 Destin, Florida

Destin is a major tourist destination located on the Florida Panhandle in Oskaloosa County. The Destin population of 12,305 residents according to 2010 census data was an approximate increase of over 1,000 people from the 2000 survey (Table 6.31). Like other communities in Florida, individuals between 18 and 64 years old make up the greatest proportion of the population in 2010. Whites comprise the largest proportion of race--96 and 90 percent in 2000 and 2010, respectively. Individuals of Hispanic or Latino ethnicity showed an increase, accounting for 2.7 and 6.5 percent of the total population in 2000 and 2010, respectively.

**Table 6.31 Demographic Profile of Destin, Florida.** Source: U.S. Census 1990, 2000, and 2010

| Destin, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 8,080 | 11,119 | 12,305 |
| **Gender Ratio M/F (Number)** | | 5,610/5,509 | 6,241 / 6,064 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | | 19.4 | 18.6 |
| 18 to 64 years of age | | 63.6 | 66.1 |
| 65 years and over | 13.2 | 17 | 15.3 |
| **Ethnicity or Race (Percent)** | | | |
| White | | 96.2 | 90.1 |
| Black or African American | | 0.4 | 1.5 |
| American Indian and Alaskan Native | | 0.4 | 0.3 |
| Asian | | 0.1 | 2.1 |
| Native Hawaiian and other Pacific Islander | | 0.1 | 0.1 |
| Some other race | | 0.4 | 3.0 |
| Two or more races | | 1.5 | 3.0 |
| Hispanic or Latino (any race) | | 2.7 | 6.5 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 1.6 | 2.3 | N/A |
| Percent high school graduate or higher | 88.1 | 91.9 | N/A |
| Percent with a Bachelor's degree or higher | 24.9 | 31.4 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |
| Percent who speak a language other than English at home | 4.3 | 6.8 | N/A |
| And Percent who speak English less than very well | 0.9 | 2.4 | N/A |
| **Household income (Median $)** | 32,712 | 53,042 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | 7 | 5.5 | N/A |
| **Percent female headed household** | 10.9 | 8 | N/A |
| **Home Ownership (Percent)** | | | |
| Owner occupied | | 75.3 | 64.5 |
| Renter occupied | | 24.7 | 35.5 |
| **Value Owner-occupied Housing (Median $)** | | 153,800 | N/A |
| **Monthly Contract Rent (Median $)** | 506 | 774 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | |
| Percent in the labor force | 66.6 | 60 | N/A |
| Percent of civilian labor force unemployed | 1.8 | 3.8 | N/A |
| **Occupation (Percent in workforce)** | | | |
| Management, professional, and related occupations | 28.6 | 36.3 | N/A |
| Service occupations | | 14.6 | N/A |
| Sales and office occupations | 28.3 | 28.4 | N/A |
| Farming, fishing, and forestry occupations | 4.7 | 2 | N/A |
| Construction, extraction, and maintenance occupations | | 10.7 | N/A |
| Production, transportation, and material moving occupations | | 8.1 | N/A |
| **Industry (Percent in workforce)** | | | |
| Agriculture, forestry, fishing, hunting and mining | 4.3 | 1.2 | N/A |
| Manufacturing | 5.5 | 4.2 | N/A |
| Percent government workers | 11.5 | 9.1 | N/A |

### 6.4.14.3 Pompano Beach, Florida

Pompano Beach is a small city directly adjacent to Fort Lauderdale. The Fort Lauderdale area is known as the “Yachting Capital of the World” and the “Venice of America” because of the vast canal system, which extends throughout Broward County and creates 165 miles of waterfront in the region. Between 2000 and 2010, the population increased from 78,191 to 99,845 individuals (Table 6.32). The male to female ratio in the Pompano population changed only slightly in the past decade with a slight decrease in the number of females (49:51 to 51:49). The percent of the total population in the 45-64 year age group increased by almost six percent, while all other age groups remaining relatively constant between 2000 and 2010. Since the 2000 Census, the ethnic and racial population of Pompano Beach has shifted to increase the number of ‘other’ ethnicities in the population. In 2000, the population was 68 percent Caucasian and 25 percent Black or African American. In 2010, the population consisted of 62 percent Caucasians, 28 percent Black or African Americans, and nine percent of people of other ethnicities.

The number of households increased from 35,197 in 2000 to 42,182 in 2010 (Table 6.32). The average household size in Pompano Beach increased from 2.1 persons per household in 2000 to 2.2 people per household in 2010. The technical, administrative, and sales industries provide the greatest source of employment, with managerial and professional positions a close second. Employment in the farming, fishing, forestry and mining industries declined from 3.1 percent in 2000 to less than one percent in 2010.

**Table 6.32 Demographic Profile of Pompano Beach, Florida. Source: U.S. Census 1990, 2000, and 2010**

| Pompano Beach, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **74,411** | **78,191** | **99,845** |
| **Sex** | | | |
| Male | 48.2% | 49.3% | 51.0% |
| Female | 51.8% | 50.9% | 49.0% |
| **Age** | | | |
| Median Age | 39.8 | 42.2 | 42.7 |
| <20 | 19.8% | 19.7% | 20.4% |
| 20-44 | 35.0% | 34.5% | 32.7% |
| 45-64 | 19.9% | 22.5% | 27.8% |
| >65 | 25.3% | 23.4% | 18.9% |
| **Race** | | | |
| White | 70.1% | 67.8% | 62.6% |
| Black or African American | 28.6% | 25.4% | 28.9% |
| American Indian & Alaska Native | 0.1% | 0.2% | 0.3% |
| Asian | 0.3% | 0.8% | 1.3% |
| Other | 0.9% | 2.0% | 6.9% |
| **Household** | | | |

| | | | |
|---|---|---|---|
| Total | 31,981 | 35,197 | 42,182 |
| Family households | 57.9% | 52.4% | 53.5% |
| Nonfamily households | 42.1% | 47.6% | 46.5% |
| Average household size | 2.26 | 2.13 | 2.27 |
| Average family size | 2.90 | 2.85 | 3.00 |
| **Housing Occupancy** | | | |
| Total housing units | 42,179 | 44,496 | 55,885 |
| Vacant housing units | 24.7% | 20.9% | 24.5% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | NA | NA | 59.2% |
| Renter-occupied housing units | NA | NA | 40.8% |
| Education: | | | |
| High school graduates (25 years or older) | 73.7% | 77.2% | 81.0% |
| Employment: | | | |
| Labor force (16 years and over) | 52.1% | 53.8% | 58.2% |
| Unemployment Rate | 3.5% | 3.6% | 18.4% |
| Median Household Income | $29,683 | $36,073 | $36,122 |
| Individuals below the poverty line* | 16.0% | 17.0% | 21.7% |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 3.1% | 0.5% | 1.2% |
| Construction | 10.4% | 9.8% | 8.9% |
| Manufacturing | 8.5% | 7.1% | 5.8% |
| Wholesale trade | 5.4% | 4.7% | 1.8% |
| Retail trade | 18.6% | 13.6% | 14.8% |
| Education, health & social services | 13.2% | 14.9% | 16.3% |
| Arts, recreation, lodging & food services | 2.3% | 11.0% | 11.2% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

#### 6.4.14.4 Fort Pierce, Florida

Fort Pierce is located in St. Lucie County, a rapidly developing area in South Florida. St. Lucie County is known as a center for citrus growing, particularly grapefruit. Fort Pierce is on the site of an Army fort built in 1838, and remained an isolated outpost until the railroad reached the town in 1900. Fort Pierce was incorporated in 1901, and soon developed as a center for industry and agribusiness. At the junction of the Florida Turnpike and Interstate 95, Fort Pierce is a thriving intermodal transportation center, distribution point, and tourist stopover point. Fort Pierce is a community in transition. Between 2000 and 2010, the population grew by four percent, increasing by about 2,000 people (Table 6.33). About 30 percent of the population is under 20 years old, and another 32 percent is between 20 and 44. The median age in 2010 was 35.7 years old.

There were 15,850 households in Fort Pierce, with an average household size of 2.59 people in 2010. It is also a relatively poor community, with a median household income of

$28,363 in 2010, and 31 percent of the population living below the poverty level. The retail trade, education, health and social services related jobs provide the greatest source of employment. Employment in the farming, fishing, forestry and mining industries declined from 7.8 percent in 2000 to 5.6 in 2010.

**Table 6.33 Demographics of Fort Pierce, Florida.** Source: U.S. Census 1990, 2000, and 2010.

| Fort Pierce, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **36,830** | **37,516** | **41,590** |
| **Sex** | | | |
| Male | 47.1% | 49.3% | 49.3% |
| Female | 52.9% | 50.7% | 50.7% |
| **Age** | | | |
| Median Age | 34.2 | 35.4 | 35.7 |
| <20 | 30.4% | 30.3% | 29.0% |
| 20-44 | 30.8% | 32.7% | 31.6% |
| 45-64 | 18.8% | 19.6% | 24.1% |
| >65 | 20.0% | 17.5% | 15.2% |
| **Race** | | | |
| White | 53.8% | 49.5% | 45.3% |
| Black or African American | 42.5% | 40.9% | 40.9% |
| American Indian & Alaska Native | 0.2% | 0.3% | 0.6% |
| Asian | 0.4% | 0.9% | 0.9% |
| Other | 3.1% | 5.4% | 12.3% |
| **Household** | | | |
| Total | 14,283 | 14,407 | 15,850 |
| Family households | 64.4% | 61.2% | 61.0% |
| Nonfamily households | 35.6% | 38.8% | 39.0% |
| Average household size | 2.58 | 2.56 | 2.59 |
| Average family size | 3.21 | 3.19 | 3.23 |
| **Housing Occupancy** | | | |
| Total housing units | 17,250 | 17,170 | 21,357 |
| Vacant housing units | 17.8% | 16.6% | 25.8% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 53.3% | 53.2% | 48.3% |
| Renter-occupied housing units | 46.7% | 46.8% | 51.7% |
| Education: | | | |
| High school graduates (25 years or older) | 56.9% | 59.7% | 69.2% |
| Employment: | | | |
| Labor force (16 years and over) | 48.2% | 55.1% | 56.5% |
| Unemployment Rate | 6.8% | 4.9% | 15.2% |
| Median Household Income | $18,913 | $25,121 | $28,363 |
| Individuals below the poverty line* | 29.2% | 30.9% | 31.0% |

| Fort Pierce, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 9.8% | 7.8% | 5.6% |
| Construction | 8.2% | 12.6% | 9.8% |
| Manufacturing | 7.1% | 8.0% | 5.4% |
| Wholesale trade | 4.1% | 4.8% | 2.0% |
| Retail trade | 21.0% | 12.5% | 15.4% |
| Education, health & social services | 17.1% | 16.9% | 24.9% |
| Arts, recreation, lodging & food services | 1.1% | 10.8% | 11.5% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.14.5 Madeira Beach, Florida

Madeira Beach is part of the Tampa Bay urban complex, one of several beach suburbs of St. Petersburg. The area is the home of the West-central Florida shark bottom longline fleet. Madeira Beach is also home to a thriving recreational HMS fishery. The population in Madeira Beach decreased by about one percent from 2000 to 2010 (Table 6.34). Median age increased from 47.6 in 2000 to 52.7 in 2010. The number of households in Madeira Beach decreased from 2,523 in 2000 to 2,302 in 2010, and the average number of persons in a household increased from 1.78 persons in 2000 to 1.85 in 2010.

**Table 6.34 Demographic Profile for Madeira Beach, Florida.** Source: U.S. Census 1990, 2000, and 2010.

| Maderia Beach, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **4,225** | **4,500** | **4,263** |
| **Sex** | | | |
| Male | 50.9% | 52.0% | 51.1% |
| Female | 49.1% | 48.0% | 48.9% |
| **Age** | | | |
| Median Age | 34.2 | 47.6 | 52.7 |
| <20 | 11.2% | 9.5% | 14.2% |
| 20-44 | 35.3% | 32.5% | 20.2% |
| 45-64 | 28.0% | 36.0% | 41.3% |
| >65 | 25.6% | 21.9% | 24.2% |
| **Race** | | | |
| White | 99.8% | 97.4% | 95.4% |
| Black or African American | 0.0% | 0.0% | 0.9% |
| American Indian & Alaska Native | 0.0% | 0.8% | 0.6% |
| Asian | 0.2% | 0.0% | 0.1% |
| Other | 0.0% | 1.8% | 3.0% |
| **Household** | | | |
| Total | 2,230 | 2,523 | 2,302 |
| Family households | 50.5% | 59.8% | 46.7% |

| Maderia Beach, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| Nonfamily households | 49.5% | 40.2% | 53.3% |
| Average household size | 1.89 | 1.78 | 1.85 |
| Average family size | 2.49 | 2.39 | 2.45 |
| **Housing Occupancy** | | | |
| Total housing units | 3,788 | 3,971 | 4,044 |
| Vacant housing units | 41.1% | 36.5% | 43.1% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | NA | NA | 59.4% |
| Renter-occupied housing units | NA | NA | 40.6% |
| Education: | | | |
| High school graduates (25 years or older) | 83.8% | 87.3% | NA |
| Employment: | | | |
| Labor force (16 years and over) | 56.9% | 61.5% | NA |
| Unemployment Rate | 1.6% | 2.7% | NA |
| Median Household Income | $24,748 | $36,671 | NA |
| Individuals below the poverty line* | 8.4% | 9.8% | NA |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 1.4% | 0.0% | NA |
| Construction | 8.8% | 7.0% | NA |
| Manufacturing | 7.5% | 11.3% | NA |
| Wholesale trade | 4.5% | 4.1% | NA |
| Retail trade | 30.7% | 11.4% | NA |
| Education, health & social services | 11.4% | 7.9% | NA |
| Arts, recreation, lodging & food services | 2.5% | 21.6% | NA |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.14.6 Panama City, Florida

Panama City is located on the Gulf of Mexico in the Florida Panhandle. Between 2000 and 2010, Panama City experienced a modest increase in its population from 36,417 in 2000 to 38,484 in 2010 (Table 6.35). The Panama City population did get older in the past decade; the median age increased from 37 years old to about 39 years old. Correspondingly, the greatest portion of the population in both decades was in the 20-44 years old age bracket. Panama City had 14,819 households in 2000, and the number of households grew to 14,792 in 2010 (Table 6.35). The average household size decreased from 2.30 persons in 2000 to 2.28 persons in 2010.

**Table 6.35 Demographic Profile for Panama City, Florida. Source:** U.S. Census 1990, 2000, and 2010.

| Panama City, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **34,378** | **36,417** | **38,484** |
| **Sex** | | | |

| Panama City, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| Male | 46.7% | 48.6% | 49.1% |
| Female | 53.3% | 51.4% | 50.9% |
| **Age** | | | |
| Median Age | 33.9 | 37.2 | 39.7 |
| <20 | 28.6% | 25.6% | 23.3% |
| 20-44 | 34.9% | 36.8% | 33.5% |
| 45-64 | 19.6% | 21.7% | 26.9% |
| >65 | 16.9% | 16.0% | 16.3% |
| **Race** | | | |
| White | 76.1% | 73.6% | 71.6% |
| Black or African American | 21.0% | 21.5% | 22.0% |
| American Indian & Alaska Native | 0.7% | 0.6% | 0.5% |
| Asian | 1.6% | 1.6% | 1.6% |
| Other | 0.6% | 0.8% | 4.3% |
| **Household** | | | |
| Total | 14,033 | 14,819 | 14,792 |
| Family households | 69.2% | 61.0% | 58.2% |
| Nonfamily households | 30.8% | 39.0% | 41.8% |
| Average household size | 2.37 | 2.30 | 2.28 |
| Average family size | 2.90 | 2.92 | 2.91 |
| **Housing Occupancy** | | | |
| Total housing units | 15,928 | 16,548 | 17,438 |
| Vacant housing units | 11.8% | 10.4% | 15.2% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 58.3% | 57.8% | 53.3% |
| Renter-occupied housing units | 41.7% | 42.2% | 46.7% |
| Education: | | | |
| High school graduates (25 years or older) | 70.3% | 79.2% | 84.5% |
| Employment: | | | |
| Labor force (16 years and over) | 54.0% | 53.9% | NA |
| Unemployment Rate | 4.6% | 3.1% | NA |
| Median Household Income | $21,881 | $31,572 | NA |
| Individuals below the poverty line* | 19.6% | 17.2% | NA |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 1.6% | 0.5% | NA |
| Construction | 7.0% | 6.7% | NA |
| Manufacturing | 7.7% | 7.0% | NA |
| Wholesale trade | 3.3% | 0.1% | NA |
| Retail trade | 21.4% | 13.8% | NA |
| Education, health & social services | 19.4% | 22.2% | NA |
| Arts, recreation, lodging & food services | 1.5% | 14.2% | NA |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.14.7 Islamorada, Florida

Islamorada, located in the Florida Keys, is a popular destination for HMS recreational fishing. In 2000, the population was 6,846 individuals, decreasing to 6,119 in 2010 (Table 6.36). The population was roughly half male and half female in both census years. The pattern of age distribution, however, changed between 2000 and 2010. The population in Islamorada is older than Fort Pierce, Pompano, and Panama City. The median age increased from just over 46 years to 52 years old over the past decade. The dominant age group shifted from 20-44 years old to 45-64 and > 65 years old. Islamorada has a very well educated population with almost 92 percent having at least graduated high school (Table 6.36).

**Table 6.36 Demographic Profile for Islamorada, Florida.** Source: U.S. Census, 1990, 2000, 2010.

| Islamorada, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **1,293** | **6,846** | **6,119** |
| **Sex** | | | |
| Male | 54.2% | 53.0% | 51.8% |
| Female | 45.8% | 47.0% | 48.2% |
| **Age** | | | |
| Median Age | 42.3 | 46.2 | 52.0 |
| <20 | 13.3% | 17.0% | 15.5% |
| 20-44 | 40.8% | 30.6% | 21.1% |
| 45-64 | 26.7% | 35.6% | 41.5% |
| >65 | 19.2% | 16.9% | 22.0% |
| **Race** | | | |
| White | 95.3% | 96.8% | 96.5% |
| Black or African American | 0.9% | 0.5% | 0.7% |
| American Indian & Alaska Native | 0.0% | 0.2% | 0.4% |
| Asian | 0.0% | 0.7% | 0.6% |
| Other | 3.9% | 0.8% | 1.8% |
| **Household** | | | |
| Total | 672 | 3,174 | 2,882 |
| Family households | 51.6% | 58.4% | 58.0% |
| Nonfamily households | 48.4% | 41.6% | 42.0% |
| Average household size | 1.92 | 2.10 | 2.07 |
| Average family size | 2.54 | 2.63 | 2.57 |
| **Housing Occupancy** | | | |
| Total housing units | 966 | 5,461 | 5,692 |
| Vacant housing units | 32.4% | 41.9% | 49.4% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 65.9% | 71.1% | 67.7% |
| Renter-occupied housing units | 34.1% | 28.9% | 32.3% |

| Islamorada, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| Education: | | | |
| High school graduates (25 years or older) | 77.8% | 91.7% | NA |
| Employment: | | | |
| Labor force (16 years and over) | 73.2% | 62.9% | NA |
| Unemployment Rate | 0.9% | 2.3% | NA |
| Median Household Income | $26,266 | $41,522 | NA |
| Individuals below the poverty line* | 9.1% | 6.9% | NA |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 6.8% | 3.7% | NA |
| Construction | 3.8% | 6.6% | NA |
| Manufacturing | 4.6% | 1.9% | NA |
| Wholesale trade | 2.9% | 1.2% | NA |
| Retail trade | 39.4% | 20.2% | NA |
| Education, health & social services | 6.1% | 12.7% | NA |
| Arts, recreation, lodging & food services | 3.2% | 21.1% | NA |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

#### 6.4.14.8 Port Salerno, Florida

Port Salerno is located on the east coast of Florida, approximately 30 miles north of West Palm Beach. It is home to 10,091 residents according to 2010 census data (Table 6.37). The population's male to female ratio has remained relatively the same over the last decade. Like other communities in Florida, individuals between 18 and 64 years old make up the greatest proportion of the population in 2010. White individuals comprise the largest proportion of race--89 and 82 percent in 2000 and 2010, respectively. Individuals of Hispanic or Latino ethnicity showed an increase, accounting for 8.2 and 14.7 percent of the total population in 2000 and 2010, respectively.

**Table 6.37 Demographic Profile of Port Salerno, Florida.** Source: U.S. Census, 1990, 2000, and 2010.

| Port Salerno, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 7,786 | 10,104 | 10,091 |
| **Gender Ratio M/F (Number)** | 3,748 / 4,038 | 4,928 / 5,176 | 4,959 / 5,132 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | 19.2 | 19.9 | 18.2 |
| 18 to 64 years of age | 56.8 | 55.4 | 57.1 |
| 65 years and over | 23.9 | 24.7 | 24.7 |
| **Ethnicity or Race (Percent)** | | | |
| White | 88.0 | 88.8 | 82.2 |
| Black or African American | 6.9 | 7.0 | 9.1 |
| American Indian and Alaskan Native | 0.2 | 0.1 | 0.6 |
| Asian | 0.4 | 0.7 | 0.7 |
| Native Hawaiian and other Pacific Islander | | 0.1 | 0.1 |
| Some other race | 0.1 | 2.3 | 5.2 |

| Port Salerno, FL | 1990 | 2000 | 2010 |
|---|---|---|---|
| Two or more races | | 1.3 | 2.1 |
| Hispanic or Latino (any race) | 4.4 | 8.2 | 14.7 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 6.3 | 3.2 | N/A |
| Percent high school graduate or higher | 81.2 | 85.4 | N/A |
| Percent with a Bachelor's degree or higher | 17.9 | 21.5 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |
| Percent who speak a language other than English at home | 10 | 9.5 | N/A |
| And Percent who speak English less than very well | 3.2 | 4.5 | N/A |
| **Household income (Median $)** | 31,687 | 39,839 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | 6.9 | 9.6 | N/A |
| **Percent female headed household** | 7.7 | 9.3 | N/A |
| **Home Ownership (Number)** | | | |
| Owner occupied | | 3262 | 3,218 |
| Renter occupied | | 1204 | 1,237 |
| **Value Owner-occupied Housing (Median $)** | | 116,900 | N/A |
| **Monthly Contract Rent (Median $)** | | 559 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | |
| Percent in the labor force | 57.1 | 54.3 | N/A |
| Percent of civilian labor force unemployed | 5.5 | 2.8 | N/A |
| **Occupation (Percent in workforce)** | | | |
| Management, professional, and related occupations | - | 28.5 | N/A |
| Service occupations | - | 19.3 | N/A |
| Sales and office occupations | - | 27.6 | N/A |
| Farming, fishing, and forestry occupations | 3.6 | 0,8 | N/A |
| Construction, extraction, and maintenance occupations | - | 13.9 | N/A |
| Production, transportation, and material moving occupations | - | 10 | N/A |
| **Industry (Percent in workforce)** | | | |
| Agriculture, forestry, fishing, hunting and mining | 3.1 | 0.9 | N/A |
| Manufacturing | 12 | 8.8 | N/A |
| Percent government workers | 9.8 | 10.4 | N/A |

### 6.4.15 Alabama

The population in Alabama has increased by about 400,000 people between 2000 and 2010 (Table 6.38). The percentage of individuals 25 years and older with a high school diploma has increased by about seven percent. The percentage of employed individuals has remained about the same, although unemployment rate and percentage of individuals below the poverty line have increased by three and seven percent in the last decade, respectively. Employment in the farming, fishing, forestry, and mining industries has remained about the same, whereas the education, health, and social services industries provided the greatest employment opportunities in 2010. Also, the arts, recreation, lodging, and food services, and manufacturing industries have been a source of employment for Alabama residents over the past decade.

In 2011, Alabama residents held 30 commercial tuna permits (Table 6.51), seven commercial shark permits (Table 6.53) and no commercial swordfish permits (Table 6.54). The communities involved in the shark fishery are Andalusia, Bayou la Batre, Elba, Elberta, Gulf Shores, and Lillian. There are seven licensed HMS dealers working in coastal Alabama (Table

6.52). Alabama residents hold about one percent or less of the commercial tuna and shark permits.

The marine recreational fishery off Alabama attracted 555 anglers in 2010, who accounted for 1,807 fishing trips (NMFS, 2011b). Of these recreational fishermen, approximately 40 percent were from out-of-state and about 25 percent were from non-coastal counties within Alabama. In 2011, there were 412 Alabama residents who held an angling permit to fish recreationally for HMS (Table 6.49). A large number of these anglers are in Mobile, Alabama. In 2009, recreational fishing activities in Alabama generated an estimated $474,000 in retail sales and supported 4,924 jobs in 2009 (NMFS, 2011a). Thus recreational fishing off Alabama also benefits the local tourist industry as it does in Florida. Shark fishing is largely incidental to recreational fishing for other fish species.

**Table 6.38 Alabama Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010.

| Alabama | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **4,040,587** | **4,447,100** | **4,779,736** |
| **Education:** | | | |
| High school graduates (25 years or older) | 66.9% | 75.3% | 82.1% |
| **Employment:** | | | |
| Labor force (16 years and over) | 61.1% | 59.7% | 59.7% |
| Unemployment Rate | 6.9% | 6.2% | 11.8% |
| Median Household Income | $23,597 | $34,135 | $40,474 |
| Individuals below the poverty line* | 18.3% | 16.1% | 19.0% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 3.03% | 1.90% | 1.9% |
| Construction | 7.1% | 7.6% | 7.1% |
| Wholesale trade | 4.1% | 3.6% | 2.8% |
| Retail | 16.2% | 12.2% | 12.3% |
| Manufacturing | 22.9% | 18.2% | 13.7% |
| Education, health & social services | 21.6% | 19.3% | 21.4% |
| Arts, recreation, lodging & food services | 0.9% | 6.4% | 8.4% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

There are 77 vessels with a 2011 HMS charter/headboat permit in Alabama (Table 6.50), and many of these vessels are located in Orange Beach. Some other communities with several charter/head boat permit owners are Birmingham, Mobile, Gulf Shores and Dauphin Island. There is a small, directed shark fishery advertised by some of the charter/headboats, but most take shark incidentally to other fish species throughout the year.

#### 6.4.15.1 Orange Beach, Alabama

Orange Beach, located along Wolf Bay in Baldwin County, is primarily a tourist beach destination and home to 5,441 residents, an increase of almost 2,000 individuals from 2000 (Table 6.39). Individuals between 18 and 64 years old made up the greatest proportion of the population in 2010. White individuals comprise the largest proportion of race--65 and 62 percent in 2000 and 2010, respectively. Individuals of Hispanic or Latino ethnicity decreased slightly accounting for 2.8 and 2.6 percent of the total population in 2000 and 2010, respectively.

**Table 6.39 Demographic Profile of Orange Beach, Alabama.** Source: U.S. Census, 1990, 2000, and 2010.

| Orange Beach, AL | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| **Total population** | | 2,253 | 3,784 | 5,441 |
| **Gender Ratio M/F (Number)** | | 1,153 / 1,100 | 1,967 / 1,817 | 2,704 / 2,737 |
| **Age (Percent of total population)** | | | | |
| | Under 18 years of age | 15 | 16.6 | 18.7 |
| | 18 to 64 years of age | 63.4 | 65.2 | 62.1 |
| | 65 years and over | 21.6 | 18.2 | 19.2 |
| **Ethnicity or Race (Number)** | | | | |
| | White | 99.2 | 94.8 | 94.3 |
| | Black or African American | 0.1 | 0.4 | 0.6 |
| | American Indian and Alaskan Native | 0.5 | 0.7 | 0.7 |
| | Asian | 0.1 | 0.2 | 0.8 |
| | Native Hawaiian and other Pacific Islander | 0.0 | 0.0 | 0.0 |
| | Some other race | 0.1 | 2.0 | 1.4 |
| | Two or more races | 0.0 | 1.9 | 2.2 |
| | Hispanic or Latino (any race) | 0.6 | 2.8 | 2.6 |
| **Educational Attainment ( Population 25 and over)** | | | | |
| | Percent with less than 9th grade | 3.1 | 2.1 | N/A |
| | Percent high school graduate or higher | 84.3 | 88.4 | N/A |
| | Percent with a Bachelor's degree or higher | 21.2 | 24.7 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | | |
| | Percent who speak a language other than English at home | 4.3 | 6.3 | N/A |
| | And Percent who speak English less than very well | 1.1 | 4.3 | N/A |
| **Household income (Median $)** | | 30,445 | 40,542 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 8.6 | 10.6 | N/A |
| **Percent female headed household** | | 5.9 | 7.8 | N/A |
| **Home Ownership (Percent)** | | | | |
| | Owner occupied | 798 | 1,305 | 65.9 |
| | Renter occupied | 228 | 474 | 34.1 |
| **Value Owner-occupied Housing (Median $)** | | 94,700 | 204,500 | N/A |
| **Monthly Contract Rent (Median $)** | | 374 | 577 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | | |
| | Percent in the labor force | 56.7 | 62.7 | N/A |
| | Percent of civilian labor force unemployed | 3.9 | 3.1 | N/A |
| **Occupation (Percent in workforce)** | | | | |
| | Management, professional, and related occupations | | 25.9 | N/A |
| | Service occupations | | 18.4 | N/A |
| | Sales and office occupations | | 27.6 | N/A |
| | Farming, fishing, and forestry occupations | 3.7 | 1.2 | N/A |
| | Construction, extraction, and maintenance occupations | | 20.4 | N/A |
| | Production, transportation, and material moving occupations | | 6.5 | N/A |
| **Industry (Percent in workforce)** | | | | |
| | Agriculture, forestry, fishing and hunting | 2.7 | 0.6 | N/A |
| | Manufacturing | 8.6 | 3.8 | N/A |
| | Percent government workers | 10.3 | 9.4 | N/A |

### 6.4.16 Mississippi

Between 2000 and 2010, Mississippi's population increased from 2.8 million people to almost 3.0 million people (Table 6.40). The percentage of individuals 25 years and older with a high school diploma has decreased by almost seven percent. The percentage of employed individuals has decreased slightly over the past decade; the unemployment rate significantly increased and the percentage of individuals below the poverty line increased by almost three percent. As with many of the other states, employment in the farming, fishing, forestry, and mining industries has declined, whereas the education, health, and social services industries provided the greatest employment opportunities in 2010. Also, the arts, recreation, lodging, and food services industries have been a source of employment in Mississippi over the past decade.

Nineteen Mississippi residents held a commercial tuna permit (Table 6.51), one held a commercial shark permit (Table 6.53) and there were no permit holders for swordfish (Table 6.54) in 2011. Communities involved in the commercial shark fishery are Moss Point, Biloxi, and Pascagoula.

Mississippi's recreational fisheries attracted approximately 216 anglers in 2010 (NMFS, 2011b). Out-of-state and in-state anglers from non-coastal counties made up 23 and 13 percent of that total, respectively. In 2011, there were 185 Mississippi residents with an HMS angling permit (Table 6.49). Marine recreational fishing activities in Mississippi generated over $417,000 in retail sales and 3,188 jobs in 2009 (NMFS, 2011a). There are 25 charter/headboats with HMS permits home-ported in Mississippi (Table 6.50).

**Table 6.40 Mississippi Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010.

| Mississippi | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **4,040,587** | **4,447,100** | **4,779,736** |
| **Education:** | | | |
| High school graduates (25 years or older) | 66.9% | 75.3% | 82.1% |
| **Employment:** | | | |
| Labor force (16 years and over) | 61.1% | 59.7% | 59.7% |
| Unemployment Rate | 6.9% | 6.2% | 11.8% |
| Median Household Income | $23,597 | $34,135 | $40,474 |
| Individuals below the poverty line* | 18.3% | 16.1% | 19.0% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 3.03% | 1.90% | 1.9% |
| Construction | 7.1% | 7.6% | 7.1% |
| Wholesale trade | 4.1% | 3.6% | 2.8% |
| Retail | 16.2% | 12.2% | 12.3% |
| Manufacturing | 22.9% | 18.2% | 13.7% |
| Education, health & social services | 21.6% | 19.3% | 21.4% |
| Arts, recreation, lodging & food services | 0.9% | 6.4% | 8.4% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

Marine recreational fishing in Mississippi has three modes: shoal water fishing along salt-water marshes, behind barrier islands, and in the sounds; near-shore fishing in relatively shallow water out to some 15 miles from shore, including trips to artificial reefs and oil platforms; and offshore fishing in deeper water with HMS species as a target. Sharks are, however, taken in all three modes and it is reported that some are retained for personal use by anglers.

### 6.4.17 Louisiana

The population of Louisiana has not changed by much between the last two census, 4.4 million people in 2000 and 4.5 million people in 2010 (Table 6.41). The percentage of individuals 25 years and older with a high school diploma has increased by almost seven percent. The percentage of unemployment and number of employed individuals increased by almost three percent over the past decade and the percentage of individuals below the poverty line declined. Employment in the farming, fishing, forestry, and mining industries has remained the same, whereas the education, health, and social services industries provided the greatest employment opportunities in 2010. Also, the arts, recreation, lodging, and food services industries have been a growing source of employment over the past decade.

Louisiana was second only to Alaska in the quantity of its commercial fisheries in the United States in 2010 and was fifth in value (NMFS, 2011b). Several of Louisiana's communities were in the top ten major U.S. ports for the greatest quantity of commercial fishery landings: Empire-Venice, Intracoastal City, and Cameron. Two communities were ranked in the top twenty for the value of the commercial fishery landings: Empire-Venice and Dulac-Chauvin, Louisiana.

**Table 6.41 Louisiana Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010.

| Louisiana | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **4,219,973** | **4,468,976** | **4,533,372** |
| **Education:** | | | |
| High school graduates (25 years or older) | 68.0% | 74.8% | 81.9% |
| **Employment:** | | | |
| Labor force (16 years and over) | 59.3% | 59.4% | 62.1% |
| Unemployment Rate | 9.6% | 7.3% | 10.1% |
| Median Household Income | $21,949 | $32,566 | $42,505 |
| Individuals below the poverty line* | 23.6% | 19.6% | 18.7% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 5.7% | 4.2%* | 4.2% |
| Construction | 6.8% | 7.9% | 8.0% |
| Wholesale trade | 4.5% | 3.5% | 2.7% |
| Retail | 17.5% | 11.9% | 11.7% |
| Manufacturing | 12.5% | 10.1% | 8.3% |
| Education, health & social services | 25.3% | 21.7% | 23.9% |
| Arts, recreation, lodging & food services | 1.1% | 9.1% | 9.7% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

Seventy-six Louisiana residents held a commercial tuna permit in 2011 (Table 6.51). Louisiana was home to the third largest number of shark permit holders in 2011 with 43 permitted vessels (Table 6.53). There are also 35 swordfish permit holders in Louisiana (Table 6.54). To support these HMS fisheries, there are 29 dealers licensed to purchase and sell tunas, sharks, and/or swordfish in Louisiana (Table 6.52).

The recreational saltwater fisheries off Louisiana attracted 796 anglers in 2010, collectively making 3,768 fishing trips (NMFS, 2011b). Of these anglers, 15 percent were from out-of-state, and 8 percent were from non-coastal counties within Louisiana. There were 606 HMS angling permit holders residing in Louisiana during 2011 (Table 6.49). The recreational fishing activities in Louisiana generated over $1.7 million in retail sales and supported 19,688 jobs in 2009 (NMFS, 2011a). Sharks are taken in both the bottom fishery and pelagic fishery.

In 2011, 88 charter/headboats from Louisiana communities had HMS permits (Table 6.50). The majority of websites sampled show that shark is a component of most trips offered by these vessels. As described in Section 6.3.2.1, the impacts from Hurricanes Katrina and Rita have been devastating to Louisiana and many Gulf Coast communities. NMFS is involved in several studies to determine the full economic and social impacts of these hurricanes

#### 6.4.17.1 Venice, Louisiana

The population of Venice has declined dramatically from 2,220 in 2000 to 202 in 2010 (Table 6.42). There are a slightly greater percentage of males compared to females in the population. The median age increased from about 31 to 38 between 2000 and 2010. The number of individuals under 20 declined by almost seven percent, while those 45 and older increased by almost seven percent in the last decade. White individuals account for a majority of the resident population, but Blacks or African American individuals accounted for 5.9 percent of the total population in 2010, a significant decrease from a 29 percent in 2000.

**Table 6.42 Demographic Profile of Venice, Louisiana.** Source: U.S. Census, 1990, 2000, and 2010.

| Venice, LA | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **2,669** | **2,220** | **202** |
| **Sex** | | | |
| Male | 51.4% | 51.0% | 51.5% |
| Female | 48.6% | 49.0% | 48.5% |
| **Age** | | | |
| Median Age | 26.3 | 31.7 | 38.3 |
| <20 | 42.0% | 35.2% | 28.6% |
| 20-44 | 35.1% | 35.2% | 27.6% |
| 45-64 | 18.3% | 22.0% | 28.8% |
| >65 | 4.6% | 7.6% | 15.0% |
| **Race** | | | |
| White | 63.9% | 61.9% | 84.7% |
| Black or African American | 31.3% | 28.7% | 5.9% |
| American Indian & Alaska Native | 3.3% | 3.4% | 2.0% |

| Venice, LA | 1990 | 2000 | 2010 |
|---|---|---|---|
| Asian | 1.4% | 4.0% | 1.0% |
| Other | 0.0% | 0.3% | 6.4% |
| **Household** | | | |
| Total | 836 | 746 | 71 |
| Family households | 84.7% | 78.3% | 62.0% |
| Nonfamily households | 15.3% | 21.7% | 38.0% |
| Average household size | 3.23 | 2.96 | 2.70 |
| Average family size | 3.58 | 3.38 | 3.52 |
| **Housing Occupancy** | | | |
| Total housing units | 960 | 933 | 119 |
| Vacant housing units | 14.0% | 20.0% | 40.3% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 87.5% | 87.1% | 84.5% |
| Renter-occupied housing units | 12.5% | 12.9% | 15.5% |
| Education: | | | |
| High school graduates (25 years or older) | 43.5% | 53.0% | NA |
| Employment: | | | |
| Labor force (16 years and over) | 48.1% | 53.0% | NA |
| Unemployment Rate | 3.3% | 2.0% | NA |
| Median Household Income | $16,250 | $33,813 | NA |
| Individuals below the poverty line* | 36.2% | 17.3% | NA |
| Industry | | | |
| Forestry, fishing, hunting, mining, and agriculture | 22.5% | 22.7% | NA |
| Construction | 10.8% | 8.1% | NA |
| Manufacturing | 7.1% | 4.8% | NA |
| Wholesale trade | 9.4% | 0.0% | NA |
| Retail trade | 16.0% | 13.1% | NA |
| Education, health & social services | 5.6% | 14.4% | NA |
| Arts, recreation, lodging & food services | 0.0% | 10.4% | NA |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

#### 6.4.17.2 Dulac, Louisiana

Dulac is located in the center of Terrebonne Parish, about 15 miles South of Houma, Louisiana. In 2000, the population was 2,458 individuals; it declined to 1,463 in 2010 (Table 6.43). Dulac reported a male to female ratio of 51 to 29 in 2010. Individuals under 20 years old and between 22 and 44 years old make up the greatest proportion of the population in both 2010, with individuals between 45 and 64 comprising the third largest age group. White individuals comprise the largest proportion of race--54 and 48 percent in 2000 and 2010, respectively. Individuals of American Indian and Native Alaskan race accounted for 39 and 42 percent of the total population in 2000 and 2010, respectively.

In 2000, Dulac had 768 households with an average size of 3.48 persons per household (Table 6.43). By 2010, the number of households had decreased to 490 and the average size of each household had dropped to 2.99 persons. In 2010, about 64 percent of the population was employed and almost 86 percent of the total population had graduated high school.

**Table 6.43 Demographic Profile of Dulac, Louisiana.** Source: U.S. Census, 1990, 2000, 2010.

| Dulac, LA | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total Population:** | **3,273** | **2,458** | **1,463** |
| **Sex** | | | |
| Male | 49.3% | 50.0% | 50.9% |
| Female | 50.7% | 50.0% | 49.1% |
| **Age** | | | |
| Median Age | 25.5 | 31.8 | 35.8 |
| <20 | 41.8% | 35.2% | 30.1% |
| 20-44 | 35.2% | 32.2% | 30.1% |
| 45-64 | 17.0% | 22.8% | 27.0% |
| >65 | 6.0% | 9.8% | 12.8% |
| **Race** | | | |
| White | 49.4% | 54.0% | 48.5% |
| Black or African American | 2.3% | 2.5% | 1.9% |
| American Indian & Alaska Native | 48.1% | 39.4% | 42.2% |
| Asian | 0.0% | 0.5% | 0.8% |
| Other | 0.3% | 0.5% | 6.6% |
| **Household** | | | |
| Total | 922 | 768 | 490 |
| Family households | 85.8% | 79.3% | 73.7% |
| Nonfamily households | 14.2% | 20.7% | 26.3% |
| Average household size | 3.55 | 3.20 | 2.99 |
| Average family size | 3.93 | 3.55 | 3.48 |
| **Housing Occupancy** | | | |
| Total housing units | 1,182 | 1,063 | 646 |
| Vacant housing units | 33.0% | 27.8% | 24.1% |
| **Housing Tenure** | | | |
| Owner-occupied housing units | 80.1% | 79.3% | 82.9% |
| Renter-occupied housing units | 19.9% | 20.7% | 17.1% |
| Education: | | | |
| High school graduates (25 years or older) | 27.1% | 39.1% | 85.6% |
| Employment: | | | |
| Labor force (16 years and over) | 37.8% | 44.9% | 64.4% |
| Unemployment Rate | 8.0% | 3.0% | 10.8% |
| Median Household Income | $12,653 | $22,900 | NA |
| Individuals below the poverty line* | 49.3% | 30.9% | NA |

| Industry | | | |
|---|---|---|---|
| Forestry, fishing, hunting, mining, and agriculture | 23.6% | 25.9% | NA |
| Construction | 3.7% | 3.1% | NA |
| Manufacturing | 14.0% | 10.0% | NA |
| Wholesale trade | 8.5% | 5.7% | NA |
| Retail trade | 17.7% | 10.3% | NA |
| Education, health & social services | 9.7% | 8.5% | NA |
| Arts, recreation, lodging & food services | 0.0% | 10.7% | NA |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

#### 6.4.17.3 Grand Isle, Louisiana

Grande Isle is located in the center of Terrebonne Parish, about 15 miles South of Houma, Louisiana. In 2000, the population was 1,541 individuals; it declined to 1,296 in 2010 (Table 6.44). Grande Isle reported a male to female ratio of 53 to 47 in 2010. Individuals between 18 and 64 years old make up the greatest proportion of the population in 2010. White individuals comprise the largest proportion of race--96 and 93 percent in 2000 and 2010, respectively. Individuals of American Indian and Native Alaskan race accounted for 2.3 and 2.2 percent of the total population in 2000 and 2010, respectively.

**Table 6.44 Demographic Profile of Grand Isle, Louisiana.** Source: U.S. Census, 1990, 2000, 2010.

| Grand Isle, LA | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 1,455 | 1,541 | 1,296 |
| **Gender Ratio M/F (Number)** | 738/717 | 788 / 753 | 693 / 603 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | 28.4 | 23.7 | 17.3 |
| 18 to 64 years of age | 49.4 | 63.1 | 65.7 |
| 65 years and over | 7.8 | 13.2 | 17.0 |
| **Ethnicity or Race (Percent)** | | | |
| White | 99.5 | 96 | 93.7 |
| Black or African American | 0.1 | 0.2 | 0.8 |
| American Indian and Alaskan Native | 0.4 | 2.3 | 2.2 |
| Asian | 0.0 | 0.2 | 0.2 |
| Native Hawaiian and other Pacific Islander | N/A | <0.1 | 0.0 |
| Some other race | 0.0 | 0.4 | 1.1 |
| Two or more races | N/A | 0.9 | 2.1 |
| Hispanic or Latino (any race) | 0.8 | 1.5 | 3.9 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 23.9 | 17 | N/A |
| Percent high school graduate or higher | 57 | 68.3 | N/A |
| Percent with a Bachelor's degree or higher | 5.6 | 13.3 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |
| Percent who speak a language other than English at home | 28.2 | 18.4 | N/A |
| And Percent who speak English less than very well | 10.9 | 3.2 | N/A |
| **Household income (Median $)** | 19,454 | 33,548 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | 25.8 | 13.2 | N/A |
| **Percent female headed household** | 9.7 | 8.4 | N/A |

| Grand Isle, LA | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Home Ownership (Percent)** | | | |
| Owner occupied | 74 | 80.1 | 56.0 |
| Renter occupied | 26 | 19.9 | 44.0 |
| **Value Owner-occupied Housing (Median $)** | 42,100 | 69,500 | N/A |
| **Monthly Contract Rent (Median $)** | 249 | 409 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | |
| Percent in the labor force | 55.1 | 57.8 | N/A |
| Percent of civilian labor force unemployed | 3.9 | 4.7 | N/A |
| **Occupation (Percent in workforce)** | | | |
| Management, professional, and related occupations | N/A | 22 | N/A |
| Service occupations | N/A | 16.9 | N/A |
| Sales and office occupations | N/A | 22.5 | N/A |
| Farming, fishing, and forestry occupations | 5.4 | 8.8 | N/A |
| Construction, extraction, and maintenance occupations | N/A | 13.9 | N/A |
| Production, transportation, and material moving occupations | N/A | 15.9 | N/A |
| **Industry (Percent in workforce)** | | | |
| Agriculture, forestry, fishing, hunting and mining | 13.9 | 15.3 | N/A |
| Manufacturing | 17.6 | 8.9 | N/A |
| Percent government workers | 13.8 | 14.2 | N/A |

### 6.4.18 Texas

The population of Texas has increased by nearly five million people over the past decade, reaching 25.1 million in 2010 (Table 6.45). The percentage of individuals 25 years and older with a high school diploma has increased slightly. The percentage of employed individuals, the unemployment rate, and percentage of individuals below the poverty line, have all increased over the past decade. Employment in the farming, fishing, forestry, and mining industries, as well as the education, health, and social services industries has slightly increased and provided the greatest employment opportunities in 2010.

In the state of Texas during 2011, 27 residents possessed a commercial tuna permit (Table 6.51), seven a commercial shark permit (Table 6.53), and four a commercial swordfish permit (Table 6.54). The commercial shark fishery generally tends to be a small portion of the commercial fisheries of Texas. There are 11 licensed HMS dealers for tuna, shark, and swordfish in Texas (Table 6.52).

In 2011, there were 739 Texas residents that held an HMS angling permit (Table 6.49). Recreational fishing activities in Texas generated over $2.8 million in retail sales and supported 22,127 jobs (NMFS, 2011a). The number of charter/headboat permit holders from Texas has increased from 129 in 2003 to 155 in 2011 (Table 6.50). Most of these take shark as an incidental catch to other near-shore and offshore fish.

**Table 6.45 Texas Demographic Profile.** Source: U.S. Census, 1990, 2000, and 2010.

| Texas | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **16,986,510** | **20,851,820** | **25,145,561** |
| **Education:** | | | |
| High school graduates (25 years or older) | 72.1% | 75.7% | 80.7% |

| Employment: | | | |
|---|---|---|---|
| Labor force (16 years and over) | 66.0% | 63.6% | 65.2% |
| Unemployment Rate | 7.1% | 6.1% | 8.8% |
| Median Household Income | $27,016 | $39,927 | $48,615 |
| Individuals below the poverty line* | 18.1% | 15.4% | 17.9% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | 4.9% | 2.7% | 2.9% |
| Construction | 6.7% | 8.1% | 8.0% |
| Wholesale trade | 4.9% | 3.9% | 2.9% |
| Retail | 17.4% | 12.0% | 11.5% |
| Manufacturing | 14.4% | 11.8% | 9.3% |
| Education, health & social services | 22.5% | 19.3% | 21.8% |
| Arts, recreation, lodging & food services | 1.2% | 7.3% | 8.6% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

### 6.4.18.1 Freeport, Texas

Freeport, located approximately 45 miles south of Houston, TX offers a home to 12,049 residents according to 2010 census data (Table 6.46). Freeport reported an almost equal male to female ratio in the last decade. Individuals between 18 and 64 years old make up the greatest proportion of the population in 2010, with individuals less than 18 making up the second highest proportion of the population. White individuals comprise the largest proportion of race--62 and 65 percent in 2000 and 2010, respectively. Individuals of Black or African American race accounted for 13.4 and 12.2 percent of the total population in 2000 and 2010, respectively.

**Table 6.46 Freeport, Texas Demographic Profile. Source: U.S. Census, 1990, 2000, and 2010.**

| Freeport, TX | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Total population** | 11,389 | 12,708 | 12,049 |
| **Gender Ratio M/F (Number)** | 5,692/5,697 | 6,353 / 6,355 | 6,034 / 6,015 |
| **Age (Percent of total population)** | | | |
| Under 18 years of age | 34.2 | 35.7 | 34.1 |
| 18 to 64 years of age | 56.7 | 56.2 | 57.8 |
| 65 years and over | 9.1 | 8.1 | 8.1 |
| **Ethnicity or Race (Percent)** | | | |
| White | 62.2 | 61.6 | 65.0 |
| Black or African American | 15.3 | 13.4 | 12.2 |
| American Indian and Alaskan Native | 0.4 | 0.6 | 0.8 |
| Asian | 0.3 | 0.4 | 0.5 |
| Native Hawaiian and other Pacific Islander | 0.0 | <0.1 | 0.0 |
| Some other race | 21.9 | 20.9 | 17.1 |
| Two or more races | 0.0 | 3.2 | 4.4 |
| Hispanic or Latino (any race) | 38.6 | 52 | 59.9 |
| **Educational Attainment ( Population 25 and over)** | | | |
| Percent with less than 9th grade | 21.3 | 22.6 | N/A |
| Percent high school graduate or higher | 58.1 | 55.1 | N/A |
| Percent with a Bachelor's degree or higher | 6.4 | 5.4 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | |
| Percent who speak a language other than English at home | 31.9 | 45.3 | N/A |

| Freeport, TX | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| | And Percent who speak English less than very well | 13.7 | 23.5 | N/A |
| **Household income (Median $)** | | 21,483 | 30,245 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 24.1 | 22.3 | N/A |
| **Percent female headed household** | | 13.4 | 16.8 | N/A |
| **Home Ownership (Percent)** | | | | |
| | Owner occupied | 57 | 57 | 56.0 |
| | Renter occupied | 43 | 43 | 44.0 |
| **Value Owner-occupied Housing (Median $)** | | 35,800 | 35,700 | N/A |
| **Monthly Contract Rent (Median $)** | | 259 | 439 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | | |
| | Percent in the labor force | 63.6 | 54.3 | N/A |
| | Percent of civilian labor force unemployed | 9.5 | 13.7 | N/A |
| **Occupation (Percent in workforce)** | | | | |
| | Management, professional, and related occupations | N/A | 16.4 | N/A |
| | Service occupations | N/A | 16.8 | N/A |
| | Sales and office occupations | N/A | 24 | N/A |
| | Farming, fishing, and forestry occupations | 2.3 | 0.1 | N/A |
| | Construction, extraction, and maintenance occupations | N/A | 20.5 | N/A |
| | Production, transportation, and material moving occupations | N/A | 22.2 | N/A |
| **Industry (Percent in workforce)** | | | | |
| | Agriculture, forestry, fishing, hunting and mining | 3.8 | 0.4 | N/A |
| | Manufacturing | 24.9 | 17.7 | N/A |
| | Percent government workers | 10.1 | 10.5 | N/A |

### 6.4.18.2 Port Aransas, Texas

Port Aransas is a small community of 3,480 residents (Table 6.47) located in Nueces County on the northern tip of Mustang Island, approximately 32 miles southwest of Corpus Christi. Port Aransas reported a male to female ratio of 51 to 49 in the last decade. Individuals between 18 and 64 years old make up the greatest proportion of the population in 2010. White individuals comprise the largest proportion of race--93 and 94 percent in 2000 and 2010, respectively. Individuals of Hispanic or Latino ethnicity accounted for 6.1 and 7.7 percent of the total population in 2000 and 2010, respectively.

**Table 6.47 Port Aransas, Texas Demographic Profile. Source: U.S. Census, 1990, 2000, and 2010.**

| Port Aransas, TX | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| **Total population** | | 2,233 | 3,370 | 3,480 |
| **Gender Ratio M/F (Number)** | | 1,146 / 1,087 | 1,753 / 1,617 | 1,779 / 1,701 |
| **Age (Percent of total population)** | | | | |
| | Under 18 years of age | 21.6 | 18.9 | 16.4 |
| | 18 to 64 years of age | 64.5 | 65.4 | 64.5 |
| | 65 years and over | 13.9 | 15.7 | 19.1 |
| **Ethnicity or Race (Percent)** | | | | |
| | White | 96.1 | 93.9 | 94.2 |
| | Black or African American | 0.2 | 0.4 | 0.3 |
| | American Indian and Alaskan Native | 0.4 | 1.2 | 0.9 |
| | Asian | 1.3 | 0.9 | 1.3 |
| | Native Hawaiian and other Pacific Islander | N/A | <0.1 | 0.1 |
| | Some other race | 1.9 | 2.2 | 1.2 |

| Port Aransas, TX | | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| | Two or more races | N/A | 1.4 | 2.0 |
| | Hispanic or Latino (any race) | 6.2 | 6.1 | 7.7 |
| **Educational Attainment ( Population 25 and over)** | | | | |
| | Percent with less than 9th grade | 3.7 | 2.5 | N/A |
| | Percent high school graduate or higher | 81.2 | 87.4 | N/A |
| | Percent with a Bachelor's degree or higher | 23.9 | 27.9 | N/A |
| **Language Spoken at Home (Population 5 years and over)** | | | | |
| | Percent who speak a language other than English at home | 8.3 | 9 | N/A |
| | And Percent who speak English less than very well | 3.1 | 2.2 | N/A |
| **Household income (Median $)** | | 23,396 | 39,432 | N/A |
| **Poverty Status (Percent of population with income below poverty line)** | | 15.8 | 11.3 | N/A |
| **Percent female headed household** | | 8.1 | 7.3 | N/A |
| **Home Ownership (Percent)** | | | | |
| | Owner occupied | 59 | 69.3 | 66.4 |
| | Renter occupied | 41 | 30.7 | 33.6 |
| **Value Owner-occupied Housing (Median $)** | | 67,100 | 110,500 | N/A |
| **Monthly Contract Rent (Median $)** | | 317 | 571 | N/A |
| **Employment Status (Population 16 yrs and over)** | | | | |
| | Percent in the labor force | 65.6 | 61.5 | N/A |
| | Percent of civilian labor force unemployed | 4.6 | 4.1 | N/A |
| **Occupation (Percent in workforce)** | | | | |
| | Management, professional, and related occupations | N/A | 36.4 | N/A |
| | Service occupations | N/A | 21 | N/A |
| | Sales and office occupations | N/A | 20.3 | N/A |
| | Farming, fishing, and forestry occupations | 6.3 | 2.8 | N/A |
| | Construction, extraction, and maintenance occupations | N/A | 11.8 | N/A |
| | Production, transportation, and material moving occupations | N/A | 7.7 | N/A |
| **Industry (Percent in workforce)** | | | | |
| | Agriculture, forestry, fishing, hunting and mining | 7.3 | 3.6 | N/A |
| | Manufacturing | 5 | 1 | N/A |
| | Percent government workers | 20.6 | 21.4 | N/A |

### 6.4.19 Puerto Rico

The population in Puerto Rico decreased by nearly 100,000 people in the last decade (Table 6.48). The percentage of individuals 25 years and older with a high school diploma and/or a graduate level degree has increased by almost ten percent in the last decade. The percentage of employed individuals has increased by almost seven percent, and the percent of unemployment rate, and percentage of individuals below the poverty line declined. Education, health, and social services provide the greatest sources of employment. The farming, fishing, forestry, and mining employed less than two percent of the population in 2010.

While Puerto Rico was home to 88 commercial tuna permit holders in 2011, there were no permit holders for sharks or swordfish (Table 6.50; Table 6.52, and Table 6.53). A large number of the commercial tuna permit holders are in Aguadilla and another large group is located in Rincon. There are seven HMS dealer permit holders in Puerto Rico (Table 6.51).

**Table 6.48 Puerto Rico Demographic Profile.** Source: U.S. Bureau of the Census, 1990, 2000 and 2010.

| Puerto Rico | 1990 | 2000 | 2010 |
|---|---|---|---|
| **Population:** | **3,522,037** | **3,808,610** | **3,725,789** |
| **Education:** | | | |
| High school graduates (25 years or older) | 49.7% | 60.0% | 69.5% |
| **Employment:** | | | |
| Labor force (16 years and over) | 47.3% | 40.7% | 47.2% |
| Unemployment Rate | 20.4% | 19.2% | 19.0% |
| Median Household Income | | $14,412 | $18,862 |
| Individuals below the poverty line* | 58.9% | 48.2% | 45.0% |
| **Employment in some industry sectors:** | | | |
| Farming, fishing, forestry & mining | | 1.7% | 1.1% |
| Construction | | | 5.9% |
| Wholesale trade | | 4.4% | 3.3% |
| Retail | | 11.7% | 13.2% |
| Manufacturing | | 13.5% | 9.5% |
| Education, health & social services | | 19.3% | 22.4% |
| Arts, recreation, lodging & food services | | 6.5% | 8.6% |

*U.S. Census uses data from 1989 and 1999 to estimate these values.

The recreational saltwater fisheries in Puerto Rico attracted 103 anglers in 2010, collectively making 536 fishing trips (NMFS, 2011b). Of these anglers, 11 percent of the anglers were not from Puerto Rico. In 2011, 674 HMS angling permit holders were residing in Puerto Rico (Table 6.49). Twenty-seven vessels from Puerto Rico held an HMS charter/headboat permit in 2011 (Table 6.50).

The fishing industry is not a prominent economic activity in Puerto Rico and variations in fishing incomes have little impact on the island's economy. Most of the recreational fishing activity occurs near the capital city of San Juan. Artisanal fishing communities are found throughout the island. These communities are extremely poor and will likely be the communities most affected by changes in regulations. The extremely deep inshore waters off these areas make billfish and other highly migratory species accessible to the artisanal fishery.

## 6.5 Future Assessments

In the 2008 assessment, MRAG Americas, Inc. developed a list of HMS communities using permit and census data similar to a study by Sepez *et al.* (2005). This assessment yielded 14 additional community profiles, and followed a method that is reproducible and can be applied in the future to identify new communities that have emerging involvement in HMS fisheries, as well as monitor changes in HMS communities that have been profiled in the past. Along with evaluating the number of HMS permits in relation to population to determine areas of concern, NMFS should continue to consult with the HMS permit databases, landings information, and HMS Advisory Panel members to determine the most appropriate community profiles for HMS-related fisheries.

**Table 6.49 Number and Percentage of HMS Angling Permits by State and Country as of October 2011**

| State | HMS Angling Permits | Percentage |
|---|---|---|
| Florida | 4035 | 17.4% |
| New Jersey | 3397 | 14.7% |
| Massachusetts | 3318 | 14.3% |
| New York | 1688 | 7.3% |
| North Carolina | 1628 | 7.0% |
| Maryland | 1187 | 5.1% |
| Virginia | 949 | 4.1% |
| Delaware | 865 | 3.7% |
| Texas | 739 | 3.2% |
| South Carolina | 714 | 3.1% |
| Puerto Rico | 674 | 2.9% |
| Rhode Island | 629 | 2.7% |
| Louisiana | 606 | 2.6% |
| Connecticut | 604 | 2.6% |
| Maine | 494 | 2.1% |
| Alabama | 412 | 1.8% |
| New Hampshire | 401 | 1.7% |
| Pennsylvania | 246 | 1.1% |
| Mississippi | 185 | 0.8% |
| Georgia | 132 | 0.6% |
| Virgin Islands | 56 | 0.2% |
| Vermont | 24 | 0.1% |
| Tennessee | 21 | 0.1% |
| Ohio | 18 | 0.1% |
| Michigan | 16 | 0.1% |
| Arkansas | 9 | 0.0% |
| British Virgin Islands | 8 | 0.0% |
| Missouri | 8 | 0.0% |
| Indiana | 7 | 0.0% |
| Oklahoma | 7 | 0.0% |
| Kentucky | 6 | 0.0% |
| California | 5 | 0.0% |
| Illinois | 5 | 0.0% |
| West Virginia | 5 | 0.0% |
| Canada | 5 | 0.0% |

| State | HMS Angling Permits | Percentage |
|---|---|---|
| Alaska | 4 | 0.0% |
| Colorado | 4 | 0.0% |
| Wisconsin | 4 | 0.0% |
| Minnesota | 3 | 0.0% |
| Montana | 3 | 0.0% |
| Washington | 3 | 0.0% |
| Iowa | 2 | 0.0% |
| Kansas | 2 | 0.0% |
| Nevada | 2 | 0.0% |
| Wyoming | 2 | 0.0% |
| Washington, DC | 1 | 0.0% |
| Idaho | 1 | 0.0% |
| North Dakota | 1 | 0.0% |
| Oregon | 1 | 0.0% |
| South Dakota | 1 | 0.0% |
| Utah | 1 | 0.0% |
| **Total** | **23,138** | **100.00%** |

**Table 6.50 Number and Percentage of HMS Charter/Headboat Permits by State and Country as of October 2011.**

| State | Atlantic HMS Charter/Headboat | Percentage |
|---|---|---|
| Massachusetts | 838 | 20.0% |
| Florida | 639 | 15.2% |
| New Jersey | 550 | 13.1% |
| North Carolina | 420 | 10.0% |
| New York | 335 | 8.0% |
| Rhode Island | 172 | 4.1% |
| Texas | 155 | 3.7% |
| South Carolina | 141 | 3.4% |
| Maine | 130 | 3.1% |
| Maryland | 125 | 3.0% |
| Delaware | 108 | 2.6% |
| Virginia | 101 | 2.4% |
| New Hampshire | 96 | 2.3% |
| Louisiana | 88 | 2.1% |
| Connecticut | 83 | 2.0% |
| Alabama | 77 | 1.8% |
| Puerto Rico | 27 | 0.6% |
| Mississippi | 25 | 0.6% |
| Pennsylvania | 25 | 0.6% |
| Virgin Islands | 23 | 0.5% |
| Georgia | 20 | 0.5% |
| Michigan | 4 | 0.1% |
| West Virginia | 4 | 0.1% |
| Idaho | 1 | 0.0% |
| Kentucky | 1 | 0.0% |
| Minnesota | 1 | 0.0% |
| Ohio | 1 | 0.0% |
| Oklahoma | 1 | 0.0% |
| Vermont | 1 | 0.0% |
| Wyoming | 1 | 0.0% |
| **Total** | **4,194** | **100%** |

**Table 6.51 Number and Percentage of Commercial Tuna Permits by State and Country as of October 2011**

| State | Commercial Tuna Permits | Percentage |
|---|---|---|
| Massachusetts | 1341 | 33.2% |
| Maine | 616 | 15.3% |
| North Carolina | 424 | 10.5% |
| Florida | 328 | 8.1% |
| New Hampshire | 231 | 5.7% |
| New Jersey | 231 | 5.7% |
| New York | 202 | 5.0% |
| Rhode Island | 161 | 4.0% |
| Puerto Rico | 88 | 2.2% |
| Louisiana | 76 | 1.9% |
| Connecticut | 74 | 1.8% |
| Virginia | 43 | 1.1% |
| South Carolina | 42 | 1.0% |
| Maryland | 38 | 0.9% |
| Delaware | 31 | 0.8% |
| Alabama | 30 | 0.7% |
| Texas | 27 | 0.7% |
| Mississippi | 19 | 0.5% |
| Virgin Islands | 13 | 0.3% |
| Pennsylvania | 7 | 0.2% |
| California | 5 | 0.1% |
| Georgia | 4 | 0.1% |
| Ohio | 2 | 0.0% |
| Arizona | 1 | 0.0% |
| Indiana | 1 | 0.0% |
| Michigan | 1 | 0.0% |
| Oregon | 1 | 0.0% |
| West Virginia | 1 | 0.0% |
| **Total** | **4038** | **100%** |

**Table 6.52 Number and Percentage of HMS Shark, Swordfish, and Tuna Dealers by State and Country as of October 2011**

| State/Country | HMS Dealer Permit | Percentage |
|---|---|---|
| Florida | 136 | 18.8% |
| Massachusetts | 127 | 17.5% |
| New York | 94 | 13.0% |
| New Jersey | 67 | 9.3% |
| North Carolina | 63 | 8.7% |
| Rhode Island | 49 | 6.8% |
| Maine | 30 | 4.1% |
| Louisiana | 29 | 4.0% |
| South Carolina | 26 | 3.6% |
| Virginia | 26 | 3.6% |
| Maryland | 15 | 2.1% |
| Texas | 11 | 1.5% |
| Alabama | 7 | 1.0% |
| California | 7 | 1.0% |
| Puerto Rico | 7 | 1.0% |
| Connecticut | 5 | 0.7% |
| Hawaii | 5 | 0.7% |
| New Hampshire | 5 | 0.7% |
| Virgin Islands | 5 | 0.7% |
| Georgia | 4 | 0.6% |
| Pennsylvania | 3 | 0.4% |
| Washington | 2 | 0.3% |
| Delaware | 1 | 0.1% |
| **Total** | **724** | **100%** |

**Table 6.53 Number and Percentage of Directed and Incidental Shark Permit Holders by State as of October 2011**

| State | Shark Permits | Percentage |
|---|---|---|
| Florida | 268 | 55.9% |
| New Jersey | 50 | 10.4% |
| Louisiana | 43 | 9.0% |
| North Carolina | 27 | 5.6% |
| New York | 21 | 4.4% |
| South Carolina | 19 | 4.0% |
| Massachusetts | 12 | 2.5% |
| Maine | 7 | 1.5% |
| Alabama | 7 | 1.5% |
| Texas | 7 | 1.5% |
| Maryland | 5 | 1.0% |
| Rhode Island | 3 | 0.6% |
| Georgia | 3 | 0.6% |
| Virginia | 2 | 0.4% |
| New Hampshire | 1 | 0.2% |
| Connecticut | 1 | 0.2% |
| Pennsylvania | 1 | 0.2% |
| Mississippi | 1 | 0.2% |
| California | 1 | 0.2% |
| **Totals** | **479** | **100%** |

**Table 6.54 Number and Percentage of Swordfish Permit Holders by State as of October 2011**

| State | Swordfish Permits | Percentage |
|---|---|---|
| Florida | 157 | 48.6% |
| New Jersey | 41 | 12.7% |
| Louisiana | 35 | 10.8% |
| New York | 22 | 6.8% |
| Massachusetts | 17 | 5.3% |
| North Carolina | 17 | 5.3% |
| Rhode Island | 12 | 3.7% |
| Maine | 6 | 1.9% |
| South Carolina | 5 | 1.5% |
| Maryland | 4 | 1.2% |
| Texas | 4 | 1.2% |
| Connecticut | 1 | 0.3% |
| Pennsylvania | 1 | 0.3% |
| Virginia | 1 | 0.3% |
| **Totals** | **323** | **100%** |

## 6.6 Chapter 6 References


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# 7.0 BYCATCH, INCIDENTAL CATCH, AND PROTECTED SPECIES

In 1998, NMFS developed a national bycatch plan, *Managing the Nation's Bycatch* (NMFS, 1998), which includes programs, activities, and recommendations for federally managed fisheries. The national goal of the Agency's bycatch plan activities is to implement conservation and management measures for living marine resources that will minimize, to the extent practicable, bycatch and the mortality of bycatch that cannot be avoided. Inherent in this goal is the need to avoid bycatch, rather than create new ways to utilize bycatch. The plan also established a definition of bycatch as fishery discards, retained incidental catch, and unobserved mortalities resulting from a direct encounter with fishing gear.

Bycatch in commercial and recreational fisheries is an important issue for the fishing industry, resource managers, scientists, and the public. Bycatch can result in death or injury to the discarded fish, and it is essential that this component of total fishing-related mortality be incorporated into fish stock assessments and evaluation of management measures. Bycatch precludes other more productive uses of fishery resources and decreases the efficiency of fishing operations. Although not all discarded fish die, bycatch can represent a large source of mortality, which can slow the rebuilding of overfished stocks. Bycatch imposes direct and indirect costs on fishing operations by increasing sorting time and decreasing the amount of gear available to catch target species. Incidental catch concerns also apply to populations of marine mammals, sea turtles, seabirds, and other components of ecosystems which may be protected under other applicable laws and for which there are no commercial or recreational uses but for which existence values may be high.

## 7.1 Bycatch Reduction and the Magnuson-Stevens Act

According to the Magnuson-Stevens Act, "The term "bycatch" means fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch and release fishery management program." Fish is defined as finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds. Birds and marine mammals are therefore not considered bycatch under the Magnuson-Stevens Act, but are examined as incidental catch.

NS 9 of the Magnuson-Stevens Act requires that fishery conservation and management measures shall, to the extent practicable, minimize bycatch and minimize the mortality of bycatch that cannot be avoided. In many fisheries, it is not practicable to eliminate all bycatch and bycatch mortality. Some relevant examples of fish caught in Atlantic HMS fisheries that are included as bycatch or incidental catch are marlin, undersized swordfish, and BFT caught by commercial fishing gear; undersized swordfish and tunas in recreational hook and line fisheries; species for which there is little or no market such as blue sharks; and species caught and released in excess of a bag limit.

There are benefits associated with the reduction of bycatch, including the reduction of uncertainty concerning total fishing-related mortality, which improves the ability to assess the status of stocks, to determine the appropriate relevant controls, and to ensure that overfishing levels are not exceeded. It is also important to consider the bycatch of HMS in fisheries that target other species as a source of mortality for HMS and to work with fishery constituents and resource manager partners on an effective bycatch strategy to maintain sustainable fisheries. This strategy may include a combination of management measures in the domestic fishery, and if appropriate, multi-lateral measures recommended by international bodies such as the International Commission for the Conservation of Atlantic Tunas (ICCAT) or coordination with Regional Fishery Management Councils or States. The bycatch in each fishery is summarized annually in the SAFE Report for Atlantic HMS fisheries. The effectiveness of the bycatch reduction measures is evaluated based on this summary.

A number of options are currently employed (*) or available for bycatch reduction in Atlantic HMS fisheries. These include but are not limited to:

Commercial

1. Gear Modifications (including hook and bait types)*
2. Circle Hooks*
3. Time/Area Closures*
4. Performance Standards
5. Education/Outreach*
6. Effort Reductions (*i.e.*, Limited Access)*
7. Full Retention of Catch
8. Use of De-hooking Devices (mortality reduction only)*

Recreational

1. Use of Circle Hooks (mortality reduction only)*
2. Use of De-hooking Devices (mortality reduction only)
3. Full Retention of Catch
4. Formal Voluntary or Mandatory Catch-and-Release Program for all Fish or Certain Species*
5. Time/Area Closures*

There are probably no HMS fisheries in which there is zero bycatch because none of the currently legal fishing gears are perfectly selective for the target species of each fishing operation (with the possible exception of the swordfish/tuna harpoon fishery and speargun fishery). Therefore, to totally eliminate bycatch of all non-target species in Atlantic HMS fisheries would be impractical. The goal then is to minimize the amount of bycatch to the extent practicable and minimize the mortality of species caught as bycatch.

### 7.1.1 Standardized Reporting of Bycatch

Section 303(a)(11) of the Magnuson-Stevens Act requires that a FMP establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery. In 2004, NMFS published a report entitled *"Evaluating Bycatch: A National Approach to Standardized Bycatch Monitoring Programs,"* which described the current status of, and guidelines for, bycatch monitoring programs (NMFS, 2004a). The data collection and analyses that are used to estimate bycatch in a fishery constitute the "standardized bycatch reporting methodology" (SBRM) for that fishery (NMFS, 2004a). Appendix 5 of the report specifies the protocols for SBRMs established by NMFS throughout the country.

As part of the Agency's National Bycatch Strategy, NMFS established a National Working Group on Bycatch (NWGB) to develop a national approach to standardized bycatch reporting methodologies and monitoring programs. This work is to be the basis for regional teams, established in the National Bycatch Strategy, to make fishery-specific recommendations. The first National Bycatch Report was published this year (NMFS, 2011).

NMFS utilizes self-reported logbook data (Fisheries Logbook System or FLS, and the supplemental discard report form in the reef fish/snapper-grouper/king and Spanish mackerel/shark logbook program), at-sea observer data, and survey data (recreational fishery dockside intercept and telephone surveys) to produce bycatch estimates in HMS fisheries. These data are collected with respect to fishing gear type (see Section 7.1.1). The number and location of discarded fish are recorded, as is the disposition of the fish (*i.e.*, released alive vs. released dead). Post-release mortality of HMS can be accounted for in stock assessments to the extent that the data allow.

The fishery logbook systems in place are mandatory programs, and it is expected that the reporting rates are generally high (Garrison, 2005). Due to the management focus on HMS fisheries, there has been close monitoring of reporting rates, and observed trips can be directly linked to reported effort. In general, the gear characteristics and amount of observed effort is consistent with reported effort. However, under-reporting is possible, which can lead to a negative bias in bycatch estimates. Cramer (2000) compared dead discards of undersized swordfish, sailfish, white and blue marlin, and pelagic sharks from HMS logbook and Pelagic Observer Program (POP) data in the U.S. Atlantic PLL fishery. Cramer (2000) provided the ratio of catch estimated from the POP data divided by the reported catch in the HMS logbooks. The ratio indicated the amount of underreporting for each species in a given area. However, the data analyzed by Cramer (2000), was based on J-hook data from 1997 – 1999 and that gear is prohibited now. In some instances, logbooks are used to provide effort information against which bycatch rates obtained from observers is multiplied to estimate bycatch. In other sectors/fisheries, self-reporting provides the primary method of reporting bycatch because of limited funding, priorities, etc.

The following section provides a review of the bycatch reporting methodologies for all HMS fisheries currently in place. Future adjustments may be implemented based on evaluation of the results of studies developed as part of the HMS Bycatch Reduction Implementation Plan, or as needed due to changing conditions in the fisheries. Further analyses of bycatch in the various HMS fisheries may be conducted as time, resources and priorities allow.

*U.S. Atlantic Pelagic Longline (PLL) Fishery*

NMFS utilizes both self-reported data (mandatory logbooks for all vessels) and observer data to monitor bycatch in the PLL fishery. The observer program has been in place since 1992 to document finfish bycatch, characterize fishery behavior, and quantify interactions with protected species (Beerkircher *et al.*, 2002). The observer program is mandatory for those vessels selected and all vessels with directed and incidental swordfish permits are selected. The program had a target coverage level of five percent of the U.S. fleet within the North Atlantic (waters north of $5^{o}$ N. latitude), as was agreed to by the United States at ICCAT. Actual coverage levels achieved from 1992 – 2003 ranged from two to nine percent depending on quarter and year (Table 7.1) Observer coverage was 100 percent for vessels participating in the NED experimental fishery during 2001 – 2003. Overall observer coverage in 2003 was 11.5 percent of the total sets made, including the NED experiment. The program began requiring an eight percent coverage rate due to the requirements of the 2004 BiOp for Atlantic PLL Fishery for HMS. Observer coverage during 2005-2010 ranged from 7.5 – 15.0 percent. NMFS increased the coverage of the longline fleet operating in the Gulf of Mexico during March/April through June for 2007-2010 to monitor BFT interactions, attempting 100% observer coverage from 2007-2009 and 50% in 2010. Since 1992, data collection priorities have been to collect catch and effort data of the U.S. Atlantic PLL fleet on HMS, although information is also collected on bycatch of protected species. Due to increased observer coverage in the Mid-Atlantic Bight as mandated by the PLTRT final rule, percent observer coverage in this fishery is expected to increase.

Fishery observer effort is allocated among eleven large geographic areas and calendar quarter based upon the historical fishing range of the fleet (Walsh and Garrison, 2006). The target annual coverage is eight percent of the total reported sets, and observer coverage is randomly allocated based upon reported fishing effort during the previous fishing year/quarter/statistical reporting area (Beerkircher *et al.*, 2002). Bycatch rates of protected species (catch per 1,000 hooks) are quantified based upon observer data by year, fishing area, and quarter (Garrison, 2005). The estimated bycatch rate is then multiplied by the fishing effort (number of hooks) in each area and quarter reported to the Fishery Logbook System (FLS) program to obtain estimates of total interactions for each species of marine mammal and sea turtle (Garrison, 2005).

*Purse Seine Fishery*

Vessels operating in the BFT purse seine fishery submit either Vessel Trip Reports (VTRs) (NMFS Northeast) or HMS logbooks (NMFS Southeast) based on the type of Federal permits they hold in addition to their HMS permit. Observers were placed on purse seine vessels operating in this fishery in 1996 and 2001 in order to monitor groundfish bycatch in closed areas in the Northwest Atlantic (B. McHale, pers. comm., 2005). The purse seine fishery was observed to have very little bycatch of groundfish or other species of fish and no protected species interactions. As a result, observer coverage has not been used recently to document bycatch or validate logbook reports. In addition, the lack of effort in recent years has not warranted consideration for additional observer coverage.

*Shark Bottom Longline Fishery*

Vessels participating in the BLL fishery for sharks are required to submit snapper/grouper/reef fish/shark logbooks to report their catch and effort, including bycatch species. All vessels having Shark LAPs are required to report. Observers have monitored the shark BLL fishery since 1994. The program has been mandatory for vessels selected to carry observers beginning in 2002. Prior to that, it was a voluntary program relying on cooperating vessels/captains to take observers. From 2002 – 2005, the objective of the vessel selection was to achieve a representative five percent level of coverage of the total fishing effort in each fishing area (North Atlantic, South Atlantic, and Gulf of Mexico) and during each fishing season of that year (Smith *et al*., 2006). Since 2006, target coverage level has been 3.9 percent of the total fishing effort. This level is estimated to attain a sample size needed to provide estimates of sea turtle, smalltooth sawfish, or marine mammal interactions with an expected coefficient of variance (CV) of 0.3 (Carlson, unpubl., as cited in Smith *et al*., 2006).

Since August 2001, selected federal permit holders that report on the Gulf of Mexico reef fish, South Atlantic snapper-grouper, king and Spanish mackerel, and shark fisheries logbook have been required to report all species and quantities of discarded (alive and dead) sea turtles, marine mammals, birds, and finfish on a supplemental discard form. A randomly selected sample of 20 percent of the vessels with active permits in the above fisheries is selected each year. The selection process is stratified across geographic area (Gulf of Mexico and South Atlantic), gear (handline, longline, troll, gillnet, and trap), and number of fishing trips (ten or less trips and more than 11 trips). Shark fishermen can also use the PLLHMS longline logbook or the northeast VTRs depending on the permits held by the vessel. If they use either the HMS logbook or VTR, they need to report all of the catch and effort, as well as all the bycatch or incidental catch.

The Final Rule for Amendment 2 to the Consolidated HMS FMP established, among other things, a shark research fishery to maintain time series data for stock assessments and to meet NMFS' 2009 research objectives. The shark research fishery permits authorize participation in the shark research fishery and the collection of sandbar and non-sandbar LCS from federal waters in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea for the purposes of scientific data collection subject to 100 percent observer coverage. The commercial vessels selected to participate in the shark research fishery are the only vessels authorized to land/harvest sandbars subject to the sandbar quota available for each year. The base quota is 87.9 mt dw/year through December 31, 2012, although this number may be reduced in the event of overharvests, if any, and 116.6 mt dw/year starting on January 1, 2013. The selected vessels would also have access to the non-sandbar LCS, small coastal shark (SCS), and pelagic shark quotas. Commercial vessels not participating in the shark research fishery may only land non-sandbar LCS, SCS, and pelagic sharks subject to the retention limits and quotas per 50 CFR 635.24 and 635.27, respectively.

*Shark Gillnet Fishery*

Vessels participating in the gillnet fishery for sharks are required to submit logbooks to report their catch and effort, including bycatch species. An observer program for the directed shark gillnet fishery has been in place from 1993–1995 and from 1998 to the present. The objectives of this program are to obtain estimates of catch and bycatch and bycatch mortality rates of protected species, juvenile sharks, and other fish species. Protected resources interactions are estimated to meet the mandates of the ALWTRP and the May 2008 BiOp. There are special regulations in place for gillnetters during certain times of the year, however, the process by which vessels are selected and coverage levels are consistent. Vessels are randomly selected on a quarterly basis and then observed for a minimum of 3 trips during that time, with a goal of estimating protected resources interactions corresponding to the sample size necessary to provide estimates of sea turtle or marine mammal interactions with an expected coefficient of variation of 0.3.

*Commercial Handgear Fishery*

The commercial handgear fishery includes vessels using handline, harpoon, rod and reel, or bandit gear to fish for HMS. NMFS has the authority to use observers to collect bycatch information from commercial vessels fishing for tunas. Many of these vessels are already required to complete Federal and/or state logbooks (*e.g.*, the NMFS Northeast Region VTR), in which they are required to report all fishing information, including that for HMS and bycatch. NMFS is currently evaluating various alternatives to increase fishery data collection of vessels fishing for HMS with handgear, such as selecting additional HMS permitted vessels to report in logbooks or to be selected for observer coverage, and is investigating alternatives for electronic reporting. Therefore, no estimates of bycatch are available at this time. Bycatch and bycatch mortality are considered to be low due to the nature of the gear but this should be validated in the future.

*Recreational Handgear Fishery*

NMFS collects recreational catch-and-release data from dockside surveys, the LPS and MRFSS for the rod and reel fishery and uses these data to estimate total landings and discards of bycatch or incidental catch. Statistical problems associated with small sample size remain an obstacle to estimating bycatch reliably in the rod and reel fishery. Coefficients of variation can be high for many HMS which are rare event species in the MRFSS; and the LPS does not cover all times/geographic areas for non-bluefin tuna species. New survey methodologies are being developed, however, especially for the Charter/Headboat sector of the rod and reel fishery, which should help to address some of the problems in estimating bycatch for this fishery. In addition, selecting recreational vessels for voluntary logbook reporting may be an option for collecting bycatch information for this sector of the HMS fishery.

NMFS has the authority to use observers to collect bycatch information from vessels with HMS Charter/Headboat or Angling permits. Many of the charter/headboat vessels are required to complete Federal and/or state logbooks (*e.g.*, the NMFS Northeast Region VTR), in which they are required to report all fishing information, including that for HMS and bycatch. NMFS is currently evaluating various alternatives to increase logbook coverage of vessels fishing for HMS, such as selecting additional HMS vessels to report in logbooks or be selected for observer coverage, and is investigating alternatives for electronic reporting.

The National Academy of Sciences assembled a committee to review current marine recreational fishing surveys at the request of NMFS (NAS, 2006). The committee was tasked with developing recommendations for improvements to current surveys and to recommend the implementation of possible alternative approaches. The committee's final report was published in April 2006, and NMFS is in the process of evaluating the recommendations. At the present time, no other alternative approach is available. Further information can be found in Section 4.4. The Marine Recreational Information Program is in the process of incorporating these recommendations into future enhancements.

## 7.2 Bycatch Reduction in HMS Fisheries

The NMFS HMS bycatch reduction program includes an evaluation of current data collection programs, implementation of bycatch reduction measures such as gear modifications and time/area closures (Table 7.1), and continued support of data collection and research relating to bycatch. Additional details on bycatch and bycatch reduction measures can be found in Section 3.5 of the 1999 FMP (NMFS, 1999), Regulatory Amendment 1 to the 1999 FMP (NMFS, 2000), Regulatory Adjustment 2 to the 1999 FMP (NMFS, 2002), Amendment 1 to the 1999 FMP (NMFS, 2003a), and in the Consolidated HMS FMP (NMFS, 2006). In addition, an HMS Bycatch Reduction Implementation Plan was developed in late 2003, which identified priority issues to be addressed in the following areas: 1) monitoring; 2) research; 3) management; and 4) education/outreach. Individual activities in each of these areas were identified and new activities may be added or removed as they are addressed or identified.

### 7.2.1 Evaluation and Monitoring of Bycatch

The identification of bycatch in Atlantic HMS fisheries is the first step in reducing bycatch and bycatch mortality. The Magnuson-Stevens Act requires the amount and type of bycatch to be summarized in the annual SAFE reports. Bycatch reporting methods are addressed in Section 7.1.1. A summary of bycatch species, data collection methods, and management measures by fishery/gear type is found in Table 7.1.

PLL dead discards of swordfish, bluefin tuna, billfish, large coastal sharks, and pelagic sharks are estimated using data from NMFS observer reports and pelagic logbook reports. Shark BLL and shark gillnet discards can be estimated using logbook data and observer reports as well. Shark gillnet discards have also been estimated using logbook data when observer coverage is equal to 100 percent.

NMFS has not estimated bycatch in the swordfish harpoon fishery. NMFS has limited historical observer data on harpooned swordfish from driftnet trips in which harpoons were sometimes used. Swordfish harpoon fishermen are required to submit pelagic logbooks and NMFS can examine those for their utility in estimating bycatch. NMFS has not estimated bycatch in the BFT harpoon fishery because these fishermen have not been selected to submit logbooks. NMFS has not estimated bycatch in the General category commercial rod and reel tuna fishery although anecdotal evidence indicates that some undersized BFT may be captured.

There is concern about the accuracy of discard estimates in the recreational rod and reel fishery for Atlantic HMS due to the low number of observations by the LPS and the MRFSS. Recreational bycatch estimates (numbers of fish released alive and dead) are not currently available, except for BFT. For some species, encounters are considered rare events, which might result in bycatch estimates with considerable uncertainty. Due to improvements in survey methodology, increased numbers of intercepts (interviews with fishermen) have been collected since 2002. NMFS intends to develop bycatch estimates (live and dead discards) and estimates of uncertainty from the recreational fishery from the LPS. These data will be included in future SAFE Reports. Bycatch estimates may also be examined by using tournament data for the recreational fishery.

**Table 7.1 Summary of bycatch species in HMS fisheries, Marine Mammal Protection Act (MMPA) category, endangered Species Act (ESA) requirements, data collection, and management measures by fishery/gear type.** (Excerpted from HMS Bycatch Priorities and Implementation Plan and updated through September 2011)

| Fishery/Gear Type | Bycatch Species | MMPA Category | ESA Requirements | Bycatch Data Collection | Management Measures |
|---|---|---|---|---|---|
| Pelagic Longline | Bluefin tuna<br>Billfish<br>Undersize target species<br>Marine mammals<br>Sea turtles<br>Seabirds<br>Non-target finfish<br>Prohibited shark species<br>Large Coastal Shark species after closure | Category I | Jeopardy findings in 2000 & 2004; Reasonable and Prudent Alternative implemented 2001-04; ITS, Terms & Conditions, RPMs | Permit requirement (1985); logbook requirement (SWO-1985; SHK - 1993); observer requirement (1992), EFPs (2001-present) | BFT target catch requirements (1981); quotas (SWO - 1985; SHK - 1993); prohibit possession of billfish (1988); minimum size (1995); gear marking (1999); line clippers, dipnets (2000); MAB closure (1999); limited access (1999); limit the length of mainline (1996-1997 only); move 1 nm after an interaction (1999); voluntary vessel operator workshops (1999); GOM closure (2000); FL, Charleston Bump, NED closures (2001); gangion length, corrodible hooks, de-hooking devices, handling & release guidelines (2001); NED experiment (2001-03); VMS (2003); circle hooks and bait requirements (2004); mandatory safe handling and release workshops (2006); sea turtle control device (2008); closed area research (2008-10); marine mammal handling and release placard, 20 nm mainline restriction in MAB, observer and research reqts in Cape Hatteras Spec. Research Area (CHSRA), increased obs coverage in Atl PLL fishery (2009)) |
| Shark Bottom Longline | Prohibited shark species<br>Target species after closure<br>Sea turtles<br>Smalltooth sawfish<br>Non-target finfish | Category III | ITS, Terms & Conditions, RPMs | Permit requirement (1993); logbook requirement (1993); observer coverage (1994) | Quotas (1993); trip limit (1994); gear marking (1999); handling & release guidelines (2001); line clippers, dipnets, corrodible hooks, de-hooking devices, move 1 nm after an interaction (2004); South Atlantic closure, VMS (2005); shark identification workshops for dealers (2007); sea turtle control device (2008); shark research fishery (2008) |
| Shark Gillnet | Prohibited shark species<br>Sea turtles<br>Marine mammals<br>Non-target finfish | Category II | ITS, Terms & Conditions, RPMs | Permit requirement (1993); logbook requirement (1993); observer coverage | Quotas (1993); trip limit (1994); gear marking (1999); deployment restrictions (1999); 30-day closure for leatherbacks (2001); handling & release guidelines (2001); net checks (2002); whale sighting (2002); VMS (2004); closure for right whale mortality (2006); |

| **Fishery/Gear Type** | **Bycatch Species** | **MMPA Category** | **ESA Requirements** | **Bycatch Data Collection** | **Management Measures** |
|---|---|---|---|---|---|
| | Smalltooth sawfish | | | (1994) | shark identification workshops for dealers (2007) |
| BFT Purse Seine | Undersize target species<br>Non-target finfish | Category III | ITS, Terms & Conditions | Permit requirement (1982); observer requirement (1996, 2001 only); EFPs (2002-03) | Quotas (1975); limited access, individual vessel quotas (1982); minimum size (1982) |
| BFT & SWO Harpoon | Undersize target species | Category III | ITS, Terms & Conditions | Permit requirement (BFT - 1982; SWO - 1987); SWO logbook requirement (1987) | Quotas (BFT - 1982; SW0 - 1985); minimum size (BFT - 1982; SWO - 1985) |
| Handgear - Commercial | Undersize target species<br>Non-target finfish | Category III | ITS, Terms & Conditions | Permit requirement (BFT - 1982; SWO 1987; SHK - 1993); logbook requirement (SWO - 1985; SHK - 1993) | Regulations vary by species, including quotas, minimum sizes, retention limits, landing form |
| Handgear - Recreational | Undersize target species<br>Non-target finfish | Category III | ITS, Terms & Conditions | Large Pelagic Survey (1992); MRFSS (1981) | Regulations vary by species, including minimum sizes, retention limits, landing form; BFT quotas |

### 7.2.2 Bycatch Mortality

The reduction of bycatch mortality is an important component of NS 9. Physical injuries may not be apparent to the fisherman who is quickly releasing a fish because there may be injuries associated with the stress of being hooked or caught in a net. Little is known about the mortality rates of many of the species managed under this FMP, but there are some data for certain species. Information on bycatch mortality of these fish should continue to be collected, and in the future, could be used to estimate bycatch mortality in stock assessments.

NMFS submits annual data (Task II) to ICCAT on mortality estimates (dead discards). These data are included in the SAFE reports and U.S. National Reports to ICCAT to evaluate bycatch trends in HMS fisheries.

*Pelagic Longline Fishery*

NMFS collects data on the disposition (released alive or dead) of bycatch species from logbooks submitted by fishermen in the PLL fishery. Observer reports also include disposition of the catch as well as information on hook location, trailing gear, and injury status of protected species interactions. These data are used to estimate post-release mortality of sea turtles and marine mammals based on guidelines for each (Angliss and DeMaster 1998, Ryder *et al*. 2006). See Section 7.4 for estimates of sea turtle and marine mammal bycatch estimates.

*Purse Seine Fishery*

NMFS has limited observer data on the BFT purse seine fishery. There are no recorded instances of non-tuna finfish, other than minimal numbers of blue sharks, caught in tuna purse seines. Anecdotal evidence indicates that if fish are discarded, they are easily released out of the net with minimal bycatch mortality.

*Bottom Longline Fishery*

The shark BLL fishery has relatively low observed bycatch rates. Historically, finfish bycatch has averaged approximately five percent in the BLL fishery. Observed protected species bycatch (sea turtles) has typically been much lower, less than 0.01 percent of the total observed catch. Disposition of discards is recorded by observers and can be used to estimate discard mortality.

*Shark Gillnet Fishery*

Many shark gillnet fishermen have begun targeting finfish rather than sharks. A total of 295 gillnet sets were observed in 2010. The majority of species caught were finfish (93.7%) versus sharks (6.3%). Only one individual protected species was observed; a common loon was caught and discarded dead. Disposition of discards is recorded by observers and can be used to estimate discard mortality.

*Commercial Handgear Fishery*

Vessels targeting BFT with harpoon gear have not been selected for observer coverage since the deliberate fishing nature of the gear is such that bycatch is expected to be low. Therefore, there are no recorded instances of non-target finfish caught with harpoons and NMFS cannot quantify the bycatch of undersized BFT in this fishery. Bycatch in the swordfish harpoon fishery is expected to be virtually, if not totally, non-existent. Since bycatch approaches zero in this fishery, it follows that bycatch mortality is near zero. Disposition of bycatch reported in logbooks is used to estimate mortality of bycatch in the hook and line handgear fisheries.

*Recreational Handgear Fishery*

The LPS collects data on disposition of bycatch (released alive or dead) in recreational HMS fisheries. Rod and reel discard estimates from Virginia to Maine during June through October can 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 low. Post-release mortality studies have been conducted on few HMS at this time. Summaries of those studies can be found in previous SAFE reports.

## 7.3 Protected Species Interactions in HMS Fisheries

This section examines the interaction between protected species and Atlantic HMS fisheries managed under the Consolidated HMS FMP. As a point of clarification, interactions are different than bycatch. Interactions take place between fishing gears and marine mammals, and seabirds; while bycatch consists of the incidental take and discards of non-targeted finfish, shellfish, mollusks, crustaceans, sea turtles, and any other marine life other than marine mammals and seabirds. Following a brief review of the three acts (MMPA, ESA, and Migratory Bird Treaty Act (MBTA)) affecting protected species, the interactions between HMS gears and each species is examined. Additionally, the interaction of seabirds and longline fisheries are considered under the auspices of the United States "National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries" (NPOA – Seabirds).

### 7.3.1 Interactions and the Marine Mammal Protection Act (MMPA)

The MMPA of 1972 as amended is one of the principal Federal statutes guiding marine mammal species protection and conservation policy. In the 1994 amendments, section 118 established the goal that the incidental mortality or serious injury of marine mammals occurring during the course of commercial fishing operations be reduced to insignificant levels approaching a zero mortality rate goal (ZMRG) and serious injury rate within seven years of enactment (*i.e*,. April 30, 2001). In addition, the amendments established a three-part strategy to govern interactions between marine mammals and commercial fishing operations. These include the preparation of marine mammal stock assessment reports, a registration and marine mammal mortality monitoring program for certain commercial fisheries (Category I and II), and the preparation and implementation of take reduction plans (TRP).

NMFS relies on both fishery-dependent and fishery-independent data to produce stock assessments for marine mammals in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea.

Draft stock assessment reports are typically published around January and final reports are typically published in the fall. Final stock assessment reports can be obtained on the web at: http://www.nmfs.noaa.gov/pr/sars/species.htm while draft 2011 stock assessment reports are available at: http://www.nmfs.noaa.gov/pr/sars/draft.htm.

The following marine mammal species occur off the Atlantic and Gulf Coasts that are, or could be of concern with respect to potential interactions with HMS fisheries.

| **Common Name** | **Scientific Name** |
|---|---|
| Atlantic spotted dolphin | Stenella frontalis |
| Blue whale | *Balaenoptera musculus* |
| Bottlenose dolphin | *Tursiops truncatus* |
| Common dolphin | *Delphinis delphis* |
| Fin whale | *Balaenoptera physalus* |
| Harbor porpoise | *Phocoena phocoena* |
| Humpback whale | *Megaptera novaeangliae* |
| Killer whale | *Orcinus orca* |
| Long-finned pilot whale | *Globicephela melas* |
| Minke whale | *Balaenoptera acutorostrata* |
| Northern bottlenose whale | *Hyperoodon ampullatus* |
| Northern right whale | *Eubalaena glacialis* |
| Pantropical spotted dolphin | *Stenella attenuata* |
| Pygmy sperm whale | *Kogia breviceps* |
| Risso's dolphin | *Grampus griseus* |
| Sei whale | *Balaenoptera borealis* |
| Short-beaked spinner dolphin | *Stenella clymene* |
| Short-finned pilot whale | *Globicephela macrorhynchus* |
| Sperm whale | *Physeter macrocephalus* |
| Spinner dolphin | *Stenella longirostris* |
| Striped dolphin | *Stenella coeruleoalba* |
| White-sided dolphin | *Lagenorhynchus acutus* |

Under MMPA requirements, NMFS produces an annual List of Fisheries (LOF) that classifies domestic commercial fisheries, by gear type, relative to their rates of incidental mortality or serious injury of marine mammals. The LOF includes three classifications:

1. Category I fisheries are those with frequent serious injury or mortality to marine mammals;
2. Category II fisheries are those with occasional serious injury or mortality; and
3. Category III fisheries are those with remote likelihood of serious injury or mortality to marine mammals.

The draft 2012 MMPA LOF was published on November 29, 2011 (76 FR 73319). The Atlantic Ocean, Caribbean, and Gulf of Mexico large PLL fishery is classified as Category I (frequent serious injuries and mortalities incidental to commercial fishing) and the southeastern

Atlantic shark gillnet fishery is classified as Category II (occasional serious injuries and mortalities). The following Atlantic HMS fisheries are classified as Category III (remote likelihood or no known serious injuries or mortalities): Atlantic tuna purse seine; Gulf of Maine and Mid-Atlantic tuna, shark and swordfish, hook-and-line/harpoon; southeastern Mid-Atlantic and Gulf of Mexico shark BLL; and Mid-Atlantic, southeastern Atlantic, and Gulf of Mexico pelagic hook-and-line/harpoon fisheries. Commercial passenger fishing vessel (charter/headboat) fisheries are subject to Section 118 and are listed as a Category III fishery. Recreational vessels are not categorized since they are not considered commercial fishing vessels. Beginning with the 2009 LOF, high seas fisheries are included in the LOF. Many fisheries operate in both U.S. waters and on the high seas thereby making the high seas component an extension of a fishery already on the LOF. NMFS categorizes the majority of high seas fisheries on the LOF as Category II based on the lack of marine mammal stock abundance information from the high seas. Exceptions to this are high seas fisheries that also operate in U.S. waters that have already been categorized as I, II, or III. For additional information on the fisheries categories and how fisheries are classified, see http://www.nmfs.noaa.gov/pr/interactions/lof/.

Fishermen participating in Category I or II fisheries are required to register under the MMPA and to accommodate an observer aboard their vessels if requested. Vessel owners or operators, or fishermen, in Category I, II, or III fisheries must report all incidental mortalities and serious injuries of marine mammals during the course of commercial fishing operations to NMFS. There are currently no regulations requiring recreational fishermen to report takes, nor are they authorized to have incidental takes (*i.e.*, they are illegal).

The PLTRT was formed to address the incidental mortality and serious injury of long-finned pilot whales (*Globicephala melas*) and short-finned pilot whales (*Globicephala macrorhynchus*) in the mid-Atlantic region of the Atlantic PLL fishery. Under section 118 of the MMPA, the PLTRT is charged with developing a TRP to reduce bycatch of pilot whales in the Atlantic PLL fishery to a level approaching a zero mortality rate within 5 years of implementation of the plan. The PLTRT developed a draft TRP and was published along with a proposed rule to implement it on June 24, 2008 (73 FR35623). The final TRP was published on May 19, 2009 (74 FR 23349) effective June 18, 2009. The TRP implemented a suite of management strategies to reduce mortality and serious injury of pilot whales and Risso's dolphins in the Atlantic PLL fishery. NMFS finalized the following three regulatory measures: (1) establish a Cape Hatteras Special Research Area (CHSRA), with specific observer and research participation requirements for fishermen operating in that area; (2) set a 20–nm (37.02–km) upper limit on mainline length for all PLL sets within the MAB; and (3) require an informational placard on handling and release of marine mammals be displayed both in the wheelhouse and on the working deck of all active PLL vessels in the Atlantic fishery. NMFS also finalized the following non-regulatory measures: (1) increased observer coverage in the MAB to 12-15 percent to ensure representative sampling of pilot whales and Risso's dolphins; (2) encourage vessel operators to maintain daily communication with other local vessel operators regarding protected species interactions throughout the PLL fishery with the goal of identifying and exchanging information relevant to avoiding protected species bycatch; (3) recommending that NMFS update the guidelines for handling and releasing marine mammals and NMFS and the industry to develop new technologies, equipment, and methods for safer and more effective handling and release of marine mammals; and (4) recommending NMFS pursue research and data collection goals in the PLTRT regarding pilot whales and Risso's dolphins. More information on the PLTRT can be found at http://www.nmfs.noaa.gov/pr/interactions/trt/pl-trt.htm. A summary of the observed and estimated marine mammal interactions with the PLL fishery is presented in Table 4.6.

### 7.3.2 Interactions and the Endangered Species Act (ESA)

The ESA of 1973, as amended (16 U.S.C. 1531 et seq.), provides for the conservation and recovery of endangered and threatened species of fish, wildlife, and plants. The listing of a species is based on the status of the species throughout its range or in a specific portion of its range in some instances. Threatened species are those likely to become endangered in the foreseeable future [16 U.S.C. §1532(20)] if no action is taken to stop the decline of the species. Endangered species are those in danger of becoming extinct throughout all or a significant portion of their range [16 U.S.C. §1532(20)]. Species can be listed as endangered without first being listed as threatened. The Secretary of Commerce, acting through NMFS, is authorized to list marine and anadromous fish species, marine mammals (except for walrus and sea otter), marine reptiles (such as sea turtles), and marine plants. The Secretary of the Interior, acting through the USFWS, is authorized to list walrus and sea otter, seabirds, terrestrial plants and wildlife, and freshwater fish and plant species.

In addition to listing species under the ESA, the service agency (NMFS or USFWS) generally must designate critical habitat for listed species concurrently with the listing decision to the "maximum extent prudent and determinable" [16 U.S.C. §1533(a)(3)]. The ESA defines critical habitat as those specific areas that are occupied by the species at the time it is listed that are essential to the conservation of a listed species and that may be in need of special consideration, as well as those specific areas that are not occupied by the species that are essential to their conservation. Federal agencies are prohibited from undertaking actions that are likely to destroy or adversely modify designated critical habitat.

| **Marine Mammals** | **Status** |
|---|---|
| Blue whale *(Balaenoptera musculus)* | Endangered |
| Fin whale *(Balaenoptera physalus)* | Endangered |
| Humpback whale *(Megaptera novaeangliae)* | Endangered |
| Northern right whale *(Eubalaena glacialis)* | Endangered |
| Sei whale *(Balaenoptera borealis)* | Endangered |
| Sperm whale *(Physeter macrocephalus)* | Endangered |
| **Sea Turtles** | |
| Green turtle *(Chelonia mydas)* | *Endangered/Threatened |
| Hawksbill sea turtle *(Eretmochelys imbricata)* | Endangered |
| Kemp's ridley sea turtle *(Lepidochelys kempii)* | Endangered |
| Leatherback sea turtle *(Dermochelys coriacea)* | Endangered |
| Loggerhead sea turtle *(Caretta caretta)* | Threatened |
| Olive ridley sea turtle *(Lepidochelys olivacea)* | Threatened |

| | |
|---|---|
| **Critical Habitat** | |
| Northern right whale | Endangered |
| **Finfish** | |
| Smalltooth sawfish *(Pristis pectinata)* | Endangered |

*Green sea turtles in U.S. waters are listed as threatened except for the Florida breeding population, which is listed as endangered. Due to the inability to distinguish between the populations away from the nesting beaches, green sea turtles are considered endangered wherever they occur in U.S. waters.

#### 7.3.2.1 Sea Turtles

NMFS has taken numerous steps in the past few years to reduce sea turtle bycatch and bycatch mortality in domestic longline fisheries. A summary of those steps can be found in Chapter 4 and previous SAFE reports. As noted in Chapter 4, sea turtle interactions have decreased since these steps have been taken.

#### 7.3.2.2 Smalltooth Sawfish

On April 1, 2003, NMFS listed smalltooth sawfish as an endangered species (68 FR 15674) under the ESA. After reviewing the best available scientific and commercial information, the status review team determined that the U.S. Distinct Population Segment (DPS) of smalltooth sawfish is in danger of extinction throughout all or a significant portion of its range from a combination of the following four listing factors: 1) the present or threatened destruction, modification, or curtailment of habitat or range; 2) overutilization for commercial, recreational, scientific, or educational purposes; 3) inadequacy of existing regulatory mechanisms; and 4) other natural or manmade factors affecting its continued existence. NMFS is working on designating critical habitat for smalltooth sawfish.

NMFS believes that smalltooth sawfish takes in the shark gillnet fishery are rare given the low reported number of takes and high rate of observer coverage. 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 five years, would occur as a result of the use of gillnets in this fishery (NMFS, 2003a). No smalltooth sawfish were observed in shark gillnet fisheries for 2010.

Smalltooth sawfish have been observed caught (eight known interactions, seven released alive, one released in unknown condition) in shark BLL fisheries from 1994 through 2004 (NMFS, 2003a). Based on these observations, expanded sawfish take estimates for 1994-2002 were developed for the shark BLL fishery (NMFS, 2003a). A total of 466 sawfish were estimated to have been taken in this fishery during 1994 - 2002, resulting in an average of 52 per year. All were released alive except one. Estimates of sawfish bycatch for 2003-06 have been developed and range from 0 to 161 interactions per year (Richards, 2007a; 2007b). However, due to the sparseness of observations (interactions) and effort variables chosen for the various approaches to estimating total interactions, the results were not very precise. A total of ten smalltooth sawfish were observed caught in 2010 by vessels fishing BLL gear for sharks in the Gulf of Mexico and South Atlantic (Hale et al, 2011).

A small BLL time-area closure to protect smalltooth sawfish southwest of Key West, Florida, was considered during the development of the Consolidated HMS FMP (NMFS, 2006). The closure was not implemented due to the lack of information regarding critical habitat for this species and a proposed rule to designate critical habitat for smalltooth sawfish published on November 20, 2008 (73 FR 70290).

#### 7.3.2.3 Interactions with Seabirds

The NPOA-Seabirds was released in February 2001. The NPOA for Seabirds calls for detailed assessments of longline fisheries, and, if a problem is found to exist within a longline fishery, for measures to reduce seabird bycatch within two years. NMFS, in collaboration with the appropriate Councils and in consultation with the USFWS, will prepare an annual report on the status of seabird mortality for each longline fishery. The United States is committed to pursuing international cooperation, through the Department of State, NMFS, and USFWS, to advocate the development of NPOAs within relevant international fora. NMFS intends to meet with longline fishery participants and other members of the public in the future to discuss possibilities for complying with the intent of the plan of action. Because interactions appear to be relatively low in Atlantic HMS fisheries, the adoption of immediate measures is unlikely.

Gannets, gulls, greater shearwaters, and storm petrels are occasionally hooked by Atlantic PLLs. These species and all other seabirds are protected under the MBTA. 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.

Bycatch of seabirds in the shark BLL fishery has been virtually non-existent. A single pelican has been observed killed from 1994 through 2010. No expanded estimates of seabird bycatch or catch rates for the BLL fishery have been made due to the rarity of seabird takes.

## 7.4 Measures to Address Protected Species Concerns

NMFS has taken a number of actions designed to reduce interactions with protected species over the last few years. Bycatch reduction measures have been implemented through the 1999 FMP(NMFS, 1999), in Regulatory Amendment 1 to the 1999 FMP (NMFS, 2000), in Regulatory Adjustment 2 to the 1999 FMP (NMFS, 2002), in Amendment 1 to the 1999 FMP (NMFS, 2003a), and in the June 2004 Final Rule for Reduction of Sea Turtle Bycatch and Bycatch Mortality in the Atlantic PLL Fishery (69 FR 40734). NMFS closed the Southeast U.S. Restricted Area to gillnet fisheries from February 15, 2006, to March 31, 2006, as a result of an entanglement and subsequent mortality of a right whale with gillnet gear (71 FR 8223). NMFS continues to monitor observed interactions with marine mammals and sea turtles on a quarterly basis and reviews data for appropriate action, if any, as necessary. A final rule requiring the possession and use of an additional sea turtle control device as an addition to the existing requirements for sea turtle bycatch mitigation gear in pelagic and BLL fisheries was effective

October 23, 2008 (73 FR 54721). NMFS finalized the PLTRT TRP effective June 18, 2009 (74 FR 23349) which implemented a suite of management strategies to reduce mortality and serious injury of pilot whales and Risso's dolphins in the Atlantic PLL fishery.

## 7.5 Bycatch of HMS in Other Fisheries

NMFS is concerned about bycatch mortality of Atlantic HMS in any federal or state-managed fishery which captures them. NMFS plans to address bycatch of these species in the appropriate FMPs through coordination with the responsible management body. For example, capture of swordfish and tunas incidental to squid trawl operations is addressed in the Squid, Mackerel, and Butterfish FMP. Capture rates of tunas in coastal gillnet fisheries may be explored through issuance of exempted fishing permits and reporting requirements. NMFS continues to solicit bycatch data on HMS from all state, interjurisdictional, and Federal data collection programs.

### 7.5.1 Squid Mid-Water Trawl

U.S. squid trawl fishermen, using mid-water gear, landed 24.9 mt ww of yellowfin tuna, skipjack tuna, albacore tuna, bigeye tuna, and swordfish in 2010 incidental to the squid, mackerel, and butterfish trawl fishery (Table 7.2). Bycatch of HMS in other trawl fisheries may be included as a portion of the overall reported trawl landings in Table 7.2. Landings increased from 2009 for yellowfin and bigeye tuna. Swordfish landings remain low relative to the directed fishery landings but have increased in 2009-2010. A retention limit of 30 swordfish per trip allows squid trawl fishermen to land some of the swordfish that are encountered, although regulatory discards may still occur.

**Table 7.2 Atlantic HMS Landed (mt ww) Incidental to Trawl Fisheries, 2001-2010.** Source: NMFS, 2003; NMFS, 2005; NMFS, 2009; NMFS, 2010; NMFS, 2011.

| Species | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Yellowfin tuna | 2.7 | 0.3 | 2.2 | 1.6 | 0.2 | 0.7 | 2.4 | 0.0 | 0.0 | 1.6 |
| Skipjack tuna | 0.2 | <0.05 | 0.5 | 0.2 | 0.07 | 0.7 | <0.01 | <0.01 | 0.0 | 0.0 |
| Bigeye tuna | 0.4 | 0.5 | 0.03 | 0.9 | 0.6 | 0.0 | 0.4 | 0.0 | 0.0 | 1.2 |
| Albacore | 0.0 | 0.3 | 0.02 | 2.7 | 1.7 | 1.1 | 0.3 | 0.01 | 0.08 | 0.03 |
| Swordfish | 2.5 | 3.9 | 5.6 | 8.3 | 8.2 | 3.5 | 6.5 | 7.6 | 22.9 | 21.1 |
| Total | 5.8 | 5.0 | 8.35 | 13.7 | 10.77 | 6.0 | 9.61 | 7.61 | 23.0 | 24.9 |

### 7.5.2 Menhaden Purse Seine Fishery

In the menhaden purse seine fishery, sharks were caught incidentally in approximately 30 percent of the purse seine sets observed (deSilva *et al.*, 2001). Ten species of sharks were identified with blacktip sharks being the most common species. Approximately 20 percent of the sharks were not identified to species. An estimated 30,000 sharks were taken in this fishery annually in 1994 and 1995. At the time of release, 75 percent of sharks were dead, 12 percent were disoriented, and eight percent were healthy. The odds of observing shark bycatch was highest in April and May. Stomach analyses of sharks suggest that their occurrence in the fishery is probably the result of sharks preying on gulf menhaden (deSilva *et al*., 2001). No new data are available at this time.

Industry workers in this fishery employ a fish excluder device to reduce the retention of sharks and other large species (Rester and Condrey, 1999). In addition, a recently introduced hose cage modification may prove to be effective in reducing shark bycatch. These devices vary in effectiveness and no standards exist for such bycatch reduction measures in this fishery. In addition, there are currently no reporting requirements for takes of sharks in the menhaden purse seine fishery. Recent estimates of large coastal sharks discarded in this fishery range from 24,000 – 26,200 individuals (Cortés, 2005).

### 7.5.3 Shrimp Trawl Fishery

Shark bycatch in the shrimp trawl fishery consists mainly of sharks too small to be highly valued in the commercial market. As a result, few sharks are retained. Bycatch estimates of LCS in this fishery have been generated and were reviewed in a recent LCS assessment (SEDAR 11, 2006). Bycatch estimates of the SCS complex were generated for both the Gulf of Mexico and South Atlantic shrimp trawl fisheries for a recent SCS stock assessment. Requirements for turtle excluder devices in these fisheries have probably resulted in less bycatch because sharks are physically excluded from entering the gear. Bycatch of the SCS complex in the Gulf of Mexico shrimp trawl fishery consists mainly of Atlantic sharpnose and bonnethead sharks (SEDAR 13, 2007). Estimates of bycatch (numbers of fish) of small coastal sharks in the U.S. south Atlantic and Gulf of Mexico shrimp trawl fisheries and BLL fishery relative to total catch for 1992-2005 can be found in Table 7.3 of the 2009 SAFE Report. More recent estimates of blacknose shark bycatch in the shrimp fisheries can be found in the most recent stock assessment, SEDAR 21 (Cortes, E. and I. Baremore. 2011). Finetooth sharks were added as a select species for the shrimp trawl observer program in 2005 to help determine if this fishery has bycatch of finetooth sharks. Prior to this, data on finetooth shark bycatch was not recorded.

## 7.6 Effectiveness of Existing Pelagic Longline Time/Area Closures in Reducing Bycatch

Since 2000, NMFS has implemented a number of time/area closures and gear restrictions in the Atlantic Ocean and Gulf of Mexico for the PLL fishery to reduce discards and bycatch of a number of species (juvenile swordfish, BFT, billfish, sharks, sea turtles, etc.). Beginning in July, 2004, circle hooks were required for the entire PLL fishery as well. Preliminary analyses of the effectiveness of the closures and combined closures and circle hook requirement are summarized here.

The combined effects of the individual area closures and gear restrictions were examined by comparing the reported catch and discards from 2005-2010 to the averages for 1997-1999 throughout the entire U.S. Atlantic fishery. Previous analyses attempted to examine the effectiveness of the time/area closures only by comparing the 2001-2003 reported catch and discards to the base period (1997-1999) chosen and are included here as well for reference. The percent changes in the reported numbers of fish caught and discarded were compared to the predicted changes from the analyses in Regulatory Amendment 1 to the 1999 FMP (NMFS, 2000). Overall effort, expressed as the number of hooks reported set, declined by 27.6 percent during 2005-2010 from 1997-1999 (Table 7.3). Declines were noted for both the numbers of kept and discards of almost all species examined including swordfish, tunas, sharks, billfish, and sea turtles. The only positive changes from the base period were the numbers of BFT and dolphin kept. The reported number of BFT kept increased by 63.7 percent for 2005-2010 compared to 1997-1999 (Table 7.3). The number of reported discards of BFT increased by almost 36 percent between the same time periods, which is more than triple the predicted 11 percent increase from the analyses in Regulatory Amendment 1. The number of dolphin kept increasing by almost 75 percent between time periods, (Table 7.3**).** Billfish (blue and white marlin, sailfish) discards reportedly decreased by 60.8 to 68.3 percent from 1997-1999 to 2005-2010 (Table 7.4). The reported discards of spearfish declined by only 7.1 percent, although the absolute number of discards was also low (less than 200 fish in most years). The reported number of turtle interactions decreased by 64 percent from 1997-1999 to 2005-2010.

The reported declines in swordfish kept and discarded, large coastal sharks kept, and dolphin kept decreased more than the predicted values developed for Regulatory Amendment 1. Reported discards of pelagic sharks, all billfish (with the exception of spearfish for which no predicted change was developed in Regulatory Amendment 1), and total BAYS tunas kept also declined more than the predicted values. The number of LCS discards remained almost unchanged from 1997-1999 to 2005-2010, while the number of BFT discards and dolphin kept increased more than predicted.

The reported distribution of effort over the same time periods was also examined for changes in fishing behavior **(**Table 7.5**).** Declines in the number of hooks set were noted for almost all areas with the exception of the Sargasso (SAR) area, where reported effort has increased almost eight-fold from the 1997-1999 period. However, this effort represents only two percent of the overall effort reported in this fishery. Overall, reported effort decreased by 27.6 percent from 1997-1999 to 2005-2010. Reported effort declined by only 5.9 percent in the MAB area, 8.8 percent in the South Atlantic Bight (SAB), and 18.8 percent in the Florida East Coast (FEC). Reported effort declined by 35 percent or more in all other areas with the exception of the SAR and the Gulf of Mexico. As a result of the Deepwater Horizon/BP oil spill in the Gulf of Mexico and the subsequent closures, reported effort for 2010 was dramatically reduced, less than one third of the reported effort of the previous year (2009). Although reported effort declined by 61 percent in the SAT area (Tuna North and Tuna South combined), recent effort has shown an increasing trend.

Concern over the status of BFT and the effects of the PLL fishery on the species led to a re-examination of a previous analysis which compared the reported catch and discards of select species or species groups from the MAB and NEC to that reported from the rest of the fishing areas (Table 7.6). The number of BFT discards reported from the MAB/NEC has increased over the last few years while the discards from the other areas has remained relatively constant. The increase in BFT discards in the MAB/NEC does not appear to be effort-related as the reported number of hooks set has also been relatively stable (MAB) or in decline (NEC).

**Table 7.3 Total number of swordfish, bluefin tuna, yellowfin tuna, bigeye tuna, total BAYS (bigeye, albacore, yellowfin and skipjack tuna), reported landed or discarded in the U.S. Atlantic PLL fishery, 1997 – 2010, and percent change from 1997-99.** Predicted values from Regulatory Amendment 1 where Pred [1] = without redistribution of effort, Pred [2] = with redistribution of effort**.** Source: HMS Logbook data.

| Year | Number of hooks set (x1000) | Swordfish kept | Swordfish discards | Bluefin tuna kept | Bluefin tuna discards | Yellowfin tuna kept | Yellowfin tuna discards | Bigeye tuna kept | Bigeye tuna discards | Total BAYS kept | Total BAYS discards |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1997-99** | 8,533.1 | 69,131 | 21,519 | 238 | 877 | 72,342 | 2,489 | 21,308 | 1,133 | 101,477 | 4,224 |
| **A) 2001-03** | 7,364.1 | 50,838 | 13,240 | 212 | 607 | 55,166 | 1,827 | 13,524 | 395 | 76,116 | 3,069 |
| **2004** | 7,325.9 | 46,950 | 10,704 | 476 | 1,031 | 64,128 | 1,736 | 8,266 | 486 | 77,989 | 3,452 |
| **2005** | 5,922.6 | 41,239 | 11,158 | 376 | 766 | 43,833 | 1,316 | 8,383 | 369 | 57,237 | 2,545 |
| **2006** | 5,662.0 | 38,241 | 8,900 | 261 | 833 | 55,821 | 1,426 | 12,491 | 257 | 73,058 | 2,865 |
| **2007** | 6,290.6 | 45,933 | 11,823 | 357 | 1,345 | 56,062 | 1,452 | 8,913 | 249 | 70,390 | 3,031 |
| **2008** | 6,498.1 | 48,000 | 11,194 | 343 | 1,417 | 33,774 | 1,717 | 11,254 | 356 | 50,108 | 3,427 |
| **2009** | 6,978.9 | 45,378 | 7,484 | 629 | 1,290 | 40,912 | 1,701 | 10,379 | 397 | 57,461 | 3,555 |
| **2010** | 5,729.1 | 33,813 | 6,107 | 392 | 1,488 | 32,567 | 748 | 12,561 | 476 | 51,786 | 1,590 |
| **B) 2005-10** | 6,177.2 | 41,186 | 9,4298 | 389.7 | 1,189.8 | 43,820.7 | 1,393 | 10,654.8 | 350.2 | 59,988.8 | 2,834.3 |
| **% dif (A)** | -13.7 | -26.5 | -38.5 | -10.9 | -30.7 | -23.7 | -26.6 | -36.5 | -65.2 | -25.0 | -27.3 |
| **% dif (B)** | -27.6 | -40.4 | -56.2 | 63.7 | 35.7 | -39.4 | -44.0 | -50.0 | -69.1 | -40.9 | -32.9 |
| **Pred [1]** | | -24.6 | -41.5 | | -1.0 | | | | | -5.2 | |
| **Pred [2]** | | -13.0 | -31.4 | | 10.7 | | | | | 10.0 | |

**Table 7.4 Total number of pelagic sharks, large coastal sharks, dolphin (mahi mahi), and wahoo reported landed or discarded and number of billfish (blue and white marlin, sailfish, spearfish) and sea turtles reported caught and discarded in the U.S. Atlantic PLL fishery, 1997 – 2010 and percent change from 1997-99.** Predicted values from Regulatory Amendment 1 where Pred [1] = without redistribution of effort, Pred [2] = with redistribution of effort. Source: HMS logbook data.

| Year | Pelagic sharks kept | Pelagic shark discards | Large coastal sharks kept | Large coastal shark discards | Dolphin kept | Dolphin discards | Wahoo kept | Wahoo discards | Blue marlin discards | White marlin discards | Sailfish discards | Spearfish discards | Sea turtles |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1997-99** | 3,898 | 52,093 | 8,860 | 6,308 | 39,711 | 608 | 5,172 | 175 | 1,621 | 1,973 | 1,342 | 213 | 596 |
| **A) 2001-03** | 3,237 | 23,017 | 5,306 | 4,581 | 29,361 | 322 | 3,776 | 74 | 815 | 1,045 | 341 | 139 | 429 |
| **2004** | 3,460 | 25,414 | 2,304 | 5,144 | 39,561 | 295 | 4,674 | 35 | 713 | 1,060 | 425 | 172 | 370 |
| **2005** | 3,150 | 21,560 | 3,365 | 5,881 | 25,709 | 556 | 3,360 | 280 | 569 | 990 | 367 | 155 | 154 |
| **2006** | 2,098 | 24,113 | 1,768 | 5,326 | 25,658 | 1,041 | 3,608 | 100 | 439 | 557 | 277 | 142 | 128 |
| **2007** | 3,504 | 27,478 | 546 | 7,133 | 68,124 | 467 | 3,073 | 52 | 611 | 744 | 321 | 147 | 300 |
| **2008** | 3,500 | 28,786 | 115 | 6,732 | 43,511 | 404 | 2,571 | 82 | 686 | 669 | 505 | 196 | 476 |
| **2009** | 3,060 | 33,721 | 403 | 6,672 | 62,701 | 433 | 2,648 | 81 | 1,013 | 1,064 | 774 | 335 | 137 |
| **2010** | 3,872 | 45,511 | 434 | 6,726 | 30,454 | 174 | 749 | 26 | 504 | 605 | 312 | 212 | 94 |
| **B) 2005-10** | 3,197.0 | 30,193.0 | 1,105.2 | 6,407.5 | 42,681.3 | 512.5 | 2,667.5 | 103.5 | 635.8 | 771.2 | 425.3 | 197.5 | 214.7 |
| **% dif (A)** | -17.0 | -55.8 | -40.1 | -27.4 | -26.1 | -47.0 | -27.0 | -57.8 | -49.7 | -47.0 | -74.6 | -34.6 | -28.1 |
| **% dif (B)** | -18.0 | -42.0 | -87.5 | 1.6 | 7.5 | -15.7 | -48.4 | -40.7 | -60.8 | -60.9 | -68.3 | -7.1 | -64.0 |
| **Pred [1]** | -9.5 | -2.0 | -32.1 | -42.5 | -29.3 | | | | -12.0 | -6.4 | -29.6 | | -1.9 |
| **Pred [2]** | 4.1 | 8.4 | -18.5 | -33.3 | -17.8 | | | | 6.5 | 10.8 | -14.0 | | 7.1 |

**Table 7.5 Reported distribution of hooks set by area, 1997-2010, and percent change from 1997-99** (CAR=Caribbean, GOM=Gulf of Mexico, FEC=Florida East Coast, SAB=South Atlantic Bight, MAB=Mid-Atlantic Bight, NEC=Northeast Coastal, NED=Northeast Distant, SAR=Sargasso, NCA=North Central Atlantic, and SAT=Tuna North & Tuna South). Source: HMS logbook data.

| Year | CAR | GOM | FEC | SAB | MAB | NEC | NED | SAR | NCA | SAT | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1997-99** | 328,110 | 3,346,298 | 722,580 | 813,111 | 1,267,409 | 901,593 | 511,431 | 14,312 | 191,478 | 436,826 | 8,533,148 |
| **A) 2001-03** | 175,195 | 3,682,536 | 488,838 | 569,965 | 944,929 | 624,497 | 452,430 | 76,130 | 222,070 | 127,497 | 7,364,086 |
| **2004** | 298,129 | 4,118,468 | 264,524 | 672,973 | 856,521 | 462,171 | 455,862 | 128,582 | 20,990 | 47,730 | 7,325,950 |
| **2005** | 180,885 | 3,037,968 | 323,551 | 467,680 | 835,091 | 356,696 | 462,490 | 110,107 | 55,716 | 92,382 | 5,922,566 |
| **2006** | 73,774 | 2,577,231 | 281,239 | 544,647 | 1,085,640 | 406,199 | 339,586 | 135,575 | 64,500 | 153,620 | 5,662,011 |
| **2007** | 32,650 | 2,914,475 | 345,486 | 737,873 | 1,319,056 | 326,532 | 285,827 | 100,336 | 11,409 | 207,598 | 6,281,242 |
| **2008** | 87,190 | 2,368,381 | 642,846 | 846,984 | 1,423,136 | 579,244 | 224,635 | 147,969 | 16,148 | 152,763 | 6,489,246 |
| **2009** | 34,783 | 3,037,197 | 830,348 | 847,525 | 1,199,657 | 481,110 | 262,003 | 107,172 | 0 | 179,152 | 6,978,947 |
| **2010** | 77,710 | 1,005,764 | 1,097,929 | 1,002,748 | 1,295,242 | 657,892 | 211,465 | 141,713 | 3,096 | 235,553 | 5,729,112 |
| **B) 2005-10** | 81,165 | 2,490,169 | 586,900 | 741,243 | 1,192,970 | 467,946 | 297,668 | 123,812 | 25,145 | 170,178 | 6,177,196 |
| **% dif (A)** | -46.6 | 10.0 | -32.3 | -29.9 | -25.4 | -30.7 | -11.5 | 431.9 | 16.0 | -70.8 | -13.7 |
| **% dif (B)** | -75.3 | -25.6 | -18.8 | -8.8 | -5.9 | -48.1 | -41.8 | 765.1 | -86.9 | -61.0 | -27.6 |

**Table 7.6 Number of bluefin tuna (BFT), swordfish (SWO), sharks (PEL-pelagic; LCS-Large Coastal Sharks), billfish, and turtles reported kept and/or discarded in the Mid-Atlantic Bight (MAB) and Northeast Coastal (NEC) areas combined, 1997-2010.** Source: HMS logbook Data.

| | | SPECIES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Year** | **Hooks set (x1000)** | **BFT kept** | **BFT discards** | **SWO kept** | **SWO discards** | **PEL shark kept** | **PEL shark discards** | **LCS kept** | **LCS discards** | **Billfish discards** | **Turtle interactions** |
| 1997 | 2,441.1 | 96 | 583 | 6,330 | 3,663 | 3,062 | 40,515 | 6,670 | 958 | 803 | 52 |
| 1998 | 2,207.4 | 94 | 1,157 | 9,684 | 4,923 | 2,143 | 28,579 | 1,781 | 890 | 401 | 57 |
| 1999 | 1,858.5 | 70 | 335 | 8,213 | 4,331 | 1,680 | 12,479 | 1,966 | 736 | 818 | 174 |
| 2000 | 1,645.4 | 26 | 356 | 8,748 | 2,846 | 2,099 | 13,083 | 4,744 | 1,407 | 240 | 30 |
| 2001 | 1,975.3 | 45 | 200 | 10,661 | 4,000 | 2,537 | 9,013 | 4,383 | 997 | 310 | 69 |
| 2002 | 1,582.3 | 18 | 389 | 10,986 | 4,219 | 2,378 | 7,308 | 2,331 | 1,207 | 311 | 41 |
| 2003 | 1,150.7 | 67 | 471 | 10,888 | 3,022 | 2,222 | 6,929 | 2,787 | 1,429 | 172 | 42 |
| 2004 | 1,318.7 | 128 | 709 | 8,486 | 2,463 | 2,323 | 7,594 | 923 | 1,488 | 219 | 54 |
| 2005 | 1,191.8 | 96 | 575 | 9,184 | 2,420 | 1,912 | 7,026 | 2,512 | 2,433 | 473 | 44 |
| 2006 | 1,491.8 | 124 | 737 | 10,278 | 2,564 | 1,428 | 7,547 | 1,279 | 2,180 | 266 | 28 |
| 2007 | 1,645.6 | 137 | 1,148 | 14,102 | 3,082 | 2,313 | 8,169 | 431 | 2,861 | 407 | 55 |
| 2008 | 2,002.5 | 143 | 1,133 | 13,208 | 3,199 | 2,695 | 9,541 | 63 | 1,781 | 320 | 100 |
| 2009 | 1,608.8 | 137 | 952 | 12,657 | 1,896 | 2,256 | 14,113 | 206 | 2,210 | 299 | 16 |
| 2010 | 1,9531 | 155 | 1,301 | 9,090 | 1,546 | 3,326 | 17,033 | 408 | 2,293 | 376 | 32 |

**Table 7.7 Number of bluefin tuna (BFT), swordfish (SWO), sharks (PEL-pelagic; LCS-Large Coastal Sharks), billfish, and turtles reported kept and/or discarded in all areas other than the Mid-Atlantic Bight (MAB) and Northeast Coastal (NEC), 1997-2010.** Source: HMS logbook Data.

| | | SPECIES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Year** | **Hooks set (x1000)** | **BFT kept** | **BFT discards** | **SWO kept** | **SWO discards** | **PEL shark kept** | **PEL shark discards** | **LCS kept** | **LCS discards** | **Billfish discards** | **Turtle interactions** |
| 1997 | 7,233.5 | 111 | 123 | 62,892 | 16,892 | 2,048 | 41,507 | 7,076 | 6,911 | 6,091 | 215 |
| 1998 | 5,823.9 | 143 | 164 | 60,943 | 18,422 | 1,588 | 16,682 | 4,677 | 4,687 | 3,364 | 833 |
| 1999 | 6,035.1 | 200 | 269 | 59,331 | 16,325 | 1,172 | 16,516 | 4,409 | 4,741 | 3,968 | 458 |
| 2000 | 6,376.5 | 210 | 382 | 54,787 | 13,860 | 969 | 14,965 | 3,014 | 5,320 | 3,394 | 241 |
| 2001 | 5,767 | 138 | 148 | 38,575 | 10,448 | 974 | 14,941 | 2,127 | 3,895 | 1,723 | 352 |
| 2002 | 5,647.3 | 160 | 204 | 39,453 | 8,963 | 693 | 15,160 | 1,746 | 2,761 | 2,866 | 426 |
| 2003 | 5,969.7 | 208 | 410 | 41,950 | 9,067 | 907 | 14,842 | 2,565 | 3,453 | 1,641 | 357 |
| 2004 | 6,007.3 | 348 | 322 | 38,464 | 8,241 | 1,137 | 17,820 | 1,381 | 3,656 | 2,151 | 316 |
| 2005 | 4,730.8 | 280 | 191 | 32,055 | 8,738 | 1,238 | 14,534 | 853 | 3,448 | 1,608 | 110 |
| 2006 | 4,170.2 | 137 | 96 | 27,963 | 6,336 | 670 | 16,566 | 489 | 3,146 | 1,149 | 100 |
| 2007 | 4,645.1 | 200 | 197 | 31,831 | 8,741 | 1,191 | 19,309 | 115 | 4,272 | 1,416 | 245 |
| 2008 | 4,495.7 | 200 | 284 | 29,592 | 7,995 | 805 | 19,245 | 52 | 4,951 | 1,736 | 376 |
| 2009 | 5,298.2 | 492 | 338 | 32,721 | 5,588 | 804 | 16,608 | 197 | 4,462 | 2,887 | 121 |
| 2010 | 3,775.9 | 237 | 187 | 24,723 | 4,561 | 546 | 28,478 | 26 | 4,433 | 1,257 | 62 |

### 7.6.1 Prohibition of Live Bait in the Gulf of Mexico

Regulatory Amendment 1 to the 1999 FMP also prohibited the use of live bait on PLL gear in the Gulf of Mexico due to concerns over the incidental bycatch of billfish. Based on logbook data, the number of hooks reported set with live bait or a combination of live and dead bait in the Gulf of Mexico decreased from 22.7 percent in 2000, to less than 0.1 percent in 2003 (Table 7.8). However, the number of hooks reported set with no bait type specified increased from zero in 1999 – 2001 to 3.7 percent in 2003, declining to less than one percent in 2004. Nearly all of the hooks reported set in the Gulf of Mexico in the past four years have been set with dead bait. NMFS will continue to analyze the effectiveness of the live bait prohibition in the Gulf of Mexico PLL fishery.

**Table 7.8 Comparison of the number of hooks (thousands) reported set in the Gulf of Mexico with dead, artificial, or live bait, or a combination of baits, 1999-2010.** Source: PLL Logbook data.

| Bait Type | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dead | 2,336 (70.9) | 2,598 (77.3) | 3,176.5 (98.3) | 3,494.6 (97.6) | 3,668.7 (96.3) | 4,089.0 (99.8) | 2,878.9 (94.8) | 2,368.2 (91.9) | 2,908.5 (99.6) | 2,359.9 (99.3) | 3,035.3 (99.91) | 1,005.3 (99.95) |
| Live | 372 (11.3) | 259 (7.7) | 5,500.0 (0.2) | 0.7 (<0.1) | 1.5 (<0.1) | 0 (0) | 0 (0) | 0 (0) | 1.2 (<0.1) | 0 (0) | 1.7 (0.06) | 0.5 (0.05) |
| Both (DL) | 585 (17.8) | 506 (15.0) | 49.3 (1.5) | 13.1 (0.4) | 1 (<0.1) | 0 (0) | 0.9 (<0.1) | 0 (0) | 0 (0) | 0 (0) | 0.65 (0.02) | 0 (0) |
| Artificial | - | - | - | - | - | - | 0 (0) | 8.7 (0.3) | 0 (0) | 3.2 (0.25) | 0.35 (0.01) | 0 (0) |
| Both (DA) | - | - | - | - | - | - | 20.3 (0.7) | 14.2 (0.6) | 0.7 (<0.1) | 6.95 (0.44) | 0 (0) | 0 (0) |
| Unknown | 0 (0) | 0 (0) | 0 (0) | 71.0 (2.0) | 139.6 (3.6) | 8.0 (0.2) | 137.5 (4.5) | 186.1 (7.2) | 10.4 (0.4) | 0 (0) | 0 (0) | 0 (0) |
| Total hooks | 3,293 | 3,363 | 3,231.2 | 3,579.5 | 3,810.8 | 4,097.0 | 3,037.5 | 2,577.2 | 2,920.7 | 2,370.1 | 3,0379.5 | 1,005.8 |

Numbers in parentheses are percent of the total number of hooks set in the Gulf of Mexico

### 7.6.2 Conclusion

The time/area closures and live bait prohibition in the Gulf of Mexico have been successful at reducing bycatch in the HMS PLL fishery. Reported discards of all species of billfish have declined. The reported number of turtles caught, swordfish discarded, and pelagic and LCS discards have also declined. However, the reported number of target species kept, such as swordfish and BAYS tuna have decreased more than was predicted. This is contrary to the other objective of the time/area closures, which was to minimize the reduction in target catch. NMFS will continue to analyze these measures as additional data become available and examine the effects of ongoing regulatory change over time.

## 7.7 Evaluation of Other Bycatch Reduction Measures

NMFS continues to monitor and evaluate bycatch in HMS fisheries through direct enumeration (pelagic and BLL observer programs, shark gillnet observer program), evaluation of management measures (closed areas, trip limits, gear modifications, etc.), and VMS.

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# 8.0 HMS PERMITS AND TOURNAMENTS

This section provides updates for the number of permits that were issued in conjunction with HMS fishing activities as of October 2011. HMS fisheries permit numbers (Table 8.1 through Table 8.8), and dealer permit numbers for shark, swordfish, and tunas are updated through October 2011. Section 8.7, Atlantic HMS Tournaments, provides a comprehensive synthesis of recreational fishing tournaments and their role in the context of HMS management. These tables have been updated since the 2010 SAFE Report, which listed numbers of permits as of October 2010.

## 8.1 HMS Commercial Fishing Permits

The LAP program was implemented in the 1999 FMP and became effective on July, 1 1999 (64 FR 29090, May 28, 1999). The program established six different permit types for limited access provisions: Swordfish Directed, Swordfish Incidental, Swordfish Handgear, Shark Directed, Shark Incidental, and Atlantic Tuna Longline. To reduce bycatch concerns in the PLL fishery, these permits were designed so that the Swordfish Directed and Incidental permits are valid only if the permit holder also holds both an Atlantic Tuna Longline and a shark permit. Similarly, the Atlantic Tuna Longline permit is valid only if the permit holder also holds both a swordfish (Directed or Incidental, not Handgear) and a shark permit. No additional LAPs are required to make a Swordfish Handgear or any of the shark permits valid. The Atlantic Tuna Longline permit is now being issued from NMFS Southeast Regional Office Permits Branch to facilitate more efficient issuance of all LAPs.LAPs There was a slight decrease in the number of permits issued between October 2010 and October 2011, from 1,052 to 1,044 (Table 8.1).

The number of commercial Atlantic tunas permit holders by category is listed in Table 8.2. The overall number of commercial tuna permits slightly decreased between October 2010 and October 2011 (Table 8.2). On August 4, 2008 (73 FR 38144, July 3, 2008) NMFS published a rule that eliminated the “sunset” provision for Atlantic Tuna Longline Category permits. This rule allows the most recent shark and swordfish LAP holders on record to renew previously expired Longline permits as long as other requirements for renewal were met. Distributions for General Category permits can be found in (Table 8.3). Trap Category permits (six total) occur from Mississippi to New Jersey. Harpoon Category permits (24 total) occur from Massachusetts north to Maine and with the exception of one permit holder in Puerto Rico (likely an error when applicant selected the permit category). Although there are five entities eligible to participate in the purse seine tuna fishery, two vessels have been sold and only three Purse Seine Category permits were issued in 2011.

**Table 8.1 Distribution of Shark, Swordfish, and Atlantic Tuna longline Limited Access Permits Between 2004 and 2011. Permit numbers as of October 2011.**

| State | # Directed Swordfish | # Incidental Swordfish | # Swordfish Handgear | # Directed Shark | # Incidental Shark | # Tuna Longline | # Permit Holders/# Permits |
|---|---|---|---|---|---|---|---|
| ME | 5 | - | 1 | 2 | 5 | 5 | 8/18 |
| NH | - | - | - | - | 1 | - | 1/1 |
| MA | 7 | 1 | 9 | 3 | 9 | 9 | 21/38 |
| RI | - | - | 12 | - | 3 | - | 12/15 |
| CT | 1 | - | - | - | 1 | 1 | 1/3 |
| NY | 16 | 3 | 3 | 10 | 11 | 19 | 24/62 |
| PA | 1 | - | - | - | 1 | 1 | 1/3 |
| NJ | 25 | 12 | 4 | 23 | 27 | 38 | 53/129 |
| DE | - | - | - | - | - | - | -/- |
| MD | 4 | - | - | 2 | 3 | 4 | 5/13 |
| VA | 1 | - | - | 1 | 1 | 1 | 2/4 |
| NC | 11 | 6 | - | 16 | 11 | 17 | 27/61 |
| SC | 4 | 1 | - | 8 | 11 | 5 | 19/29 |
| GA | - | - | - | 2 | 1 | - | 3/3 |
| FL | 72 | 36 | 49 | 133 | 135 | 105 | 317/530 |
| AL | - | - | - | 6 | 1 | - | 7/7 |
| MS | - | - | - | - | 1 | - | 1/1 |
| LA | 31 | 4 | - | 8 | 35 | 33 | 44/111 |
| TX | - | 4 | - | 3 | 4 | 3 | 7/14 |
| CA | - | - | - | - | 1 | 1 | 2/2 |
| ***Totals 2011** | **178** | **67** | **78** | **217** | **262** | **242** | **555/1044** |
| **2010** | **177** | **72** | **75** | **215** | **265** | **248** | **566/1052** |
| **2009** | **187** | **72** | **81** | **223** | **285** | **259** | **636/1107** |
| **2008** | **181** | **76** | **81** | **214** | **285** | **241** | **628/1079** |
| **2007** | **180** | **79** | **82** | **231** | **296** | **218** | **613/1086** |
| **2006** | **191** | **86** | **88** | **240** | **312** | **214** | **604/1131** |
| **2005** | **190** | **91** | **92** | **235** | **320** | **200** | **639/1128** |
| **2004** | **195** | **99** | **96** | **241** | **348** | **222** | **657/1201** |

* Number of permit holders in each category, and state, is subject to change as permits are renewed or expire.

**Table 8.2 The number of commercial Atlantic tuna permit holders in each category are listed for 2004 through 2011. Permit numbers for 2011 are as of October 2011.**

| Category | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011* |
|---|---|---|---|---|---|---|---|---|
| Longline | 222 | 200 | 214 | 218 | 241 | 259 | 248 | 242 |
| Harpoon | 49 | 40 | 40 | 26 | 26 | 23 | 29 | 24 |
| Trap | 2 | 7 | 7 | 9 | 9 | 4 | 6 | 6 |
| General | 5,057 | 4,494 | 4,824 | 3,616 | 4,031 | 3,824 | 3,849 | 3,764 |
| Purse Seine | 5 | 5 | 5 | 4 | 4 | 3 | 3 | 3 |
| **Total** | **5,335** | **4,746** | **5,090** | **3,873** | **4,311** | **4,113** | **4,135** | **4,039** |

*The actual number of 2011 permit holders in each category is subject to change as individuals renew or allow their permits to expire.

**Table 8.3 General Category permits as of October 2011**

| State | General Category permits | State | General Category permits |
|---|---|---|---|
| AL | 30 | NC | 407 |
| AZ | 1 | NH | 231 |
| CA | 4 | NJ | 191 |
| CT | 73 | NY | 183 |
| DE | 31 | OH | 2 |
| FL | 220 | OR | 1 |
| GA | 4 | PA | 6 |
| IN | 1 | PR | 87 |
| LA | 43 | RI | 160 |
| MA | 1,325 | SC | 37 |
| MD | 34 | TX | 24 |
| ME | 593 | VA | 42 |
| MI | 1 | VI | 13 |
| MS | 18 | WV | 1 |
| **Total** | | | **3,763** |

### 8.2 Atlantic HMS Charter/Headboat Permits

In 2002, NMFS published a final rule (67 FR 77434, Dec. 18, 2002) expanding the HMS recreational permit from tuna only to include all HMS and defining HMS charter/headboat operations. This permit was effective March 2003 and established a requirement that owners of charter boats or headboats that are used to fish for, take, retain, or possess Atlantic tunas, sharks, swordfish, or billfish must obtain a Atlantic HMS Charter/Headboat permit. This permit replaced the Atlantic Tunas Charter/Headboat permit. A vessel issued an Atlantic HMS Charter/Headboat permit for a fishing year will not be issued an HMS Angling permit or any Atlantic Tunas permit in any category for that same fishing year, even if there is a change in the vessel's ownership. The total number of Atlantic HMS Charter/Headboat permits increased slightly between 2010 and 2011. The distribution of Atlantic HMS Charter/Headboat permits can be seen in Table 8.4.

**Table 8.4 Atlantic HMS Charter/Headboat Permits by State as of October 2011.**

| State | Atlantic HMS Charter/Headboat | State | Atlantic HMS Charter/Headboat |
|---|---|---|---|
| AL | 77 | NJ | 550 |
| CT | 83 | NY | 335 |
| DE | 108 | OH | 1 |
| FL | 639 | OK | 1 |
| GA | 20 | PA | 25 |
| ID | 1 | PR | 27 |
| KY | 1 | RI | 172 |
| LA | 88 | SC | 141 |
| MA | 838 | TX | 155 |
| MD | 125 | VA | 101 |
| ME | 130 | VI | 23 |
| MI | 4 | VT | 1 |
| MN | 1 | WV | 4 |
| MS | 25 | WY | 1 |
| NC | 420 | **Total** | **4,194** |
| NH | 96 | | |

### 8.3 HMS Angling Permit

Since March 2003 (67 FR 77434, Dec. 18, 2002), the HMS Angling Permit has been required to fish for, retain, or possess, including catch and release fishing, any federally regulated HMS. Species authorized for harvest with an HMS Angling permit include: sharks, swordfish, white and blue marlin, sailfish, spearfish, and federally regulated Atlantic tunas BFT, yellowfin, bigeye, skipjack, and albacore). Atlantic HMS caught, retained, possessed, or landed by persons on board vessels with an HMS Angling Category permit may not be sold or transferred to any person for a commercial purpose. By definition, recreational landings of Atlantic HMS are those that cannot be marketed through commercial channels, therefore it is not possible to monitor anglers' catches through ex-vessel transactions as in the commercial fishery. Instead, NMFS conducts statistical sampling surveys of the recreational fisheries. These survey programs have been used for over a decade and include the MRFSS and the LPS. A vessel issued an HMS Angling Category permit for a fishing year will not be issued an HMS Charter/ Headboat permit or an Atlantic Tunas permit in any category for that same fishing year, regardless of any change in the vessel's ownership. The total number of Atlantic HMS Angling permits decreased slightly between 2010 and 2011. The distribution of Atlantic HMS Angling permits can be seen in Table 8.5.

## Table 8.5 Atlantic HMS Angling permits as of October 2011

| State | Permits by Home Port* | Permits by Residence** | State | Permits by Home Port* | Permits by Residence** |
|---|---|---|---|---|---|
| AK | 4 | - | NC | 1628 | 1519 |
| AL | 412 | 394 | ND | 1 | 1 |
| AR | 9 | 11 | NE | - | 4 |
| AZ | - | 2 | NH | 401 | 479 |
| BVI | 8 | 6 | NJ | 3397 | 2862 |
| CA | 5 | 7 | NV | 2 | 6 |
| CO | 4 | 9 | NY | 1688 | 1811 |
| CT | 604 | 691 | OH | 18 | 32 |
| DC* | 1 | 6 | OK | 7 | 12 |
| DE | 865 | 532 | OR | 1 | - |
| FL | 4035 | 3761 | PA | 246 | 1244 |
| GA | 132 | 215 | PR | 674 | 701 |
| IA | 2 | 4 | RI | 629 | 453 |
| IL | 5 | 25 | SC | 714 | 688 |
| ID | 1 | 2 | SD | 1 | 3 |
| IN | 7 | 10 | TN | 21 | 36 |
| KS | 2 | 5 | TX | 739 | 759 |
| KY | 6 | 10 | UT | 1 | 3 |
| LA | 606 | 613 | VA | 949 | 1020 |
| MA | 3318 | 3268 | USVI | 56 | 28 |
| MD | 1187 | 1142 | VT | 24 | 45 |
| ME | 494 | 429 | WA | 3 | 1 |
| MI | 16 | 30 | WI | 4 | 8 |
| MN | 3 | 9 | WV | 5 | 10 |
| MO | 8 | 14 | WY | 2 | 4 |
| MS | 185 | 203 | Canada | 5 | 8 |
| MT | 3 | 3 | **Total** | **23,138** | **23,138** |

*The home port is identified for the Atlantic HMS Angling permit are listed as the port where the vessel is stored submitted by the permit holder

**The residence identified for the Atlantic HMS Angling permit are listed as the bill to state submitted by the permit holder

## 8.4 Dealer Permits

Dealer permits are required for commercial receipt of Atlantic tuna, swordfish, and sharks, and are described in further detail in the 2006 Consolidated HMS FMP. Dealer permits are open access. An Atlantic shark dealer permit is required for any entity, person, or company that is the "first receiver" of any Atlantic shark or part of an Atlantic shark. A first receiver is any entity, person, or company that takes, for commercial purposes (other than solely for transport), immediate possession of the fish, or any part of the fish, as the fish are offloaded from a fishing vessel of the United States. Shark dealers, or a proxy for each location that first receives sharks, must attend and successfully complete an Atlantic Shark Identification Workshop, and be issued a certificate in order to obtain or renew their shark dealer permit. Also, trucks or other conveyances which are extensions of a shark dealer's place of business must possess a copy of a valid Atlantic Shark Identification Workshop Certificate. All permitted dealers are required to submit reports detailing the nature of their business. Swordfish and shark dealer permit holders must submit bi-weekly dealer reports on all HMS they purchase. Swordfish and shark dealer permit numbers and distributions are listed in Table 8.6. Tuna dealers must submit, within 24 hours of the receipt of a BFT, a landing report for each BFT purchased from U.S. fishermen. Dealers must also submit bi-weekly reports that include additional information on tunas they purchase. To facilitate quota monitoring, "negative reports" for shark and swordfish are also required from dealers when no purchases are made (*i.e.*, NMFS can determine who has not purchased fish versus who has neglected to report). Tuna dealer permit numbers and distributions can be found in Table 8.6. NMFS continues to automate and improve its permitting and dealer reporting systems and plans to make additional permit applications and renewals available online in the near future. On June 28, 2011, NMFS proposed requiring electronic reporting for shark, swordfish, and BAYS tunas dealers (76 FR 37750). This rule also proposed more frequent reporting and changes to the definition of a shark dealer. NMFS is working on the final rule now and hopes to implement the system in mid-2012.

**Table 8.6 Number of domestic Atlantic shark and swordfish dealer permits issued in each between 2004 and 2011. Permits for 2011 are as of October 2011. The actual number of permits per state may change as permit holders move or sell their businesses.**

| State/Country | Bluefin Only * | BAYS Only | Bluefin and BAYS | Atlantic swordfish | Atlantic sharks | Total # of permits |
|---|---|---|---|---|---|---|
| AL | - | - | 1 | 3 | 3 | 7 |
| CA | 2 | - | 1 | 4 | - | 7 |
| CT | - | 2 | 2 | 1 | - | 5 |
| DE | - | 1 | - | - | - | 1 |
| FL | 2 | - | 16 | 79 | 39 | 136 |
| GA | - | - | 2 | 1 | 1 | 4 |
| HI | - | - | 2 | 3 | - | 5 |
| LA | - | - | 7 | 13 | 9 | 29 |
| MA | 9 | 6 | 88 | 17 | 7 | 127 |
| MD | - | - | 9 | 3 | 3 | 15 |
| ME | 9 | 1 | 13 | 4 | 2 | 30 |
| NC | 5 | 4 | 24 | 15 | 15 | 63 |
| NH | - | - | 5 | - | - | 5 |
| NJ | 2 | 11 | 36 | 10 | 8 | 67 |
| NY | 2 | 18 | 58 | 11 | 5 | 94 |
| PA | - | 1 | 2 | 1 | - | 3 |
| PR | - | 6 | 1 | - | - | 7 |
| RI | 1 | 7 | 31 | 8 | 2 | 49 |
| SC | - | 1 | 2 | 8 | 15 | 26 |
| TX | - | 2 | 1 | 5 | 3 | 11 |
| VA | 1 | 4 | 12 | 4 | 5 | 26 |

| State/Country | Bluefin Only * | BAYS Only | Bluefin and BAYS | Atlantic swordfish | Atlantic sharks | Total # of permits |
|---|---|---|---|---|---|---|
| VI | - | 3 | 2 | - | - | 5 |
| WA | - | - | 1 | 1 | - | 2 |
| **Totals 2011** | **33** | **67** | **316** | **191** | **117** | **724** |
| **2010** | **32** | **58** | **323** | **181** | **108** | **702** |
| **2009** | **32** | **55** | **289** | **177** | **106** | **659** |
| **2008** | **30** | **62** | **303** | **171** | **128** | **694** |
| **2007** | **9** | **22** | **255** | **269** | **206** | **761** |
| **2006** | **43** | **60** | **313** | **285** | **336** | **1037** |
| **2005** | **68** | **66** | **332** | **294** | **228** | **988** |
| **2004** | **-** | **-** | **-** | **321** | **230** | **1075**** |

*Does not include Pacific bluefin tuna dealer permits which were eliminated July 1, 2005.
**Total includes sum of all Atlantic tuna dealer permits but total number of permit holders with BAYS and bluefin dealer permits were not calculated.

### 8.5 Exempted Fishing Permits (EFPs), Display Permits, Letters of Acknowledgement (LOAs) Chartering Permits, and Scientific Research Permits (SRPs)

EFPs, display permits, LOAs and SRPs are issued under the authority of the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.) and/or ATCA (16 U.S.C. 971 et seq.). EFPs are issued to individuals for the purpose of conducting research or other fishing activities using private (non-NOAA) vessels, whereas an SRP would be issued to agency scientists who are using NOAA vessels as their research platform. Similar to SRPs, LOAs are issued to individuals conducting research from "bona fide" research vessels on species that are only regulated by Magnuson-Stevens Act and not ATCA. NMFS does request research plans for these activities and indicates concurrence by issuing an LOA. Display permits are issued to individuals who are fishing for, catching, and then transporting HMS to certified aquariums for public display. Regulations at 50 CFR 600.745 and 50 CFR 635.32 govern scientific research activity, exempted fishing, and exempted educational activity with respect to Atlantic HMS. Amendment 1 to the 1999 FMP implemented and created a separate display permitting system, which operates apart from the exempted fishing activities that are focusing on scientific research. The application process for display permits is similar to that required for EFPs and SRPs. When NMFS implemented Amendment 2 to the 2006 Consolidated HMS FMP (73 FR 35788 June, 24 2008), the shark quota for EFPs, display permits, and SRPs remained the same. However, the quota for sandbar shark was reduced to 1.39 mt. authorized for display and 1.39 mt authorized for research under EFPs and SRPs.

The HMS Management Division has continued to work closely with agency researchers and outside researchers to assess the Deepwater Horizon/BP Oil Spill. Many EFPs and SRPs were issued to sample and monitor HMS for oil contamination. The numbers of permits associated with the oil spill are included in the numbers of permits in Table 8.7.

Amendment 2 to the 2006 Consolidated HMS FMP also implemented a shark research fishery. This research fishery is conducted under the auspices of the exempted fishing program. Research fishery permit holders assist NMFS in collecting valuable shark life history data and data for future shark stock assessments. Fishermen must fill out an application for a shark research permit under the exempted fishing program to participate in the shark research fishery. In 2010, NMFS received 12 applications. Based on the qualification criteria, 9 were chosen to participate in the shark research fishery. Shark research fishery participants are subject to 100 percent observer coverage in addition to other terms and conditions.

Issuance of EFPs, display permits, and SRPs may be necessary because possession of certain shark and billfish species are otherwise prohibited, possession of billfishes onboard commercial fishing vessels is prohibited, the commercial fisheries for BFT, swordfish and large coastal sharks may be closed for extended periods during which collection of live animals and/or biological samples would otherwise be prohibited, or for other reasons. These EFPs, SRPs, and display permits would authorize collections of tunas, swordfish, billfishes, and sharks from Federal waters in the Atlantic Ocean and Gulf of Mexico for the purposes of scientific data collection and public display. In addition, NMFS regulations at 50 CFR 635.32 regarding implantation or attachment of pop-up satellite archival tags in Atlantic HMS require prior authorization and a report on implantation activities.

In order to implement the chartering recommendations of ICCAT, NMFS published a rule on December 6, 2004 (69 FR 70396), requiring U.S. vessel owners with HMS permits to apply for and obtain a chartering permit before fishing under a chartering arrangement outside U.S. waters. These permits are issued in a manner similar to other EFPs. Under this final rule and consistent with the ICCAT recommendations, vessels issued a chartering permit are not authorized to use the quota or entitlement of the United States until the chartering permit expires or is terminated. This is because of the fact that under a chartering arrangement that U.S. vessels have attained authorization to harvest another ICCAT CPCs' quota. Having a chartering permit does not obviate the need to obtain a fishing license, permits, or other authorizations issued by the chartering nation in order to fish in foreign waters, or obtain other authorizations such as a High Seas Fishing Compliance Act Permit, 50 CFR 300.10 et seq. A U.S. vessel shall not be authorized to fish under more than one chartering arrangement at the same time. NMFS will issue chartering permits only if it determines that the chartering arrangement is in conformance with ICCAT's conservation and management programs.

The number of EFPs, display permits, and SRPs issued from 2007 – 2011 by category and species are listed in Table 8.7. Year-end reports for permits issued for 2011 are required, and are expected to be submitted to NMFS in early 2012.

**Table 8.7 Number of Atlantic HMS Exempted Fishing Permits (EFPs), Display Permits, and Scientific Research Permits (SRPs) issued between 2007 and 2011.**

| Permit type | | 2007 | 2008 | 2009 | 2010 | 2011* |
|---|---|---|---|---|---|---|
| Exempted Fishing Permit | Sharks for display | 6 | 5 | 4 | 2 | 3 |
| | HMS for display | 3 | 1 | 2 | 2 | 2 |
| | Tunas for display | 0 | 0 | 0 | 0 | 0 |
| | Shark research on a non-scientific vessel | 4 | 4 | 4 | 9 | 8 |
| | Tuna research on a non-scientific vessel | 4 | 4 | 4 | 5 | 5 |
| | HMS research on a non-scientific vessel | 9 | 7 | 5 | 2 | 2 |
| | Billfish research on a non-scientific vessel | 3 | 3 | 1 | 2 | 2 |
| | Shark Fishing | 0 | 0 | 0 | 0 | 0 |
| | HMS Chartering | 0 | 0 | 0 | 0 | 0 |
| | Tuna Fishing | 0 | 0 | 0 | 0 | 0 |
| | **TOTAL** | **29** | **24** | **20** | **22** | **22** |
| Scientific Research Permit | Shark research | 2 | 0 | 4 | 1 | 3 |
| | Tuna research | 1 | 0 | 0 | 1 | 1 |
| | Billfish research | 0 | 0 | 0 | 0 | 0 |
| | HMS (multi-species) research | 1 | 1 | 0 | 4 | 6 |
| | **TOTAL** | **4** | **1** | **4** | **6** | **10** |
| Letters of Acknowledgement | Shark research | 8 | 6 | 5 | 8 | 7 |
| | **TOTAL** | **8** | **6** | **5** | **8** | **7** |

*Permit numbers for 2011 are as of November 1, 2011.

## 8.6 Atlantic HMS Tournaments

Fishing tournaments are an important component of HMS recreational fisheries. HMS regulations define a tournament as any fishing competition involving Atlantic HMS in which participants must register or otherwise enter or in which a prize or award is offered, for catching or landing such fish. Atlantic HMS tournaments are conducted from ports along the U.S. Atlantic coast, Gulf of Mexico, and Caribbean (i.e., the U.S. Virgin Islands and Puerto Rico). Some foreign tournaments (i.e., those held in the Bahamas, Bermuda, and the Turks and Caicos) voluntarily register because their participants are mostly U.S. citizens. Since 1999, Federal regulations have required that tournament registration with NMFS take place at least four weeks prior to the commencement of tournament fishing activities. Tournament operators may be selected for reporting, in which case a record of tournament catch and effort must be maintained and submitted to NMFS within seven days of the conclusion of the tournament.

Tournament registration and reporting is necessary because it provides an important source of information used for the assessment of HMS fish stocks and estimation of HMS annual catch. NMFS may use the information to plan for the assignment of tournament observers to assist in catch/effort data compilation, including the collection of biological data and samples from landed fish (length/weight, stomach contents, injuries, parasites, hard and soft tissue samples for age determination, genetic and microconstituent analysis, spawning condition, fecundity, etc.). NMFS may also use registration information to assess the practicality of educational outreach to anglers at tournament events, including the distribution of written informational materials, notification of public hearings, and explanation of HMS regulations. The Atlantic HMS tournament registration form currently includes an option for tournament operators to request HMS regulation booklets and other outreach materials. In 2010, nearly 100 tournaments requested and received outreach materials from the HMS Management Division. As of December 2011, more than 100 tournaments had requested and received outreach materials during the 2011 tournament season. HMS tournament registration and reporting information further allows NMFS, in the course of developing fishery management plans, to evaluate the social and economic impact of tournament angling in relation to other types of angling (*e.g.*, commercial and non-tournament recreational) and the relative effect of tournament angling on populations of various regulated HMS. Finally, the information is essential for the United States to meet its reporting obligations to ICCAT.

All billfish tournaments are selected for reporting to the Recreational Billfish Survey (RBS). The information collected by the RBS is critical to the calculation of U.S. billfish landings for ICCAT compliance purposes. Tournament registration and reporting forms are available at http://www.nmfs.noaa.gov/sfa/hms/Tournaments.

Atlantic HMS tournaments vary in size. They may range from relatively small, “members-only” club events with as few as ten participating boats (40 – 60 anglers) to larger, statewide tournaments with 250 or more participating vessels (1,000 – 1,500 anglers). Larger tournaments often involve corporate sponsorship from tackle manufacturers, marinas, boat dealers, marine suppliers, beverage distributors, resorts, radio stations, publications, chambers of commerce, restaurants, and other local businesses.

As of January 1, 2008, anglers fishing from an HMS permitted vessel in any tournament awarding points or prizes for Atlantic billfish are required to deploy only non-offset circle hooks when using natural bait or natural bait/artificial lure combinations. Many HMS fishing tournaments, particularly those that target billfish, promote strict conservation principles in their tournament rules. For example, a significant number of blue marlin, white marlin, and sailfish tournaments are "release-only," utilizing observers, angler affidavits, polygraph tests, photographs, or digital video camcorders to document the live release of billfish. Further, many tournaments require a larger size for landed fish than the minimum size required by state and/or Federal regulations. Because fishing tournament participants are often well known and respected anglers, these conservation trends likely influence the general angling population in a positive manner.

The total number of tournaments that registered with the Atlantic HMS tournament registry for each year from 2003 to 2010 is shown in Table 8.8. On annual average, 260 HMS tournaments register each year. In 2010, 270 tournaments that were conducted along the U.S. Atlantic coast, including the Gulf of Mexico and Caribbean, registered with the HMS Management Division. This number matches that of 2009. The highest number of HMS tournament registrations received in one year was 299 in 2007.

**Table 8.8 Number of registered Atlantic HMS tournaments by year (2003-2010).** Source: NMFS Atlantic HMS Tournament Registration Database.

| Year | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | Average |
|---|---|---|---|---|---|---|---|---|---|
| **Total** | 244 | 215 | 256 | 259 | 299 | 267 | 270 | 270 | 260 |

Figure 8.1 shows the distribution of HMS fishing tournaments among the coastal states along the Atlantic and Gulf of Mexico coastal states, as well as the Caribbean, based on data from 2003-2010. In 2010, most HMS fishing tournaments were conducted in Florida (89), Texas (21), Louisiana (21), New Jersey (20), North Carolina (17), Puerto Rico (16), South Carolina (15), New York (14), Maryland (12), Massachusetts (13), and Alabama (7). Since 2003, Florida has consistently been the state with the highest number of registered HMS tournaments.

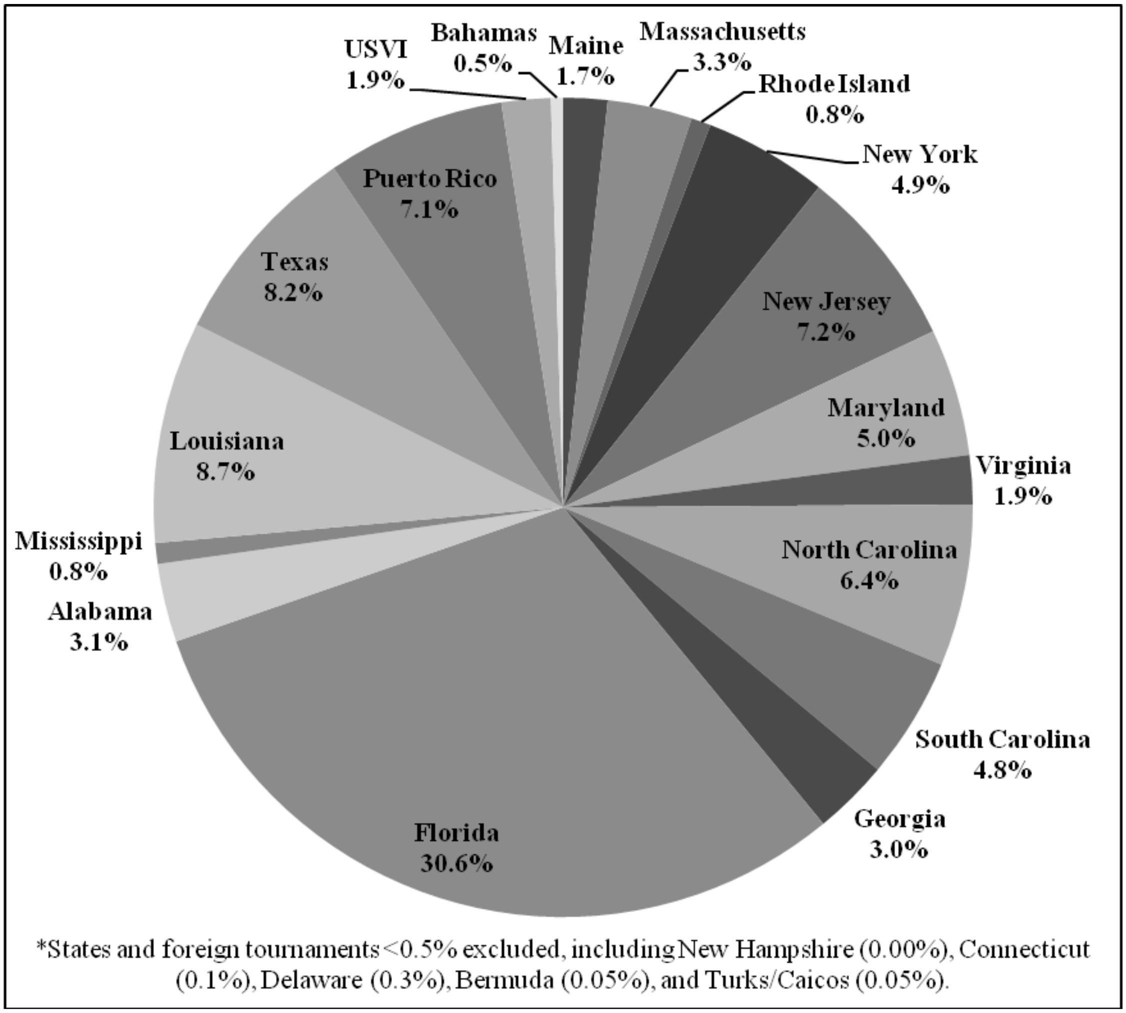


**Figure 8.1 Percentage of Atlantic HMS tournaments from 2003 to 2010 by state.**
Source: NMFS Atlantic HMS Tournament Registration Database.

Atlantic HMS are listed in Table 8.9, along with the number of HMS tournaments in 2009 and 2010 that indicated points or prizes would be awarded for the catch or landing of each species. From 2009 to 2010, the number of tournaments decreased for longbill spearfish, sailfish, and swordfish; increased for blue marlin and white marlin; increased for all sharks; and increased for all tunas except yellowfin. The most dramatic increase in tournament numbers per species was for bigeye tuna, which was registered as a category in 26 more tournaments in 2010 than it was in 2009. Roundscale spearfish was not added to the list of HMS until the end of the 2010 tournament season; therefore, it was not indicated as a target species in any 2010 tournament registrations and is not listed below.

**Table 8.9 Number of 2009 and 2010 Atlantic HMS tournaments by species.** Source: NMFS Atlantic HMS Tournament Registration Database.

| **Species** | **2009** | **2010** |
|---|---|---|
| Blue Marlin | 155 | 157 |
| White Marlin | 142 | 146 |
| Longbill Spearfish | 76 | 75 |
| Sailfish | 170 | 160 |
| Swordfish | 89 | 83 |
| Bigeye Tuna | 57 | 83 |
| Albacore Tuna | 31 | 40 |
| Yellowfin Tuna | 154 | 151 |
| Skipjack Tuna | 17 | 23 |
| Bluefin Tuna | 86 | 91 |
| Pelagic Sharks | 51 | 69 |
| Small Coastal Sharks | 12 | 18 |
| Non-Ridgeback Sharks | 10 | 21 |
| Ridgeback Sharks | 10 | 20 |

As is shown in Figure 8.2, sailfish, blue marlin, yellowfin tuna, and white marlin are the predominant target species in HMS fishing tournaments. Between 2009 and 2010, the percentage of tournaments that registered to award points or prizes increased for each category of sharks, and most dramatically for the category of bigeye tuna.

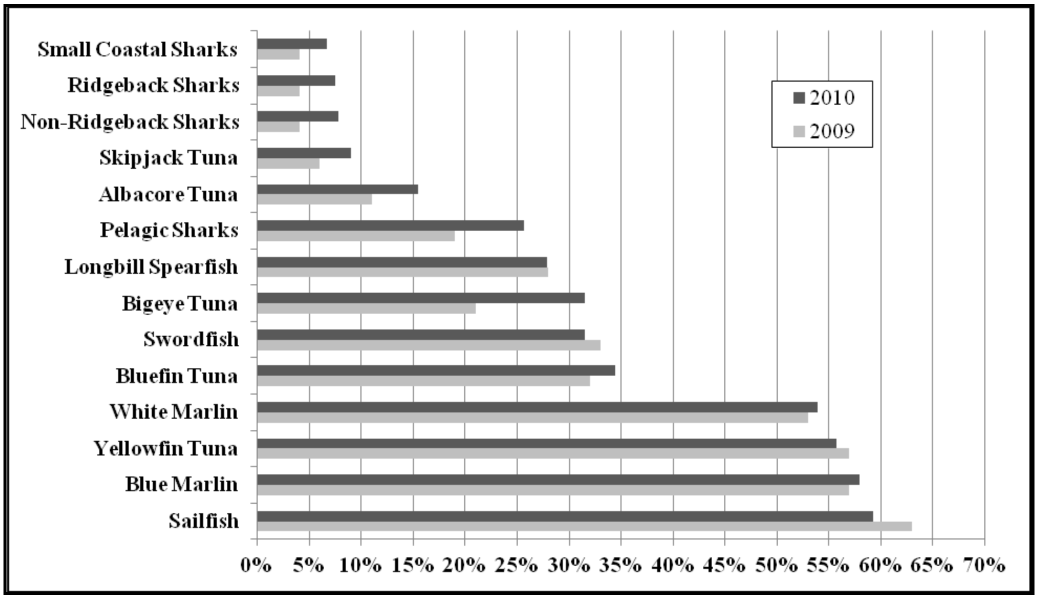


**Figure 8.2 Percentage of total Atlantic HMS tournaments registered in 2009 (270) and 2010 (270) by species.** Source: NMFS Atlantic HMS Tournament Registration Database.

The following three figures show the number of tournaments in 2010 that indicated points or prizes would be awarded for the catch or landing of sailfish (Figure 8.3), blue marlin (Figure 8.4), and white marlin (Figure 8.5). These graphs indicate that Florida is the leading state in terms of numbers of registered billfish tournaments, followed by Louisiana and Texas.

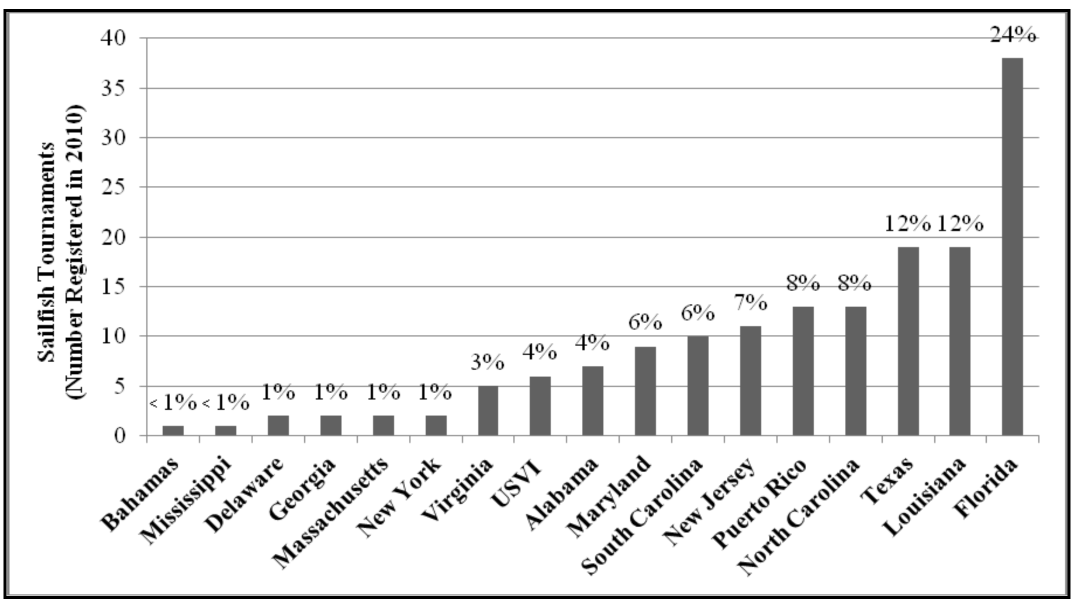


**Figure 8.3 Number and percentage of total 2010 registered Atlantic sailfish tournaments by state.** Source: NMFS Atlantic HMS Tournament Registration Database.

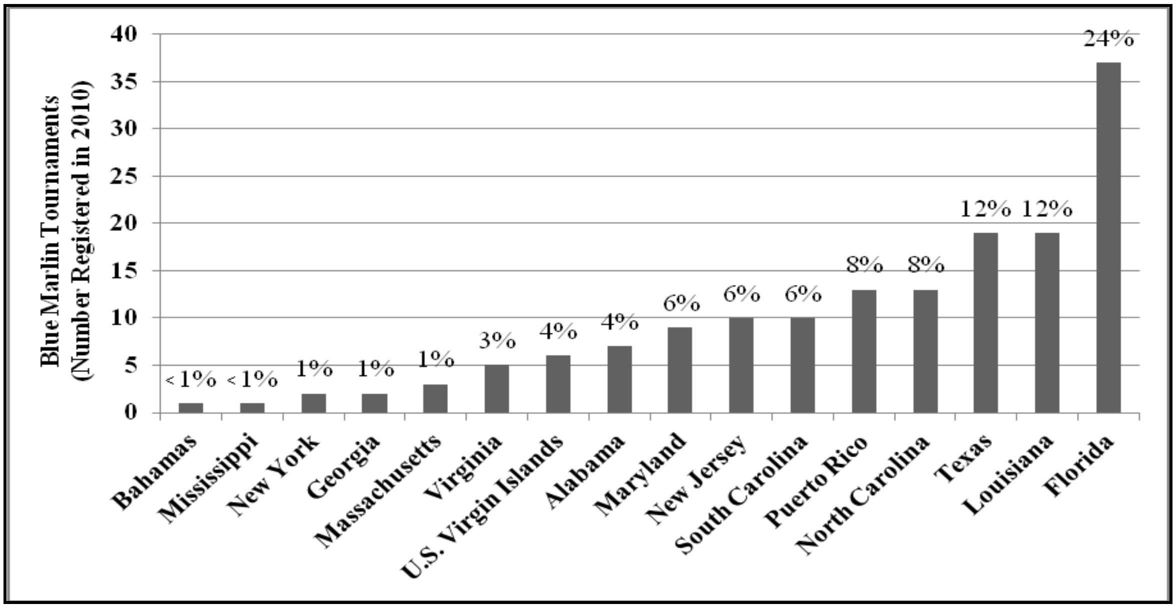


**Figure 8.4** **Number and percentage of total 2010 registered Atlantic blue marlin tournaments by state.** Source: NMFS Atlantic HMS Tournament Registration Database.

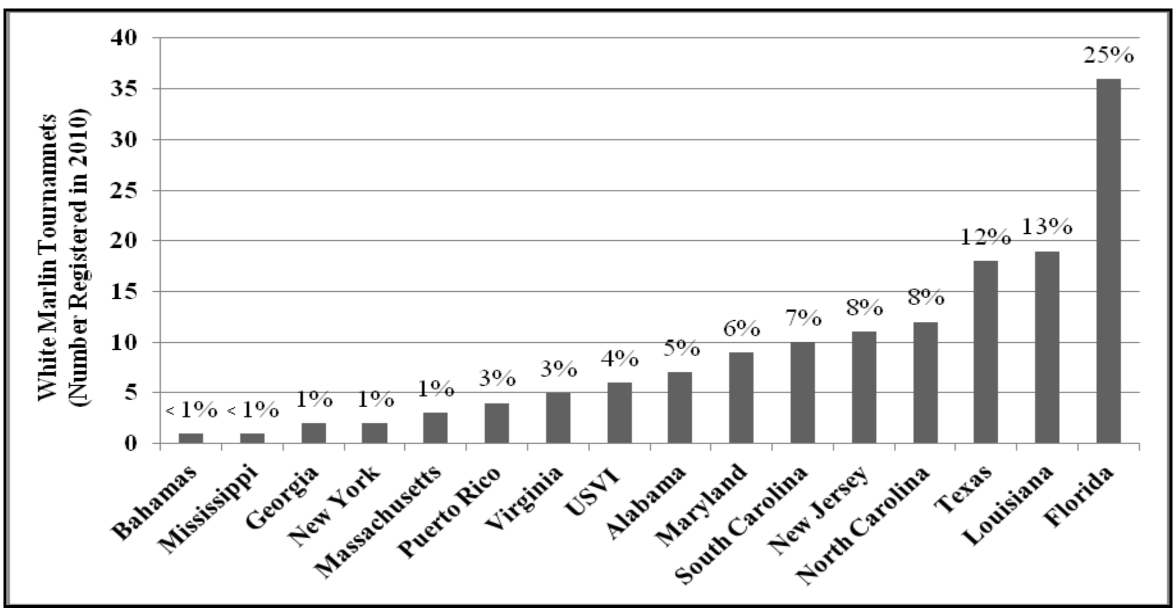


**Figure 8.5** **Number and percentage of total 2010 registered white marlin tournaments by state.** Source: NMFS Atlantic HMS Tournament Registration Database.