STOCK ASSESSMENT AND FISHERY EVALUATION (SAFE) REPORT FOR

ATLANTIC HIGHLY MIGRATORY SPECIES

2007

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

Stock Assessment and Fishery Evaluation (SAFE) Report for

Atlantic Highly Migratory Species

2007

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The photo on the cover was contributed by Loraine Hale, SEFSC, NOAA Fisheries

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Documentation Requests:

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).

Charter/Headboat Permits, Atlantic Tuna Permits & Recreational HMS Vessel Permits:

Charter/Headboat Permits, Atlantic Tuna Permits & Recreational HMS Vessel Permits are issued via the internet (www.hmspermits.gov) or through a toll free automated telephone system (1-888-872-8862). Questions regarding these permits should be directed to Customer Service at 1-888-872-8862, Monday through Friday, from 8 a.m. to 5 p.m. Eastern Time. Fishermen may also listen to or view updates to the regulations via this toll-free automated telephone system or at the website listed above.

Atlantic Shark and Swordfish Permits:

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

EXECUTIVE SUMMARY

The annual Stock Assessment and Fishery Evaluation (SAFE) Report provides a summary of the best available scientific information on the condition of stocks, marine ecosystems, and fisheries being managed under Federal regulation. Consistent with the guidelines for National Standard 2 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the SAFE Report is used as a reference in the evaluation and refinement of fisheries management practices. The report summarizes the best scientific data available for determining appropriate annual harvest levels; documents significant trends in the resource, marine ecosystems, and fisheries over time; and identifies associated bycatch and safety issues. These data may be used in the decision-making process for future regulations.

The 2007 SAFE Report for Highly Migratory Species (HMS) is a stand alone document differing from the previous year in which it appeared in the 2006 Final Consolidated Atlantic HMS Fishery Management Plan (Consolidated HMS FMP) for HMS (July 14, 2006, 71 FR 40096). 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) through December of 2007 are included. In addition, this SAFE report includes updated data for domestic shark populations for 2006.

Stock Assessment Update

In 2006, the SCRS completed several stock assessments for Atlantic HMS. Blue marlin, white marlin, Atlantic swordfish, and Atlantic bluefin tuna were assessed for abundance by ICCAT's SCRS during 2006. The SCRS conducted stock assessments on bigeye tuna, albacore, and Mediterranean swordfish (not considered in the HMS management unit) in 2007. Furthermore, ICCAT held a data preparation meeting for both blue and shortfin mako sharks in 2007. The SCRS plans to conduct another assessment of Atlantic pelagic sharks in 2008. All SCRS stock assessments can be found at http://www.iccat.es/assess.htm. The National Marine Fisheries Service (NMFS) is responsible for conducting stock assessments for large coastal sharks (LCS) and small coastal sharks. The LCS complex was evaluated in 2006 by NMFS (July 24, 2006, 71 FR 41774), following the Southeast Data, Assessment, and Review (SEDAR) process. In 2007, NMFS released a stock assessment for small coastal sharks (SCS) (November 13, 2007, 72 FR 63888).

Essential Fish Habitat

In 2007, Essential Fish Habitat (EFH) work continued with various tagging and monitoring projects for HMS. The Consolidated HMS FMP did not modify EFH descriptions or boundaries for HMS, but presented new data for EFH that was collected since 1999. NMFS plans to publish Draft Amendment 1 to the 2006 Consolidated FMP in 2008 which would consider modifications to current EFH for Atlantic HMS,

potentially amend current Habitat Areas for Particular Concern (HAPCs), and implement new HAPCs and EFH regions.

Fisheries Data Update

Atlantic HMS data is gathered from many different user groups of the fisheries. These sources include mandatory commercial and recreational permits, observer reports, mandatory logbook reporting in some fisheries, dealer reports, recreational surveys, and reporting requirements, and an HMS tournament database. Data has been analyzed by gear type to determine management strategies for these multi-species fisheries.

Economic Status of HMS Fisheries

The 2007 SAFE Report includes a section on the economic status of commercial and recreational HMS fisheries. Information in this section includes production (U.S. and international), ex-vessel prices, wholesale prices, fishing costs and revenues for commercial fisheries, costs and revenues for dealers, recreational fishing, and charter/headboat fisheries. This SAFE Report updates 2006 information regarding ex-vessel prices and total ex-vessel values in table format. A full description of economic information sources is given in the 2006 SAFE Report.

Community and Social Data Update

Analyses relative to National Standard 8 of the Magnuson-Stevens Act rely heavily on the availability of community studies and profiles. This section of the SAFE Report provides a summary of the socio-economic impacts of selected regulations. A brief bibliography of recent social science publications is given in Section 6 of the 2006 SAFE Report.

Fish Processing, Industry, and Trade

Domestic and international consumer preference continues to play a large role in HMS markets. Section 7 provides an overview of U.S. trade activities relative to HMS, required documentation, and summaries of U.S. imports and exports of HMS products. The use of trade data to supplement existing information sources is an important tool in the monitoring and management of HMS. Tables updating the 2006 SAFE Report with 2007 trade data on tunas, sharks, and swordfish are provided.

Bycatch

Bycatch and bycatch mortality of finfish, as well as incidental catches and fishing-induced mortality of marine mammals, sea turtles, and seabirds, continue to be issues of concern in the management of HMS fisheries. An HMS bycatch reduction plan identifies 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 will be undertaken during 2008 and new activities may be added or removed

as they are addressed or identified. This section of the 2007 SAFE Report includes a discussion on the results of various bycatch reduction efforts in the HMS fisheries as well as bycatch reduction of HMS species in other fisheries.

HMS Permits

NMFS continues to monitor capacity in the HMS fisheries. Updated vessel and dealer permit numbers for HMS fisheries in 2007 are included in Section 9. Additional information on HMS permit programs can be found in the Consolidated HMS FMP.

NMFS continues to modify and improve its Atlantic tunas permitting system, including the website where constituents can purchase and renew permits for Atlantic tunas, update permit information, and report recreational landings of bluefin tuna and non-tournament landings of billfish and swordfish (www.hmspermits.gov). Increasing the level of automation in the permitting process, as well as the methods of renewal (i.e., phone, fax, internet), is expected to improve constituent satisfaction and reduce administrative costs. Information on new and existing regulations in the Atlantic HMS fishery can be obtained via the HMS "info line" (800-894-5528) and HMS website http://www.nmfs.noaa.gov/sfa/hms/. NMFS hopes to build upon this success and consider automating other HMS permitting processes in the future.

Issues for Consideration and Outlook

In 2008, NMFS plans to continue implementing and evaluating FMP measures to rebuild stocks, prevent or stop overfishing, and address overcapitalization in the HMS fisheries. The major effort planned for 2008 is both a first and second amendment to the Consolidated HMS FMP. Issues that may be addressed in these amendments are listed in Section 10.

The 2007 HMS Advisory Panel meetings in March and October provided an excellent opportunity to discuss these and other issues raised in the previous SAFE report which may require further action. Through continuous public and constituent interaction, increased monitoring, ongoing scientific research, and additional socio-economic assessment, NMFS strives to continue building sustainable fisheries for all Atlantic HMS, as discussed in this SAFE Report.

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1. INTRODUCTION

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes a long-range, transparent, and inclusive process to sustainably manage the fisheries of the United States. The fishery management plan (FMP) is the primary management instrument established by the Magnuson-Stevens Act. A component of the 2006 Final Consolidated Atlantic Highly Migratory Species Fishery Management Plan (Consolidated HMS FMP) is the production of an annual Stock Assessment and Fishery Evaluation (SAFE) Report. 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 fishery management.

The SAFE Report provides a summary of the best available scientific information on the condition of stocks, marine ecosystems, and fisheries being managed under Federal regulation. It also provides updated information regarding the economic status of fisheries, fishing communities, and industries, as well as the socio-economic and environmental impacts of recently implemented regulations. This information evaluates the effectiveness of Federal and state Atlantic HMS management programs, and provides the basis for future management decisions.

Consistent with the guidelines for National Standard 2 of the Magnuson-Stevens Act, the SAFE report is prepared annually and used as a reference in the evaluation and refinement of fisheries management practices. This 2007 SAFE Report is a separate document from any other rulemaking. The report provides the most current data that would be used to determine appropriate annual harvest levels; document significant trends in the resource, marine ecosystems, and fisheries over time; assess the relative success of state and Federal management programs; and identify bycatch and safety issues. Through a comprehensive annual update of key biological, economic, and social indicators, the National Marine Fisheries Service (NMFS) can ensure use of the best available scientific data in its decision making process.

This SAFE Report is a vehicle to introduce new information, identify additional management issues that may need to be addressed, and begin a preliminary assessment and evaluation of fishery regulations. The 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 National Standard 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 on HMS Management Division Activities During 2006 and 2007

NMFS held HMS Advisory Panel meetings in March and October 2007, and April 2008 in Silver Spring, MD. These meetings provided valuable comments on a suite of management actions considered during calendar years 2007 and 2008. A summary of the discussion can be found on the HMS website at: www.nmfs.noaa.gov/sfa/hms, along with the meeting transcripts. These documents are also available by calling the HMS Management Division at 301-713-2347.

In 2006, NMFS published the Consolidated HMS FMP (July 14, 2006, 71 FR 40096). The Consolidated HMS FMP combines management measures and regulations for all HMS in the current management unit. In 2007, the bluefin tuna fishery was subject to various inseason actions (primarily changes to Angling and General category daily retention limits). The Atlantic shark fishery also was the subject of several rulemakings, including a draft amendment to the Consolidated HMS FMP in response to the 2006 large coastal shark (LCS) and dusky shark stock assessments, several rules to implement trimester seasons in 2006 and 2007, implementation of mandatory dehooking equipment to ensure the safe handling and release of protected resources, and identification workshops for shark dealers. The swordfish fishery was also modified by a rulemaking in 2007 that changed several upgrading restrictions for vessels, increased the swordfish retention limits of limited access incidental permit holders, and increased retention limits of charter/headboat and Angling category permit holders. Swordfish quota specifications were finalized in 2007. A billfish tournament requirement to use circle hooks with natural bait and natural bait/artificial combinations was suspended in early 2007 but was reinstated effective January 2008.

1.2 2006 and 2007 Accomplishments of the International Commission for the Conservation of Atlantic Tunas

The 15th Special Meeting of the ICCAT was held in Dubrovnik, Croatia, November 20-26, 2006. ICCAT is an international fishery management organization with 45 members, including the United States. The United States helped develop agreements aimed at promoting the conservation and rebuilding of Atlantic highly migratory fish stocks (e.g., tunas, swordfish, and billfish), including those critical to U.S. fishermen.

Many proposals were adopted in Croatia, including the extension of existing conservation and management measures for blue and white marlin stocks, North and South Atlantic swordfish stocks, western and eastern Atlantic bluefin tuna stocks, and the North Atlantic albacore tuna stock. A summary of the agreed measures follows:

Marlins: ICCAT adopted revisions to its rebuilding plan for blue and white marlin to enhance conservation of the stocks via Recommendation 06-09. Enhancements included:

1) Improved reporting requirements which mandate submission of data on the disposition of released and discarded marlin by area and season

2) Submission to SCRS of documentation on the character and extent of artisanal fisheries
3) Beginning in 2007, but no later than 2008, implementation of domestic measures to cap artisanal marlin catches at 2006 levels
4) Monitoring of and reporting on effort (including number of fishing vessels) and catches (landings and discards) in artisanal marlin fisheries
5) Presentation by SCRS of work plans to achieve Phase 2 of the rebuilding plan at the 2010 ICCAT meeting

In addition, Recommendation 06-09 set the next assessment for Atlantic blue and white marlin for 2010. It also extended the U.S. recreationally caught annual marlin landing limit of 250 blue and white marlin combined until 2010, and extended requirements for the United States to maintain billfish tournament observer coverage levels at 10 percent through 2010. Finally, Recommendation 06-09 maintained various scientific monitoring programs.

North Atlantic Swordfish: The 2006 ICCAT recommendation 06-02 set a total allowable catch (TAC) of 14,000 metric tons (mt) for 2007 and 2008 with 3,907 mt allocated to the United States per year. In addition, the recommendation set carryover caps for Contracting Parties and Co-operating Non-Contracting Parties, Entities or Fishing Entities (CPCs). The maximum underage that a CPC may carry over cannot exceed 50 percent of its quota allocation, which is 1,953.5 mt for the United States under the current allocation scheme. Furthermore, recommendation 06-02 includes a clause that allows CPCs with a TAC allocation to make a one-time transfer within a fishing year of up to 15 percent of its TAC allocation to other CPCs with TAC allocations. The recommendation allocated 2,690 mt of U.S. underharvest from the 2003 - 2006 management period to the TAC for 2007 and 2008 in an effort to accommodate interest expressed by a number of developing states to develop fisheries for North Atlantic swordfish. This allocation was evenly split at 1,345 mt per year for 2007 and 2008. Finally, recommendation 06-02 retains the provision allowing the United States to harvest up to 200 mt of its annual catch limit between 5 degrees North latitude and 5 degrees South latitude, and also retains the provision for the transfer of 25 mt to Canada annually.

South Atlantic Swordfish: The 2006 ICCAT recommendation 06-03 set a TAC of 17,000 mt for 2007, 2008, and 2009, with 100 mt allocated to the United States per year. In addition, the recommendation set carryover caps for CPCs. The maximum underage that a CPC may carry over cannot exceed 50 percent of its quota allocation.

Western Atlantic Bluefin Tuna: The 2006 ICCAT Recommendation (06-06) lowered the western Atlantic TAC from 2,700 mt to 2,100 mt, in line with scientific advice to stop overfishing. The western bluefin recommendation also includes provisions to: (1) limit carryover of underharvest to no more than 50 percent of a contracting party's initial TAC; (2) limit mortality of school bluefin tuna (under 30 kg) to an average of 10 percent of the initial TAC, calculated on a four-year basis; and (3) allow a contracting party with a TAC allocation to make a one-time transfer within a fishing year of up to 15 percent of its TAC allocation to other contracting parties with TAC allocations, consistent with

domestic obligations and conservation considerations. In anticipation of a cap on carryover for the 2007 fishing year (i.e., 595.1 mt, or one half of the initial U.S. TAC of 1,190.12 mt) and in anticipation of a substantial underharvest of the 2006 fishing year domestic quota, the United States agreed at the 2006 ICCAT meeting to transfer a total of 275 mt of current U.S. underharvest (i.e., underharvest of the 2006 fishing year quota) as follows: 75 mt and 100 mt for 2007 and 2008, respectively, to Mexico, and 50 mt for each of the years 2007 and 2008 to Canada.

Eastern Atlantic and Mediterranean Bluefin Tuna: Despite the strong recommendation from SCRS that catch levels for this stock should not exceed about 15,000 mt (the level expected to halt overfishing), Recommendation 06-05 as adopted by ICCAT did not include an appropriate suite of measures to ensure this. Recommendation 06-05 established a 15 year management plan, which is to be reviewed in 2008. It set a 29,500 mt catch level for 2007 with gradual reductions to 25,500 by 2010. Country specific quota allocations were developed at a special intersessional meeting in early 2007 and adopted by mail vote in March 2007. In addition to the high TAC, the adopted time/area closure for the fishery did not cover the peak Mediterranean spawning month of June for the purse seine fleet, and the increase in the minimum size limit to 30 kg contained significant carve outs that allow 8 kg fish to be harvested in certain fisheries (e.g., for farming purposes). The recommendation also did not require Contracting Parties to payback past quota overharvests, and it allows the carry forward of 50 percent of under harvests from 2005 and/or 2006.

The recommendation included enhancements to fishery monitoring and control to improve compliance with agreed conservation and management measures. Among other things, these included; (1) prohibition of chartering by 2010 and prohibition of trans-shipment at sea; (2) enhanced controls on landing in port; (3) real time data collection and reporting to the flag state and the ICCAT Secretariat; (4) enhanced controls on farming activities, including the use of observers; (5) increased observer coverage on bluefin tuna fleets; (6) centralized VMS data reporting to the ICCAT Secretariat; (7) enhanced market controls; and (7) application of ICCAT's existing joint international inspection scheme and a commitment to develop a revised scheme. (Note: The additional farming controls are in addition to a separate recommendation adopted in 2006 amending earlier farming recommendations.)

North Atlantic Albacore: Via Recommendation 06-04, ICCAT agreed to roll over the existing recommendation for northern albacore through 2007. It was agreed that management measures for albacore would be comprehensively reviewed at the 2007 ICCAT meeting in light of the 2007 stock assessment.

Other Commission actions of significance in 2006 included:

Trade related measures: ICCAT agreed to identify Cambodia and Sierra Leone under the Trade Measures Resolution, which is a first step toward the implementation of trade restrictive measures. ICCAT also agreed to continue sanctions against Georgia and Bolivia. Cooperating Status for Netherlands Antilles was revoked. Cooperating Status

for Taiwan (i.e., Chinese Taipei) and Guyana was continued. Because St. Vincent and the Grenadines became a contracting party during the 2006 ICCAT meeting, consideration of its 2005 identification was taken up in the Compliance Committee and eventually revoked. The Trade Measures Resolution was converted from a non-binding resolution to a binding recommendation. It was also expanded to explicitly cover farming activities.

Taiwan: ICCAT reinstated Taiwan's bigeye tuna quota, given the effort made by that party to comply with the 2005 directive to reduce fleet capacity, ensure compliance by the remaining fleet, and investigate illegal, unregulated and unreported (IUU) fishing activities. In reinstating the quota, ICCAT adopted a recommendation (06-01) that requires Taiwan to continue certain monitoring and control activities, including periodic reports on its compliance activities through 2007, and continued efforts to eliminate IUU fishing supported by Taiwan business interests.

IUU vessel list: A measure was adopted amending provisions of the existing ICCAT IUU vessel list, including defining IUU activities, establishing a process to remove vessels from the list inter-sessionally (by majority decision), and extending the measure to ICCAT member vessels.

Other compliance related measures: ICCAT adopted Recommendation 06-15 to enhance control and management of ICCAT quotas through cooperation between and among parties. This recommendation specifies that flag countries shall validate bluefin tuna statistical documents only when a country has not exhausted its quota and is in compliance with other relevant conservation and management measures. Importing states shall not import bluefin tuna unless the statistical document is duly validated. Finally, countries are required to cooperate to ensure statistical (trade tracking) documents are not forged or do not contain misinformation.

Commission Actions of Significance in 2007:

The 20thth Regular Meeting of ICCAT was held in Antalya, Turkey, November 12-18, 2007. ICCAT made progress on a number of issues in 2007, but failed to take meaningful action to address the decline of the eastern Atlantic and Mediterranean bluefin tuna stock and poor monitoring and control of that fishery. While the United States pressed ICCAT to adopt a measure to suspend bluefin fishing in the eastern Atlantic and Mediterranean until monitoring and control issues could be addressed, ICCAT instead adopted a non-binding measure (Resolutions 06-08). The non-binding measure requested that parties submit documents by February 2008 detailing how they are implementing ICCAT's 2006 management plan for the eastern fishery and submit a report at the end of the fishing season on the results of implementation. It further requests that parties involved in the bluefin tuna fishery hold a stakeholder meeting in March 2008 to review fishery rules and market activities and to work out a voluntary action plan to reduce fishing, caging, and imports to ensure catch levels are commensurate with those specified in the 2006 management plan. In a more positive and concrete action, ICCAT adopted a catch documentation scheme for bluefin tuna which

should improve overall data reporting since the new approach will cover bluefin whether it enters international trade or not.

ICCAT adopted a two-year measure (Recommendation 07-02) for northern albacore tuna that reduced the TAC. This measure reduced the U.S. allocation of northern albacore from 607 mt to 538 mt. A binding recommendation (07-03) for southern albacore adopted in 2007 that reduced the TAC consistent with scientific advice was also adopted. ICCAT also adopted measures for the conservation of sharks (Recommendation 07-06) that included requirements to reduce fishing mortality in fisheries targeting porbeagle and shortfin mako sharks. This measure will not directly impact the United States because there is not a directed U.S. fishery for these species and because the United States has already taken steps to reduce mortality of these species that satisfy ICCAT requirements. A binding recommendation requiring the use of tori lines and line weighting on vessels fishing south of 20 degrees South to reduce seabird bycatch was also adopted.

Other actions taken by ICCAT in 2007, included: (1) amendment of IUU vessel list measures by providing a process for incorporating vessels on other tuna regional fishery management organization IUU lists into the ICCAT IUU list; (2) a continuation of trade sanctions against certain non-members; and (3) the election of Dr. Christopher Rogers, of the United States, as Chairman of the Compliance Committee. U.S. leadership of this committee will give the United States a heightened ability to address compliance issues.

1.3 Summary of Regulatory Actions During 2006 and 2007

During calendar year 2006, NMFS' HMS Management Division completed numerous rulemakings and in-season actions, including the Consolidated HMS FMP, which implemented management measures for all HMS in the management unit. In 2007, Amendment 2 to the Consolidated HMS FMP was undertaken and is expected to rebuild and end overfishing of some shark species. The Final Rule was published June 24, 2008 (73 FR 35778). Each of these regulatory actions is consistent with existing HMS stock rebuilding plans, and is supported by a regulatory analysis, as required, of the action's socio-economic and/or ecological effects. These analyses are updates to previous environmental and regulatory impact analyses, and are found in supporting documents including but not limited to Environmental Assessments (EA), Environmental Impact Statements (EIS), and/or Regulatory Impact Reviews (RIR). As reflected in these supporting documents, which are available from NMFS upon request, these actions are not expected to have adverse ecological impacts on target, non-target, or protected species, but are expected to have positive cumulative impacts. Table 1.2 provides a list of all Federal Register notices published during 2006 and 2007 related to specific actions pertaining to Atlantic HMS fisheries. The Consolidated HMS FMP summarizes state rules and regulations pertaining to HMS.

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

AA	**Assistant Administrator for Fisheries**
ACCSP	**Atlantic Coastal Cooperative Statistics Program**
ACS	**Angler consumer surplus**
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**
BET	**Bigeye tuna**
BFT	**Bluefin tuna**
BiOp	**Biological Opinion**
B_{MSY}	**Biomass expected to yield maximum sustainable yield**
B_{OY}	**Biomass expected to yield optimum yield**
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**
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**
FAO	**Food and Agriculture Organization**
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**
GSAFDF	**Gulf and South Atlantic Fishery Development Foundation**
GMFMC	**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**
ITQ	**Individual transferable quota**
ITS	**Incidental take statement**
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**
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**

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**
OSF	**Office of Sustainable Fisheries**
OY	**Optimum yield**
POP	**Pelagic observer program**
OPR	**Office of Protected Resources**
PRA	**Paperwork Reduction Act**
Reg Flex Act	**Regulatory Flexibility Act**
RIR	**Regulatory Impact Review**
RPAs	**Reasonable and Prudent Alternatives**
RPMs	**Reasonable and Prudent Measures**
SAFE Report	**Stock Assessment and Fishery Evaluation report**
SAFMC	**South Atlantic Fishery Management Council**
SCRS	**Standing Committee for Research and Statistics**
SCS	**Small coastal sharks**
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**
USFWS	**United States Fish and Wildlife Service**
VMS	**Vessel monitoring system**
WTP	**Willingness to pay**
ww	**Whole weight**

Table 1.2 Summary of NMFS' Atlantic HMS Fisheries Actions

Action Type NMFS ID#	CFR Part	Action Description	Action Pub Info
Temporary Rule ID 122805B	635	Atlantic Bluefin Tuna General Category Restricted Fishing Days	1/4/2006 71 FR 273
Temporary Rule ID 010406B	635	Atlantic Bluefin Tuna General Category Suspension of Restricted Fishing Days	1/9/2006 71 FR 1395
Temporary Rule ID 011206I	635	Atlantic Bluefin Tuna General Category Retention Limit Adjustment	1/20/2006 71 FR 3245
Temporary Rule ID 011906B	635	Atlantic Bluefin Tuna General Category Last Three Restricted Fishing Days Lifted	1/26/2006 71 FR 4310
Proposed Rule ID 100405C RIN 0648-AT73	635	Atlantic Swordfish Quota Adjustment	2/13/2006 71 FR 7499
Proposed Rule ID 012006B RIN 0648-AU17	635	Atlantic Shark Commercial Management Measures to Establish the Third and Second Trimester Seasons	2/17/2006 71 FR 8557
Proposed Rule ID 020206C RIN 0648-AT72	635	Atlantic Bluefin Tuna Quota Specification and Effort Control	2/24/2006 71 FR 9507
Notice ID 120505C	635	Large Costal Shark Review Workshop	3/9/2006 71 FR 12185
Notice	635	Atlantic Highly Migratory Species Recreational Landings Report	3/22/2006 71 FR 14502
Final Rule ID 012006B RIN 0648-AU17	635	Atlantic Shark Commercial Management Measures for Second and Third Trimester Seasons	3/31/2006 71 FR 16243
Notice ID 033006B	635	Scientific Research Permit for Pelagic Shark Research	5/4/2006 71 FR 26351

Final Rule ID 100405C RIN 0648-AT73	635	Atlantic Swordfish Quotas Adjustment	5/19/2006 71 FR 29087
Notice of Availability ID 051706A	635	Stock Assessment of Dusky Sharks	5/25/2006 71 FR 30123

Action Type NMFS ID#	**CFR Part**	**Action Description**	**Action Pub Info**
Final Rule ID 020206C RIN 0648-AT72	635	Atlantic Bluefin Tuna Quota and Effort Controls for the General and Angling Categories	5/30/2006 71 FR 30619
Notice of Availability ID 062306B	635	Final Stock Assessment for Large Costal Sharks	7/24/2006 71 FR 41774
Temporary Rule ID 081006A	635	Atlantic Bluefin Tuna Fisheries Retention Limit Adjustment	8/30/2006 71 FR 51529
Notice ID 081606A	635	Atlantic Swordfish Public Meetings	8/31/2006 71 FR 51803
Final Rule ID 051603C RIN 0648-AQ65	300, 600, and 635	Final Rule for the HMS Consolidated Fishery Management Plan	10/2/2006 71 FR 58058
Proposed Rule ID 091106B RIN 0648-AU84	635	Atlantic Shark Commercial Management Measures	10/5/2006 71 FR 58778
Notice ID 101106F	635	Shark Dealer Identification Workshops and Protected Species Safe Handling and Release Workshops	10/23/2006 71 FR 62095
Notice ID 101206E	635	Nominations for the Highly Migratory Species Advisory Panel	10/26/2006 71 FR 62586
Proposed Rule ID 091106B RIN 0648-AU84	635	Extension of Comment Period Regarding the 2007 First Trimester Season	11/1/2006 71FR 64213
Temporary Rule ID 102606C	635	Atlantic Bluefin Tuna Retention Limit Adjustment	11/1/2006 71 FR 64165
Notice of Intent ID 082906A RIN 0648-AU89	635	Atlantic Shark Management Measures Comments for an Environmental Impact Statement in Response to Shark Stock Assessments	11/7/2006 71 FR 65086
Notice of Intent ID 101606B RIN 0648-AV00	635	Modification of Essential Fish Habitat for Some Atlantic Highly Migratory Species	11/7/2006 71 FR 65087

Proposed Rule ID 091106B RIN 0648-AU84	635	Extension of Comment Period Regarding the 2007 First Trimester Season	11/13/2006 71 FR 66154

Action Type NMFS ID#	**CFR Part**	**Action Description**	**Action Pub Info**
Notice ID 101106F	635	Shark Dealer Identification Workshops and Protected Species Safe Handling and Release Workshops	11/27/2006 71 FR 68561
Notice of Intent ID 101206B	635	Request for Comments on Exempt Fishing, Scientific Research, Display, and Chartering Permits	11/27/2006 71 FR 68557
Proposed Rule ID 110206A RIN 0648-AU86	635	Request for Comment Atlantic Swordfish Management Measures to Revitalize the Fishery	11/28/2006 71 FR 68784
Final Rule and Temporary Rule ID 091106B RIN 0648-AU84	635	Atlantic Shark Commercial Management Measures for 2007 First Trimester Season and South Atlantic Quota Modification	12/14/2006 71 FR 75122
Notice ID 112206A	635	Shark Dealer Identification Workshops and Protected Species Safe Handling and Release Workshops	12/18/2006 71 FR 75714
Notice ID 110206A RIN 0648-AU86	635	Notification of Public Hearings Regarding Swordfish Management Measures	1/3/2007 72 FR 96
Notice of Availability ID 082906A	635	Atlantic Shark Management Measures and Public Hearings	1/3/2007 72 FR 123
Notice ID 011907C	635	NMFS Announces the Receipt of an Exempted Fishing Permit to Collect Data on Impacts of J-Hooks on Billfish	2/1/2007 72 FR 4691
Final Rule ID 082305E RIN 0648-AT37	223 and 635	Atlantic Shark Management Measures; Gear Operation and Deployment; Complementary Closures	2/7/2007 72 FR 5633

Action Type NMFS ID#	CFR Part	Action Description	Action Pub Info
Regional Fishery Closure ID 013107D	635	Closure of the Small Coastal Shark Fishery for the Gulf of Mexico	2/14/2007 72 FR 6966
Notice of Availability ID 010307C	635	Revised List of Equipment Models for Careful Release of Sea Turtles in the Pelagic and Bottom Longline Fisheries	2/15/2007 72 FR 7417
Notice ID 013007A	635	Advisory Panel Meeting for March 2007	2/21/2007 72 FR 7860
Notice ID 021307C	635	New VMS Type Approval for HMS Fisheries and Other Programs	2/27/2007 72 FR 8695
Proposed Rule ID 021307B RIN 0648-AV09	635	Atlantic Commercial Shark Management Measures for Second and Third Trimester Seasons	3/8/2007 72 FR 10480
Notice ID 030107C	635	NMFS Announces the Receipt of an Exempted Fishing Permit to Fish PLL Gear in Closed Areas	3/13/2007 72 FR 11327
Notice ID 030507D	635	Schedule of Public Protected Recourses Dehooking Workshops and Atlantic Shark Identification Workshop	3/13/2007 72 FR 11335
Proposed Rule ID 022607F RIN 0648-AV25	635	Suspension of the Circle Hook Rule Intended for Billfish Tournaments	3/15/2007 72 FR 12154
Temporary Rule ID 032107B	635	Inseason Adjustment to the Recreational Retention Limits of Atlantic Bluefin Tuna	3/28/2007 72 FR 14491
Proposed Rule and Notice ID 030507A RIN 0648-AU87	635	Atlantic Bluefin Tuna Quota Specifications and Effort Controls to the General and Angling Categories	4/4/2007 72 FR 16318
Notice ID 030107C	635	Extension of Comment Period for an Exempt Fishing Permit to Fish in Closed Areas	4/11/2007 72 FR 18208
Notice ID 110306B	635	Small Costal Shark Stock Assessment Workshop	4/19/2007 72 FR 19701
Final Rule ID 021307B RIN 0648-AV09	635	Atlantic Commercial Shark Management Measures for Second and Third Trimester	4/26/2007 72 FR 20765

Action Type NMFS ID#	CFR Part	Action Description	Action Pub Info
		Seasons	
Notice ID 030107C	635	Reopening of Comment Period for Exempt Fishing Permit to Fish in Closed Areas	5/7/2007 72 FR 25748
Final Rule ID 022607F RIN 0648-AV25	635	Suspension of Circle Hook Requirements for Participants in Atlantic Billfish Tournaments	5/11/2007 72 FR 26735
Temporary Rule RIN 0648-XA57	635	Inseason Adjustment to the Recreational Retention Limits of Atlantic Bluefin Tuna	5/31/2007 72 FR 30297
Final Rule ID 110206A RIN 0648-AU86	635	Atlantic Swordfish Management Measures to Revitalize the Fishery	6/7/2007 72 FR 31688
Notice RIN 0648-XA61	635	Public Information Meetings for Greenstick Gear	6/8/2007 72 FR 31812
Notice RIN 0648-XA69	635	Schedule of Public Protected Recourses Dehooking Workshops and Atlantic Shark Identification Workshop	6/14/2007 72 FR 32836
Proposed Rule ID 020607C RIN 0648-AV10	635	Atlantic Swordfish Quotas	6/18/2007 72 FR 33436
Final Rule ID 030507A RIN 0648-AU87	635	Atlantic Bluefin Tuna Quota and Effort Controls	6/18/2007 72 FR 33401
Notice RIN 0648-XB32	635	Small Costal Shark 2007 Peer Review Workshop	7/18/2007 72 FR 39606
Proposed Rule RIN 0648-AU89	600 635	Amendment 2 to the Consolidated Atlantic Highly Migratory Species Fishery Management Plan Availability	7/27/2007 72 FR 41392
Notice RIN 0648–XB84	635	Denial of Highly Migratory Species Exempt Fishing Permit for Research In A Closed Area	8/9/2007 72 FR 44834
Notice RIN 0648-XC20	635	Notice of Atlantic Highly Migratory Species Advisory panel meeting and EFH FMP Amendment public scoping meeting	8/28/2007 72 FR 49264
Temporary Rule RIN 0648-XC23	635	Inseason retention limit adjustment for Atlantic bluefin tuna fisheries	8/31/2007 72 FR 50257

Action Type NMFS ID#	CFR Part	Action Description	Action Pub Info
Notice RIN 0648-XC53	635	Schedules for Atlantic Shark Identification Workshops and Protected Species Safe Handling, Release, and Identification Workshops	9/14/2007 72 FR 52552
Proposed Rule RIN 0648-AV93	635	Atlantic Commercial Shark Management Measures –2008 first trimester quotas	10/1/2007 72 FR 55729
Proposed Rule RIN 0648-AV58	635	2008 Atlantic Bluefin tuna Quota Specifications and Effort Controls	10/2/2007 72 FR 56036
Proposed Rule RIN 0648-AU89	635	Amendment 2 to the Consolidated FMP – extension of comment period	10/3/2007 72 FR 56330
Final Rule RIN 0648-AV10	635	Atlantic Swordfish Quotas	10/5/2007 72 FR 56929
Temporary Rule RIN 0648-XD44	635	Atlantic Bluefin Tunas Fisheries – inseason retention limit adjustment	10/31/2007 72 FR 61565
Notice		Proposed Information Collection; Comment request; Implantation and Recovery of Archival Tags	10/31/2007 72 FR 61624
Notice		Proposed information Collection; Comment Request; Billfish Certificate of Eligibility	10/31/2007 72 FR 61623
Notice RIN 0648-XD46	635	Advisory Panel - nominations solicitation	11/1/2007 72 FR 61866
Notice RIN 0648-XD57	635	Pelagic Longline Research in closed areas – request for comments	11/5/2007 72 FR 62441
Notice RIN 0648-XD51		Small Coastal Shark Stock Assessment - notice of availability	11/13/2007 72 FR 63888
Final Rule RIN 0648-AV93	635	Atlantic Commercial shark Management Measures	11/29/2007 72 FR 67580
Final Rule RIN 0648-AV58	635	2008 Atlantic Bluefin Tuna Quota Specifications and Effort Controls	12/31/2007 72 FR 74193

2. STOCK ASSESSMENT UPDATES

With the exception of Atlantic sharks, stock assessments for Atlantic HMS are conducted by ICCAT's SCRS. In 2006, the SCRS completed several stock assessments for Atlantic HMS including Atlantic bluefin tuna, blue and white marlin, and Atlantic swordfish. In 2007, the SCRS conducted stock assessments for bigeye tuna, northern albacore tuna, and Mediterranean swordfish (not considered in the HMS management unit). Furthermore, ICCAT held a data preparation meeting for both blue and shortfin mako sharks in 2007. For porbeagle sharks, NMFS has accepted a 2005 species report and assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (November 7, 2006, 71 FR 65086).

Atlantic shark stock assessments for LCS and small coastal sharks (SCS) are completed by the NMFS Southeast Data, Assessment, and Review (SEDAR) process. The LCS complex, blacktip, and sandbar sharks were evaluated in 2006 (July 24, 2006, 71 FR 41774). The 2006 LCS assessment assessed blacktip sharks for the first time as two separate populations - Gulf of Mexico and Atlantic – and also assessed the status of sandbar sharks separately. In addition, the first dusky-specific shark assessment was released on May 25, 2006 (71 FR 30123). In 2007, NMFS released a stock assessment for SCS. Tables 2.1 and 2.2 have summaries of stock assessment information.

Table 2.1 Stock Assessment Summary Table (SCRS, 2007)

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Rate	Outlook
West Atlantic Bluefin	SSB_{04}/SSB_{MSY} = 0.41 (0.29-0.54) SSB_{04}/SSB_{1975} = 0.18	$0.86SSB_{MSY}$	F_{04}/F_{MSY} = 1.7 (low recruitment) $F_{04}/F_{0.1}$ = 3.1 (high recruitment)	F_{year}/F_{MSY} = 1.00	Overfished; overfishing is occurring
East Atlantic Bluefin	SSB_{04}/SSB_{74} = 0.48	*Not Estimated*	F_{04}/F_{max} = 3.1	*Not Estimated*	Overfished; overfishing is occurring
Atlantic Bigeye Tuna	B_{06}/B_{MSY} = 0.92 (0.85-1.07)	$0.6B_{MSY}$ (age 2+)	F_{05}/F_{MSY} = 0.87 (0.70-1.24)	F_{year}/F_{MSY} = 1.00	Rebuilding; overfishing is occurring.
Atlantic Yellowfin Tuna	B_{01}/B_{MSY} = 0.73 - 1.10	$0.5B_{MSY}$ (age 2+)	F_{01}/F_{MSY} = 0.87- 1.46	F_{year}/F_{MSY} = 1.00	Approaching an overfished condition.
North Atlantic Albacore Tuna	B_{05}/B_{MSY} = 0.81 (0.68-0.97)	$0.7B_{MSY}$	F_{05}/F_{MSY} = 1.5 (1.3-1.7)	F_{year}/F_{MSY} = 1.00	Overfished; overfishing is occurring.

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Rate	Outlook
South Atlantic Albacore Tuna	B_{05}/B_{MSY} = 0.91 (0.71-1.16)	*Not estimated*	F_{05}/F_{MSY} = 0.63 (0.47-0.9)	*Not estimated*	Overfished; overfishing not occurring.
West Atlantic Skipjack Tuna	*Unknown*	*Unknown*	*Unknown*	F_{year}/F_{MSY} = 1.00	Unknown
North Atlantic Swordfish	B_{06}/B_{MSY} = .99 (0.87-1.27)	*Unknown*	F_{05}/F_{MSY} = 0.86	F_{year}/F_{MSY} = 1.00	Rebuilding; overfishing not occurring
South Atlantic Swordfish	Likely >1	*Unknown*	Likely <1	F_{year}/F_{MSY} = 1.00	Unknown
Blue Marlin	$B_{04}<B_{MSY}$; Yes	$0.9B_{MSY}$	$F_{2004}>F_{MSY}$; Yes	F_{year}/F_{MSY} = 1.00	Overfished; overfishing is occurring
White Marlin	$B_{04}<B_{MSY}$; Yes	$0.85B_{MSY}$	$F_{2004}>F_{MSY}$; Possibly	F_{year}/F_{MSY} = 1.00	Overfished; overfishing is occurring
West Atlantic Sailfish	*Unknown*	$0.75B_{MSY}$	*Unknown*	*Not estimated*	Overfished: Overfishing is occurring
Spearfish	*Unknown*	*Unknown*	*Unknown*	*Not estimated*	*Unknown*

Table 2.2 Stock Assessment Summary Table

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Rate	Outlook
LCS	*Unknown*	*Unknown*	*Unknown*	*Unknown*	*Unknown*
Sandbar	SSF_{04}/SSF_{MSY}= 0.72	4.75-5.35E+05	F_{04}/F_{MSY}=3.72	0.015	Overfished; Overfishing is occurring
Gulf of Mexico Blacktip	SSF_{04}/SSF_{MSY}= 2.54-2.56	0.99-1.07E+07	F_{04}/F_{MSY}= 0.03-0.04	0.20	Not overfished; overfishing not occurring
Atlantic Blacktip	*Unknown*	*Unknown*	*Unknown*	*Unknown*	*Unknown*
Dusky Sharks	B_{2003}/B_{MSY}= 0.15 - 0.47	unknown	F_{2003}/ F_{MSY}=1.68-1,810	0.00005 – 0.0115	Overfished; Overfishing is occurring

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Rate	Outlook
SCS	N_{2005}/N_{MSY} = 1.69	2.1 E+07	F_{2005}/F_{MSY} = 0.25	F_{MSY} = 0.091	Not overfished; overfishing not occurring
Bonnethead Sharks	SSF_{2005}/SSF_{MSY} = 1.13	1.4 E+06	F_{2005}/F_{MSY} = 0.6	F_{MSY} = 0.31	Not overfished; overfishing not occurring
Atlantic Sharpnose Sharks	SSF_{2005}/SSF_{MSY} = 1.47	4.09 E +06	F_{2005}/F_{MSY} = 0.74	F_{MSY} = 0.19	Not overfished; overfishing not occurring
Blacknose Sharks	SSF_{2005}/SSF_{MSY} = 0.48	4.3 E+05	F_{2005}/F_{MSY} = 3.77	F_{MSY} = 0.07	Overfished; Overfishing is occurring
Finetooth Sharks	N_{2005}/N_{MSY} = 1.80	2.4 E+06	F_{2005}/F_{MSY} = 0.17	F_{MSY} = 0.03	Not overfished; overfishing not occurring
Pelagic sharks (SCRS)	*Unknown*	*Unknown*	*Unknown*	*Unknown*	*Unknown*
Porbeagle Sharks (COSEWIC)	SSN_{2004}/SSN_{MSY} = 0.15 – 0.32	*Unknown*	F_{2004}/F_{MSY} = 0.83	0.033 – 0.065	Overfished; overfishing is not occurring

2.1 Stock Assessment Update: ATLANTIC BLUEFIN TUNA

2.1.1` Life History/Species Biology

Current life history information for Atlantic bluefin tuna can be found in the Consolidated HMS FMP. In 2006, the SCRS was concerned with issues of mixing between the western and eastern bluefin tuna stocks. Movements between the east and west are complex and it is difficult to quantify the amount of mixing that occurs. A positive correlation between age and migration distances exists with all Atlantic bluefin tuna. Recent research activities for bluefin tuna can be found in the 2007 Annual Report of the United States to ICCAT (NMFS, 2007). This document can be found at www.nmfs.noaa.gov/sfa/hms/hmsdocument_files/ICCAT.htm or by calling the HMS Management Division at 301-713-2347.

2.1.2 Recent Stock Assessment Results

The SCRS completed the stock assessment for both management units (east and west) of Atlantic bluefin tuna in 2006 and provided additional comment on the stock outlook during their 2007 meeting, in advance of the next assessment in 2008. The 2006 western bluefin tuna assessment showed results consistent with previous year evaluations, where the spawning stock biomass (SSB) declined rapidly in the early 1970s. This sharp decline was followed by a more gradual decline in SSB during the early 1990s. The SSB did, however, make a slight recovery in 1998 climbing to 28 percent of the SSB level in 1975. The 2006 assessment shows a decline in 2004 to about 18 percent of SSB when compared to the 1975 SSB level. Recruitment following the decline during the 1970s-1990s varied from year to year and did not conform to any particular trend.

The SCRS noted that although the large decline in SSB since the early 1970's is clear from the assessment, the potential for rebuilding is less clear. There has been poor western bluefin tuna recruitment since 1976 (with the reasons unclear), although the 1994 year class was relatively strong.

The current assessment done by the SCRS used data through 2004, since 2005 data were not fully available. The SCRS has noted the failure of the fishery to take a substantial portion of the total allowable catch (TAC) (about a third in 2005) and noted that this trend continued in 2006 (with only about 15 percent of the TAC landed). The SCRS has identified two reasons that could account for the low catch of the U.S. quota: (1) the availability of fish to the U.S. fishery was abnormally low, and/or (2) the overall size of the population of bluefin tuna in the western Atlantic has dropped substantially. The fact that Canada and Japan did not have abnormally low catches in 2005 and 2006 supports the first explanation. Conversely, other fishery indicators (e.g., some abundance indices and declining size in some areas in 2005) support the second explanation. The SCRS has not found any evidence to favor either explanation over another, but notes that for a fishery to only catch a third of its TAC, especially a highly susceptible species like bluefin tuna, is cause for concern. The SCRS noted that the continuation of this trend in 2006, and probably in 2007, and other new evidence reviewed by the SCRS, heightened concern that the estimate of stock status from the 2006 assessment may be optimistic (i.e., gives further weight to the second explanation). It noted that this phenomenon has been seen in other fisheries prior to it becoming clear that they were in trouble. The SCRS also noted that the incorporation of the relatively low catch in 2005 into short term projections may lead to somewhat of an increase in projected abundance in the first few years of the projections, and if the second explanation is correct, this gives an overly optimistic outlook.

2.1.3. Management Recommendations

The SCRS gave the following advice for consideration by ICCAT in 2006:

1) Given the current recruitment that has been exhibited by western Atlantic bluefin tuna, it is extremely unlikely that SSB can recover to levels that were exhibited in the 1970s in the next 15 years or so without reducing catch to near zero.

2) The current TAC (2,700 t) is not expected to result in major changes in SSB from 2007-2009 (small declines on the order of 3 percent per year).

3) Fishing at F_{MSY} (conditional on current recruitment) during the period 2007-2009 would be expected to increase SSB over that period by about 1.5 percent per year.

4) A constant TAC over the period 2007-2009 which would produce gains in SSB equivalent to those gains in 3) would be about 2,100 t.

5) The constant TAC over the period 2007-2009 which would be expected to maintain SSB at 2006 levels would be about 2,300 t.

The SCRS noted that the evidence is accumulating which indicates that both the productivity of western bluefin tuna and western bluefin tuna fisheries are linked to the eastern Atlantic and Mediterranean stock. The western fishery is partly dependent on fish of eastern origin, and the population of eastern origin fish has become less available to the west. Therefore, management actions in the east are likely to impact recovery in the west, because even small rates of mixing from east to west can have significant effects on the west due to the fact that the eastern Atlantic and Mediterranean stock is so much larger than that of the western Atlantic.

Table 2.1.1 Summary Table for the Status of West Atlantic Bluefin

Age/size at Maturity	Age 8 (~196 cm CFL), or older in the Gulf of Mexico
Spawning Sites	Gulf of Mexico and Florida Straits
Current Relative Biomass Level *Minimum Stock Size Threshold*	$SSB_{04}/SSB_{MSY} = 0.18$ $SSB_{04}/SSB_{MSY/R} = 0.41$ (0.29-0.54) $0.86SSB_{MSY}$
Current Relative Fishing Mortality Rate *Maximum Fishing Mortality Threshold*	$F_{04}/F_{MSY} = 1.7$ (low recruitment) $F_{04}/F_{0.1} = 3.1$ (high recruitment) $F_{year}/F_{MSY} = 1.00$
Maximum Sustainable Yield	3,200 t (3,000-3,400)
Current (2006) Catch (including discards)	1,929 t
Current (2006) Replacement Yield	2,300 t
Outlook	Overfished; overfishing is occurring

Table 2.1.2 Summary Table for the Status of East Atlantic Bluefin

Age/size at Maturity	Age 4-5 (~25 kg)
Spawning Sites	Mediterranean
Current Relative Biomass Level	$SSB_{04}/SSB_{74} = 0.48$
Current Relative Fishing Mortality Rate	$F_{04}/F_{max} = 3.1$

Maximum Fishing Mortality Threshold	*not estimated*
Maximum Sustainable Yield	~15,000 t
Current (2006) Yield	32,665 t reported; 50,000 t estimated by SCRS
Long-term Potential Yield	~45,000 t
Outlook	Overfished; overfishing is occurring

2.2 Stock Assessment Update: BLUE AND WHITE MARLIN

2.2.1 Life History/Species Biology

Blue and white marlin can be found in both temperate and tropical waters of the Atlantic and other oceans across the world. Both marlin species range from Canada to Argentina in the western Atlantic and from the Azores to South Africa in the eastern Atlantic. Blue marlin attain an average weight of between 100-175 kg. White marlin, on the other hand, reach an average weight between 20-30 kg. Blue marlin are known to be solitary and highly migratory in nature. White marlin can exhibit the same characteristics, but have also been known to congregate in small groups. Young blue marlin are one of the fastest, if not the fastest growing of all teleosts, reaching from 30 – 45 kg by age 1. Female white and blue marlin grow faster and reach a much larger maximum size than males. Very little is known about the age and growth of white marlin, although they are considered to be very fast growing, as are all the Istiophoridae

A new study has confirmed the existence of the round scaled spearfish through scale shape and relative anus position, morphometrics, and DNA sequencing. Misidentification between white marlin and round scale spearfish is possible where these two overlap. The importance of these misidentifications is being evaluated by several researchers. Other recent research activities for white and blue marlin can be found in the 2007 Annual Report of the United States to ICCAT (NMFS, 2007). This document can be found by calling the HMS Management Division at 301-713-2347.

2.2.2 Recent Stock Assessment Results

Blue Marlin

The recent biomass level most likely remains well below the B_{msy} estimated in 2000. Current and provisional diagnoses suggest that F has recently declined and is possibly smaller than $F_{replacement}$, but larger than the F_{msy} estimated in the 2000 assessment. Over the period 2001-2005, several abundance indicators suggest that the decline has been at least partially arrested, but some other indicators suggest that abundance has continued to decline. Confirmation of these recent apparent changes in trend may require an additional four or five years of data, especially since the reliability of the recent information has diminished and may continue to do so.

White Marlin

The recent biomass most likely remains well below the B_{msy} estimated in the 2002 assessment. Current and provisional diagnoses suggest that F is probably smaller than $F_{replacement}$ and probably also larger than the F_{msy} estimated in the 2002 assessment. Over the period 2001-2004, combined longline indices and some individual fleet indices suggest that the decline has been at least partially reversed, but some other individual fleet indices suggest that abundance has continued to decline. Confirmation of these recent apparent changes in trend may require an additional four or five years of data, especially since the reliability of the recent information has diminished and may continue to do so.

2.2.3 Management Recommendations

The SCRS made five management recommendations regarding Atlantic blue and white marlin to the Commission in the 2007 SCRS report. These included:

1) ICCAT should, at a minimum, continue the management measures already in place because marlins have not yet recovered.

2) ICCAT should take steps to assure that the reliability of the recent fishery information improves in order to provide a basis for verifying possible future rebuilding of the stocks. Improvements are needed in the monitoring of the fate and amount of dead and live releases, with verification from scientific observer programs. In addition, verification of current and historical landings from some artisanal and industrial fleets needs to be conducted.

3) Should ICCAT wish to increase the likelihood of success of the current management measures of the marlin rebuilding plan, further reduction in mortality would be needed, for example by:

- implementing plans to improve compliance of current regulations,
- encouraging the use of circle hooks in fisheries where its use has been shown to be beneficial,
- broader application of time/area catch restrictions.

4) Given the recent importance of the catch from artisanal fisheries, and to increase the likelihood of recovery of marlin stocks, ICCAT should consider regulations that control or reduce the fishing mortality generated by these fisheries.

5) While substantial research into habitat requirements of blue and white marlin have been undertaken since the last assessments, the results of this research are not yet sufficient to allow the SCRS to reach scientific consensus on the best method for directly estimating MSY benchmarks for these species based on the complete time-series of data. ICCAT should encourage continued research on thedevelopment of methods to

incorporate this information into stock assessments in order to provide a basis for increasing the certainty with which management advice can be provided.

Table 2.2.1 Summary Table for the Status of Blue Marlin

Age/size at Maturity	Age 2-4 (Females: 193 cm Males: 175 cm)
Spawning Sites	Tropical and subtropical waters in summer and fall
Current Relative Biomass Level *Minimum Stock Size Threshold*	$B_{04}<B_{MSY}$; Yes $0.9B_{MSY}$
Current Relative Fishing Mortality Rate *Maximum Fishing Mortality Threshold*	$F_{2004}>F_{MSY}$; Yes $F_{year}/F_{MSY} = 1.00$
Maximum Sustainable Yield	~ 2,000 t (1,000 ~ 2,400 t)
Current Catch (2004)	2,916 t
Outlook	Overfished; overfishing is occurring

Table 2.2.2 Summary Table for the Status of White Marlin

Age/size at Maturity	Unknown (Females: 155 cm Males: 140 cm)
Spawning Sites	Tropical and subtropical waters in the mid- to late spring
Current Relative Biomass Level *Minimum Stock Size Threshold*	$B_{04}<B_{MSY}$; Yes $0.85B_{MSY}$
Current Relative Fishing Mortality Rate *Maximum Fishing Mortality Threshold*	$F_{2004}>F_{MSY}$; Possibly $F_{year}/F_{MSY} = 1.00$
Maximum Sustainable Yield	600-1,320 t
Current Catch (2004)	610 t
Outlook	Overfished; overfishing is occurring

2.3 Stock Assessment Update: ATLANTIC SWORDFISH

2.3.1 Life History/Species Biology

Swordfish are one of the fastest and largest predators of the Atlantic Ocean, reaching maximum size at 530 kg. Highly migratory in nature, swordfish exhibit a long bill that is used for both foraging and defense of territory. Swordfish are also pelagic in nature, but have been known to feed throughout the water column on ground fish,

pelagic, deep-water fish, and invertebrates. A fusiform body and stiff, deeply forked tail allow them to swim at high speeds.

In 2006, a SCRS workshop took place to determine both swordfish stock structure and boundaries of the North and South Atlantic and Mediterranean stocks. This workshop, held in Crete, was conducted to satisfy ICCAT's resolution 99-03, *Resolution by ICCAT on the Clarification of the Stock Structure and Boundaries Between the Swordfish Stocks in the Atlantic.* In 1999, ICCAT noted that there were considerable uncertainties about the structure, mixing and boundaries of the swordfish stocks, and called for national and international research programs on swordfish stock structure. The stock structure data presented at the workshop was consistent with current theories about Atlantic and Mediterranean swordfish stock structure. Researchers at the workshop found that without intensified collaborative and multi-disciplinary research, different swordfish stock boundaries could not be improved upon. However, the workshop confirmed that some mixing of stocks between the Atlantic and Mediterranean occur, and fish from the Mediterranean stock are genetically different from swordfish in other oceans. The next stock assessment scheduled by ICCAT is to take place in 2009.

2.3.2 Recent Stock Assessment Results

North Atlantic

The biomass of North Atlantic swordfish has improved, reaching 99 percent MSY in 2006. Several strong year classes in the late 1990s, and a reduction in the overall catch since 1987 has allowed the rebound of swordfish in the North Atlantic. In 2005, the fishing mortality for North Atlantic swordfish was 14 percent below the level needed to maintain MSY. The F_{2005} was less than $F_{MSY,}$ but the SCRS has shown some uncertainty in the estimates of F_{2005}. The replacement yield for 2006 (14,438 t) was slightly above MSY, and the TAC set by ICCAT in 2005 was 14,000 t assuming that North Atlantic swordfish biomass would continue to reach B_{MSY} with those catch levels.

South Atlantic

The SCRS used a simple production model using catch per unit effort (CPUE) data to estimate the biomass of South Atlantic swordfish. Depending on the use of bycatch fishery data or target fishery data, two different outcomes are reached. When using bycatch CPUE the conclusion is a relatively low abundance. In contrast, using target CPUE data leads to a positive outlook. The SCRS believes that the bycatch CPUE data could not be supported as an indictor of abundance. In addition, the use of target fishery data cannot be used because it is believed that increased catchablity of South Atlantic swordfish and not abundance was the reason for high CPUE. The SCRS choose to use a composite CPUE for both fisheries data for the base case estimate. Though more research is needed, results from the analyses using data from both fisheries show that current fishing mortality is less than that needed to maintain MSY, and biomass levels are above that which would occur when fishing at F_{MSY} for a long period of time. The estimated MSY (about 17,000 t) is 33 percent higher than current reported landings.

2.3.3 Management Recommendations

North Atlantic

The current TAC, which has been set at 14,000 t, should continue to be used for the foreseeable future. Given the current MSY at 14,100 t and productivity (r=0.42), this TAC should provide sustainable fishing practices, as long as changes in the environment or fishery do not occur.

South Atlantic

The SCRS recommends keeping the TAC (~17,000 t) for South Atlantic swordfish until more substantive research is done.

Table 2.3.1 Summary Table for the Status of North Atlantic Swordfish

Age/size at Maturity	Females: 180 cm lower jaw fork length (LJFL) Male: 129 cm LJFL
Spawning Sites	Warm tropical and subtropical waters throughout the year
Current Relative Biomass Level	B_{06}/B_{MSY} = .99 (0.87-1.27)
Current Relative Fishing Mortality Rate *Maximum Fishing Mortality Threshold*	F_{05}/F_{MSY} = 0.86 F_{year}/F_{MSY} = 1.00
Maximum Sustainable Yield	14,133 t (12,800-14,790)
Current (2006) Yield	11,445 t
Current (2006) Replacement Yield	14,438 t
Outlook	Stock is nearly rebuilt; overfishing is not occurring

Table 2.3.2 Summary Table for the Status of South Atlantic Swordfish

Age/size at Maturity	Females: 180 cm lower jaw fork length (LJFL) Male: 129 cm LJFL
Spawning Sites	Warm tropical and subtropical waters throughout the year
Current Relative Biomass Level	Likely >1
Current Relative Fishing Mortality Rate *Maximum Fishing Mortality Threshold*	Likely <1 F_{year}/F_{MSY} = 1.00
Maximum Sustainable Yield	~17,000 t
Current (2006) Yield	13,354 t

Current (2006) Replacement Yield	*not estimated*
Outlook	*unknown*

2.4 Stock Assessment Update: ATLANTIC SHARKS

NMFS is responsible for conducting stock assessments for the LCS and SCS complexes. Atlantic shark stock assessments are performed by the SEDAR process. This process is a cooperative program designed to improve the quality and reliability of the stock assessments. The SEDAR process emphasizes constituent and stakeholder participation in the assessment development, transparency in the assessment process, and a rigorous and independent scientific review of the completed stock assessment. Pelagic shark stock assessments are conducted by SCRS. NMFS relies on these assessments to determine the stock status of pelagic shark species.

2.4.1 Large Coastal Sharks

The latest 2005/2006 stock assessments for LCS in the Gulf of Mexico and Atlantic Ocean were recently completed. Unlike past assessments, the 2005/2006 LCS stock assessment determined that it is inappropriate to assess the LCS complex as a whole due to the variation in life history parameters, different intrinsic rates of increase, and different catch and abundance data for all species included in the LCS complex. Based on these results, NMFS changed the status of the LCS complex from overfished to unknown and is continuing to examine viable options to assess shark populations (November 7, 2006; 71 FR 65086).

Sandbar Sharks

As with the 2002 LCS stock assessment, the 2005/2006 LCS stock assessment assessed sandbar sharks separately. According to this sandbar stock assessment, sandbar sharks (*Carcharhinus plumbeus*) are overfished ($SSF_{2004}/SSF_{MSY} = 0.72$; SSF is spawning stock fecundity and was used a proxy for biomass), and overfishing is occurring ($F_{2004} / F_{MSY} = 3.72$). The assessment recommends that rebuilding could be achieved with 70 percent probability by 2070 with a total allowable catch across all fisheries of 220 mt whole weight (ww) each year and fishing pressure (F) between 0.0009 and 0.011.

Blacktip Sharks

The 2005/2006 stock assessment assessed blacktip sharks (*Carcharinus limbatus*) for the first time as two separate populations: Gulf of Mexico and Atlantic. The results indicate that the Gulf of Mexico stock is not overfished and overfishing is not taking place (November 7, 2006; 71 FR 65086), but the SEDAR Assessment Panel did not accept the absolute estimates of the stock status from the blacktip stock assessment. The three abundance indices believed to be most representative of the stock were consistent with each other, suggesting that stock abundance has been increasing over a period of

declining catch during the past 10 years. Based on life history characteristics, blacktip sharks are a relatively productive shark species, and a combination of these characteristics and recent increases in the most representative abundance indices suggested that the blacktip stock is relatively healthy. There was no scientific basis, however, to advise an increase in catch. The quota for the non-sandbar LCS complex in the Gulf of Mexico region, which includes blacktip sharks, in Amendment 2 to the Consolidated HMS FMP maintains catch at its current levels.

The 2005/2006 stock assessment also indicated that the current status of the blacktip shark population in the Atlantic region is unknown. The assessment scientists were unable to provide estimates of stock status or reliable population projections, but indicated that current catch levels should not change. As with the Gulf of Mexico region, the quota for the non-sandbar LCS complex in the Atlantic region, which includes blacktip sharks, in Amendment 2 to the Consolidated HMS FMP maintains catch at its current levels. NMFS has declared the status of the Atlantic blacktip shark population to be unknown (November 7, 2006; 71 FR 65086).

Dusky Sharks

The first dusky-specific shark assessment separate from the LCS stock assessment was released on May 25, 2006 (71 FR 30123). The 2006 dusky shark (*Carcharhinus obscurus*) stock assessment used data through 2003 and indicates that dusky sharks are overfished ($B_{2003}/B_{MSY} = 0.15 – 0.47$) with overfishing occurring ($F_{2004}/F_{MSY} = 1.68 – 1810$). The assessment recommends that rebuilding for dusky sharks could require 100 to 400 years. Based on these results, NMFS declared the status of dusky sharks as overfished with overfishing occurring (November 7, 2006; 71 FR 65086).

2.4.2 Small Coastal Sharks

A stock assessment for SCS following the SEDAR process was completed in 2007 (November 13, 2007; 72 FR 63888). Data from the assessment can be found in Table 2.2.

2.4.3 Pelagic Sharks

ICCAT Stock Assessment on Blue and Shortfin Mako Sharks

At the 2004 Inter-Sessional Meeting of the ICCAT Subcommittee on Bycatch, stock assessments for Atlantic blue shark and shortfin mako were conducted (SCRS, 2004). This work included a review of their biology, a description of the fisheries, analyses of the state of the stocks and outlook, analyses of the effects of current regulations, and recommendations for statistics and research. The assessment indicated that the current biomass of North and South Atlantic blue shark seems to be above MSY ($B>B_{MSY}$); however, these results are conditional and based on assumptions that were made by the committee. These assumptions indicate that blue sharks are not currently overfished. However, this conclusion is conditional and based on limited landings data. NMFS has determined that the stock status of blue sharks is unknown (see Table 2.2).

The committee estimates that between 82,000 and 114,000 mt ww (180,779,054 – 251,326,978 lb) of blue shark are harvested from the Atlantic Ocean each year.

The North Atlantic shortfin mako population has experienced some level of stock depletion as suggested by the historical CPUE trend and model outputs. The current stock may be below MSY ($B<B_{MSY}$), suggesting that the species may be overfished. Overfishing may also be occurring, as between 13,000 and 18,000 mt ww (28,660,094 – 39,683,207 lb) of shortfin mako are harvested in the Atlantic Ocean annually. South Atlantic stocks of shortfin mako shark are likely fully exploited as well, but depletion rates are less severe than in the North Atlantic. NMFS has determined that the stock status of shortfin mako sharks is unknown (see Table 2.2).

The results of both of these assessments should be considered preliminary in nature due to limitations on quality and quantity of catch data available. The subcommittee stated that catch data currently being reported to ICCAT does not represent the total catch actually landed, and are very limited with regard to size, age, and sex of sharks harvested or caught incidentally. In order to attain a more accurate estimate of total landings, and improve future stock assessments, the committee made several recommendations, including: 1) increase the infrastructure investment for monitoring the overall catch composition of sharks; 2) standardize catch per unit effort (CPUE) from major fishing fleets; 3) expand use of trade statistics (fins) to extend historical time series; and 4) include input from scientists from all Contracting Parties with significant blue and shortfin mako catches in future assessments. ICCAT held pelagic shark (blue and shortfin mako) data review meetings in the fall of 2007. Shark assessments for shortfin mako and blue sharks are scheduled for 2008. An assessment for porbeagle sharks may be completed in the future.

COSEWIC Stock Assessment on Porbeagle

The COSEWIC conducted a species report and assessment for porbeagle sharks in 2004. They suggest that significant declines in porbeagle shark abundance have occurred as a result of overexploitation in the fisheries. In May 2004, the COSEWIC recommended to the Canadian Minister of Fisheries that porbeagle sharks be listed as endangered under the Species at Risk Act (SARA) under Canadian Law. In 2006, the Canadian government decided not to list the porbeagle shark under SARA.

The Canadian Department of Fisheries and Ocean has conducted stock assessments on porbeagle sharks in 1999, 2001, 2003, and 2005. Reduced Canadian porbeagle quotas in 2002 brought the 2004 exploitation rate to a sustainable level. According to the 2005 recovery assessment report conducted by Canada, the North Atlantic porbeagle stock has a 70 percent probability of recovery in approximately 100 years if F is less than or equal to 0.04. To date, the United States has not conducted a stock assessment on porbeagle sharks. NMFS has reviewed the Canadian stock assessment and deems the Canadian assessment to be the best available science and appropriate to use for U.S. domestic management purposes. The Canadian assessment indicates that porbeagle sharks are overfished ($SSN_{2004}/SSN_{MSY} = 0.15 – 0.32$; SSN is

spawning stock number and used as a proxy for biomass). However, the Canadian assessment indicates that overfishing is not occurring ($F_{2004}/F_{MSY} = 0.83$). Based on these results, NMFS declared the status of porbeagle sharks as overfished, but overfishing is not occurring (71 FR 65086).

Additional information on all Atlantic shark species managed by NMFS can be found in the Final Environmental Impact Statement (FEIS) of Amendment 2 to the Consolidated HMS FMP (73 FR 21124, April 18, 2008; Final Rule: 73 FR 35778, June 24, 2008). This document can be found electronically at: http://www.nmfs.noaa.gov/sfa/hms/hmsdocument_files/sharks.htm, or by calling the HMS Management Division at 301-713-2347.

References for Section 2:

NMFS. 2007. Annual Report of the United States. ANN/2007. 47 pp.

SCRS. 2004. Report of the 2004 Inter-Sessional Meeting of the ICCAT Sub-Committee on Bycatches: Shark Stock Assessment. June 14-18, Tokyo, Japan. SCRS/2004/014.

SCRS. 2007. Report of the Standing Committee on Research and Statistics. ICCAT SCRS. Madrid, Spain. October 1-5, 2007.

3. ESSENTIAL FISH HABITAT

NMFS began Phase I of the five-year HMS Essential Fish Habitat (EFH) review and update in the Consolidated HMS FMP, which was released on July 14, 2006 (71 FR 40096). In that document, NMFS provided new information collected since the EFH boundaries were established in 1999. However, NMFS did not modify any of the existing EFH identifications or boundaries in the Consolidated HMS FMP or propose any measures to minimize impacts from fishing gears. Rather, NMFS presented new EFH information and data collected since 1999, including gear evaluations, and requested public comment on any additional data or information that needed to be included in the five-year review. The purpose of the EFH review was to gather any new information and determine whether modifications to existing EFH descriptions and delineations were warranted. While NMFS has presented new information relative to HMS EFH in the annual SAFE reports in previous years, the Consolidated HMS FMP included the first comprehensive review of all new information related to HMS EFH that had been completed since 1999.

On November 7, 2006, NMFS published a Notice of Intent (71 FR 65088) to prepare an EIS to examine management alternatives for revising existing HMS EFH, consider additional Habitat Areas of Particular Concern (HAPCs), and identify ways to avoid or minimize, to the extent practicable, adverse fishing impacts on EFH, consistent with the Magnuson-Stevens Act and other relevant Federal laws. At that time, NMFS requested new information not considered previously in the Consolidated HMS FMP, comments on potential HAPCs, and information regarding potential fishing/non-fishing impacts that may adversely affect EFH.

Amendment 1 to the Consolidated FMP will update and revise existing HMS EFH as necessary, consider any new HAPCs or modifications to existing HAPCs, analyze fishing and non-fishing impacts on EFH, and consider measures to minimize fishing impacts if any gears are determined to have a negative impact. NMFS has developed a Pre Draft for Amendment 1 that provides the overall approach and range of alternatives to be considered in the development of the Draft FMP Amendment. The Magnuson-Stevens Act requires a comprehensive review of all EFH information at least once every five years, and this amendment constitutes Phase 2 of the comprehensive review and update of EFH for all HMS that began with the Consolidated HMS FMP. In addition, a great deal of new information has become available in recent years, including information on the biology, habitat requirements, life history characteristics, migratory patterns, spawning, pupping, and nursery areas of Atlantic HMS that will be considered when updating EFH. NMFS presented the Pre Draft to the HMS Advisory Panel in October 2007. NMFS is currently developing Draft Amendment 1 to the HMS FMP, which it plans to publish in 2008.

4. FISHERY DATA UPDATE

The purpose of this section is to provide a summary of recent landings of HMS on a species by species basis, for both commercial and recreational fisheries.

4.1 Sharks

Commercial and recreational landings of large coastal, small coastal and pelagic shark species during recent years are summarized in the following tables.

Table 4.1 Commercial Landings of Large Coastal Sharks in lb dw: 2001-2006. (Sources: Cortés 2003; Cortés and Neer 2002, 2005; Cortés pers. comm.)

Large Coastal Sharks	2001	2002	2003	2004	2005	2006
Basking**	0	0	0	0	0	0
Bignose*	1,442	0	318	0	98	61
Bigeye sand tiger**	0	0	0	0	0	0
Blacktip	1,135,199	1,099,194	1,474,362	1,092,600	993,380	1,272,016
Bull	27,037	40,463	93,816	49,556	133,265	173,125
Caribbean Reef*	1	0	0	0	0	0
Dusky*	1,973	8,779	23,288	1,025	874	4,183
Galapagos*	0	0	0	0	0	0
Hammerhead, Great	0	0	0	0	0	0
Hammerhead, Scalloped	0	0	0	0	0	0
Hammerhead, Smooth	0	0	0	92	54	108
Hammerhead, Unclassified	69,356	108,160	150,368	116,546	197,067	153,592
Large Coastal, Unclassified	172,494	147,359	51,433	0	0	0
Lemon	24,453	56,921	80,688	67,810	71,805	62,738
Narrowtooth*	0	0	0	0	0	0
Night*	0	0	20	0	0	0
Nurse	387	69	70	317	97	2,258
Sandbar	1,407,550	1,863,420	1,425,628	1,223,241	1,282,477	1,516,497
Sand Tiger**	1,248	409	624	1,832	5,167	3,166
Silky	14,197	30,731	51,588	11,808	17,646	16,173
Spinner	6,970	8,447	12,133	14,806	44,150	96,259
Tiger	26,973	16,115	18,536	30,976	33,477	53,706
Whale**	0	0	0	0	0	0
White**	26	0	1,454	58	0	88
Unclassified, assigned to large coastal	525,661	771,450	908,077	603,229	527,026	397,851

Large Coastal Sharks	2001	2002	2003	2004	2005	2006
Unclassified, fins	23,988	142,565	181,431	137,375	110,613	145,928
Total (excluding fins)	**3,414,967 (1,549 mt dw)**	**4,151,594 (1,883 mt dw)**	**4,292,403 (1,947 mt dw)**	**3,213,896 (1,458 mt dw)**	**3,306,583 (1,500 mt dw)**	**3,751,821 (1,698 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 4.2 Commercial Landings of Small Coastal Sharks in lb dw: 2001-2006. (Sources: Cortés and Neer 2002, 2005; Cortés 2003; Cortés pers. comm.)

Small coastal sharks	2001	2002	2003	2004	2005	2006
Atlantic Angel*	0	495	1,397	818	3,587	249
Blacknose	160,990	144,615	131,511	68,108	120,320	187,907
Bonnethead	63,461	36,553	38,614	29,402	33,295	33,911
Finetooth	303,184	185,120	163,407	121,036	107,327	80,536
Sharpnose, Atlantic	196,441	213,301	190,960	230,880	375,881	519,019
Sharpnose, Atlantic, fins	209	0	0	0	0	0
Sharpnose, Caribbean*	205	0	0	0	0	0
Unclassified Small Coastal	51	35,831	8,634	1,407	9,792	471
Total (excluding fins)	**724,332 (329 mt dw)**	**615,915 (279 mt dw)**	**534,523 (242 mt dw)**	**451,651 (205 mt dw)**	**650,202 (295 mt dw)**	**822,093 (373 mt dw)**

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

Table 4.3 Commercial Landings of Pelagic Sharks in lb dw: 2001-2006. (Sources: Cortés and Neer 2002, 2005; Cortés 2003; Cortés pers. comm.)

Pelagic Sharks	2001	2002	2003	2004	2005	2006
Bigeye thresher*	330	0	0	719	267	0
Bigeye sixgill*	0	0	0	0	0	0
Blue shark	65	137	6,324	423	0	588
Mako, longfin*	9,453	3,008	1,831	1,827	403	2,125
Mako, shortfin	171,888	159,840	151,428	217,171	188,608	107,267
Mako, Unclassified	73,556	58,392	33,203	50,978	35,241	27,231
Oceanic whitetip	922	1,590	2,559	1,082	713	338
Porbeagle	1,152	2,690	1,738	5,832	2,452	3,456
Sevengill*	0	0	0	0	0	0
Sixgill*	0	0	0	0	0	0
Thresher	56,893	53,077	46,502	44,915	24,280	32,549
Unclassified, pelagic	0	5,965	79,439	0	0	411

Pelagic Sharks	2001	2002	2003	2004	2005	2006
Unclassified, assigned to pelagic	31,636	182,983	314,300	356,522	18,057	12,936
Unclassified, pelagic, fins	12,239	0	0	41	0	0
Total (excluding fins)	**345,895 (157 mt dw)**	**467,682 (212 mt dw)**	**637,324 (289 mt dw)**	**679,469 (308 mt dw)**	**270,021 (122 mt dw)**	**186,901 (85 mt dw)**

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

Table 4.4 Estimates of Total Recreational Harvest of Atlantic Sharks: 2000-2006 (Numbers of Fish in Thousands). (Sources: Cortés and Neer 2005, Cortés, pers. comm. Estimates include prohibited species.)

Species Group	2000	2001	2002	2003	2004	2005	2006
LCS	140.0	137.2	82.8	88.8	66.6	86.2	59.5
Pelagic	13.3	3.8	4.7	4.3	5.0	5.4	18.1
SCS	199.9	212.5	153.8	133.7	126.0	119.1	121.7
Unclassified	10.9	24.5	5.4	18.1	27.9	47.4	7.3

Table 4.5 Recreational Harvest of Atlantic Large Coastal Sharks by Species, in Number of Fish: 2000-2006. (Sources: Cortés and Neer 2005, Cortés, pers. comm.)

LCS Species	2000	2001	2002	2003	2004	2005	2006
Basking**	0	0	0	0	0	0	0
Bignose*	0	0	0	0	17	0	0
Bigeye sand tiger**	0	0	0	0	0	0	0
Blacktip	73,998	49,488	39,756	40,402	30,872	44,831	31,724
Bull	6,075	4,117	1,823	3,455	4,883	1,377	4,284
Caribbean Reef*	59	268	741	0	652	5	47
Dusky*	3,116	5,993	1,047	2,806	142	3,050	191
Galapagos*	0	0	0	0	0	0	0
Hammerhead, Great	925	3,446	4	47	9	162	139
Hammerhead, Scalloped	3,781	1,494	1,358	2,956	930	5,212	537
Hammerhead, Smooth	2	703	2	1	0	0	2
Hammerhead, Unclassified	3,691	0	5,247	0	0	2,676	1,099
Lemon	5,434	5,884	4,921	4,876	5,578	506	1,145
Night*	24	0	0	0	0	15	1
Nurse	2,214	4,934	2,562	563	3,463	2,341	1,553
Sandbar	10,965	36,094	8,530	5,151	3,853	2,795	848
Sand tiger**	0	604	0	0	0	0	1,040
Silky	6,233	3,928	1,741	1,943	399	3,589	2,042
Spinner	4,810	3,384	3,732	4,483	3,435	3,055	2,022
Tiger	1,480	732	126	110	1	1,321	1,309

LCS Species	2000	2001	2002	2003	2004	2005	2006
Whale**	0	0	0	0	0	0	0
White**	0	0	0	0	0	0	0
Requiem shark unclassified	17,164	16,136	11,173	21,990	12,388	15,319	11,511
Total:	**139,971**	**137,205**	**82,763**	**88,783**	**66,622**	**86,254**	**59,494**

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

Table 4.6 Recreational Harvest of Atlantic Pelagic Sharks by Species, in Number of Fish: 2000-2006. (Sources: Cortés and Neer 2005, Cortés, pers. comm.)

Pelagic Shark Species	2000	2001	2002	2003	2004	2005	2006
Bigeye thresher*	0	0	65	0	0	0	42
Bigeye sixgill*	0	0	0	0	0	0	0
Blue Shark	7,011	950	0	376	0	31	980
Mako, Longfin*	0	0	0	0	0	0	0
Mako, Shortfin	5,813	2,827	3,206	3,922	4,964	3,857	3,363
Mako, Unclassified	0	0	0	0	0	0	0
Oceanic whitetip	0	0	0	0	0	0	0
Porbeagle	0	0	0	0	0	0	0
Sevengill*	0	0	0	0	0	0	0
Sixgill*	0	0	0	0	0	0	0
Thresher	529	0	1,467	0	0	1,504	13,747
Total:	**13,353**	**3,777**	**4,738**	**4,298**	**4,964**	**5,392**	**18,132**

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

Table 4.7 Recreational Harvest of Atlantic Small Coastal Sharks by Species, in Number of Fish: 2000-2006. (Sources: Cortés and Neer 2005, Cortés, pers. Comm..)

SCS Species	2000	2001	2002	2003	2004	2005	2006
Atlantic Angel*	0	0	0	0	0	0	0
Blacknose	10,410	14,885	11,438	6,615	15,215	7,110	9,947
Bonnethead	56,436	59,017	51,048	40,066	42,050	31,369	24,302
Finetooth	1,390	6,628	3,027	1,758	286	2,847	268
Sharpnose, Atlantic	130,727	131,912	88,297	85,299	68,421	77,712	87,180
Sharpnose, Caribbean*	0	0	0	0	0	0	0
Smalltail*	973	70	0	0	71	35	0
Total:	**199,936**	**212,512**	**153,810**	**133,738**	**126,043**	**119,073**	**121,697**

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

4.2 Tunas

The U.S. catch of tuna and tuna-like fishes (including swordfish, but excluding other billfishes) during recent years is summarized below (major grears only). (NMFS, Annual Report of the United States (to ICCAT), 2007).

Table 4.8 Annual Landings (MT) of Yellowfin Tuna from 2002 to 2006.

Area	Gear	2002	2003	2004	2005	2006
NW Atlantic	Longline	400	272	659	394	703
	Rod and reel*	2,624	4,672	3,434	3,504	4,649
	Gillnet	5	1	3	0.1	5
	Trawl	0	2	2	0.2	0.7
	Handline	137	148	213	105	103
	Uncl	**	0	11	4	4
Gulf of Mexico	Longline	2,109	1,828	1,812	1,210	1,121
	Rod and reel*	200	640	247	147	258
	Handline	100	59	28	46	43
Caribbean	Longline	12	7	4	141	180
	Handline	7	9	7	10	8
NC Area 94a	Longline	0	5	**	0.5	0
SW Atlantic	Longline	52	42	17	0	0
	Total	**5,646**	**7,685**	**6,437**	**5,562**	**7,075**

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

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

** $\leq$ 0.05 MT

Table 4.9 Landings (MT) of Skipjack Tuna from 2002 to 2006

Area	Gear	2002	2003	2004	2005	2006
NW Atlantic	Longline	**	0.9	0.1	0.05	**
	Rod and reel*	23.3	34.0	27.3	8	35
	Gillnet	**	0.9	16.7	2	0.2
	Trawl	**	0.5	0.2	0.07	0.8
	Handline	0.2	0.2	0.6	0.9	0.2
	Trap	**	1.5	**	0	0.3
Gulf of Mexico	Longline	**	**	0.3	0.3	0
	Rod and reel*	13.2	11	6.3	3	6.4
	Handline	0.0	**	0.2	**	0
Caribbean	Longline	2.5	3.3	0.3	0.2	0.2
	Gillnet	0.6	0.4	0.3	0.06	**
	Handline	12.5	9.2	9.6	11	10
	Rod and reel*	33	16	40	4	8
	Total	**85.3**	**77.9**	**101.9**	**29.6**	**61**

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

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

** <= 0.05 MT

Table 4.10 Landings (MT) of Bigeye Tuna by year for 2002-2006

Area	Gear	2002	2003	2004	2005	2006
NW Atlantic	Longline	329	169	267	273	465
	Rod and reel*	50	189	95	165	422
	Handline	14	6	3	6	21
	Trawl	0.5	**	1	0.6	0
	Uncl	0.0	0.0	4	0.6	0.8
Gulf of Mexico	Longline	41	27	20	25	38
	Rod and reel*	0	0	6	0	24
	Handline	0.6	0.3	0.2	0.1	2
Caribbean	Longline	30	7	3.5	7	11
	Handline	0.0	0.0	0.06	**	0
NC Area 94a	Longline	45	37	5	7	3
SW Atlantic	Longline	91	45	14	0	0
	Total	**600**	**480**	**419**	**484**	**987**

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

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

** $\leq$ 0.05 MT

Table 4.11 Landings (MT) of Bluefin Tuna for 2002 to 2006						
Area	Gear	2002	2003	2004	2005	2006
NW Atlantic	Longline	7.8	16.3	28.8	22.3	30
	Handline	4.5	2.5	1.5	2.3	4.7
	Purse Seine	207.7	265.4	31.8	178.3	3.6
	Harpoon	55.5	87.9	41.2	31.5	30.3
	* Rod and reel (>145 cm LJFL)	1008.4	684.8	329.0	254.4	217.2
	* Rod and reel (<145 cm LJFL)	519.3	314.6	387.4	170.4	158.2
Gulf of Mexico	Longline	32.8	53.8	67.3	45.7	17.5
	* Rod and reel	1.5	0.0	0.0	0.0	0.6
NC area 94a	Longline	9.3	11.3	12.1	13	10.1
	TOTAL	**1847**	**1437**	**899**	**718**	**472**

Table 4.12 Landings (MT) of Albacore Tuna for 2002 to 2006						
Area	Gear	2002	2003	2004	2005	2006
NW Atlantic	Longline	124.0	95.6	106.6	88.9	82.3
	Gillnet	2.6	0.1	4.9	6	0.8
	Handline	3.9	1.4	6.1	3	2.5
	Trawl	0.3	**	2.7	1.7	1.2
	Rod and reel*	323.0	333.8	500.5	356	284
	Uncl	0.0	0.0	3.6	9.9	6.7
Gulf of Mexico	Longline	9.5	7.7	9.8	6.9	7.6
	Handline	0.0	**	0.0	0.2	0.1
Caribbean	Longline	8.4	4.0	3.2	12	10.5
	Trap	0.6	0.2	0.0	0.0	0.0
	Handline	2.7	2.0	2.1	1	0.4
NC Area 94a	Longline	4.8	1.6	0.2	0.6	**
SW Atlantic	Longline	8.3	2.0	0.5	0.0	0.0
	Total	**488**	**448**	**640**	**486**	**396**

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

** $\leq$= 0.05 MT

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

4.3 Swordfish

The U.S. catch of swordfish during recent years is summarized below (major gears only). (NMFS, Annual Report of the United States (to ICCAT), 2007).

Table 4.13 Catches and Landings (MT) of Swordfish for 2002 to 2006

Area	Gear	2002	2003	2004	2005	2006
NW Atlantic	* Longline	1,132.8	1,341.3	1,169.6	1,096.3	1,154.5
	Gillnet	0.1	0.0	**	0.0	0.0
	Handline	8.8	10.8	18.7	34.4	32.4
	Trawl	3.9	6.0	8.3	8.2	3.7
	* unclassified	1.6	1.6	3.9	4.7	5.1
	Harpoon	2.8	0.0	0.5	0.0	0.3
	Rod and Reel***	21.5	5.9	24.3	53.1	50.6
Gulf of Mexico	* Longline	549.1	507.6	453	480.9	324.2
	* unclassified	5.7	3.4	**	4.1	2.7
	Rod and Reel***	0.0	**	0.5	1.5	2.1
	Handline	2.9	9.8	4	0.3	4.3
Caribbean	* Longline	329.0	274.5	295.9	143.5	88.9
	* unclassified	0.2	0.15	**	0.7	0
	Rod and Reel***	0.0	0.0	0.4	6.6	0
NC Area 94a	* Longline	587.9	632.8	599.9	552.3	379.6
	* unclassified	0.2	0.3	0.1	1.2	0.0
S Atlantic	* Longline	199.9	20.9	15.7	0.0	0.0
	TOTAL	**2,606.5**	**2,815**	**2,594**	**2,387**	**2,048**

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

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

** $\leq$ = 0.5 MT

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

4.4 Blue and White Marlin

Reported recreational catches of blue and marlin over the last several years are summarized in the following table.

Table 4.14 Blue and White Marlin Recreational Landings

YEAR	BLUE MARLIN	WHITE MARLIN	TOTAL
2001	77	116	193
2002	88	191	279
2003	108	23	131
2004	31	118	149
2005	76	31	107
2006	64	66	130

References for Section 4:

Cortés, E. and J.A. Neer. 2002. Updated catches of sharks. Shark Bowl Working Document SB/02/15. Document presented at the 2002 Shark Evaluation Workshop, NMFS, Panama City, Florida.

Cortés, E. 2003. Updated catches of Atlantic sharks. SFD Contribution 2003-0031. NMFS, Southeast Fisheries Science Center, Panama City, Florida. 75 p.

Cortés, E. and J.A. Neer. 2005. Updated catches of Atlantic sharks. LCS05/06-DW-16. NMFS, Southeast Fisheries Science Center, Panama City, Florida. 58 p.

NMFS. 2007. Annual Report of the United States. ANN/2007. 47 pp.

5. ECONOMIC STATUS OF HMS FISHERIES

The review of each rule, and of HMS fisheries as a whole, is facilitated when there is a baseline against which the rule or fishery may be evaluated. In this analysis, NMFS used the past seven 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 2000 to 2006 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 this result by the price that is being adjusted for inflation. From 1996 to 2004, the Consumer Price Index (CPI-U) indicates that prices have risen by 20.4 percent, the Gross Domestic Product (GDP) Implicit Price Deflator indicates that prices have risen 16.3 percent, and the Producer Price Index (PPI) for unprocessed finfish indicates a 20.8 percent rise in prices. From 2004 to 2005, the CPI, GDP Deflator, and the PPI for unprocessed finfish indicate prices rose by 3.4 percent, 3.2 percent, and 12.9 percent respectively. From 2005 to 2006, the CPI, GDP Deflator, and the PPI for unprocessed finfish indicate prices rose by 3.2 percent, 3.2 percent, and 32.2 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 (2000=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
2000	172.2	100.0	182.4
2001	177.1	102.4	176.1
2002	179.9	104.2	201.5
2003	184	106.4	195.8
2004	188.9	109.5	224.1
2005	195.3	113.0	253.1
2006	201.6	116.6	334.6

5.1 Commercial Fisheries[1]

In 2006, the total commercial landings of all fish species by U.S. fishermen at ports in the 50 states were 9.5 billion pounds valued at $4.0 billion. In 2005, the total commercial landings by U.S. fishermen at ports in the 50 states were 9.6 billion pounds and were valued at $3.9 billion. The overall value of landings between 2005 and 2006 had increased by one percent. The total value of commercial HMS landings in 2006 was $37.5 million (Table 5.4). The 2006 ex-vessel price index indicated that 17 of the 33 finfish species groups tracked had increasing ex-vessel prices and 14 species had decreasing ex-vessel prices since 2005. The total edible finfish ex-vessel price index for 2006 was up 27 percent from 2005.

[1] All the information and data presented in this section were obtained from NMFS 1997a and NMFS 2005b.

The estimated value of the 2006 domestic production of all fishery products was $8.4 billion. This is $608.7 million more than the estimated value in 2005. The total import value of fishery products was $27.7 billion in 2006. This is an increase of $2.6 billion from 2005. The total import value in 1996 was $13.1 billion. The total export value of fishery products was $17.8 billion in 2006. This is an increase of $2.4 billion from 2005. The total export value in 1996 was $8.7 billion.

Consumers spent an estimated $69.5 billion for fishery products in 2006, including $46.6 billion at food service establishments, $22.7 billion in retail sales for home consumption, and $318.1 million for industrial fish products. The commercial marine fishing industry contributed $35.1 billion to the U.S. Gross National Product in 2006. 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.

5.1.1 Ex-Vessel Prices

The average ex-vessel prices per pound dressed weight (dw) for 2000 to 2006 by area, Atlantic HMS, and major fishing gear types are summarized in Table 5.2. The average ex-vessel prices per lb dw for 2000 to 2006 by species and area are summarized in Table 5.3. For both of these tables, 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 **Average Ex-vessel Prices per lb dw for Atlantic HMS by Gear and Area.** (Source: Dealer weighout slips from the Southeast Fisheries Science Center and Northeast Fisheries Science Center, and bluefin tuna dealer reports from the Northeast Regional Office. HND=Handline, harpoon, spears, trot lines, and trolls, PLL=Pelagic longline, BLL=Bottom longline, Net=Gillnets and pound nets, TWL=Trawls, SEN=Seines, TRP=Pots and traps, DRG=Dredge, and UNK=Unknown. 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 bluefin tuna, all NC landings are included in the Mid-Atlantic.)

Gulf of Mexico								
Species	**Gear**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Bigeye tuna	HND	$1.83	$1.82	$1.44	$1.25	$3.45	$1.40	$3.45
	PLL	$2.82	$2.64	$5.09	$3.41	$4.58	$5.19	$4.58
	BLL	$2.31	$0.50	$4.24	$3.53	$5.67	$6.00	$5.67
Bluefin tuna	HND	$1.86	$1.25	$2.69	-	-	-	-
	PLL	-	-	$6.40	$6.32	$4.64	$4.67	$4.39
	BLL	-	-	$4.50	-	-	-	-
Yellowfin tuna	HND	$2.48	$2.55	$2.83	$2.34	$2.56	$2.27	$2.56
	PLL	$3.40	$3.25	$3.68	$3.64	$4.01	$4.00	$4.01
	BLL	$3.68	$3.31	$3.23	$3.73	$4.01	$3.84	$4.01
Other tunas	HND	$0.76	$0.79	$0.91	$0.87	$1.04	$1.06	$1.04
	PLL	$0.72	$0.70	$0.79	$0.66	$0.58	$0.65	$0.58

	BLL	$0.85	$0.74	$0.75	$0.55	$0.65	$0.85	$0.65
	NET	$0.58	$0.33	$0.83	$0.29	$0.41	$0.41	$0.41
	TWL	$0.61	$0.78	$0.40	$0.30	-	$0.24	-
	SEN	-	$0.61	$0.19	-	$0.21	$0.20	$0.21
	TRP	-	-	$0.30	$0.30	-	$1.00	-
Swordfish	HND	$3.91	$2.84	$3.19	$3.68	$3.38	$3.98	$3.38
	PLL	$3.33	$3.41	$2.94	$2.91	$3.32	$3.15	$3.32
	BLL	$3.10	$3.25	$2.88	$2.67	$2.89	$2.37	$2.89
Large coastal sharks	HND	$0.59	$0.51	$0.44	$0.45	$0.45	$0.58	$0.45
	PLL	$0.48	$0.45	$0.36	$0.38	$0.53	$0.54	$0.53
	BLL	$0.43	$0.44	$0.36	$0.38	$0.34	$0.44	$0.34
	NET	$0.48	$0.50	$0.39	$0.43	$0.39	$0.45	$0.39
	TWL	$0.15	$0.25	$0.25	$0.25	$0.25	$0.26	$0.25
Pelagic sharks	HND	$1.38	$1.48	$0.93	$1.04	$1.21	$1.25	$1.21
	PLL	$1.27	$1.32	$1.06	$1.11	$1.08	$1.07	$1.08
	BLL	$1.31	$1.42	$1.19	$1.15	$1.03	$1.14	$1.03
Small coastal sharks	HND	$0.93	$0.37	$0.38	$0.32	$0.59	$0.51	$0.59
	PLL	$0.47	$0.74	$0.32	$0.33	$0.37	$0.47	$0.37
	BLL	$0.41	$0.61	$0.53	$0.50	$0.45	$0.51	$0.45
	NET	-	$0.45	$0.46	$0.36	$0.50	$0.72	$0.50
	TRP	-	$0.74	-	-	-	-	-
Shark fins	HND	$21.57	$15.90	$21.28	$13.97	$12.49	$16.62	$12.49
	PLL	$15.65	$21.08	-	$15.21	$17.81	$14.31	$17.81
	BLL	$15.89	$21.50	$22.72	$20.17	$21.95	$22.16	$21.95
	NET	$15.50	$11.02	-	$6.05	$5.86	$6.91	$5.86
	TWL	$9.17	-	-	-	-	-	-
South Atlantic								
Species	**Gear**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Bigeye tuna	HND	$1.02	$2.14	$2.29	$1.89	$2.97	$2.80	$2.97
	PLL	$2.27	$2.78	$2.33	$2.26	$2.85	$3.41	$2.85
	BLL	$1.87	$2.63	$2.74	$2.66	-	$3.04	-
	NET	-	-	-	-	-	-	-
Bluefin tuna	HND	$7.99	$3.52	$3.35	-	$5.94	-	$11.35
	PLL	$5.36	$4.82	$4.95	$4.11	$4.91	$4.60	$6.06
	BLL	-	$3.61	$5.15	-	-	-	-
Yellowfin tuna	HND	$1.56	$1.41	$1.54	$1.54	$1.24	$1.52	$1.24
	PLL	$2.23	$2.14	$1.89	$2.09	$2.00	$2.83	$2.00
	BLL	$2.29	$2.45	$2.29	$2.60	$0.90	$1.19	$0.90
	NET	-	$1.21	$1.12	-	-	$0.87	-
	TWL	-	-	$0.44	-	-	-	-
Other tunas	HND	$0.59	$0.61	$0.47	$0.58	$0.52	$0.53	$0.52
	PLL	$1.31	$1.33	$1.09	$1.26	$1.28	$1.53	$1.28
	BLL	$1.49	$1.86	$1.67	$1.13	$0.48	$0.67	$0.48
	NET	$0.20	$0.23	$0.21	$0.21	$0.20	$0.31	$0.20
	TWL	$0.25	$0.47	$0.26	-	$0.20	-	$0.20
	SEN	-	-	-	-	-	-	-
	TRP	-	$0.18	-	-	-	-	-

Swordfish	HND	$3.92	$4.24	$3.93	$3.91	$4.44	$4.72	$4.44
	PLL	$3.12	$3.27	$2.84	$2.98	$3.18	$3.32	$3.18
	BLL	$3.42	$3.14	$2.76	$3.19	-	$2.36	-
	NET	-	-	$2.50	-	-	-	-
Large coastal sharks	HND	$0.59	$0.96	$1.01	$0.49	$0.43	$0.48	$0.43
	PLL	$1.21	$1.69	$2.63	$0.35	$0.54	$0.55	$0.54
	BLL	$0.78	$0.89	$1.10	$0.39	$0.44	$0.51	$0.44
	NET	$0.91	$1.49	$1.59	$0.30	$0.35	$0.45	$0.35
	TWL	$0.49	$0.51	$0.81	$0.41	$0.71	$0.43	$0.71
	TRP	-	-	$0.23	-	-	$0.30	-
Pelagic sharks	HND	$0.78	$0.71	$0.68	$0.84	$0.97	$0.87	$0.97
	PLL	$0.95	$0.95	$0.93	$0.93	$0.84	$0.96	$0.84
	BLL	$0.90	$0.78	$0.75	$0.87	$0.81	$0.77	$0.81
	NET	$0.35	$0.36	$0.34	$0.34	$0.29	$0.37	$0.29
	TWL	$0.20	$0.26	$0.26	-	-	$0.22	-
Small coastal sharks	HND	$0.40	$0.46	$0.53	$0.49	$0.44	$0.60	$0.44
	PLL	$0.57	$0.63	$0.41	$0.24	-	$0.19	-
	BLL	$0.56	$0.53	$0.54	$3.19	$0.61	$0.60	$0.61
	NET	$0.48	$0.54	$0.54	$0.53	$0.65	$0.64	$0.65
	TWL	$0.23	$0.23	-	-	-	$0.20	-
Shark fins	HND	$11.92	$19.75	$15.53	$17.17	$20.31	$18.71	$20.31
	PLL	$10.34	$11.44	$6.81	$12.72	$9.91	$13.52	$9.91
	BLL	$17.57	$22.21	$22.26	$17.83	$19.48	$22.85	$19.48
	NET	$6.95	$10.60	$10.41	$12.85	$8.76	$8.89	$8.76
	TWL	-	$12.17	$14.00	$10.77	$5.90	$10.85	$5.90

Mid-Atlantic

Species	**Gear**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Bigeye tuna	HND	$4.45	$4.32	$3.97	$3.79	$4.93	$4.57	$4.33
	PLL	$4.30	$3.81	$4.12	$3.92	$4.48	$4.76	$4.49
	BLL	$3.45	$4.37	$2.84	$3.91	$4.34	$4.61	$5.02
	NET	$5.55	$4.50	-	-	-	-	$3.99
	TWL	$5.68	-	-	-	-	-	-
	DRG	-	-	$1.50	-	-	-	-
	UNK	-	-	$5.00	-	$5.36	$4.95	$5.40
Bluefin tuna	HND	$6.60	$4.93	$4.06	$7.54	$10.25	$11.07	$10.40
	PLL	$5.73	$6.83	$5.72	$6.25	$6.03	$5.41	$7.53
	NET	-	$2.23	-	-	-	-	-
	BLL	-	$7.00	$7.00	-	-	-	-
Yellowfin tuna	HND	$2.14	$2.11	$2.00	$1.93	$1.76	$1.99	$2.33
	PLL	$2.32	$2.30	$2.14	$2.00	$1.91	$2.20	$2.19
	BLL	$1.86	$2.11	$1.81	$1.89	$2.20	$2.40	$2.76
	NET	$1.77	$1.49	$1.81	$1.50	$2.08	$2.23	$1.81
	TWL	$1.56	$1.53	-	$1.48	-	$3.33	$1.95
	TRP	-	-	$1.97	$1.57	$1.59	-	-
	DRG	-	-	$1.94	-	-	-	$4.22
	UNK	-	-	$2.75	-	$2.62	$3.70	$2.57

Other tunas	HND	$0.94	$0.89	$0.69	$0.66	$0.65	$0.74	$0.74
	PLL	$1.03	$0.88	$0.86	$0.93	$1.09	$0.86	$0.92
	BLL	$1.17	$0.78	$0.83	$1.08	$0.97	$0.91	$1.17
	NET	$0.44	$0.49	$0.75	$0.48	$0.35	$0.66	$0.58
	TWL	$0.70	$0.47	$0.42	$0.62	$0.52	$1.11	$0.62
	TRP	-	-	$0.57	$0.47	$0.58	$0.60	$0.67
	DRG	-	-	$1.00	-	-	-	$1.50
	UNK	-	-	$1.03	$1.69	$0.65	$1.13	$0.74
Swordfish	HND	$3.25	$3.70	-	-	-	$3.29	$3.52
	PLL	$3.59	$3.47	$3.18	$2.97	$2.86	$3.60	$3.47
	BLL	$2.91	$3.45	$4.00	-	$3.43	$3.80	$3.70
	NET	-	$4.19	$3.51	-	-	$3.26	$3.59
	UNK	-	-	-	-	-	$4.37	$3.49
	TWL	$3.94	$2.86	$3.34	$3.21	$3.55	$3.31	$3.60
Large coastal sharks	HND	$0.50	$0.88	$2.09	$2.19	$1.06	$1.60	$0.96
	PLL	$0.45	$2.62	$2.78	$2.32	$3.37	$2.33	$2.19
	BLL	$0.41	$0.55	$1.11	$2.08	$2.32	$3.03	$4.01
	NET	$0.53	$0.89	$1.02	$1.02	$1.52	$0.84	$1.37
	TWL	$0.72	$0.55	$0.52	$0.50	$0.80	$1.67	$0.87
	TRP	-	-	$2.50	-	-	-	-
	SEN	-	-	$1.26	-	-	-	-
	UNK	-	-	$0.50	-	$0.68	$2.69	$0.85
Pelagic sharks	HND	$1.41	$1.26	$1.41	$1.57	$1.26	$1.33	$1.38
	PLL	$1.45	$1.56	$1.31	$1.32	$1.22	$1.40	$1.45
	BLL	$1.24	$0.97	$1.12	$1.17	$1.41	$1.50	$1.82
	NET	$1.02	$1.02	$0.97	$1.08	$1.32	$1.42	$1.03
	TWL	$0.90	$0.69	$1.03	$0.88	$0.55	$1.08	$0.78
	TRP	-	$0.40	-	$1.43	-	-	-
	DRG	-	$0.49	$2.00	-	-	-	-
	UNK	-	-	-	$0.57	$1.78	$1.22	$1.30
Small coastal sharks	HND	$0.38	$0.51	$0.45	$0.36	$0.50	$0.44	$0.44
	PLL	$0.20	$0.44	$0.50	$0.39	-	$0.46	$0.44
	BLL	-	$0.95	-	-	-	-	$0.50
	NET	$0.40	-	$0.42	$0.39	$0.44	$0.39	$0.47
	TWL	-	-	$1.26	-	-	-	-
Shark fins	HND	$6.17	-	-	-	-	-	-
	PLL	$8.57	-	-	-	-	-	-
	BLL	-	-	-	-	-	-	-
	NET	$3.38	-	-	-	-	-	-

North Atlantic

Species	**Gear**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Bigeye tuna	HND	$4.22	$6.00	-	-	$4.89	-	$5.95
	PLL	$4.39	$3.42	$4.08	$3.50	$3.79	$4.79	$5.06
	BLL	-	-	-	-	$4.30	$3.87	$3.97
	NET	$0.42	-	-	-	-	-	-

	TWL	$3.87	$3.54	$3.76	-	-	$5.26	-
Bluefin tuna	HND	$10.02	$8.21	$7.94	$6.33	$7.79	$8.03	$8.20
	PLL	$5.65	$5.24	$5.96	$4.21	$5.38	$4.61	$5.24
	NET	-	$4.26	-	-	-	-	-
	SEN	$7.80	$7.43	$6.61	$4.92	$5.92	$3.33	$5.24
	TWL	-	$3.80	-	-	-	-	-
Yellowfin tuna	HND	$2.66	$2.87	$3.25	$1.90	$2.90	$3.35	$2.57
	PLL	$2.77	$3.01	$2.76	$2.57	$2.89	$3.83	$2.93
	BLL	$2.32	$3.77	-	-	$2.51	$3.18	$2.69
	NET	-	-	$4.75	-	-	-	-
	TWL	$2.31	$2.10	$2.19	$1.65	$3.25	$4.31	$2.87
	TRP	-	-	$4.50	$3.10	-	$1.49	-
Other tunas	HND	$1.59	$2.39	$2.03	$1.56	$1.78	$1.29	$1.00
	PLL	$1.13	$0.70	$1.15	$1.00	$1.17	$1.25	$1.43
	BLL	$0.50	$3.00	-	-	$0.66	$0.91	$1.24
	NET	$0.50	$0.36	$0.70	$1.14	$0.44	$0.52	$0.71
	TWL	$0.22	$0.80	$0.69	$0.37	$0.89	$0.75	$0.32
	TRP	-	-	$0.34	$0.44	-	$0.75	$0.94
	DRG	-	-	$3.00	-	-	-	-
Swordfish	HND	$8.00	$5.69	$5.32	-	$4.79	-	$4.39
	PLL	$3.67	$3.58	$3.30	$3.36	$3.85	$4.20	$4.18
	BLL	$2.00	-	-	-	$3.75	$3.73	$3.87
	NET	-	-	$4.25	-	-	-	-
	TWL	$4.05	$4.75	$3.05	$3.18	$4.89	$3.64	$2.75
	TRP	-	-	$3.74	-	-	-	-
Large coastal sharks	HND	-	$0.50	$0.45	$0.74	-	$0.20	-
	PLL	$1.00	$1.21	$0.29	$0.28	$1.03	$0.28	-
	BLL	$0.65	$1.43	$1.00	-	-	-	-
	NET	$1.06	$0.99	$0.89	$0.89	$0.68	$0.81	-
	TWL	$1.08	$0.93	$0.86	$0.66	$0.56	$0.66	-
	UNK	-	-	-	-	-	$0.95	$1.27
	TRP	-	-	$0.28	$0.22	-	-	-
Pelagic sharks	HND	-	$1.38	$1.71	-	-	$5.77	$1.50
	PLL	$1.38	$1.37	$1.31	$1.30	$1.34	$1.48	$1.48
	BLL	$1.50	-	$0.65	-	$1.07	$1.46	$1.57
	NET	$0.82	$0.98	$0.60	$1.30	$1.99	$0.78	$1.23
	TWL	$0.97	$1.19	$0.81	$0.63	$0.78	$0.78	$0.75
	UNK	-	-	-	-	-	$1.24	$1.47
	TRP	-	-	$0.69	$0.68	-	-	-
Small coastal sharks	HND	-	-	-	-	-	-	-
	NET	-	$1.51	-	-	-	-	-
	TWL	-	-	$0.58	-	-	$0.50	-
Shark fins	PLL	$5.54	-	-	-	-	-	-
	BLL	$25.19	-	-	-	-	-	-
	NET	$2.41	-	-	-	-	-	-
	TWL	$3.00	-	-	-	-	-	-

Table 5.3 Average Ex-vessel Prices per lb for Atlantic HMS by Area.

Species	Area	2000	2001	2002	2003	2004	2005	2006
Bigeye tuna	Gulf of Mexico	$2.26	$1.94	$4.33	$3.29	$4.54	$4.81	$4.58
	S. Atlantic	$1.98	$2.57	$2.45	$2.24	$2.86	$3.32	$3.20
	Mid-Atlantic	$4.39	$4.26	$3.82	$3.77	$4.56	$4.72	$4.73
	N. Atlantic	$4.12	$4.32	$4.03	$3.45	$4.42	$4.65	$4.88
Bluefin tuna	Gulf of Mexico	$1.86	$1.25	$5.56	$6.32	$4.64	$4.67	$4.39
	S. Atlantic	$6.83	$4.00	$3.77	$4.11	$4.91	$4.60	$6.36
	Mid-Atlantic	$5.98	$5.25	$4.70	$7.38	$9.62	$10.30	$9.81
	N. Atlantic	$8.94	$5.79	$7.31	$5.71	$7.42	$5.57	$7.92
Yellowfin tuna	Gulf of Mexico	$3.22	$2.98	$3.23	$3.31	$3.75	$3.60	$3.71
	S. Atlantic	$1.88	$1.70	$1.73	$1.76	$1.53	$$2.10	$1.85
	Mid-Atlantic	$2.12	$1.91	$2.02	$1.91	$1.98	$2.42	$2.53
	N. Atlantic	$2.65	$2.93	$2.90	$2.38	$2.65	$3.15	$2.54
Other tunas	Gulf of Mexico	$0.74	$0.76	$0.84	$0.75	$0.89	$0.92	$0.91
	S. Atlantic	$0.58	$0.58	$0.49	$0.59	$0.49	$0.59	$0.53
	Mid-Atlantic	$0.76	$0.70	$0.73	$0.70	$0.63	$0.81	$0.82
	N. Atlantic	$0.93	$1.46	$1.17	$0.95	$0.94	$0.85	$0.84
Swordfish	Gulf of Mexico	$3.25	$3.31	$2.91	$2.95	$3.31	$3.18	$3.06
	S. Atlantic	$3.24	$3.43	$3.14	$3.26	$3.52	$3.73	$3.77
	Mid-Atlantic	$3.67	$3.53	$3.25	$2.97	$3.37	$3.70	$3.62
	N. Atlantic	$3.87	$4.67	$3.47	$3.33	$4.06	$3.78	$3.87
Large coastal sharks	Gulf of Mexico	$0.43	$0.44	$0.36	$0.38	$0.37	$0.46	$0.43
	S. Atlantic	$0.78	$1.12	$1.27	$0.39	$0.44	$0.50	$0.40
	Mid-Atlantic	$0.53	$1.09	$1.56	$1.62	$1.93	$1.75	$1.71
	N. Atlantic	$1.01	$1.02	$0.77	$0.72	$0.70	$0.74	$1.02
Pelagic sharks	Gulf of Mexico	$1.31	$1.42	$1.11	$1.13	$1.08	$1.12	$1.21
	S. Atlantic	$0.76	$0.68	$0.67	$0.71	$0.65	$0.73	$0.72
	Mid-Atlantic	$1.20	$1.09	$1.17	$1.21	$1.29	$1.39	$1.38
	N. Atlantic	$1.10	$1.23	$1.00	$1.12	$1.46	$1.40	$1.26
Small coastal sharks	Gulf of Mexico	$0.52	$0.58	$0.48	$0.40	$0.45	$0.55	$0.53
	S. Atlantic	$0.48	$0.52	$0.53	$0.51	$0.61	$0.62	$0.55
	Mid-Atlantic	$0.38	$0.55	$0.48	$0.38	$0.44	$0.42	$0.45
	N. Atlantic	-	$1.51	$0.58	-	-	$0.50	-
Shark fins	Gulf of Mexico	$15.99	$20.90	$22.64	$18.12	$17.93	$20.24	$20.76
	S. Atlantic	$14.16	$18.43	$17.10	$15.85	$14.57	$16.12	$16.30
	Mid-Atlantic	$4.90	-	-	-	-	-	-
	N. Atlantic	$6.83	-	-	-	-	-	-

Table 5.2 and Table 5.3 indicate that the average ex-vessel prices for bigeye tuna have generally increased since 2000. Price changes from 2005 to 2006 were on average moderate and varied in direction for all four regions. The gears used also influenced the average price of bigeye tuna.

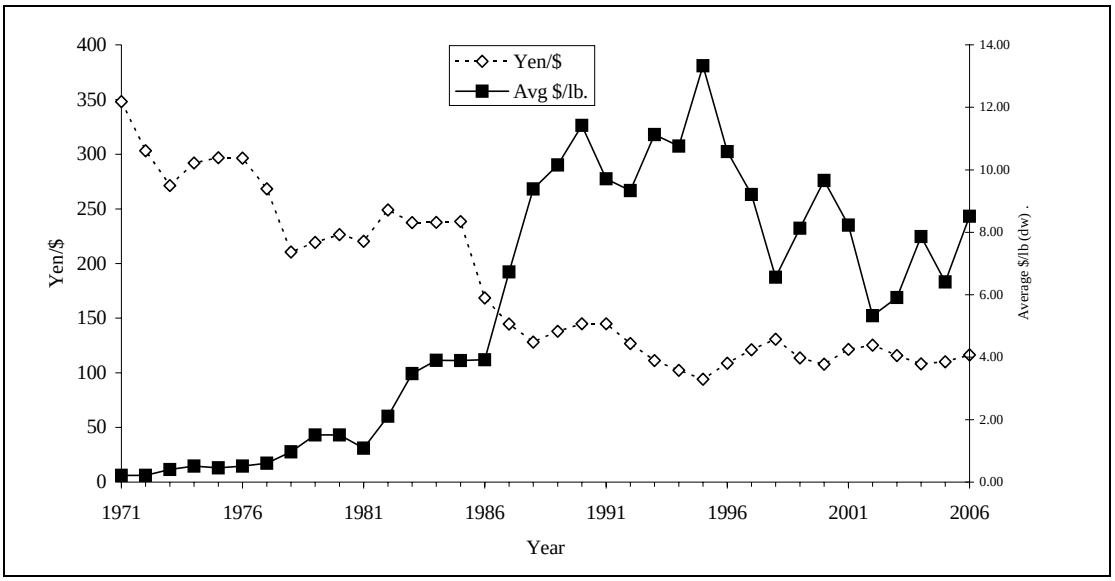

Figure 5.1 Average Annual Yen/$ Exchange Rate and Average U.S. BFT Ex-vessel $/lb (dw) for All Gears: 1971-2003. (Source: Federal Reserve Bank (www.stls.frb.org) and Northeast Regional Office.)

Average ex-vessel prices for bluefin tuna have not displayed a consistent trend since 2000. Since 2002, however, prices increased in all regions except the North Atlantic (Table 5.3). The gear used also made a difference in the ex-vessel price (Table 5.2). In the North Atlantic and Mid-Atlantic, bluefin tuna caught with handgear had higher average prices than those caught with longline. This trend has been fairly consistent over the years between 2000 and 2006. The ex-vessel prices for bluefin tuna can be influenced by many factors, including market supply and the Japanese Yen/U.S. Dollar (¥/$) exchange rate. Figure 5.1 shows the average ¥/$ exchange rate, plotted with average ex-vessel bluefin tuna prices, from 1971 to 2006.

The average ex-vessel prices for yellowfin tuna have increased in 2006 in the Gulf of Mexico and Mid-Atlantic (Table 5.3). Yellowfin tuna caught with longline gear had higher average ex-vessel prices than fish caught with other gear types in 2006 (Table 5.2). The average ex-vessel price for other tunas decreased in all regions except the Mid-Atlantic in 2006 (Table 5.3). The average price of other tunas is lowest in the South Atlantic compared to other regions. The type of gear used did not appear to consistently influence the average ex-vessel prices of other tuna. Average ex-vessel prices for swordfish increased in 2006 in all regions (Table 5.3).

The average ex-vessel price for LCS slightly decreased in all regions except the North Atlantic in 2006 (Table 5.3). The average ex-vessel prices for pelagic sharks increased in the Gulf of Mexico region in 2006 (Table 5.), while prices decreased in the other three regions. The

average ex-vessel prices for SCS remained fairly stable from 2005 to 2006 (Table 5.3). Gear type did not consistently affect the ex-vessel price of small coastal sharks in 2006 (Table 5.2).

5.1.2 Revenues

Table 5.4 summarizes the average annual revenues of the Atlantic HMS fisheries based on average ex-vessel prices and the weight reported landed as per the U.S. National Report (NMFS, 2006), the Shark Evaluation Reports, information given to ICCAT (Cortes, 2006), as well as price and weight reported to the NMFS Northeast Regional Office by Atlantic bluefin tuna dealers. These values indicate that the estimated total annual revenue of Atlantic HMS fisheries has increased in 2006 to $37.5 million from $32.0 million in 2005. From 2005 to 2006, the tuna fishery's total revenue decreased slightly. A majority of that decrease can be attributed to reduced commercial landings of bluefin tuna. From 2005 to 2006, the annual revenues from shark increased by just under 20 percent. In contrast, the annual revenues from swordfish from 2005 to 2006 decreased by 12.7 percent.

Table 5.4 **Estimates of the Total Ex-vessel Annual Revenues of Atlantic HMS Fisheries.** (Sources: NMFS, 1997; NMFS 2007a; Cortes, 2006; and bluefin tuna dealer reports from the Northeast Regional Office.)

Species		2000	2001	2002	2003	2004	2005	2006
Bigeye tuna	Ex-vessel $/lb dw	$3.18	$3.27	$3.66	$3.19	$4.10	$4.38	$4.35
	Weight lb dw	1,012,352	2,391,350	1,267,645	846,191	551,503	703,275	1,192,701
	Fishery Revenue	$3,222,636	$7,827,218	$4,637,372	$2,697,233	$2,258,404	$3,080,345	$5,188,249
Bluefin tuna	Ex-vessel $/lb dw	$9.66	$8.23	$5.33	$5.91	$7.86	$6.41	$8.51
	Weight lb dw	2,137,580	2,176,016	4,133,625	2,519,345	885,720	646,395	211,644
	Fishery Revenue	$20,648,413	$17,904,240	$22,042,839	$14,889,328	$6,961,760	$4,143,392	$1,801,090
Yellowfin tuna	Ex-vessel $/lb dw	$2.46	$2.38	$2.48	$2.34	$2.48	$3.06	$2.66
	Weight lb dw	12,435,708	14,777,800	12,885,887	13,556,340	4,832,483	4,213,034	4,779,622
	Fishery Revenue	$30,577,372	$35,193,181	$31,919,170	$31,721,836	$11,972,477	$12,891,884	$12,713,795
Other tunas*	Ex-vessel $/lb dw	$0.75	$0.87	$0.81	$0.75	$0.74	$0.79	$0.78
	Weight lb dw	795,243	867,960	1,298,509	900,522	287,127	318,788	272,491
	Fishery Revenue	$593,595	$754,322	$1,057,273	$673,140	$211,756	$251,843	$212,543
Total tuna	**Fishery Revenue**	**$55,042,015**	**$61,678,960**	**$59,656,653**	**$49,981,537**	**$21,404,397**	**$20,367,464**	**$19,915,677**
Swordfish	Ex-vessel $/lb dw	$3.51	$3.74	$3.20	$3.13	$3.57	$3.60	$3.58
	Weight lb dw	4,832,384	5,662,350	5,985,489	4,668,466	4,317,369	3,244,763	2,847,135
	Fishery Revenue	$16,974,346	$21,153,927	$19,150,819	$14,600,627	$15,391,422	$11,681,147	$10,192,743
Large coastal sharks	Ex-vessel $/lb dw	$0.68	$0.91	$0.99	$0.78	$0.86	$0.86	$0.89
	Weight lb dw	3,762,000	3,562,546	4,097,363	4,421,249	3,206,377	2,639,554	3,299,933
	Fishery Revenue	$2,560,307	$3,256,955	$4,040,977	$3,437,521	$2,757,484	$2,270,016	$2,936,940
Pelagic sharks	Ex-vessel $/lb dw	$1.09	$1.11	$0.99	$1.04	$1.12	$1.16	$1.14
	Weight lb dw	215,005	362,925	303,666	616,967	450,833	270,021	149,072
	Fishery Revenue	$233,650	$401,430	$299,487	$643,188	$504,933	$313,224	$169,942
Small coastal sharks	Ex-vessel $/lb dw	$0.46	$0.79	$0.52	$0.43	$0.50	$0.52	$0.51
	Weight lb dw	672245*	719,484	579,441	549,799	677,305	650,202	751,301
	Fishery Revenue	$309,926	$568,441	$299,023	$236,414	$338,653	$338,105	$383,164
Shark fins (weight = 5% of all sharks landed)	Ex-vessel $/lb dw	$10.47	$19.67	$19.87	$17.09	$16.25	$18.18	$18.53
	Weight lb dw	232,462	232,248	249,024	279,401	216,726	177,989	210,015
	Fishery Revenue	$2,434,344	$4,568,937	$4,949,056	$4,774,959	$3,521,793	$3,235,840	$3,891,578
Total sharks	**Fishery Revenue**	**$5,538,227**	**$8,795,763**	**$9,588,545**	**$9,092,082**	**$7,112,863**	**$6,157,185**	**$7,381,624**
Total HMS	Fishery Revenue	$77,554,588	$91,628,650	$88,396,016	$73,674,245	$43,918,682	$32,048,611	$37,490,044

Note: Average ex-vessel prices may have some weighting errors, except for bluefin tuna which is based on a fleet-wide average. Other tunas includes skipjack and albacore.

5.1.3 Wholesale Market

Currently, NMFS does not collect wholesale price information from dealers. However, the wholesale price of some fish species is available (http://www.st.nmfs.noaa.gov/st1/publications.html). The wholesale prices presented in Table 5.5 are from the annual reports of the Fulton Fish Market. As with ex-vessel prices, wholesale prices depend on a number of factors including the quality of the fish, the weight of the fish, the supply of fish, and consumer demand. This series of data from the Fulton Fish Market was discontinued in 2005, so only data up through 2004 are available.

As reported by the Fulton Fish Market, Table 5.5 indicates that the average wholesale price of HMS sold in Atlantic and Gulf of Mexico states generally decreased from 1996 to 2003, except for blacktip shark. Prices have appeared to have rebounded in 2004, breaking from the declining trend. During that same period, the wholesale price of swordfish weighing over 100 pounds decreased 19 percent, swordfish weighing between 50 and 99 pounds decreased 25 percent, and swordfish cuts decreased 15 percent. The wholesale price of blacktip shark increased 27 percent from 1996 to 2003, with most of the increase occurring in 2003. The wholesale price of mako shark decreased 14 percent from 1996 to 2003, however 2003 wholesale prices were up from 2002. The wholesale price of thresher shark has decreased 22 percent from 1996 to 2003. Wholesale yellowfin tuna prices have remained relatively stable from 1996 to 2003. The yellowfin tuna wholesale price of #2 quality fish had decreased eight percent while the price of #2 cuts has increased seven percent from 1996 to 2003. Bigeye tuna wholesale prices from 1999 to 2003 have increased significantly for both high grade cuts and fish.

Table 5.5 The Overall Average Wholesale Price Per Lb of Fresh HMS Sold in Atlantic and Gulf of Mexico States as Reported by the Fulton Fish Market. (Source: NMFS, 2004.)

Species	Description	1996 Price/lb	1999 Price/lb	2000 Price/lb	2001 Price/lb	2002 Price/lb	2003 Price/lb	2004 Price/lb
Blacktip	-	$1.05	$1.04	$1.04	$1.05	$1.00	$1.33	$1.08
Mako	-	$2.77	$2.74	$3.18	$3.00	$2.00	$2.37	$2.24
Thresher	-	$1.00	$0.91	$0.82	$1.25	$1.25	$0.78	$1.24
Swordfish	100# and up	$6.28	$5.26	$5.26	$5.42	$5.19	$5.08	$5.66
	50-99#	$6.02	$4.54	$4.72	$4.81	$4.59	$4.50	$5.15
	26-49#	$5.50	$3.36	$3.58	$4.05	$3.50	-	$3.25
	Cuts	$7.74	$6.55	$6.54	$6.73	$6.84	$6.55	$7.13
Yellowfin tuna	#1: BTF	$7.00	$5.97	$5.69	$5.50	$7.42	-	$6.00
	#1: Cuts	$9.38	$8.23	$8.00	$8.23	$10.67	-	$8.50
	#2: BTF	$5.00	$4.24	$4.36	$3.97	$4.92	$4.60	$4.62
	#2: Cuts	$6.52	$6.22	$6.20	$6.00	$7.29	$6.98	$7.32
	#3: BTF	-	$3.00	-	-	-	$2.50	-
	#3: Cuts	-	$4.50	-	-	-	-	$3.00
Bigeye tuna	#1: BTF	-	$4.00	-	-	-	$6.50	$7.75
	#1: Cuts	-	$5.50	-	-	-	$8.50	$11.00
	#2: BTF	-	$4.26	-	-	-	-	-
	#2: Cuts	-	$6.00	-	-	-	-	-

Note: #'s indicate quality (1 is highest, 3 is lowest); BTF is by the fish.

5.2 Recreational Fisheries

Although NMFS believes that recreational fisheries have a large influence on the economies of coastal communities, NMFS has only recently been able to gather additional information on the costs and expenditures of anglers or the businesses that rely on them. The following information is taken from the Consolidated HMS FMP.

An economic survey done by the U.S. Fish and Wildlife Service[2] in 2001 found that for the entire United States 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). 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 (USFWS, 2001). Saltwater anglers spent $4.5 billion on trip-related costs and $3.9 billion on equipment (USFWS, 2001). Approximately 76 percent of the saltwater anglers surveyed fished in their home state (USFWS, 2001). The most recent USFWS survey was conducted in 2006 and the results of that survey are currently being analyzed.

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' Marine Recreational Fisheries Statistics Survey (MRFSS). These angler expenditure data were analyzed on a per person per trip-day level and reported in 2003 dollars. The expenditure data include 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 2001 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 $116 billion dollars (ASA, 2001). Florida, Texas, North Carolina, New York, and Alabama are among the top ten states in terms of overall economic impact for both saltwater and freshwater fishing (ASA, 2001). Florida is also one of the top states in terms of economic impact of saltwater fishing with $2.9 billion in angler expenditures, $5.4 billion in overall economic impact, $1.5 billion in salaries and wages related to fishing, and 59,418 fishing related jobs (ASA, 2001). California followed Florida with $0.8 billion in angler expenditures, $1.7 billion in overall economic impact, $0.4 billion in salaries and wages, and 15,652 jobs (ASA, 2001). Texas and New Jersey were the next highest states in terms of economic impact (ASA, 2001).

At the end of 2004, NMFS collected market information regarding advertised charterboat rates. The analysis of this data collected focused on observations of advertised rates on the internet for full day charters. Full day charters vary from six to 14 hours long with a typical trip being 10 hours. Most vessels can accommodate six passengers, but this also varies from two to

[2] This survey interviewed over 77,000 households during phase 1 and approximately 25,070 sports persons during phase 2. The response rate during phase two of the survey was 75 percent.

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.

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.

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.

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 richest fishing tournament," established a new world record payout for catching a fish when it awarded $1.32 million in 2004 to the vessel catching the largest white marlin. The 21st Annual Pirates Cove Billfish Tournament in North Carolina awarded over $1 million in prizes in 2004, with the top boat garnering over $400,000 for winning in six categories. Total prize money awarded in the Big Rock Tournament in North Carolina has exceeded $1 million since 1998.

Blue marlin, sailfish, and tunas are also often targeted in fishing tournaments, including those discussed above. In 2004, blue marlin was the HMS most frequently identified as a prize category in registered HMS tournaments. Forty-five teams participated in the 2004 Emerald Coast Blue Marlin Classic at Sandestin, Florida, with over $482,000 in cash prizes and the top boat receiving over $58,000. The 34th Annual Pensacola (Florida) International Billfish Tournament indicated that it would award over $325,000 in cash and prizes in 2004. The World Sailfish Championship in Key West, Florida had a $100,000 guaranteed first prize for 2005. In South Carolina, the Megadock Billfishing Tournament offered a $1,000,000 prize for any boat exceeding the current blue marlin state record. The 2004 Florida Billfish Masters Tournament in Miami, Florida awarded over $123,000 in prize money, with the top boat receiving over $74,000. Sixty-two boats competed in the 2003 Babylon Tuna Club Invitational in Babylon, New York for over $75,000 in cash prizes, and the Mid-Atlantic Tuna Tournament sponsored by the South Jersey Marina in Cape May, New Jersey anticipates awarding over $25,000 in prizes in 2005.

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 2004, the 24th Annual South Jersey Shark Tournament hosted over 200 boats and awarded over $220,000 in prize money, with an entry fee of $450 per boat. The "Mako Fever" tournament, sponsored by the Jersey Coast Shark Anglers, in 2004 awarded over $55,000 in prizes, with the first place vessel receiving $25,000. In 2004, the 18th Annual Monster Shark Tournament in Martha's Vineyard, Massachusetts was broadcast on ESPN, and featured a new fishing boat valued at over $130,000 awarded to the winner.

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. Both of these tournaments anticipated awarding over $30,000 in total cash and prizes, assuming that 50 boats would participate.

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. Besides the entry fee to the tournament and possibly the calcutta, anglers may also pay for marina space and gas (if they have their own vessel), vessel rental (if they do not have their own vessel), meals and awards dinners (if not covered by the entry fee), hotel, fishing equipment, travel costs to and from the tournament, camera equipment, and other miscellaneous expenses. Fisher and Ditton (1992) found that the average angler who attended a billfish tournament spent $2,147 per trip (2.59 days), and that billfish tournament anglers spent an estimated $180 million (tournament and non-tournament trips) in 1989. Ditton and Clark (1994) estimated annual expenditures for Puerto Rican billfish fishing trips (tournaments and non-tournaments) at $21.5 million. More recently, 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.

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The 2000 Virginia Beach Red, White, and Blue Fishing Tournament: Participants' Characteristics, Attitudes, Expenditures, and Economic Impacts. VIMS, College of William and Mary, Virginia Marine Resources Report No. 2001-9, VSG-01-88, Texas A & M University, College Station, TX. 110pp.

6. COMMUNITY AND SOCIAL UPDATE

According to National Standard 8, conservation and management measures should, consistent with conservation requirements, attempt to both provide for the continued participation of a community and, to the extent practicable, minimize the economic effects on the community. The information presented here addresses new data concerning the social and economic well-being of participants in the fishery and considers the impact of significant regulatory measures enacted in the past year.

6.1 Overview of Current Information and Rationale

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)).

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, mitigate impacts of regulations on affected constituents.

Social impacts are generally the consequences to human populations that follow from some type of public or private action. Those consequences may include alterations to the ways in which people live, work, 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 impact analyses help determine the consequences of a policy action in advance by comparing the status quo with the projected impacts. 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.

While geographic location is an important component of a fishing community, the transient nature of HMS may necessitate permitted fishermen to shift location in an attempt to follow the fish. Because of this characteristic, management measures for HMS often have the most identifiable impacts on fishing fleets that use specific gear types. The geographic concentrations of HMS fisheries may also vary from year to year as the behavior of these migratory fish is unpredictable. The relationship between these fleets, gear types, and geographic fishing communities is not always a direct one; however, they are important variables for understanding social and cultural impacts. As a result, the inclusion of typical community profiles in HMS management decisions is somewhat difficult, as geographic factors and the use of a specific gear type have to be considered.

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.

The information used in the 1999 HMS FMP and the 1999 Billfish FMP Amendment was obtained through a contract with Dr. Doug Wilson, from the Ecopolicy Center for Agriculture, Environmental and Resource Issues at Rutgers, the State University of New Jersey. Dr. Wilson and his colleagues completed their field work in July 1998. Their study considered HMS that have important commercial and recreational fisheries extending along the Atlantic and Gulf Coast 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 have important fishing communities that could be affected by measures included in the 1999 HMS FMP and the 1999 Billfish FMP Amendment, and because they are fairly evenly spread along the Atlantic and Gulf Coast and the Caribbean. 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. Complete descriptions of the study results can be found in Chapter 9 of the 1999 HMS FMP and Chapter 7 of the 1999 Billfish FMP Amendment.

In 2002, NMFS contracted the Virginia Institute of Marine Science (VIMS) at the College of William and Mary to re-evaluate several of the baseline communities and, specifically, to determine if the 1999 HMS FMP had a negative social impact on the communities dependent upon HMS. The 2005 report provided a brief overview and examination of changes in social and economic structures of communities which land

HMS. The analysis of change since the 1999 HMS FMP regulations were implemented was based on demographics, landings information, and informal interviews with individuals from three different communities. Some of the report's findings are incorporated into the community profiles in Chapter 9 of the Consolidated HMS FMP.

6.2 Summary of Social Data and Information for Consolidated HMS FMP

The Consolidated HMS FMP consolidated all of the community profiles from previous HMS management plans or amendments and updated the community information, where possible. To ensure continuity with the 1999 HMS FMP and previous amendments, if a community was selected and described as being involved with an HMS fishery, the same community was included in the 2006 assessment. The communities profiled were originally selected due to the proportion of HMS landings, 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. The communities selected for detailed study were Gloucester and New Bedford, Massachusetts; Barnegat Light and Brielle, New Jersey; Wanchese, and Hatteras Township, North Carolina; Pompano Beach, Fort Pierce, Madeira Beach, Panama City Beach, and Islamorada, Florida; Boothville/Venice and Dulac, Louisiana; and Arecibo, Puerto Rico. These communities are not intended to be an exhaustive list of every HMS-related community in the United States; rather the objective was to give a broad perspective of representative areas.

The demographic profiles in the Consolidated HMS FMP have been modified to include the same baseline information for each community profiled. As a result, most of the tables include more information than portrayed in the 1999 HMS FMP and its amendments. The demographic tables still use both 1990 and 2000 Bureau of the Census data for comparative purposes. The descriptive community profiles include the same information provided by the Wilson *et al.,* (1998) and Kirkley (2005) analyses with some new information provided by Impact Assessment, Inc (2004) on the Gulf of Mexico communities. Unlike the Wilson *et al.,* (1998) study used in the 1999 HMS FMP, it was not possible to undertake field research for this assessment.

The Consolidated HMS FMP also reviewed the HMS permit databases to incorporate information about residence. This information was also used to identify additional HMS-related fishing communities that should be profiled in the future. Six GIS maps were generated to identify the communities where angler, charter/headboat, HMS dealers (tunas, shark, and swordfish combined), commercial tuna (all gear categories combined), directed and incidental shark, and swordfish (directed, incidental, and handgear combined) permit holders reside. In past community profile and social impact analyses, it was difficult to identify where recreational HMS fishermen were located because no data were available for the number of recreational fishermen, as well as recreational landings by community. Previous social impact assessments report on charter fishing operations, fishing tournaments, and related activities to identify the scope of recreational fishing for each of the communities described. The information provided

by the HMS permit databases should facilitate the identification of recreational HMS communities that should be profiled in the future.

6.3 Summary of New Social and Economic Data Available

The following reports were published in 2006:

- Agar, Juan and Brent Stoffle. 2006. Profiling Fishing Communities in St. Croix and the U.S. Virgin Islands.
- Boyd, Heather and Anthony Charles. 2006. Creating Community-based Indicators to Monitor sustainability of Local Fisheries. Ocean & Coastal Management, 49:237-258.
- Griffith, David, Manuel Valdés Pizzini and Carlos García Quijano. 2006. Entangled Communities: Socioeconomic Profiles of Fishers, their Communities, and their Responses to Marine Protective Measures in Puerto Rico.
- Impact Assessment, Inc. 2006a. Preliminary Assessment of the Impacts of Hurricane Katrina on Gulf of Mexico Coastal Fishing Communities. Final Technical Report submitted to U. S. Department Of Commerce NOAA Fisheries, Southeast Regional Office St. Petersburg, Florida. Contract # WC133F-06-CN-0003
- Impact Assessment, Inc. 2006b. Identifying Communities Associated with the Fishing Industry in Alabama and Mississippi. U. S. Department Of Commerce NOAA Fisheries, Southeast Regional Office St. Petersburg, Florida. Contract WC133F-03-SE-0603.
- Jepson, Michael. 2006. A Cultural Sea Change. Forum Magazine. A Florida Humanities Council Publication. Summer.
- Jepson, Michael and Steve Jacob. 2006. Social Indicators and Measurements of Vulnerability for Gulf Coast Fishing Communities. NAPA Bulletin 28 (In Press)
- NOAA Fisheries. (2006). Final Consolidated Atlantic Highly Migratory Species Fishery Management Plan.
- SAFMC. 2006. Final Amendment 13c to the Snapper Grouper Fishery Management Plan. South Atlantic Fishery Management Council, Charleston, SC .
- Sepez, J., B.D. Tilt, C.L. Package, H.M. Lazrus and I. Vaccaro. 2006. Community Profiles for North Pacific Fisheries – Alaska. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-160.
- Walker, Bobbi, Robert Zales and Betty Rockstall. 2006. Charter Boat Fleet In Peril: Losses to the Gulf of Mexico Charter Fleet From Hurricane Storms during 2005. National Association of Charterboat Operators, Orange Beach, Alabama.
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6.4 HMS Community Profile Needs

Since the publication of the Consolidated HMS FMP, a contract has been underway to assess the current level of social science data available for HMS fishing communities and to determine which communities should be priorities for additional profiling. A comprehensive literature review has been conducted to define fishing communities and identify research in other fisheries that may also be relevant for HMS fishing communities. Results from this literature review yielded a list of communities recently profiled, when they were profiled, and suggested communities for future profiling.

After consideration of previous methods used, our contractor employed a recent methodology by Sepez *et al*. (2005). In their paper, they utilized a method with a variety of data including ratios of permits by population for each community. Permit data for 2006 was grouped into seven classes of permits: angling permits, charter permits, tuna dealer, general, longline, swordfish, and shark. Each type of permit was then ranked by the ratio of the number of permits (by type) to the community population (U.S. Census 2000 population data for each community). Communities that did not meet the mean for number of permits (by type) were not further considered. This yielded a list of 25 communities. This list was then further refined by prioritizing the list according to how recently these communities had been profiled.

The prioritized list below contains all of the communities for which appraisals will be conducted under the contract:

- Beaufort, NC
- Atlantic Beach, NC
- Wakefield, RI
- Montauk, NY
- Cape May, NJ
- Ocean City, MD
- Port Salerno, FL
- Morehead City, NC
- Destin, FL
- Apalachicola, FL
- Port St. Joe, FL
- Orange Beach, AL
- Grand Isle, LA
- Port Aransas, TX
- Freeport, TX
- Barnegat Light, NJ
- Brielle, NJ
- Wanchese, NC

- Hatteras Village, NC
- Islamorada, FL
- Madeira Beach, FL
- New Bedford, MA
- Gloucester, MA
- Dulac, LA
- Venice LA

Updates to current profiles will be completed through the use of phone interviews. Key informants within each of those communities should provide sufficient updated rapid appraisals with a focus on HMS activities. Not listed are the communities of Puerto Rico and the U.S. Virgin Islands. These communities have received little attention and would benefit from rapid appraisals, although due to incomplete data from these regions and the time constraints of this project, it is unlikely that these communities will be profiled in this current project. The upcoming report, however, will provide a brief discussion of HMS activities and relevant social aspects of the U.S. Virgin Islands.

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Impact Assessment, Inc. 2004. Identifying Communities Associated with the Fishing Industry in Louisiana. La Jolla, California. (NOAA-NMFS-Contract WC133F-02-SE-0297).

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NMFS, 1999b. Amendment 1 to the Atlantic Billfish Fishery Management Plan. Silver Spring, MD. U.S. Department of Commerce, National Marine Fisheries Service, Highly Migratory Species Management Division.

NMFS, 2001. NMFS Operational Guidelines – Fishery Management Process: Appendix 2(g)**:** Guidelines for Assessment of the Social Impact of Fishery Management Actions. Silver Spring, MD: U.S. Department of Commerce, National Marine Fisheries Service. NMFS, 2003. Final Amendment 1 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks. Silver Spring, MD: U.S. Department of Commerce, National Marine Fisheries Service.

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Wilson, D., B.J. McCay, D. Estler, M. Perez-Lugo, J. LaMargue, S. Seminski, and A. Tomczuk. 1998. Social and Cultural Impact Assessment of the Highly Migratory Species Fishery Management Plan and the Amendment to the Atlantic Billfish Fisheries Management Plan. The Ecopolicy Center for Agriculture, Environmental, and Resource Issues, New Jersey Agricultural Experiment Station, Cook College, Rutgers, the State University of New Jersey (NOAA-NMFS-HMS contract report).

7. INTERNATIONAL TRADE AND FISH PROCESSING

Several regional fishery management organizations (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. United States participation in HMS related international trade programs, as well as a review of trade activity, is discussed in this section. This section also includes a review of the available information on the processing industry for Atlantic HMS species.

7.1 Overview of International Trade for Atlantic HMS

7.1.1 Trade Monitoring

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, such as sharks, are grouped together, which can limit the value of these data for fisheries management when species specific information is needed. These data are further limited since the ocean area of origin for each product is not distinguished. For example, the HTS code for Atlantic, Pacific, and even Indian Ocean bigeye tuna is the same.

Trade data for Atlantic HMS are of more use as a conservation tool when they indicate 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 information while monitoring international trade of bluefin tuna, swordfish, southern bluefin tuna, and frozen bigeye tuna. These 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. Copies of all trade monitoring documents associated with these programs may be 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 further detail below.

7.1.2 Bluefin Tuna Statistical Document

The trade of bluefin tuna is tracked internationally as a result of ICCAT's original recommendation to implement the Bluefin Statistical Document (BSD) program

(Recommendation 92-01). Japan's support for the program, as a major importer of bluefin tuna, is partially responsible for its success. In the United States, each bluefin tuna is tagged when documented, and for all nations, the BSD travels with each shipment until the final point of destination. This document is used by ICCAT and other participating nations to track both imports and exports of bluefin tuna. If bluefin tuna are exported from, or imported to, the United States, the document is submitted to NMFS as part of the monitoring program. Since 1997, NMFS has also received CBP data (derived from Entry Form 7501) on imports of fresh and frozen bluefin tuna and swordfish on a monthly basis. Comparison of these data with BSD data allows NMFS to identify shipments without BSDs in order to obtain missing data and enforce dealer reporting requirements. In 2003, ICCAT updated the BSD program to include the collection of farming related information on the BSD. In 2005, NMFS added a re-export certificate to the program and expanded it to include southern bluefin tuna as well. Data collected under the BSD program are discussed in Sections 7.2 and 7.3 addressing U.S. exports and imports of HMS.

In 2007, ICCAT recommendation 07-10 adopted a bluefin tuna catch document (BCD) program to replace the BSD program. The BCD program is intended to begin tracking Atlantic bluefin tuna at point of capture (for farming operations) or harvest. The BCD would then continue to track bluefin through farming, harvest, domestic trade (inside the European Union), and international trade. The BCD program is scheduled for implementation in July 2008.

7.1.3 Swordfish Statistical Document

In 2005, the ICCAT swordfish statistical document (SD) program was implemented by the United States, similar to the BSD program described above. The swordfish SD program is based on a 2001 ICCAT recommendation (01-22), and incorporates all of the prior functions of the COE, including the following: ensuring that all imported swordfish are greater than the minimum size of 14.9 kg (33 lb) dw, identifying the flag of the harvesting vessel, and indicating ocean area of origin. Similar to the BSD program, CBP data on swordfish imports is also used to obtain missing data and identify dealers that are not following the required reporting procedures. From 1999-2005, a certificate of eligibility was required for swordfish imports, which ensured that all imports were greater than the required minimum size.

7.1.4 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.

7.1.5 Dolphin-safe Tuna Imports (NOAA Form 370)

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 to the U.S. Customs and Border Protection 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 fresh 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 yellowfin tuna into the United States. The form is *not* required for fresh tuna, animal food, or canned petfood made from tuna. Further information is available on the website http://dolphinsafe.gov/.

7.1.6 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; it is not necessary to use the form available from NMFS or to submit the form to NMFS upon final disposition of the billfish.

7.2 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.

7.2.1 Atlantic and Pacific Bluefin Tuna Exports

As discussed in the previous section, NMFS collects detailed export data on Atlantic and Pacific bluefin tuna through the BSD program. Table 7.1 gives bluefin tuna export data for exports from the United States. Recent decreases in Atlantic BFT exports since 1999 could in part be a result of the growing U.S. market for high-quality fresh bluefin tuna meat. In 2006, exports also could have been impacted by a reduction in U.S. landings. BFT re-exports are listed separately in Table 7.7.

Table 7.1 United States Exports of Atlantic and Pacific Bluefin Tuna, 1999-2006. (Sources: NMFS BSD Program, NERO, and Census Bureau.)

Year	Atlantic Commercial Landings (NERO, MT)	Atlantic BFT Exports (BSD, MT)	Pacific BFT Exports (BSD, MT)	Total U.S. Exports (BSD, MT)	Total U.S. Exports (Census Bureau, MT)	Value of U.S. Exports (Census Bureau, $ million)
1999	876.0	735.6	95.7	831.3	1,183	9.37
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	572.2	2.1	574.3	998	11.36
2004	495.0	247.2	0.0	247.2	370	4.50
2005	492.0	245.7	125.1	370.8	458	5.31
2006	260.1	93.1	0.0	93.1	286	3.62

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

7.2.2 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. After bluefin tuna, albacore tuna accounts for the next most valuable tuna export from the United States (Table 7.2). Comparing the last five years, the amount and value of exported albacore was greatest for the year 2004. In general, the amount and value of albacore exports appears to have leveled off in recent years. During the time period covered by this table, the annual amount and value of frozen exports exceeded fresh exports for every year.

Table 7.2 Amount and Value of U.S. Exports of Albacore Tuna From All Ocean Areas, 1999-2006 (Census Bureau data) and U.S. Landings of North Atlantic Albacore Tuna (*2007 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)
1999	317	517	1.01	2,743	5.52	3,260	6.54
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	396	378	1.04	8,810	19.56	9,187	20.60

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 7.3 and Table 7.4 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 7.5), although yellowfin tuna exports decreased markedly in 2004. Export of fresh yellowfin product exceeded the value of frozen yellowfin product for all years except 2001. Fresh product exports were highest in 2002 and 2003. The amount and value of exported fresh and frozen skipjack tuna has varied over the six year period covered in Table 7.4, without any discernable trends. Exports and landings of skipjack in 1999 far exceeded values for the following five years.

Table 7.3 **Amount and Value of U.S. Exports of Yellowfin Tuna From All Ocean Areas, 1999-2006 (Census Bureau data) and U.S. Landings of Atlantic Yellowfin Tuna** (*2007 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)**
1999	7,569	947	2.09	390	.84	1337	2.93
2000	7,051	412	1.12	406	.76	819	1.89
2001	6,703	290	.71	834	1.45	1124	2.17
2002	5,646	1612	2.37	420	.81	2033	3.19
2003	7,685	1792	2.93	176	.68	1968	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	7,075	183	1.96	108	.37	291	2.32

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 7.4 **Amount and Value of U.S. Exports of Skipjack Tuna From All Ocean Areas, 1999-2006 (Census Bureau data) and U.S. Landings of West Atlantic Skipjack Tuna** (*2007 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)**
1999	152	88	.20	1092	.89	1,181	1.10
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

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 7.5. 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.

Table 7.5 **Amount and Value of U.S. Exports of Bigeye Tuna From All Ocean Areas, 1999-2006 (Census Bureau data) and U.S. Landings of Atlantic Bigeye Tuna** (*2007 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	987	223	1.69	76	.20	299	1.89

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.

7.2.3 Shark Exports

Export data for sharks is gathered by the Census Bureau, and includes trade data for sharks from any ocean area of origin. Shark exports are not categorized down 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 HTS 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 7.6 indicates the magnitude and value of shark exports by the United States from 1999 – 2006. The reduction in shark fin exports from 2001 to 2006 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 the result of the Shark Finning Prohibition Act, which was enacted in December of 2000 and implemented by final rule in February 2002.

Table 7.6 **Amount and Value of U.S. Shark Product Exports From 1999-2006.** (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)
1999	106	.91	8.54	270	.48	1.80	155	.46	2.97	532	1.86
2000	365	3.51	9.62	430	.78	1.82	345	.81	2.35	1140	5.10
2001	335	3.16	9.44	332	.54	1.64	634	2.34	3.69	1301	6.04
2002	123	3.46	28.00	968	1.47	1.52	982	2.34	2.38	2075	7.28
2003	45	4.03	87.79	837	1.31	1.57	592	1.34	2.28	1476	6.70

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)
2004	63	3.02	47.53	536	1.18	2.21	472	.98	2.09	1071	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	1597	6.17

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

7.2.4 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, re-export activity is a small fraction of export activity and well below the reference points of 1000 mt and/or one million dollars annually. Exceptions to this include fresh yellowfin tuna re-exports which were valued at $1.5 million in 2003 and fresh and frozen yellowfin valued at $1.1 million in 2002 (Census Bureau data). In 2004, dried shark fin re-exports reached a six year maximum value of $1.8 million (29 mt, down from 34 mt in 2003).

Bluefin tuna re-exports also reached a five year maximum in 2004, at 2,118 mt valued at $29.46 million (Census Bureau data), which exceeded the amount of bluefin exports for the year, for the first time in the history of the BSD program (K. Goldsmith, pers. com.). Further investigation into BSD program data found that the recent increases in bluefin re-exports reflects the growth of the Mexican farming/mariculture industry which exports product to the United States for re-export to Japan.

7.2.5 Summary of Atlantic HMS Exports

Nationally, the value of HMS exports (from all ocean areas combined) is dominated by tuna products. In 2006, fresh and frozen tuna products accounted for 13,644 mt dw or 1.2 percent of the 1,161,378 mt dw of fresh and frozen seafood products exported from the United States, as indicated in Fisheries of the United States, 2006. The value of these HMS products accounted for $49.07 million, out of a national total of $3.3 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 2003 were reported in the 2004 U.S. National Report to ICCAT as 448 mt (Table 7.2). National trade data show that over 10,000 mt of albacore were exported, which indicates that the majority of albacore exports were Pacific Ocean product. Trade tracking programs such

as the bluefin tuna, swordfish, and bigeye tuna statistical document programs are much more useful for describing the international disposition of Atlantic HMS.

7.3 U.S. Imports of Atlantic HMS

All import shipments must be reported to the U.S. Bureau of Customs and Border Protection. "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 statistical document programs. U.S. Census Bureau import data are used by NMFS as well.

7.3.1 Bluefin Tuna Imports

United States imports and re-exports of bluefin tuna for 1999 through 2006, as reported through both CBP and BSD program data, are shown in Table 7.7. The difference in import numbers between the CBP and BSD data may be explained by a lack of knowledge and compliance with the BSD program by importers, especially those on the Pacific coast.

The rise in popularity of sashimi in the United States has generated increased imports of bluefin tuna, and dealers are reporting an expanded domestic market for both locally-caught and imported raw tuna. As discussed previously, the large amount of re-exports in the last several years resulted from the increase in importation of farmed bluefin from Mexico and re-exportation to Japan.

Table 7.7 Imports of Atlantic and Pacific Bluefin Tuna Into the United States: 1999-2006. (Sources: NMFS BSD program and CBP data.)

YEAR	NMFS BSD Program		U.S. CBP Data	
	Imports (MT)	Re-exports (MT)	Imports (MT)	VALUE (US$ million)
1999	411.9	16.6	558.6	3.02
2000	361.9	99.3	453.4	7.67
2001	512.9	7.0	532.3	8.21
2002	529.3	94.1	605.0	9.75
2003	649.9	691.0	780.3	11.67
2004	823.4	684.8	886.1	15.25
2005	966.1	496.0	1064.0	19.96
2006	791.5	18.5	865.2	17.05

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 bluefin tuna trade was included in figures for Atlantic and Pacific bluefin tuna trade prior to 2002.

7.3.2 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 included under general tuna imports. The total amount and value of bigeye tuna imports have been decreasing over the last three years, as shown in Table 7.8.

Table 7.8 Imports of Bigeye Tuna Into the United States From All Ocean Areas Combined: 2001-2006. (Source: Census Bureau data.)

Year	Fresh		Frozen		Total for all Imports	
	MT	US$ (million)	MT	US$ (million)	MT	US$ (million)
2001	4684	25.70	135	.32	4,820	26.02
2002	6312	39.84	319	.70	6,632	40.55
2003	7312	51.01	560	1.48	7,872	52.49
2004	6752	49.10	1175	2.62	7,928	51.73
2005	5040	38.18	1539	3.33	6,579	41.51
2006	4920	36.55	1522.6	3.15	6,442	39.70

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 7.9. 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 of yellowfin imports has increased gradually from 1999 – 2006. The total annual amount of product imported has remained fairly consistent, with a slight dip in 2000 and a slight rise in 2005 and 2006.

Table 7.9 Imports of Yellowfin Tuna Into the United States From All Ocean Areas Combined: 1999-2006. (Source: Census Bureau data.)

Year	Fresh		Frozen		Total for all Imports	
	MT	US$ (million)	MT	US$ (million)	MT	US$ (million)
1999	11,756	63.04	9411	24.90	21,168	87.94
2000	13,153	70.27	3290	18.73	16,443	89.00
2001	15,563	85.50	3967	23.45	19,530	108.95
2002	15,966	95.22	4619	29.31	20,585	124.53
2003	15,299	94.03	5579	39.67	20,878	133.71
2004	15,624	99.41	5833	35.35	21,457	134.96
2005	17,064	116.58	6002	46.89	23,066	163.47

Year	Fresh		Frozen		Total for all Imports	
	MT	US$ (million)	MT	US$ (million)	MT	US$ (million)
2006	17,792	126.47	5442	42.78	23,234	169.25

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

The amount of fresh albacore imports from all ocean areas has generally been declining since 2002 while imports of frozen product have decreased dramatically over the last eight years, with the greatest reduction occurring between 2001 and 2002 (Table 7.10). In 1999, albacore imports were valued at $144 million while in 2006 the value dropped to approximately $5 million. (Products in airtight containers are not included in these data.)

Table 7.10 Imports of Albacore Tuna into the United States From All Ocean Areas Combined: 1999-2006. (Source: Census Bureau data.)

Year	Fresh		Frozen		Total for all Imports	
	MT	US$ (million)	MT	US$ (million)	MT	US$ (million)
1999	1776	5.39	63,284	139.50	65,060	144.89
2000	1843	6.42	51,001	127.33	52,845	133.76
2001	1107	3.85	40,428	105.58	41,536	109.43
2002	1296	4.81	11,903	24.49	13,200	29.31
2003	1062	4.11	12,569	25.90	13,632	30.02
2004	1004	3.12	4943	11.67	5947	14.80
2005	706	2.38	1016	2.96	1722	5.34
2006	876	3.54	667	1.71	1543	5.25

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 7.11). Like albacore tuna, the amount and value of skipjack imports have also decreased dramatically since 1999, but have rebounded recently. The amount of product imported fell from over 8,000 mt dw in 1999 to 112 mt dw in 2004, but have climbed back up to 1,023 mt dw in 2006. Likewise, the value of these products during this time period fell from $6.3 million to $0.98 million.

Table 7.11 Imports of Skipjack Tuna From All Ocean Areas Combined Into the United States: 1999-2006. (Source: U.S. Census Bureau data.)

Year	Fresh		Frozen		Total for all Imports	
	MT	US$ (million)	MT	US$ (million)	MT	US$ (million)

Year	Fresh		Frozen		Total for all Imports	
	MT	US$ (million)	MT	US$ (million)	MT	US$ (million)
1999	0	0	8,238	6.30	8,238	6.30
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

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

7.3.3 Swordfish Imports

Table 7.12 summarizes swordfish import data collected by NMFS' Swordfish Import Monitoring Program for the 2004 calendar year. According to these data, most swordfish imports were Pacific Ocean product. For Atlantic product, most imports came from Brazil (48 percent), followed by Canada (22 percent) and Uruguay (16 percent). 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 7.12 Swordfish Import Data for the 2004 Calendar Year Collected Under the NMFS Swordfish Import Monitoring Program.

Flag of Harvesting Vessel	Ocean Area of Origin				TOTAL (mt dw)
	Atlantic (mt dw)	Pacific (mt dw)	Indian (mt dw)	Not Provided (mt dw)	
Not Provided	0.00	9.12	0.00	11.10	20.22
Australia	0.00	111.94	6.59	0.00	118.53
Barbados	0.08	0.00	0.00	0.00	0.08
Belize	0.00	6.10	0.00	0.00	6.10
Bolivia	12.42	0.00	0.00	0.00	12.42
Brazil	721.11	0.00	0.00	0.00	721.11
Canada	328.26	0.00	0.00	0.00	328.26
Chile	0.00	442.38	0.00	0.00	442.38
China	0.00	0.00	58.91	0.00	58.91
Cook Islands	0.00	9.85	0.00	0.00	9.85
Costa Rica	0.00	242.92	0.00	0.00	242.92
Ecuador	0.00	133.65	0.00	0.00	133.65
El Salvador	0.00	1.80	0.00	0.00	1.80

Flag of Harvesting Vessel	Ocean Area of Origin				TOTAL (mt dw)
	Atlantic (mt dw)	Pacific (mt dw)	Indian (mt dw)	Not Provided (mt dw)	
Fiji Islands	0.00	33.62	0.00	0.00	33.62
Georgia	0.00	4.28	0.00	0.00	4.28
Grenada	33.48	0.00	0.00	0.00	33.48
Indonesia	0.00	0.00	16.54	0.00	16.54
Malaysia	0.00	17.49	73.19	0.00	90.68
Mexico	0.00	249.56	0.00	0.00	249.56
New Zealand	0.00	147.88	0.00	0.00	147.88
Nicaragua	0.00	0.25	0.00	0.00	0.25
Panama	0.00	649.75	0.00	0.00	649.75
Philippines	0.00	4.77	0.00	0.00	4.77
Singapore	0.00	0.00	33.58	0.00	33.58
South Africa	10.23	0.00	53.19	0.00	63.42
Taiwan	59.31	323.81	1,073.33	0.00	1,456.44
Tonga	0.00	7.81	0.00	0.00	7.81
Trinidad & Tobago	36.44	0.00	0.00	0.00	36.44
Uruguay	234.59	0.00	0.00	0.00	234.59
Venezuela	64.51	0.00	0.00	0.00	64.51
Vietnam	0.00	270.15	0.00	0.00	270.15
Total Imports Reported by COEs	1500.4	2667.1	1315.3	11.1	5494.0
Total Imports Reported by U.S. Customs & Border Patrol					11,265.00
Total Imports Not Reported by COEs					5771.03

COE Data as of 8/18/05

Table 7.13 indicates the amount and value of swordfish products imported by the United States from 1999 – 2006, as recorded by the U.S. Census Bureau, for all ocean areas combined. The amount of each product imported per year and annual totals for product and value were fairly consistent over the past three years.

Table 7.13 Imported Swordfish Products by Year: 1999-2006. (Source: Census Bureau data.)

Year	Fresh (MT)		Frozen (MT)			Total for all Imports	
	Steaks	Other	Fillets	Steaks	Other	MT	US$ (million)
1999	81	8595	4377	401	386	13,842	71.70
2000	161	8626	4833	524	167	14,314	85.57
2001	71	8982	3814	710	119	13,697	81.89
2002	195	9726	4156	956	677	15,711	88.26
2003	147	8079	3929	433	560	13,150	75.62

Year	Fresh (MT)		Frozen (MT)			Total for all Imports	
	Steaks	Other	Fillets	Steaks	Other	MT	US$ (million)
2004	157	6568	3261	387	351	10,726	70.95
2005	172	6388	2957	367	304	10,187	77.17
2006	77	6830	2875	351	201	10,334	75.63

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

7.3.4 Shark Imports

Similar to tuna imports other than bluefin tuna and frozen bigeye tuna, NMFS does not require 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 7.14 summarizes Census Bureau data on shark imports for 1999 through 2006. Imports of fresh shark products and shark fins have decreased significantly since 1999. The 2004 ICCAT recommendation addressing the practice of shark finning may result in a further reduction of imports in the near future. From 1999 to 2006, the overall annual amount and value of shark imports has fluctuated.

Table 7.14 U.S. Imports of Shark Products From All Ocean Areas Combined: 1999-2006.
(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)
1999	59	2.10	1,095	2.03	105	.62	1,260	4.76
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

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)
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

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

7.3.5 Summary of U.S. Imports of Atlantic HMS

The import data in this section show that many HMS species are part of a valuable import market. As discussed previously regarding exports, most data documenting imports include products harvested from many ocean areas, not just the Atlantic Ocean. However, the statistical document programs for bluefin tuna, swordfish, and frozen bigeye tuna provide information specifically about product harvested from the Atlantic Ocean and imported into the United States.

7.4 The Use of Trade Data for Conservation 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 bluefin tuna, 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 F of these species, which improves scientific stock assessments. In addition, these data can 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 numerous occasions, ICCAT has adopted recommendations to address the lack of compliance with management programs for the bluefin tuna, 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 bluefin tuna rebuilding program, and resulted in a 1996 ICCAT recommendation for sanctions against the import of bluefin tuna from these countries (Table 7.15). 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 bluefin tuna. The bluefin sanction for Belize was lifted by ICCAT in 2002.

In another example, import data from 1997–1999 revealed significant Atlantic bluefin tuna 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 bluefin tuna 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 7.15, most of the trade sanctions recommended by ICCAT since 1996 have been lifted. In fact, only trade sanctions for Bolivia and Georgia remain in effect. Thus, the imposition of trade sanctions seems to be an effective measure for ensuring that countries involved in international trade operate in a manner consistent with ICCAT recommended conservation programs. As illustrated above, the data obtained by monitoring international trade in tuna and tuna like species is instrumental in the development of ICCAT trade restrictions. Current discussions at ICCAT include expanding the statistical document program to a catch documentation scheme, which may better assist in preventing IUU fishing.

Table 7.15 Summary and Current Status of ICCAT Recommended Trade Sanctions for Bluefin Tuna, 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	In effect	In effect
Sierra Leone	Bluefin	2002	2004	2004	2005
	Bigeye	2002	2004	2004	2005
	Swordfish	2002	2004	2004	2005
Georgia	Bigeye	2003	2004	In effect	In effect

7.5 Overview of the Processing Industry for Atlantic HMS

Understanding the harvesting and processing sectors is essential when analyzing world trade in highly migratory fish species. The processing related entities that depend on Atlantic HMS are as diverse as the species and products themselves. Processing techniques range from the simple dressing and icing of swordfish at sea, to elaborate

grading and processing schemes for bluefin tuna, to processing shark fins. Like all other seafood, HMS are perishable and may pose health hazards if not handled properly. Products range from those having a long shelf-life, such as swordfish, to highly perishable species like yellowfin tuna. Improperly handled yellowfin tuna can produce histamine, swordfish and sharks may contain high levels of mercury, and shark meat requires careful handling due to the high concentrations of urea in the body of the shark. Processing companies are aware of these characteristics and their costs of doing business vary accordingly to protect consumers. The Food and Drug Administration (FDA) works closely with NOAA Office of Law Enforcement to monitor incoming shipments of seafood, including highly migratory species.

FDA's Seafood Hazard Analysis Critical Control Point (HACCP) program implemented regulations that require processors of fish and fishery products to operate preventive control systems to ensure human food safety. Among other things, processors must effectively maintain the safety of their products, systematically monitor the operation of critical control points to ensure that they are working as they should, and keep records of the results of that monitoring. Processors must also develop written HACCP plans that describe the details and operation of their HACCP systems. Each processor may tailor its HACCP system to meet its own circumstances. The best way for FDA to determine whether a processor is effectively operating a HACCP system is by inspecting the processor. Federal review of monitoring and other records generated by the HACCP system is a critical component of an inspection because it allows the inspector to match records against the practices and conditions being observed in the plant and it discourages fraud. NMFS works closely with the FDA, in support of the HACCP program.

Just as HACCP plans vary between processors, transportation of the seafood to market also varies widely from the direct domestic sale of some shark or swordfish meat by a fisherman to a restaurant (carried by truck) to the quick, and sometimes complicated, export of bluefin tuna from fisherman to dealer to broker to the Japanese auction (carried by a commercial airline carrier). Frozen swordfish and tunas are often brought to the United States by overseas shipping companies and sharks and other products may be exported from the United States, processed overseas, and imported in a final product form.

It is unknown how many U.S. companies economically depend on HMS fisheries, other than the registered dealers who buy fish directly from U.S. fishermen and/or who import bluefin tuna or swordfish. The proportion of those companies that depend solely on Atlantic HMS versus those that handle other seafood and/or products is also unknown. This section provides a summary of the most recent trade data that NMFS has analyzed, as well as a brief description of the processing and trade industries employed in delivering Atlantic HMS from the ocean to the plate.

7.5.1 Processing and Wholesale Sectors

NMFS has limited quantitative information on the processing sector, including the amount of HMS products sold in processed forms. In addition, knowledge regarding the utilization of Atlantic HMS is largely limited to the major or most valuable product forms, such as export quality bluefin tuna.

Much of the processing of export-quality Atlantic bluefin tuna occurs onboard the vessel harvesting the fish, which serves to maximize fish quality. Bluefin are gutted and bled, and protected from the heat and sunlight by immersion in ice or an icy brine. Upon landing, bluefin are immediately graded and prepared for export to Japan's fresh fish market. The fish are either refrigerated or exported immediately in insulated crates or "coffins" filled with ice or icepacks.

Other Atlantic tunas, especially bigeye tuna, are frequently shipped fresh to Japan in dressed form. Swordfish are sold fresh and frozen in dressed form and as processed products (e.g., steaks and fillets). The utilization of sharks is also not well known since trade statistics frequently do not indicate product forms such as skins and leather, jaws, fishmeal and fertilizer, liver oil, and cartilage (Rose, 1996). Domestically-landed sandbar and blacktip shark meat may be sold to supermarkets and processors of frozen fish products. NMFS continues to work with industry to collect information specific to U.S. and foreign processing of Atlantic HMS to better track markets, conserve stocks, and manage sustainable fisheries.

The U.S. processing and wholesale sectors are dependent upon both U.S. and international HMS fisheries. Individuals involved in these businesses buy the seafood, cut it into pieces that transform it into a consumer product, and then sell it to restaurants or retail outlets. Employment varies widely among processing firms. Often employment is seasonal unless the firms also process imported seafood or a wide range of domestic seafood. The majority of firms handles other types of seafood and is not solely dependent on HMS. Other participants in the commercial trade sector include brokers, freight forwarders, and carriers (primarily commercial airlines, trucking, and shipping companies). Swordfish, tunas, and sharks are important commodities on world markets, generating significant amounts in export earnings in recent years.

NMFS has recently observed that many seafood dealers that buy and sell HMS and other seafood products have expanded their operations into internet-powered trading platforms specifically designed to meet the needs of other seafood professionals. Through these platforms, interested parties can conduct very detailed negotiations with many trading partners simultaneously. Buyers and sellers can bargain over all relevant elements of a market transaction (not just price) and can specify the product needed to buy or sell in detail, using seafood-specific terminology. The platforms are purportedly very easy to use because they mimic the pattern of traditional negotiations in the seafood industry. NMFS expects that the use of the internet will continue to change the way HMS trade occurs in the future.

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8. BYCATCH, INCIDENTAL CATCH, AND PROTECTED SPECIES

Bycatch in commercial and recreational fisheries has become 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 become 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.

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 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.

8.1 Bycatch Reduction and the Magnuson-Stevens Act

The Magnuson-Stevens Act defines bycatch as fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic and regulatory discards. Fish is defined as finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds. Seabirds and marine mammals are therefore not considered bycatch under the MSA but are examined as incidental catch. Bycatch does not include fish released alive under a recreational catch-and-release fishery management program.

National Standard 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 bluefin tuna caught and released 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 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.

8.1.1 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. Descriptions of the methodologies to report bycatch in HMS fisheries can be found in Section 3.8.2 of the Consolidated HMS FMP (NMFS 2006a).

8.1.2 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, and continued support of data collection and research relating to bycatch (Table 8.1). Additional details on bycatch and bycatch reduction measures can be found in Section 3.5 of the 1999 HMS FMP (NMFS, 1999), in Regulatory Amendment 1 to the 1999 HMS FMP (NMFS, 2000), in Regulatory Adjustment 2 to the 1999 HMS FMP (NMFS, 2002), and in Amendment 1 to the 1999 HMS FMP (NMFS, 2003). In addition, an HMS Bycatch Reduction Implementation Plan was developed in late 2003 which identifies 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.

8.1.3 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.

Pelagic longline discards of swordfish, billfish, large coastal sharks and pelagic sharks are estimated using data from NMFS observer reports and pelagic logbook reports. Shark bottom longline discards have been estimated using logbook data and observer reports as well. Shark gillnet discards can be estimated using logbook data.

Table 8.1 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.

Fishery/Gear Type	Bycatch Species	MMPA Category	ESA Requirements	Bycatch Data Collection	Management Measures
Pelagic Longline	Bluefin tuna Billfish Undersize target species Marine mammals Sea turtles Seabirds Non-target finfish Prohibited shark species Large Coastal Shark species after closure	Category I	Jeopardy finding (2000); Reasonable and Prudent Alternative (RPA) implemented 2001; Jeopardy finding and RPA implementation (2004)	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); VMS (2003); circle hook requirement (2004); mandatory safe handling and release workshops (2006)
Shark Bottom Longline	Prohibited shark species Target species after closure Sea turtles Smalltooth sawfish 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)
Shark Gillnet	Prohibited shark species Sea turtles Marine mammals Non-target finfish Smalltooth sawfish	Category II	ITS, Terms & Conditions, RPMs	Permit requirement (1993); logbook requirement (1993); observer coverage (1994)	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); shark identification workshops for dealers (2007)

Fishery/Gear Type	Bycatch Species	MMPA Category	ESA Requirements	Bycatch Data Collection	Management Measures
BFT Purse Seine	Undersize target species Non-target finfish	Category III	ITS, Terms & Conditions	Permit requirement (1982); observer requirement (1996, 2001 only); EFPs (2002, 2003 only)	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 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 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

NMFS has not estimated swordfish harpoon bycatch. NMFS has limited historical observer data on harpooned swordfish from driftnet trips in which harpoons were sometimes used. However, swordfish harpoon fishermen are required to submit pelagic logbooks and NMFS will examine those data for use in estimating bycatch. NMFS has not estimated bluefin tuna harpoon bycatch estimates 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 bluefin tuna may be captured.

There is concern about the accuracy of discard estimates in the recreational rod and reel fishery for HMS due to the low number of observations by the Large Pelagic Survey and the MRFSS. These bycatch estimates are not currently available, except for bluefin tuna. For some species, encounters are considered rare events, which might result in bycatch estimates with considerable uncertainty. Increased numbers of intercepts (interviews with fishermen) have been collected since 2002 due to improvements in survey methodology. NMFS is planning to devote more effort into developing bycatch estimates and estimates of uncertainty from the recreational fishery. These data will be included in future SAFE Reports. Bycatch estimates may also be examined using tournament data for the recreational fishery.

8.1.4 Bycatch Mortality

The reduction of bycatch mortality is an important component of National Standard 9. Physical injury to an animal 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 bycatch 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 I) to ICCAT on mortality estimates (dead discards). These data are included in the SAFE Reports and Annual Reports of the United States to ICCAT to evaluate bycatch trends in HMS fisheries (NMFS, 2007).

8.2 Interactions of HMS Fishing Gears with Protected Species

This section examines the interaction between protected species and Atlantic HMS fisheries. As a point of clarification, interactions are different than bycatch. Interactions take place between fishing gears and marine mammals, sea turtles, and seabirds while bycatch consists of discards of fish. Following a brief review of the three acts (Marine Mammal Protection Act, Endangered Species Act, and Migratory Bird Treaty Act) 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).

8.2.1 Interactions and the Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA), as amended, is one of the principal Federal statutes that guide 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 2006 and draft 2007 stock assessment reports can be obtained on the web at: http://www.nmfs.noaa.gov/prot_res/pr/sars/

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
3. Category III fisheries are those with remote likelihood of serious injury or mortality to marine mammals

The final 2008 MMPA LOF was published on November 27, 2007 (72 FR 66048). The Atlantic Ocean, Caribbean, and Gulf of Mexico large pelagic longline 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 bottom longline; 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. 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).

8.2.2 Interactions and the Endangered Species Act

The Endangered Species Act of 1973 (ESA), 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 U.S. Fish and Wildlife Service (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.*

8.2.2.1 Sea Turtles

NMFS has taken several steps in the past few years to reduce sea turtle bycatch and bycatch mortality in domestic longline fisheries. On March 30, 2001, NMFS implemented via

interim final rule requirements for U.S. flagged vessels with pelagic longline gear on board to have line clippers and dipnets to remove gear on incidentally captured sea turtles (66 FR 17370). Specific handling and release guidelines designed to minimize injury to sea turtles were also implemented. NMFS published a final report which provides the detailed guidelines and protocols (Epperly *et al*., 2004) and a copy can be found at http://www.nmfs.noaa.gov/sfa/hms/Protected%20Resources/TM_524.pdf . NMFS published a final rule in July 2004 implementing mandatory circle hook use for pelagic longline gear along with bait restrictions and required certain safe handling and release gear (69 FR 40734).

Internationally, the United States is pursuing sea turtle conservation through international, regional, and bilateral organizations such as ICCAT, the Asia Pacific Fisheries Commission, and FAO Committee on Fisheries (COFI). The United States intends to provide a summary report to FAO for distribution to its members on bycatch of sea turtles in U.S. longline fisheries and the research findings as well as recommendations to address the issue. At the 24th session of COFI held in 2001, the United States distributed a concept paper for an international technical experts meeting to evaluate existing information on turtle bycatch, to facilitate and standardize collection of data, to exchange information on research, and to identify and consider solutions to reduce turtle bycatch. COFI agreed that an international technical meeting could be useful despite the lack of agreement on the specific scope of that meeting. The United States has developed a prospectus for a technical workshop to address sea turtle bycatch in longline fisheries as a first step. Other gear-specific international workshops may be considered in the future such as the circle hook workshop scheduled for 2008.

8.2.2.2 Smalltooth sawfish

On April 1, 2003, NMFS listed smalltooth sawfish as an endangered species (68 FR 15674) under the ESA. After reviewing the best scientific and commercial information, the status review team determined that the U.S. DPS (Distinct Population Segment) 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) over utilization 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.

Smalltooth sawfish takes in the shark gillnet fishery are rare given the 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 Biological Opinion (BiOp) estimates that one incidental capture of a sawfish (released alive) over the next five years, will occur as a result of the use of gillnets in this fishery (NMFS, 2003a).

Smalltooth sawfish have been observed caught (eight known interactions, seven released alive, one released in unknown condition) in shark bottom longline fisheries from 1994 through

2004 (NMFS, 2003a). Based on these observations, expanded sawfish take estimates for 1994-2002 were developed for the shark bottom longline fishery (NMFS, 2003a). A total of 466 sawfish were estimated to have been taken in this fishery 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.

8.2.2.3 Interactions with Seabirds

Observer data from 1992 through 2005 indicate that seabird bycatch is relatively low in the U.S. Atlantic pelagic longline fishery (NMFS, 2006b). Since 1992, a total of 132 seabird interactions have been observed, with 93 observed killed (70.5 percent). In 2005, there were 115 active U.S. pelagic longline vessels fishing for swordfish in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea that reportedly set approximately 5.9 million hooks. A total of four seabirds were observed taken. Detailed analysis of seabird bycatch in the U.S. pelagic longline fishery can be found in the 2007Annual Report of the U.S. to ICCAT (NMFS, 2007).

Bycatch of seabirds in the shark bottom longline fishery has been virtually non-existent. A single pelican has been observed killed from 1994 through 2005. Expanded estimates of seabird bycatch or catch rates have not been calculated for the bottom longline fishery.

8.2.3 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 HMS FMP (NMFS, 1999), in Regulatory Amendment 1 to the 1999 HMS FMP (NMFS, 2000), in Regulatory Adjustment 2 to the 1999 HMS FMP (NMFS, 2002), in Amendment 1 to the 1999 HMS FMP (NMFS, 2003), and in the June 2004 Final Rule for Reduction of Sea Turtle Bycatch and Bycatch Mortality in the Atlantic Pelagic Longline Fishery (NMFS, 2004). 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.

8.3 Bycatch of HMS in Other Non-HMS 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 are being examined 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. NMFS supports development of an interstate management plan for coastal sharks by the Atlantic States Marine Fisheries Commission (ASMFC) to protect sharks caught

incidentally in state-managed fisheries. NMFS has requested assistance from the ASMFC, the Gulf States Marine Fisheries Commission (GSMFC), and Atlantic and Gulf Regional Fishery Management Councils in identifying potential sources of bycatch of finetooth sharks in state waters fisheries or other fisheries outside the jurisdiction of this FMP.

8.3.1 Squid Mid-Water Trawl

U.S. mid-water trawl fishermen landed 10.8 mt ww of yellowfin tuna, skipjack tuna, albacore tuna, bigeye tuna, and swordfish in 2005 incidental to the squid, mackerel, and butterfish trawl fishery (Table 8.2). Bycatch of HMS in other trawl fisheries may be included as a portion of the overall reported trawl landings in Table 8.2. Swordfish landings increased but remain at a low level relative to the directed fishery landings. A retention limit of fifteen swordfish per trip allows squid trawl fishermen with swordfish limited access permits (incidental permits) to land some of the swordfish that may be encountered, although regulatory discards may still occur.

Table 8.2 Atlantic HMS Landed (mt ww) Incidental to Trawl Fisheries, 1999 – 2005. (Source: NMFS, 2007.)

Species	1999	2000	2001	2002	2003	2004	2005
Yellowfin tuna	4.1	1.76	2.7	0.3	2	1	0.2
Skipjack Tuna	1.0	<0.05	0.2	<0.05	0.5	0.2	0.06
Bigeye Tuna	1.2	1.7	0.4	0.5	<0.05	0.3	0.6
Albacore	0.4	<0.05	0.0	0.3	<0.05	2.6	1.7
Swordfish	7.5	10.9	2.5	3.9	6.0	7.6	8.2
Total	14.2	14.43	5.8	4.8	8.6	11.7	10.8

8.3.2 Menhaden Purse Seine Fishery

In the Gulf of Mexico menhaden purse seine fishery, sharks were caught incidentally in approximately 30 percent of the purse seine sets observed (de Silva *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. 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. Recent estimates of large coastal sharks discarded in this fishery are approximately 20,000 individuals (NMFS, 2006b).

8.3.3 Shrimp Trawl Fishery

Shark bycatch in the shrimp trawl fishery consists mainly of sharks too small to be highly valued in the commercial market (Table 8.3). As a result, few sharks are retained. However, requirements for turtle excluder devices in this fishery have probably resulted in less bycatch because sharks are physically excluded from entering the gear.

Table 8.3 **Estimates of (Number of Fish) of Blacknose, Bonnethead, Atlantic Sharpnose, and Finetooth Sharks in the U.S. South Atlantic Shrimp Trawl Fishery. (**Source: NMFS, 2007.)

Year	Blacknose	Bonnethead	Atlantic sharpnose	Finetooth
1995	5,068	27,032	71,287	0
1996	4,437	53,496	56,197	0
1997	7,330	46,596	36,745	0
1998	4,285	18,412	57,209	0
1999	3,452	30,357	34,744	0
2000	3,967	15,318	60,202	0
2001	5,732	29,430	35,624	0
2002	3,193	34,159	71,365	0
2003	6,821	24,192	32,951	0
2004	8,240	50,689	19,356	0
2005	2,586	12,529	36,380	0

Bycatch of the SCS complex in the Gulf of Mexico shrimp trawl fishery consists mainly of Atlantic sharpnose and bonnethead sharks (Table 8.4) (NMFS, 2007). Finetooth sharks were added as a select species in shrimp trawl observer program to help determine if this fishery has bycatch of finetooth sharks as well.

Table 8.4 **Estimates of (Number of Fish) of Blacknose, Bonnethead, Atlantic Sharpnose, and Finetooth Sharks in the U.S. Gulf of Mexico Shrimp Trawl Fishery, 1995-2005.** (Source: NMFS, 2007.)

Year	Blacknose	Bonnethead	Atl. Sharpnose	Finetooth
1995	40,316	215,025	567,054	0
1996	35,295	425,538	446,999	0
1997	58,309	370,649	292,293	0
1998	34,082	146,640	455,072	0
1999	27,461	241,472	276,374	0
2000	31,556	121,846	478,883	0
2001	45,593	234,102	283,371	0
2002	25,400	271,715	567,679	0
2003	54,258	192,434	262,108	0
2004	65,546	403,209	153,970	0
2005	20,568	99,659	289,384	0

8.3.4 Southeast Gillnet Fishery

Gillnet fisheries operating in the South Atlantic, particularly off Florida, have been shown to result in the bycatch of various species of sharks. These fisheries are primarily targeting Spanish mackerel and whiting (kingfish). Vessels participating in these fisheries either

have a mackerel permit and a commercial shark permit which allows retention and landing of sharks, or may be operating in an unmanaged fishery (e.g., whiting) that requires no permit at this time. Vessels operating in these fisheries and holding a federal permit are required to file trip reports (Coastal Fisheries Logbook). Preliminary data from observed gillnet trips not targeting sharks indicate that Atlantic sharpnose, bonnethead, blacktip, finetooth, scalloped hammerhead, blacknose, spinner and tiger sharks were caught (Carlson and Bethea, 2006). Expanding observer coverage in South Atlantic gillnet fisheries that are landing sharks could provide additional data on the extent of the bycatch of HMS species in these fisheries and thereby improve the stock assessments for these species.

8.4 Effectiveness of Existing Time/Area Closures in Reducing Bycatch

During the past several years, NMFS has implemented several time/area closures in the Atlantic Ocean and Gulf of Mexico for the pelagic longline (PLL) fishery to reduce discards and bycatch of a number of species (juvenile swordfish, bluefin tuna, billfish, sea turtles, etc.). A detailed analysis of the effectiveness of the time/area closures was conducted during the development of the Consolidated HMS FMP (NMFS, 2006a). The continued decline in reported effort (hooks set) indicates a further contraction of the PLL fleet caused by a number of factors such as regulations (time/area restrictions, gear modifications), economics, and weather (2005 hurricanes). These factors make it difficult to accurately assess the impacts of the time/area closures alone. Continued research into the effectiveness of recent mandatory gear modifications is required to accurately assess the effectiveness of these closures and their utility as future bycatch reduction tools. The reported catch and bycatch of selected species or species groups by the PLL fishery for 1995-2006, are listed in Tables 8.5 and 8.6**.**

Table 8.5. Reported Catch (Kept) and Discards From the U.S. Pelagic Longline Fishery (Numbers of Fish), 1995-2006. (Source: PLL Logbook)

Year	Hooks Set	Swordfish Kept	Swordfish Discards	Bluefin Tuna Kept	Bluefin Tuna Discards	Yellowfin Tuna Kept	Yellowfin Tuna Discards	Bigeye Tuna Kept	Bigeye Tuna Discards	BAYS Kept	BAYS Discards
1995	10184577	73036	29835	252	2894	83536	2980	22519	1326	120639	5164
1996	10393702	73764	24380	203	1716	66657	2448	17402	1169	89431	4001
1997	9674513	69222	20555	207	706	76211	1869	21985	1618	105553	4264
1998	8031333	70627	23345	237	1321	55507	2710	19324	876	82572	4018
1999	7893597	67544	20656	270	604	85307	2889	22615	906	116306	4389
2000	8021874	63535	16706	236	738	73205	1772	13890	348	95294	2968
2001	7742247	49236	14448	183	348	53751	1811	18976	559	82997	3806
2002	7229628	50439	13182	178	593	59758	1655	14056	277	80749	2599
2003	7120383	52838	12089	275	881	51988	2015	7539	348	64601	2802
2004	7325950	46950	10704	476	1031	64128	1736	8266	486	77989	3452
2005	5922566	41239	11158	376	766	43833	1316	8383	369	57237	2545
2006	5662011	38241	8900	261	833	55821	1426	12491	257	73058	2865

Table 8.6. Reported Catch (Kept) and Discards From the U.S. Pelagic Longline Fishery (Numbers of Fish), 1995-2006. (Source: PLL Logbook)

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	Turtle Interactions
1995	5777	90352	25630	8265	72767	4182	5554	442	2876	3158	1171	432	1128
1996	5564	85468	20904	10296	38330	935	3875	541	3146	2599	1456	565	494
1997	5110	82022	13746	7869	63530	1204	4787	91	2309	2436	1765	384	267
1998	3731	45261	6458	5577	23643	299	5445	305	1301	1511	850	103	890
1999	2852	28995	6375	5477	31960	321	5285	128	1253	1971	1411	151	632
2000	3068	28048	7758	6727	29272	294	4232	48	1163	1286	1106	79	271
2001	3511	23954	6510	4892	27914	329	3084	62	659	874	358	142	421
2002	3071	23325	4077	3968	30559	185	4223	33	1181	1449	386	161	467
2003	3129	21771	5332	4882	29609	452	4020	126	606	813	280	114	399
2004	3460	25414	2304	5144	39561	295	4674	35	713	1060	425	172	370
2005	3150	21560	3365	5881	25709	556	3360	280	569	990	367	155	154
2006	2098	24113	1768	5326	25658	1041	3608	100	439	557	277	142	128

8.5 Evaluation of Other Bycatch Reduction Measures

NMFS continues to monitor and evaluate bycatch in HMS fisheries through direct enumeration (e.g., pelagic and bottom longline observer programs, shark gillnet observer program), evaluation of management measures (e.g., closed areas, trip limits, gear modifications, etc.), and vessel monitoring systems (VMS).

The following section provides a review of additional management measures or issues that may address bycatch reduction:

- Atlantic Large Whale Take Reduction Plan (ALWTRP)

NMFS requires 100 percent observer coverage during right whale calving season (November 15 – March 31) and 33 percent coverage outside the right whale calving season (April 1 – November 14). Observers were placed on shark gillnet vessels during 2005-06 and covered 84 strikenet, 35 driftnet, and 249 sink gillnet sets during and outside of the right whale calving season (Carlson and Bethea, 2007). No marine mammals were observed caught in either year. A total of 10 sea turtles (nine loggerhead, one leatherback) were observed caught. Five sea turtles (four loggerhead, one leatherback) were taken in drift gillnet sets, four loggerheads were taken in strikenet sets and one loggerhead was taken in a sink gillnet set.

- Atlantic Bottlenose Dolphin Take Reduction Team

NMFS published a final rule on April 22, 2006, to implement the TRP (71 FR 24776). Included in the final rule are: 1) effort reduction measures; 2) gear proximity requirements; 3) gear or gear deployment modifications; and 4) outreach and education measures to reduce dolphin bycatch below the stock's potential biological removal level. The final rule also includes time/area closures and size restrictions on large mesh fisheries to reduce incidental takes of endangered and threatened sea turtles as well as to reduce dolphin bycatch.

- MMPA List of Fisheries Update/Stock Assessment

NMFS continues to update the MMPA List of Fisheries and published the final 2008 List of Fisheries on November 27, 2007. Final 2006 marine mammal stock assessment reports and draft 2007 reports are also available. See **Section 3.1.6.1** for information on obtaining these reports.

- Pelagic Longline Take Reduction Team (PLTRT)

NMFS appointed a PLTRT in June 2005, to address issues in the longline fishery and marine mammals, specifically interactions with pilot whales. A proposed rule was published on June 24, 2008 (73 FR 35623).

- Vessel Monitoring Systems (VMS) in the pelagic longline fishery

NMFS adopted fleet-wide VMS requirements in the Atlantic pelagic longline fishery in May 1999, but was subsequently sued by an industry group. By order dated September 25, 2000, the U.S. District Court for the District of Columbia prevented any immediate implementation of VMS in the Atlantic pelagic longline fishery, and instructed NMFS to "undertake further consideration of the scope of the [VMS] requirements in light of any attendant relevant

conservation benefits." On October 15, 2002, the court issued a final order that denied plaintiff's objections to the VMS regulations. Based on this ruling, NMFS implemented the VMS requirement in September 2003.

- VMS in other HMS fisheries

Starting in 2004, gillnet vessels with a directed shark permit and gillnet gear onboard were required to install and operate a VMS unit during the Right Whale Calving Season (November 15 – March 31). In an attempt to better quantify bycatch, NMFS will require all vessels with Limited Access Shark Permits to participate in the Directed Shark Gillnet Observer program. Directed shark bottom longline vessels located between 33^{o} N and 36^{o} 30' N need to install and operate a VMS unit from January through July.

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NMFS. 2006b. SEDAR 11 - Stock Assessment Report: Large Coastal Shark Complex, Blacktip and Sandbar Shark. Highly Migratory Species Management Division, 1315 East West Highway, Silver Spring, MD 20910. 257 pp.

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NMFS. 2007. SEDAR 13 – Stock Assessment Report: Small Coastal Shark Complex, Atlantic Sharpnose, Blacknose, Bonnethead, and Finetooth Shark. Highly Migratory Species Management Division, 1315 East West Highway, Silver Spring, MD 20910. 395 pp.

NOAA. 1998. Managing the Nation's Bycatch: Programs, Activities, and Recommendations for the National Marine Fisheries Service. 174 pp.

9. HMS PERMITS

NMFS continues to monitor capacity in the HMS fisheries. The FEIS of Amendment 2 to the Consolidated HMS FMP contains the most up to date permit information in the shark fishery, including dealers (73 FR 21124, April 18, 2008). The final EA for the revitalization of the U.S. swordfish fishery contains current commercial limited access and dealer permits numbers (72 FR 33436, June 18, 2007). In addition, an updated number of tuna dealer permits is included in this report.

Table 9.1. Distribution of Shark, Swordfish and Other Permits Held, by State (October 2007)

State	SHK Directed	SHK Inci-dental	SWO Directed	SWO Incidental /Handgear	GOM Reef Fish	Dolphin Wahoo	*Mackerel: King and Spanish	Lobster	Snapper Grouper	Non-HMS Charter Head Boat General	Other
ME	2	1	2	1	--	2	--	--	--	--	--
NH	2	2	0	1	--	--	--	--	--	--	--
MA	4	10	7	13	--	11	5	2	--	--	3
RI	0	7	1	18	--	5	1	--	--	11	--
CT	1	1	0	1	1	1	--	--	--	--	--
NY	9	9	12	8	--	17	6	--	2	1	--
NJ	25	27	26	18	--	33	33	2	2	8	4
DE	--	--	--	--	--	--	--	--	--	--	--
MD	4	5	7	1	--	9	2	--	--	3	--
VA	2	5	0	3	--	2	2	--	1	--	--
NC	20	15	11	8	--	28	42	--	16	7	4
SC	7	12	4	1	--	14	14	1	14	9	2
GA	2	1	--	--	--	3	5	4	3	--	--
FL	132	137	63	69	111	186	309	46	81	154	13

State	SHK Directed	SHK Inci-dental	SWO Directed	SWO Incidental /Handgear	GOM Reef Fish	Dolphin Wahoo	*Mackerel: King and Spanish	Lobster	Snapper Grouper	Non-HMS Charter Head Boat General	Other
AL	5	1	0	2	5	--	3	--	--	--	--
MS	1	5		--	3	--	7	--	-	--	--
LA	4	35	31	4	3	4	7	--	-	--	2
TX	3	9	2	5	11	1	8	--	--	--	1
No Vessel ID	7	14	14	7	--	--	---	--	--	--	--
Total 2007 **	**231**	**296**	**180**	**160**	**134**	**316**	**444**	**54**	**119**	**193**	**29**
Total 2006	**240**	**312**	**191**	**174**	***	***	***	***	***	***	***
Total 2005	**235**	**320**	**190**	**183**	***	***	***	***	***	***	***

** Totals for 2007 are as of November 1, 2007
*** Non-HMS permits were not calculated in 2005 and 2006

Table 9.2. HMS CHB Permits by State as of October 1, 2007

State	CHB permits	State	CHB Permits
AL	62	NH	51
CT	93	NJ	555
DE	143	NV	1
FL	598	OH	2
GA	21	PA	48
LA	77	PR	18
MA	643	RI	155
MD	163	SC	127
ME	90	TN	--
MI	2	TX	152
MS	25	VA	123
NC	375	VI	20
NY	341	Other	14
Total (2007)			**3,899**
Total (2006)			**4,173**

Table 9.3. Number of Atlantic Tuna Dealer Permits by State Issued in the 2007 Calendar Year*

State	Bluefin Only	BAYS Only	Bluefin and Bays	Total Atlantic Tunas Dealer Permits
AL	--	1	--	1
CA	--	--	4	4
CT	--	1	--	1
DE	--	--	4	4
FL	1	1	18	20
GA	--	--	--	--
IL	--	--	--	--
HI	--	--	--	--
LA	--	--	4	4
MA	2	2	58	62
MD	--	--	8	8
ME	2	--	10	12
NC	--	--	16	16
NH	--	--	2	2
NJ	4	--	58	62
NY	--	7	34	41
PA	--	--	--	--
PR	--	3	--	3
RI	--	3	19	22
SC	--	--	4	4
TX	--	1	--	1
VA	--	1	14	15
VI	--	2	2	4
WA	--	--	--	--
Total	9	22	255	286

* Dealers may obtain a permit to sell and purchase only bluefin tuna, only BAYS tunas, or both bluefin and BAYS tunas.

Table 9.4. The Number of Atlantic Tuna Permit Holders by Category, 2004 through 2007*

Category	2004	2005	2006	2007
Longline	222	200	214	218
Angling	20,245	24,127	25,236	24,220
Harpoon	49	40	40	26
Trap	2	7	7	9
General	5,057	4,494	4,824	3,616
Purse Seine	5	5	5	4
Charter Headboat	3,881	3,963	4,173	3,899
Total	**29,461**	**32,836**	**34,501**	**31,992**

***** The actual number of 2007 permit holders in each category are subject to change as individuals renew or allow their permits to expire.

Table 9.5. Number of International Trade Permits by State as of December 2007.

State	Number of Permits
CA	59
CT	1
FL	40
GA	1
HI	9
IL	2
KS	1
LA	2
MA	24
MD	2
ME	3
NC	3
NJ	12
NY	16
OR	1
PA	2
RI	5

State	Number of Permits
TX	2
VA	3
WA	10
Total	**198**

10. ISSUES FOR CONSIDERATION AND OUTLOOK

NMFS strives to create economically and biologically healthy fisheries. Identifying and addressing emerging issues in a timely manner, NMFS can work towards achieving and maintaining the balance of biological and economic imperatives necessary to realize goals of stable, prosperous, and sustainable HMS fisheries.

Based on unresolved matters identified by the HMS Advisory Panel, the general public, and NMFS staff, this section serves as an important means to identify potential areas for future management practices to ensure sustainable HMS fisheries. The order of issues does not reflect any order of importance, and this list is not meant to be an exhaustive list of management issues facing Atlantic HMS fisheries. Rather, the intent is to inspire discussion on these topics, trigger identification of other important issues, and, in some cases, take regulatory action if necessary. NMFS may consider some of these issues for future rulemakings, but it is worth noting that some of these matters are complicated and may require further input from the public (e.g., scoping meetings, workshops, etc.) which could take several years to complete. This section will also serve as a starting point for discussions by the HMS Advisory Panel.

Possible Issues for Future Rules and/or FMP Amendments

Tunas

I.	Implementation of international requirements (bluefin, yellowfin, bigeye)
II.	Bluefin quota allocations
III.	Bluefin discard estimates from harpoon, purse seine, and rod and reel fisheries
IV.	Possession at-sea and landing requirements (e.g., tails on, filleting at sea)

Billfish

V.	Tournament registration and reporting - electronic v. call-in system
VI.	Improving recreational catch and effort data
VII.	Comprehensive Caribbean FMP amendment
VIII.	Scope of Certificate of Eligibility Form

Swordfish

IX.	Quota allocations (directed, incidental and recreational)
X.	Implementation of international recommendations
XI.	Swordfish fleet revitalization - next steps

Sharks

XII.	Vessel allocations (directed, incidental, research, ITQs)
XIII.	Small coastal shark measures based on new assessment
XIV.	Coordination with state management

General

XV.	Aquaculture and fish farming
XVI.	Improving outreach to fishermen/constituents

Tuna Longline/Shark/Swordfish Limited Access Program

XVII.	Permit reform (Individual Transferable Quotas (ITQs)/Limited Access Privilege Programs (LAPPs)); gear based v. species based permit
XVIII.	Rationalization of permits with harvesting capacity
XIX.	Revisiting handgear permit issuance

Bycatch Reduction

XX.	Examining the efficacy of existing pelagic longline time/area closures
XXI.	On-going identification and careful handling workshops and three year certificate renewal period
XXII.	Use of VMS
XXIII.	Highgrading
XXIV.	Bluefin tuna bycatch in the Gulf of Mexico
XXV.	Implementation of Pelagic Longline Take Reduction Plan requirements

Recordkeeping and Reporting

XXVI.	Streamlining the reporting process and/or revising/creating logbooks for all fishermen and dealers (e.g., one logbook for each fishery, electronic logbooks)
XXVII.	Implementation of the International Trade Data System
XXVIII.	Tournament reporting (e.g., electronic, call-in, logbooks)
XXIX.	Recreational surveys v. direct reporting for all HMS
XXX.	Observer coverage on all fishing vessels, including recreational
XXXI.	Paying for observer coverage on fishing vessels

Exempted Fishing/Scientific Research/Public Display Permits

XXXII.	Consistency with state regulations
XXXIII.	Monitoring and enforcement issues

Review of State Regulations Under the Atlantic Tunas Conservation Act and Magnuson-Stevens Fishery Conservation and Management Act

XXXIV.	Formal review of swordfish and billfish regulations under ATCA
XXXV.	Update tuna review under ATCA