10. SUMMARY: ANALYSIS, ISSUES FOR CONSIDERATION, AND OUTLOOK

The HMS Management Division witnessed another eventful year in 2001. Management measures stemming from ICCAT recommendations, the BiOp, as well as the from the HMS FMP and the Billfish Amendment were implemented. The swordfish, tuna, shark and billfish fisheries were also monitored during the year. Some of the information provided in this section serves as a means of introducing some of the issues that will need to be addressed in the near future; some issues are new, while other are continuations of previous years' efforts. As the SAFE report is intended to provide information to help develop and evaluate regulatory adjustments, an analysis of current management actions, as well as an outlook on the future of HMS fisheries management strategies is both valuable and necessary.

10.1 Analysis of Management Measures *(For an economic impact analysis of management measures, please refer to Section 5; for a social impact analysis, please refer to Section 6)*

The following details major management HMS actions implemented or ongoing in 2001. Unfortunately, for many of these actions it is not possible to provide a current assessment due to the lack of elapsed time since implementation. For some of these actions, in particular the closed areas, it is expected that it may take several years to accrue conservation benefits.

10.1.1 Swordfish

Catch limits: In 2000, U.S. fishermen were limited to a 2,951 mt catch limit and a 320 mt dead discard allowance for North Atlantic swordfish and a 384 mt catch limit for South Atlantic swordfish. The reported landings for U.S. fishermen for 2000 was 2864.3 mt and 488.9 mt dead discards for the North Atlantic fishery, resulting in an underharvest of 87 mt, but a overage in the dead discard allowance of 168 mt. Reported landings from U.S. fishermen in the South Atlantic fishery was 51 mt, resulting in a 333 mt underharvest.

Minimum size limit: Calculations to evaluate compliance with the swordfish minimum size limit were not made by SCRS in 2000 or 2001. However, based on estimates made for 1998 fishing activities, SCRS could calculate that the percentage of landings less than 125 cm LJFL would be about 23 percent.

The Swordfish Certificate of Eligibility program was implemented to support enforcement of the U.S. minimum size requirement. That program requires that all imported swordfish be accompanied by a document stating that the fish meets the minimum size requirement, or that if it does not, it was harvested from other than the Atlantic Ocean. Importers must submit copies of

all COEs on a bi-weekly basis which are then compared to dealer reports on purchased fish, and U.S. Customs data.

Stock structure: NMFS is concerned about the uncertainties in the stock structure of Atlantic swordfish and its management implications. Note that evaluation of international management measures on a stock-wide basis can only occur based on *reported* landings and discards. A significant problem exists internationally with the underreporting of fishing activities. Therefore, overfishing of North Atlantic swordfish continues to occur, likely at a rate higher than estimated.

10.1.2 Billfish

Catch Limits: While some countries have already implemented the billfish catch limits, information is not yet available to evaluate the effects of regulations agreed to at ICCAT in 2000 (e.g., reduction in landings).

Prohibition on Sale: The NOAA Office for Law Enforcement continues to expend resources responding to reports of illegal sale of Atlantic billfish. The prohibition on sale precludes the possession of Atlantic billfish by commercial fishermen, seafood dealers, restaurants with the intent to sell. While billfish are caught incidental to commercial fishing operations, this management measure has precluded any directed fishing effort on these species which supports rebuilding.

There are no management measures in place specifically for sailfish/spearfish, with the exception of a spearfish possession prohibition.

10.1.3 Sharks

LCS quota/SCS quota/prohibited species/division of LCS into ridgeback and non-ridgeback subgroups/counting dead discards and state landings after Federal closures against Federal quotas/minimum size for ridgeback LCS in commercial fisheries: these measures and others will be considered at the 2002 LCS stock assessment. For further information, see section 4.5.

LCS directed commercial trip limit of 4,000 lb dw: anecdotal information indicates that the commercial LCS trip limit resulted in the larger vessels in the fleet leaving the fishery because it was no longer profitable for them to target sharks. Now that the commercial fishery is under a limited access program with upgrading restrictions, NMFS intends to reevaluate the

appropriateness of the trip limit as part of the refinement of the limited access program. For further information, see chapter 9.

Scheduling commercial fishery openings and closings in advance: NMFS has received comments that some fishermen like scheduling the fishing seasons in advance so that they can develop markets and do not have to worry about unexpected closures (for LCS). However, NMFS has also received comments that other fishermen do not like scheduling the fishing seasons in advance and would prefer to return to closures being announced with 5 days advanced notice. NMFS intends to revisit this issue in upcoming rulemaking.

Recreational retention limit and minimum size limit: NMFS has not conducted a stock assessment on LCS, SCS, or pelagic sharks since the current recreational retention and minimum size limits were established in 1999. Harvest data for 2000 by species group (see Table 4.4.2) indicate that catches of LCS declined 23 percent from 1997 levels (the level from which the rebuilding plan for LCS was established). However, species-specific data on LCS recreational harvest are currently under review at this time so it is not possible to determine the species composition of the catch and whether catches of sandbar and blacktip individually were reduced. These data will be analyzed at the 2002 LCS SEW. Catches of pelagic sharks increased slightly and catches of SCS increased 42 percent from 1999 levels.

Observer coverage in the shark drift gillnet fishery: In 2001, NMFS modified the level of observer coverage required in the southeast shark drift gillnet fishery because new analyses indicated that a reduced level of coverage outside of right whale calving season would still provide statistically valid and reasonable estimates of protected species bycatch. The 2001 observer data will be analyzed with the 2001 logbook data to extrapolate take estimates when the logbook data are ready for analysis.

Prohibition of finning of deepwater and other sharks: NMFS had previously extended the ban on finning to the deepwater and other shark management group. The recently published final rule implementing the Shark Finning Prohibition Act effectively prohibits finning of all sharks by persons under U.S. jurisdiction in Federal waters or with Atlantic Federal shark limited access permits. While the final rule does not prohibit finning by persons in state waters without a Federal shark permit, most deepwater sharks occur primarily in Federal waters so that NMFS believes separate actions by states to ban finning for this management group are unnecessary.

Pelagic shark quotas (porbeagle, blue, other pelagics): NMFS established separate quotas for porbeagles (92 mt dw) and blue sharks (273 mt dw) in 1999 (the remaining pelagic shark quota was reduced to 488 mt dw when porbeagle sharks were broken out). In 2000, commercial landings of porbeagles and blue sharks were less than one percent of the available quotas and 19.8 percent of the pelagic shark quota was harvested (see Table 4.5.8).

10.1.4 Tunas

Catch limits: In 2000, U.S. fishermen were limited to a 1,387 mt landings quota and a 68 mt dead discard allowance for Western Atlantic bluefin tuna. The reported landings for U.S. fishermen for 2000 was 1212.1 mt, plus an estimated 67 mt of dead discards, resulting in an underharvest of 175 mt for the landings quota, and one mt under the dead discard allowance.

Minimum size limits: The United States has zero tolerance for landings of bluefin tuna less than the ICCAT minimum size of 6.4 kg, and no landings of undersized fish were reported in 2000. Bluefin tuna under 115 cm are limited to eight percent of the total U.S. landings quota, and, in 2000, U.S. vessels landed 34.6 mt of bluefin under 115 cm, accounting for 2.5 percent of the landings quota of 1,387 mt.

The United States has implemented a minimum size for bigeye and yellowfin tuna that corresponds to 6.4 kg (a higher minimum size than the 3.2 kg adopted by ICCAT). There is zero tolerance for bigeye and yellowfin tuna less than 6.4 kg in both the commercial and recreational U.S. fisheries.

Stock structure: NMFS is concerned about the uncertainties in the stock structure of North Atlantic bluefin tuna and its management implications. Recent scientific studies indicate that overfishing in the eastern management area could impact fisheries in the western management area. Note that evaluation of international management measures on a stock or ocean-wide basis can only occur based on *reported* landings and discards. A significant problem exists internationally with the underreporting of fishing activities and with continued overfishing in the eastern Atlantic and Mediterranean management areas.

Domestic Allocation: The HMS FMP set domestic quota allocation percentages for the U.S. bluefin tuna fishery. The HMS regulations allow for NMFS to adjust quotas on an annual basis to reflect overharvest or underharvest in each category during the previous year. If a quota category or subcategory exceeds its quota or adjusted quota in a particular year, its quota must be reduced by that amount for the following year. In the following year NMFS also may allocate any remaining quota from the Reserve to cover this overharvest. Over the past two seasons there has been large underharvests in several BFT quota categories, especially the Angling and Longline categories. There are several negative consequences to excessive carry-overs of underharvest. For example, large carry-overs of unharvested quota may provide for the start of new unsustainable fisheries. Also, excessive fishing mortality during one year may significantly impact a particular year class and hinder long-term rebuilding. Adjusting the target catch requirements in the Longline category and the retention limits in the Angling category may mitigate these

excessive under-harvests, but NMFS is continuing to investigate alternatives to limit excessive carry-overs from one year to the next and welcomes public input on this issue.

Retention Limits: Over the last several years, NMFS has attempted to establish "date-certain" periods of increased daily retention limits in the recreational bluefin tuna fishery. The date-certain retention limit adjustments allow recreational and for-hire fishermen to plan trips, and NMFS' actions in setting bluefin tuna retention limits have been received well by the recreational and for-hire fishing community.

10.1.5 Bycatch

Reduction in length of longline to increase survival of marine mammals and turtles: the effectiveness of this measure has not been analyzed. However, NMFS intends to conduct an analysis of this measure to increase the survival of marine mammals and sea turtles in 2002.

Closed area in June to decrease bluefin tuna bycatch in the pelagic longline fishery: the number of bluefin tuna landed and discarded by month and year is reported in the pelagic logbook. Tables 8.3 and 8.4 provide an enumeration of logbook submissions of the disposition of bluefin tuna catches (kept, discarded dead, discarded alive). Caution should be exercised in utilizing these data to determine the effectiveness of the June closure that went into effect during 1999 as a result of implementing the HMS consolidated regulations (May 28, 1999; 64 FR 29090). This information also does not consider the pooling method utilized to report catch to ICCAT.

Based on reported data, Table 8.4 demonstrates that bluefin tuna discards in the closed area have been reduced considerably due to the June closure. Tables 8.3 and 8.4 also illustrate that, while annual landings of bluefin tuna from the closed area have been reduced, annual overall landings of bluefin tuna have not been reduced. These data indicate that the June closure is effective at reducing bluefin discards while not impacting bluefin tuna landings. These data also indicate that discards of pelagic sharks, billfish, and turtles from the closed area have been reduced considerably, although discards of pelagic sharks from open areas have declined as well.

Atlantic Large Whale Take Reduction Plan (ALWTRP) regulations: observers were placed on shark drift gillnet vessels during right whale calving season (November 15- March 31, 2001) off the East Coast of Florida between Fort Pierce and West Palm Beach and covered 12 strikenet and 70 drift gillnet sets (Carlson, 2001). Four Atlantic bottlenose dolphin and one Atlantic spotted dolphin were observed caught and discarded dead; two Atlantic spotted dolphin were released alive. No large whales were encountered by this gear during right whale calving season.

Atlantic Bottlenose Dolphin Take Reduction Team: due to the observed takes of Atlantic bottlenose dolphin in the shark drift gillnet fishery, representatives of the fishery have been included in the newly formed Atlantic Bottlenose Dolphin Take Reduction Team. The second meeting of the team was held in January 2002.

MMPA List of Fisheries Update/Stock Assessment: NMFS continues to update the MMPA List of Fisheries and the 2002 final list is now available. Final 2000 stock assessment reports and draft 2001 reports are also available. See section 8.1 for information on obtaining these reports.

Atlantic Offshore Cetacean Take Reduction Team (AOCTRT): NMFS Office of Protected Resources has disbanded the AOCTRT due to the fact that two of the three fisheries addressed by the AOCTRT were closed by fishery management actions, leaving only the pelagic longline fishery, which has also been the subject of recent fishery management actions and increased observer coverage related to bycatch. NMFS intends to review the fishery and any marine mammal interactions in the future to determine if additional take reduction measures are necessary at that time.

Observer coverage of shark drift gillnet fleet: on March 30, 2001, NMFS reduced the level of observer coverage required in the shark drift gillnet fishery from 100 percent year-round to 100 percent during right whale calving season and a statistically significant level during the rest of the year. Recent scientific analyses indicate that a 53-percent level of coverage is statistically significant and adequate to provide reasonable estimates of sea turtle and marine mammal takes outside of the right whale calving season. The level of observer coverage necessary will be re-evaluated annually and adjusted accordingly. Reduced observer coverage will reduce industry and administrative costs. Due to the high costs of these observer programs and limited funding, NMFS is considering requiring VMS in the shark drift gillnet fishery.

Vessel monitoring systems 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 to "undertake further consideration of the scope of the [VMS] requirements in light of any attendant relevant conservation benefits."

On January 10, 2001 (66 FR 1907), pursuant to that order, NMFS published a request for comments on options for implementing VMS requirements in the Atlantic HMS pelagic longline fishery. The agency received and considered seven comments from vessel owners and their fishing organization, environmental advocacy groups, a fishery management council member, and a VMS distributor. NMFS also examined monitoring and enforcement in the fishery, the limits of conventional methods, and the applications of VMS. NMFS conducted an analysis of HMS

pelagic longline vessels to determine whether the VMS requirement could be restricted to a subset of HMS pelagic longline vessels. This information has been submitted to the court, and NMFS is awaiting further direction regarding its ability to implement a VMS program.

Live vs Dead Bait in the Gulf of Mexico: analysis of the effectiveness of the live bait prohibition in the Gulf of Mexico pelagic longline fishery is not possible at this time because the data from 2001 (the first full year that the prohibition was effective) are not ready for analysis.

Time and Area Closures in the Charleston Bump, Florida East Coast, and DeSoto Canyon: analyses of the effectiveness of the time and area closures to pelagic longlining in the Charleston Bump, Florida East Coast, and DeSoto Canyon are not possible at this time because the data from 2001 (the first year that the closures were effective) are not ready for analysis.

Anecdotal information from recreational fishermen suggests that there has been an increase in encounters with juvenile swordfish off Florida. However, this may also be an artifact resulting from an increase in participation within the recreational swordfish fishery.

Time and Area Closure in Northeast Distant Area: analysis of the effectiveness of the time and area closure to pelagic longlining in the Northeast Distant Area is not possible at this time because the data from 2001 (the first full year that the closure was effective) are not ready for analysis.

10.2 Outlook by Species

10.2.1 Swordfish

The 1999 SCRS stock assessment on North and South Atlantic swordfish was somewhat optimistic. The positive outlook provided by the 1999 swordfish stock assessment spurred the adoption of a 10-year rebuilding program at ICCAT. A reduction in quotas sets the stage for long-term sustainable fisheries Atlantic-wide. The mortality of small swordfish in the pelagic longline fishery was addressed through time/area closures in the United States, accounting for dead discards of small swordfish as part of the total allowable catch, and the resolution to examine possible areas of small fish concentration *outside* the U.S. EEZ. Reductions in the mortality of small swordfish may yield significant long-term gains in yield. Concerns remain regarding the impact of the ICCAT recommendations implementing a dead discard allowance for U.S. commercial fishermen for the 2000 fishing season and beyond to 2003 when the dead discard allowance levels are reduced to zero.

In terms of addressing Illegal, Unregulated and Unreported (IUU) vessels and other vessels (belonging to both non-Contracting and Contracting Parties), ICCAT took important steps in 1999 to encourage all countries to report harvests of ICCAT-regulated species. The United States has implemented the 1999 ICCAT recommendation that prohibits imports of swordfish and tunas from non-compliant countries. Collection of swordfish import data will prove to be an important data source in the future to identify countries that are fishing in such a manner that diminishes the effectiveness of ICCAT conservation and management measures.

Due to the changes in the pelagic longline fishery resulting from implementation of extensive time/area closures, NMFS will be re-evaluating the comprehensive management of this fishery. NMFS will consider re-evaluating incidental catch limits in the commercial swordfish fishery in the future.

As anticipated in the 2001 SAFE report, the recreational swordfish fishery experienced an additional growth in popularity during 2001, not only along the east Florida coast, but in the mid-Atlantic Bight and off New Jersey as well. Further expansion of the recreational fishery during 2002 may necessitate expanded efforts to accurately monitor recreational landings. A proposed rule was published on December 26, 2001 (66 FR 66386), which outlined a mandatory toll-free call-in reporting system for all non-tournament billfish and swordfish recreational landings. Additional concerns regarding sale of recreational-caught swordfish and the number of fish landed will also be considered.

10.2.2 Tunas

Issues regarding the yellowfin tuna bag limits, bluefin tuna bycatch and discards in pelagic longline fisheries, quota management, rebuilding programs for overfished species, and stock definition for bluefin tuna will continue to be of concern during 2002. The most recent stock assessment for bluefin indicated that the 20 year rebuilding program is on track. Newly established totally established catches for bigeye tuna dn northern albacore should serve as an important step toward rebuilding these overfished stocks.

One of the issues on which the HMS Division and NMFS has received many phone calls and letters during 2001 has been the establishment of a commercial handgear fishery for bluefin tuna in the southern mid-Atlantic area, specifically North Carolina. Since the mid-1990's, large amounts of commercial-sized bluefin tuna have been available to fishermen in North Carolina during the winter and spring months when the General category is usually closed. Fishermen in North Carolina feel that they are unfairly excluded from the General category because of the start date of the fishery, June 1.

Establishing a commercial General category BFT fishery for North Carolina has been extensively discussed in recent years. In the final HMS FMP, NMFS took the position that allowing the development of new fisheries for BFT would not be consistent with the other measures adopted to rebuild the overfished BFT stock. Therefore, in the final regulations to implement the HMS FMP, the BFT General category fishing season was maintained at June 1 through December 31 of each year, with no separate quota reserved for North Carolina. However, NMFS intends to raise concerns again about commercial BFT fishing opportunities in North Carolina with the HMS AP at its 2002 meeting, and will consider its recommendations.

The current General category season does not preclude commercial landings by permitted vessels from North Carolina. All permitted vessel operators may seek BFT throughout their migratory range and many tuna fishermen travel to areas outside their home state. Additionally, if quota remains available and commercial size fish are present in North Carolina waters, BFT may be landed and sold in North Carolina throughout the summer and fall. In 2000, NMFS transferred 100 metric tons of BFT quota to the General category in October, of which about 50 metric tons was caught and landed in North Carolina during November and December. In 2001, NMFS transferred 93 metric tons to the General Category in November, and over 40 metric tons were caught and landed in North Carolina.

Of course, fishing activity in North Carolina is subject to variation from year to year as it is dependent on the migratory pattern of the fish and the catch rates in other fishing areas. Even if a portion of the General category quota were to be set aside for a specific fishing area or time period, there is no guarantee that a certain level of harvest will be attained. As described above, NMFS expects this issue will be discussed at the 2002 meeting of the HMS AP, and will consider the recommendations of the AP in future rulemaking.

10.2.3 Billfish

The 2000 ICCAT recommendation related to Atlantic blue and white marlin may require agency actions to address recreational landing levels. One of the critical components of U.S. compliance will be development of adequate monitoring tools, as discussed in the recent proposed rule. NMFS is considering public comments as part of development the final rule in 2002. Improving the tournament registration and reporting process will also be examined in 2002. Monitoring the impact of the time/area closures and live bait prohibition in the Gulf of Mexico by pelagic longline fishermen and the resulting reduction in billfish bycatch will also be an important element in the near-future management of billfish resources.

NMFS is currently conducting a status review of Atlantic white marlin in response to a petition to list the species under ESA. NMFS will review that petition in light of the upcoming SCRS stock assessment and will publish a finding of whether a proposal to list Atlantic white marlin as endangered or threatened under ESA is warranted by September 2002.

10.2.4 Sharks

NMFS will conduct two stock assessments for LCS and SCS in 2002. The LCS assessment will be peer reviewed following the same procedures as the 1998 LCS assessment, per the amended settlement agreement. Based on the results of the assessments, NMFS may conduct proposed and final rulemaking or, if warranted, may prepare an environmental impact statement and amend the HMS FMP.

International efforts to conserve and manage sharks continue to gain momentum. The ICCAT Sub-committee on bycatch held a workshop to analyze pelagic shark catch rates and an internaional pelagic shark workshop was held in February 2000. NMFS released the Final National Plan of Action for Shark Conservation and Management, consistent with FAO guidelines and requirements in February 2001. Additionally, NMFS published the final rule implementing the Shark Finning Prohibition Act on February 11, 2002 (67 FR 6194) to prohibit finning of sharks in the United States. These actions should contribute to the general awareness of the need for long-term, rational domestic and international management of all sharks.

10.4 Data and Monitoring Issues

Improving data coordination is essential for successful HMS management. As fisheries resources become increasingly managed under quota systems, real time monitoring is critical. Failure to abide by the quota levels established by international agreement may result in penalties assessed against future U.S. harvests. In order for the United States to continue to serve as a leader in the conservation of these resources, the development and use of innovative techniques must receive proper attention and funding. The following is a short list of data management tools and techniques that may assist in HMS management:

- The development of streamlined systems that transcend the traditional regional structures of NMFS data collection, entry, and dissemination.
- Implementation of VMS in the pelagic longline and shark drift gillnet fisheries.
- Improvement in the coordination of data collection and organization among various components of the agency.
- Use of contractors to consolidate data and add to the rapid dispersal of information.
- Placement of summary data on the HMS web page.
- Placing data in consolidated Oracle tables for easier access of data by scientists and managers.
- Improved tracking of dealer reports.

- Resolution of the LPS status including a retrospective analysis of the existing system and the exploration of alternative methods to gather increasingly accurate data from the recreational components in the future.
- The use of electronic logbooks to facilitate reporting and data analysis.

10.5 Permitting Issues

NMFS continues to consider refinements to the limited access system for commercial swordfish, shark, and tuna longline fisheries implemented in 1999. Detailed discussions of the issues and potential alternatives can be found in the 2001 SAFE Report and Chapter 9 of this report. NMFS encourages public comments on these issues and potential alternatives and intends to consider permitting issues in upcoming rulemaking.

10.6 Conclusion

The SAFE report is designed to not only summarize the current condition of the resource, but also address whether or not the fishery is operating properly under the mandates of the Magnuson-Stevens Fishery Conservation and Management Act and the Sustainable Fisheries Act. Through an annual appraisal of recent information, the SAFE report allows for a re-evaluation of management measures in light of the Magnuson-Stevens provisions and the National Standard Guidelines. In 2002, HMS plans to continue implementing and evaluating the FMP measures in an attempt to remedy the overcapitalization and overfishing problems that affect many highly migratory species. The 2002 AP meeting provides an excellent opportunity to identify and discuss those issues raised in the SAFE report which require further management actions. Through continuous public and constituent interaction, increased monitoring, ongoing life history work, and additional socio-economic assessment, NMFS strives to continue building sustainable fisheries for all Atlantic highly migratory species.

APPENDIX A: FINAL NATIONAL PLAN OF ACTION (NPOA) FOR THE CONSERVATION AND MANAGEMENT OF SHARKS

Summary

Sharks, skates, rays (elasmobranchs) and the chimaeras together comprise the class Chondrichthyes, or cartilaginous fishes.[8] As a group, elasmobranchs present an array of problems for fisheries management and conservation. Elasmobranchs are primarily at the top of the food web, often top-level carnivores (Cortes, 1999), and their abundance is relatively small compared to groups situated in lower trophic levels. Thus, fishing elasmobranchs down to unsustainable levels may occur rapidly, and successful management of elasmobranch fisheries requires a stronger commitment to fishery monitoring, biological research, and proactive management than many teleost fisheries (Walker, 1998).

The life-history characteristics of many elasmobranchs, such as late age of maturity and relatively slow growth rates, make them more susceptible to overfishing than most bony fishes. These characteristics, together with their low fecundity, result in low productivity for most species (Bonfil, 1994; Smith *et al.*, 1998). Recovery of populations from severe depletions (caused either by natural phenomena or human-induced mortality) will probably take many years for most elasmobranch species.

Furthermore, the historically low economic value of shark and ray products compared to other fishes has resulted in research and conservation of these species being a lower priority than for traditionally high-value species. However, the growth in demand for some shark products, such as fins, continues to drive increased exploitation (Bonfil, 1994; Rose, 1996; Walker, 1998). Modern technology, greater access to distant markets, and the depleted status of many traditionally targeted species have also led to directed fishing effort on previously non-targeted species, including elasmobranchs (FAO, 1998). Increased elasmobranch catches in both directed and incidental fisheries have resulted in growing concern over the fate of some elasmobranch populations in several areas of the world's oceans (Bonfil, 1994; FAO, 1998; Musick, 1999). Many fishery managers must now assess and manage shark fisheries without the benefit of the long-term, high-quality databases available for more traditionally high-value species.

While a few countries (including Canada, New Zealand, Australia, South Africa, and the United States) have specific fishery management plans for certain shark fisheries, there are no

[8] The International Plan of Action for the Conservation and Management of Sharks considers the term "shark" to include all species of sharks, skates, rays, and chimaeras.

international management mechanisms effectively addressing the capture of sharks at present. However, a number of international bodies, e.g., the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Northwest Atlantic Fisheries Organization, and the Inter-American Tropical Tuna Commission, have initiated efforts to encourage member countries to collect information about shark catches and, in some cases, develop regional databases for the purpose of stock assessments. In addition, some countries already have laws that facilitate international management. For instance, U.S. participation in international management initiatives is guided by the Atlantic Tunas Convention Act and the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.

The objective of the International Plan of Action for the Conservation and Management of Sharks (IPOA) is to ensure the conservation and management of sharks and their long-term sustainable use. In the IPOA, member nations have agreed voluntarily to develop, implement, and monitor a national plan of action if their vessels conduct directed fisheries for sharks or if their vessels regularly catch sharks in non-directed fisheries. As stated in paragraph 22 of the IPOA, shark plans should aim to:

1. Ensure that shark catches from directed and non-directed fisheries are sustainable;
2. Assess threats to shark populations, determine and protect critical habitats, and implement harvesting strategies consistent with the principles of biological sustainability and rational long term economic use;
3. Identify and provide special attention in particular to vulnerable or threatened shark stocks;
4. Improve and develop frameworks for establishing and coordinating effective consultation involving stakeholders in research, management, and educational initiatives within and between member Nations;
5. Minimize unutilized incidental catches of sharks;
6. Contribute to the protection of biodiversity and ecosystem structure and function;
7. Minimize waste and discards from shark catches in accordance with article 7.2.2. (g) of the *Code of Conduct for Responsible Fisheries* (for example, requiring the retention of sharks from which fins are removed);
8. Encourage full use of dead sharks;
9. Facilitate improved species-specific catch and landings data and monitoring of shark catches;
10. Facilitate the identification and reporting of species-specific biological and trade data.

Additionally, national plans of action are to be implemented by United Nations Food and Agriculture Organization (FAO) members in a manner consistent with the FAO (1995) *Code of Conduct for Responsible Fisheries* and any applicable rules of international law, and in conjunction with relevant international organizations.

Consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the IPOA, the NPOA further identifies the following management principles:

Adopt the Precautionary Approach: Management entities should initiate, continue, or improve research on elasmobranch catches in their fisheries, address the uniqueness of each fishery, identify key habitats and their impacts on populations, and implement necessary elasmobranch management measures before stock declines are evident.

Protect Vulnerable Life History Stages: Management entities should consider protecting juvenile, subadult, and early adult life history stages and habitat in order to rebuild overfished shark stocks and to prevent overfishing on other shark stocks. Potential measures to increase protection of sensitive life history stages include minimum sizes for retention, enhanced conservation of essential fish habitat, and time/area closures of nursery areas.

Protect Vulnerable Species: Management entities should consider additional, separate measures to protect species particularly vulnerable to overfishing. Potential measures to increase protection of vulnerable species may include prohibiting possession of that species (e.g., white sharks in California, numerous species in Atlantic Federal waters), time/area closures or marine reserves to protect important habitats or essential fish habitat, gear modifications, and precautionary limits on harvest levels.

Minimize Waste: Management entities should consider measures to minimize waste, discards, and unutilized incidental catches in shark fisheries, consistent with the Shark Finning Act and the IPOA.

Prioritize Limited Resources: Management entities should determine whether a particular species is overfished, which fisheries should be regulated in regard to shark catches, and determine which shark species have higher conservation needs and act appropriately.

Implementation of the NPOA in Atlantic Highly Migratory Species (HMS) Fisheries

The authority for implementing the U.S. NPOA in Atlantic HMS Fisheries comes from the U.S. participation and endorsement of the IPOA as well as through the Magnuson-Stevens Act. The Magnuson-Stevens Act defines Atlantic HMS as Atlantic tunas (bluefin, bigeye, albacore, yellowfin, and skipjack), Atlantic swordfish, Atlantic billfish (blue and white marlin, longbill spearfish, and sailfish), and oceanic sharks. The Magnuson-Stevens Act further designates the Secretary of Commerce with the authority to manage these species directly. Thus, NMFS, as the designee for the Secretary of Commerce, has jurisdiction of shark fisheries in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea in Federal waters.

The NPOA calls for data collection, population assessments, evaluation of the need for management measures, research and development of mitigation measures and methods, limitations on fishing capacity, outreach and education, and reporting and monitoring. In addition to the existing programs summarized in the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks as well as the NPOA, NMFS has taken several actions to implement the NPOA in Atlantic HMS fisheries.

1. Data Collection: Data collection programs should collect reliable data to determine the directed and incidental catch, bycatch, and disposition of elasmobranchs by the various fisheries; the effectiveness of existing management measures; the locations and characteristics of nursery and wintering grounds; information on EFH or key habitat for all life stages; and the status of the stocks.

Implementation in Atlantic HMS fisheries:

The University of Florida is continuing an observer program of the directed bottom longline commercial shark fishery in the Atlantic and Gulf of Mexico to enhance the reliability of management strategies for the shark fishery. Observers provide baseline characterization information, by region, on the species composition, relative abundance, and size composition within species for the large coastal and small coastal bottom longline shark fisheries. During the 2001 sampling season, a total of 36 shark trips were observed, representing 84 sets yielding 480,476 observed hook hours. Catches, catch rates, and disposition were documented for total of 3,937 LCS and 1,304 SCS. The biological data is being processed to identify catch patterns by species and region. Effective January 2002, observer coverage in the directed bottom longline shark fishery is mandatory, if selected.

NMFS continues to conduct an observer program in the southeast shark drift gillnet fishery. During right whale calving season (November 15 through March 31), 100 percent observer coverage of all shark trips is required. Outside of right whale calving season, a statistically significant level of observer coverage is required (currently approximately 53 percent

of all shark trips). During the 2001 right whale calving season, a total of 70 drift gillnet sets and 12 strikenet sets were observed (Carlson, 2001). Catches, catch rates, and disposition were documented for total of 17,849 sharks. Outside the right whale calving season (April 1 through November 14), a total of 37 drift gillnet sets were observed from April through October (15 in 2000 and 22 in 2001) and a total of eight strikenet sets were observed from August to September (three in 2000 and five in 2001) (Carlson and Baremore, 2001). Catches, catch rates, and disposition were documented for total of 10,324 sharks.

Effective August 1, 2001, selected Federal permit holders in the Gulf of Mexico reef fish, South Atlantic snapper-grouper, king and Spanish mackerel, and shark fisheries must report all species and quantities of discarded (alive and dead) sea turtles, marine mammals, birds, and finfish on a supplemental discard form. A randomly selected sample of 20 percent of the vessels with active permits in the above fisheries during 2000 was selected in 2001; a different group of vessels will be selected in subsequent years. The selection process was stratified across geography (Gulf of Mexico and South Atlantic), gear (handline, longline, troll, gillnet, and trap), and number of fishing trips (ten or less trips and more than 11 trips). Of the 2,676 vessels with Federal permits in these fisheries, a total of 454 vessels were selected to report.

In order to continue to delineate shark distributions and migratory patterns, the Cooperative Shark Tagging Program (CSTP) and Mote Marine Laboratory (MML) Center for Shark Research (CSR) continue to tag sharks. In 2001, approximately 6,000 sharks were tagged by the CSTP and 510 sharks were recaptured. To date, CSTP has tagged more than 165,700 sharks of 40 species and nearly 9,500 sharks of 32 species have been recaptured. To date, the CSR has tagged 9,741 sharks of 16 species and has received data on 355 recaptures.

NMFS conducted two fishery independent bottom longline surveys in 2001 to monitor the distribution, abundance, and species composition of sharks, tag sharks for migration studies, collect biological samples for age and growth, feeding ecology, and reproductive studies, and collect morphometric data. In April and May, the Northeast Fisheries Science Center (NEFSC) Apex Predators Program shark survey was conducted from Key West, Florida, to the Maryland/Delaware border. A total of 668 fish (652 sharks), representing 26 species (13 shark species) were caught on 85 sets. In June, the MEXUS-Gulf coastal shark survey was staged from Veracruz, Mexico, and was conducted in the Gulf of Mexico along the Yucatan peninsula coast of the Bay of Compeche, Mexico. The survey produced 37 sharks represented by 3 species caught in 38 sets.

The NEFSC also continued the Cooperative Atlantic States Shark Pupping and Nursery Survey (COASTSPAN). Researchers in each major coastal Atlantic state conducted a cooperative, comprehensive and standardized investigation of shark nursery areas to gauge the

relative importance of these areas and determine migration and distribution patterns of neonate and juvenile sharks. COASTSPAN cooperators sampled a total of 2,132 sharks in 2000. Seven hundred and fifty-five of the sharks sampled were tagged with fin tags and released.

The MML CSR has also conducted tagging studies with the cooperation of the Instituto Nacional de la Pesca in Mexico. In the six field trips to date (1995, 1996, 1997, 1998, 2000, 2001), a total of 390 gillnet sets have been made resulting in the capture and tagging of 1,160 juvenile blacktip sharks with Spanish/English dart tags.

2. *Assessment:* *Assessments of elasmobranchs subject to directed, incidental, or bycatch fishing mortality to determine the sustainable level of fishing mortality should be conducted following the completion of this NPOA by NMFS, the Councils, the Commissions, and appropriate States (management entities). The purpose of the assessment is to determine whether the level of total fishing mortality of shark, skate, and ray species is sustainable. To continue to improve upon existing elasmobranch assessments and help make future assessments more effective, the following items should be included for collection and analysis: Fishery-dependent data on catches, landings, bycatch, effort, and gears and areas fished; fishery-independent data on distribution and abundance; fishing fleet data; habitat data; market (utilization, price) and trade data (imports and exports); and monitoring of fisheries with directed and incidental catches and bycatch of elasmobranchs (e.g., observer programs).*

Implementation in Atlantic HMS fisheries:

No new stock assessments were conducted for Atlantic sharks in 2001, although assessments for large coastal and small coastal sharks had been scheduled for this year. These assessments are now rescheduled for 2002.

In addition to the NMFS assessment of small coastal sharks, MML and the Florida Museum of Natural History have been undertaking a project to assess the status of small coastal shark species in the Gulf of Mexico and western North Atlantic. This project is funded by Florida Sea Grant. Age-structured population models have been developed and are in their final testing phase. The final data for the models is being collated and model runs using the final data should be finished and the final report written by mid-2002.

The SCRS Subcommittee on Bycatch has recommended that ICCAT take the lead in conducting stock assessments for Atlantic blue, porbeagle and mako sharks. The subcommittee held a data preparatory meeting to review all available shark statistics in September, 2001.

Numerous papers on catches and catch rates as well as two papers on assessment methodologies were presented. The Commission is considering adoption of a resolution that the SCRS should conduct assessments for Atlantic shortfin mako and blue sharks in 2004, and hold an interim meeting in 2003, as SCRS considers necessary, to determine improvements in data collection.

NMFS solicited a status review for dusky sharks from the fishery-independent shark monitoring program at the Virginia Institute of Marine Science (VIMS) and Florida State Museum Commercial Shark Fishery Observer Program, which was completed in 2001. The dusky shark was listed on the Endangered Species Act Candidate Species List in 1997 due to its depleted stock status and concern for further stock declines. Observer program analyses indicate a distinct shift in catch composition from a widely scattered size distribution in 1994 to catches comprised primarily of sharks less than 110 cm FL (0-2 age classes) in 1999 (Romine et al. 2001). VIMS data show a decrease in relative abundance from 1980 to 1992, however recent years (1997-2000), have shown an increase in relative abundance. Observer catch rate data show an increase from 1974-1999, particularly for dusky sharks less than 110 cm FL, although catch rates of sharks greater than 170 cm FL declined over the period (Romine et al. 2001).

The NMFS Southeast Fisheries Science Center (SEFSC) conducted a study on demographic modeling of sharks under included estimation of natural mortality rates of sharks through indirect life history methods, and incorporated uncertainty in vital rates on demographic analyses of sharks. Monte Carlo simulation was used to incorporate uncertainty into life tables and matrix population models and estimate population statistics and elasticities for 41 shark populations. Correlation analysis was also used in concert with elasticity analysis to identify which vital rates explained most of the variation on population growth rates and provide advice for conservation and management. A publication detailing this study is expected to be available in the summer of 2002.

The SEFSC also studied the life history and population dynamics of the finetooth shark by determining age, growth, size-at-maturity, natural mortality, productivity, and elasticity of vital rates of the population. Results suggest the finetooth shark exhibits life-history traits and population parameters that fall between those of the blacktip shark and those of other small coastal species. Population analysis indicates management actions should focus preferentially on protection of juveniles and adults rather than age-0 individuals. A publication on this study is expected in the summer of 2002.

3. <u>*Need for Management Measures:*</u> *If the assessment concludes the stock is overfished, that overfishing is occurring, or that the stock is approaching an overfished state, appropriate management measures (e.g., reduce harvest levels or effort, use of alternative gears, reduce adverse effects on EFH or other habitats, implement minimum*

sizes, establish time-area closures) should be prescribed to end and/or prevent overfishing, to conserve necessary habitats, and to minimize waste, discards, and unutilized incidental catches of all elasmobranchs harvested.

Implementation in Atlantic HMS fisheries:

NMFS published an emergency rule on December 28, 2001 (66 FR 67118), that established the commercial large and small coastal shark quotas at 1997 levels and suspended regulations on several non-quota commercial management measures, pending new stock assessments for both species groups (to be conducted in 2002) and consistent with the terms of a settlement agreement reached with commercial shark fishermen and dealers. NMFS determined that the settlement agreement was appropriate because it will conserve Atlantic sharks while maintaining a sustainable fishery in the long-term; move the management process for Atlantic sharks forward through quality-controlled scientific assessment and appropriate rulemaking; and promote confidence in the management process and its underlying science. Upon completion of the new stock assessments, NMFS may enter into rulemaking to take appropriate action to conserve sharks while maintaining sustainable fisheries in the long-term.

NMFS is continuing to work with Atlantic States Marine Fisheries Commission in the issuance of exempted fishing permits for collection of sharks for public display. Issuance of exempted fishing permits may be necessary because possession of certain shark species is prohibited and because the commercial fisheries for large coastal sharks may be closed for extended periods during which collection of live animals and/or biological samples would otherwise be prohibited. NMFS is working with the Commission to improve tracking of sharks collected and enforcement of permit requirements.

4. *Research and Development of Mitigation Measures and Methods:* *Regardless of the determination of the assessment, management entities should invest in elasmobranch research, fishery monitoring, reduction of bycatch and bycatch mortality, minimization of waste, and enforcement.*

Implementation in Atlantic HMS fisheries:

For information on fishery monitoring, observer programs, and collection of bycatch information, see the discussion under data collection. For information on research on EFH and tagging programs, see the discussion under data collection.

To investigate post-release survivorship in support of bycatch mortality reduction, a two-phase study was undertaken on the relationship between exhaustive exercise and recovery rates in neonatal and juvenile sandbar sharks in 1999 utilizing sharks made available by the COASTSPAN Delaware Bay sampling program (Spargo et. al. 2001). Most metabolites returned to normal within 6-10 hours, indicating that sandbar sharks are able to physiologically recover after the exhaustive exercise associated with rod and reel angling. Therefore, catch and release fishing may not severely impact neonatal and juvenile sandbar sharks in important nursery areas (Spargo et. al. 2001).

NMFS took several steps in 2001 to reduce sea turtle bycatch and bycatch mortality in domestic longline fisheries, including the bottom longline shark fishery. On July 13, 2001 (66 FR 36711), NMFS closed the northeast distant statistical reporting area to pelagic longline fishing (effective July 15, 2001), modified how pelagic longline gear may be deployed effective (August 1, 2001), and required that all longline vessels (pelagic and bottom) post safe handling guidelines for sea turtles in the wheelhouse (effective September 15, 2001).

Due to a high number of interactions with leatherback sea turtles and other protected species (fourteen leatherback turtles, one loggerhead turtle, and one hawksbill turtle and three Atlantic spotted and four bottlenose dolphins were encountered in 62 drift gillnet sets), NMFS implemented a temporary 30-day rule that prohibited shark gillnet fishing (strikenetting was allowed) between Savannah, Georgia, and West Palm Beach, Florida (66 FR 15045, March 15, 2001). The prohibition was effective from March 9 through April 9, 2001. NMFS continues to monitor this fishery through the observer program described above.

5. *Limitation of Fishing Capacity:* *Limitation of capacity should be investigated as a method for increasing the sustainability of elasmobranch fisheries. The greater the number of fishing vessels participating, the more likely it is that individual fishing enterprises will become unprofitable or marginal. Combined with limited quotas, the resulting "race for the fish" or derby fishery produces market gluts, poor product quality, safety concerns, and high administrative costs.*

Implementation in Atlantic HMS fisheries:

Commercial fisheries for sharks are already regulated under a limited entry permit system implemented in 1999. NMFS continues to review the limited entry permit system and may consider additional limitations on fishing capacity in the future. Possible future management measures could include attrition/use or lose that would reduce the number of permits based on lack of landings; two-for-one entry that would require entrants to the fishery to transfer two permits in order to obtain one limited access permit; non-transferable individual fishing quotas;

individual transferable quota based on landings, auction, and/or lottery allocation; permit buybacks; and, changing the current species-based permits to a more gear-based permitting system.

6. *Outreach and Education: Each management entity should cooperatively or individually to develop and implement training tools and programs in elasmobranch identification, reduce bycatch mortality, and raise awareness about the ecological benefits from elasmobranch populations, detrimental effects of habitat destruction (e.g., coastal development, coastal pollution), and appropriate conservation measures to avoid, minimize or mitigate adverse effects on necessary habitats.*

Implementation in Atlantic HMS fisheries:

NMFS is developing an identification guide for Atlantic HMS, including sharks, that is scheduled for production in spring 2002. The guide is intended to facilitate species identification of fish by commercial and recreational fishermen. NMFS has also produced a brochure of regulations governing recreational shark fishing which is available on the internet at http://www.nmfs.noaa.gov/sfa/hmspg.html. NMFS intends to produce a similar brochure for commercial shark fishing.

7. *Reporting and Monitoring: Each management entity should prepare a biennial report on the status of sharks and shark fisheries under its jurisdiction so that NMFS can incorporate that information into biennial reports to COFI. For any fisheries that are under the authority of the Magnuson-Stevens Act and that are identified as overfished, the development of rebuilding programs must be consistent with Section 304(f) of the Magnuson-Stevens Act.*

Implementation in Atlantic HMS fisheries:

For information on fishery monitoring, observer programs, and collection of bycatch information, see the discussion under data collection. NMFS also produces an annual Stock Assessment and Fishery Evaluation report which discusses the status of sharks and shark fisheries.

Atlantic HMS Research and Management Needs

The NPOA identified several high priority research and management needs in commercial and recreational fisheries for Atlantic shark fisheries. The following table lists those research and management needs as well as the actions taken to address them.

Research and Management Need	
Commercic	
Improve species-specific identification of catches, landings, discards, and trade data	Production of HMS Identification Guide in 2002
Conduct stock assessments on small coastal and pelagic sharks and species-specific assessments on dusky and sand tiger sharks	Dusky shark status review, NMFS and MML/University of FL small coastal shark assessments in 2002, ICCAT blue and shortfin mako assessments in 2004
Continue participation in international research and management initiatives, particularly for pelagic sharks	NEFSC Apex Predator Investigation cooperative studies with Canada, MML studies in Mexico, participation in ICCAT
Determine and minimize bycatch mortality rates of sharks, particularly prohibited species and juvenile sharks	Bottom longline, drift gillnet, and pelagic longline observer programs
Continue research to determine nursery areas and spatial and temporal use of nursery areas for sharks by size/stage and species	COASTSPAN, MML studies in Mexico
Recreationc	
Improve species-specific identification of catches and landings data	Production of HMS Identification Guide in 2002, Recreational fishing brochure
Determine post-release mortality rates and ways to minimize that mortality	Post-release survivorship study on sandbar sharks
Conduct stock assessment on small coastal sharks and species-specific assessments on dusky and sand tiger sharks	Dusky shark status review, NMFS and MML/University of FL small coastal shark assessments in 2002
Continue participation in international research and management initiatives, particularly for pelagic sharks	NEFSC Apex Predator Investigation cooperative studies with Canada, MML studies in Mexico, participation in ICCAT

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APPENDIX B: FINAL NATIONAL PLAN OF ACTION FOR REDUCING THE INCIDENTAL CATCH OF SEABIRDS IN ATLANTIC TUNA, SWORDFISH, AND SHARK LONGLINE FISHERIES

NPOA-Seabird Executive Summary

Increased concerns have arisen about the incidental capture of non-target species in various fisheries throughout the world. Incidental capture can be economically wasteful, it impacts living marine resources, and the accidental killing of non-harvested animals may be aesthetically aversive. Incidental catch of non-target marine species such as marine mammals, sea turtles, and seabirds has generated growing concern over the long-term ecological effects of such bycatch in longline and other fisheries conducted in many areas of the world's oceans.

The United States has voluntarily developed the U.S. *National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries* (NPOA-S) to fulfill a national responsibility to address seabird bycatch in longline fisheries, as requested in the *International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries* (IPOA-S). The IPOA-S applies to "States" (hereafter Countries) in whose waters longline fishing is being conducted by their own or foreign vessels, and to Countries that conduct longline fishing on the high seas and in the exclusive economic zones (EEZs) of other Countries. The IPOA-S is a voluntary measure that calls on Countries to: (1) assess the degree of seabird bycatch in their longline fisheries; (2) develop individual national plans of action to reduce seabird bycatch in longline fisheries that have a seabird bycatch problem; and (3) develop a course of future research and action to reduce seabird bycatch. The NPOA-S is to be implemented consistent with the FAO *Code of Conduct for Responsible Fisheries* and all applicable rules of international law, and in conjunction with relevant international organizations.

Development of the NPOA-S was a collaborative effort between the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS) and the Department of State (DOS), carried out in large part by the Interagency Seabird Working Group (ISWG) consisting of representatives from those three agencies. This partnership approach recognizes the individual agency management authorities covering seabird interactions with longline fisheries. NMFS manages U.S. fisheries under the authority of the Magnuson-Stevens Fishery Conservation and Management Act and the High Seas Fishing Compliance Act. FWS manages birds predominately under the authority of the Endangered Species Act and the Migratory Bird Treaty Act. In addition, DOS has the lead role in international negotiations on fisheries conservation and management issues that should help promote IPOA implementation by encouraging other nations to develop NPOAs. Given each agency's responsibilities, the NPOA-S was developed collaboratively by NMFS and FWS. This collaborative effort has increased communication

between seabird specialists and fishery managers in FWS and NMFS. Maintaining this cooperation is a high priority for both agencies.

The NPOA-S contains the following themes:

1. Action Items: NMFS, with the assistance of the Regional Fishery Management Councils (Councils), the NMFS Regional Science Centers, and FWS, as appropriate, should conduct the following activities:

- Detailed assessments of its longline fisheries for seabird bycatch within 2 years of the adoption of the NPOA-S;
- If a problem is found to exist within a longline fishery, measures to reduce this seabird bycatch should be implemented within 2 years. These measures should include data collection, prescription of mitigation measures, research and development of mitigation measures and methods, and outreach, education, and training about seabird bycatch; and
- NMFS, in collaboration with the appropriate Councils and in consultation with FWS, will prepare an annual report on the status of seabird mortality for each longline fi shery, including assessment information, mitigation measures, and research efforts. FWS will also provide regionally-based seabird population status information that will be included in the annual reports.

2.) Interagency Cooperation: The continuation, wherever possible, of the ongoing cooperative efforts between NMFS and FWS on seabird bycatch issues and research.

3.) International Cooperation: The United States' commitment, through the DOS, NMFS and FWS, to advocate the development of National Plans of Action within relevant international fora. The development of the NPOA-S has emphasized that all U.S. longline fisheries have unique characteristics, and that the solution to seabird bycatch issues will likely require a multi-faceted approach requiring different fishing techniques, the use of mitigating equipment, and education within the affected fisheries. Therefore, the NPOA-S does not prescribe specific mitigation measures for each longline fishery. Rather, this NPOA-S provides a framework of actions that NMFS, FWS, and the Councils, as appropriate, should undertake for each longline fishery. By working cooperatively, fishermen, managers, scientists, and the public may use this national framework to achieve a balanced solution to the seabird bycatch problem and thereby promote sustainable use of our nation's marine resources.

Detailed assessments should address the following:

• Criteria used to evaluate the need for seabird bycatch mitigation and management measures

• Longline fishing fleet data (numbers and characteristics of vessels)

• Fishing techniques data (demersal, pelagic, and other pertinent technical information)

• Fishing areas (by season and geographic location)

• Fishing effort data (seasons, species, catch, number of sets, and number of hooks/year/fishery)

• Status of seabird populations in the fishing areas, if known

• Estimated total annual seabird species-specific catch and catch-per-unit-effort (number/1,000 hooks set/species/fishery)

• Existing area and species-specific seabird bycatch mitigation measures and their effectiveness in reducing seabird bycatch

• Efforts to monitor seabird bycatch (e.g., observer program and logbooks), and

• Statement of conclusions and decision to develop and implement mitigation measures as needed.

Bycatch of Seabirds in Atlantic Tuna, Swordfish, and Shark Longline Fisheries

Introduction

The Secretary of Commerce manages Atlantic tunas, swordfish, and sharks - collectively known as highly migratory species or HMS - under the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks. The HMS FMP includes five species of Atlantic tunas (bluefin, yellowfin, albacore, bigeye, skipjack), swordfish, and 39 species of sharks in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. Longline fisheries for these species include the pelagic longline fishery for Atlantic tunas and swordfish and the bottom longline fishery for sharks. The HMS Management Division assesses seabird bycatch annually in the Stock Assessment and Fishery Evaluation Report.

Seabird Bycatch Assessment.

Atlantic pelagic longline fishery

Observer data from 1992 through 2001 indicate that bycatch is relatively low (Table 1). Since 1992, a total of 92 seabird interactions have been observed, with 67 seabirds observed killed in the Atlantic pelagic longline fishery. No expanded estimates of seabird bycatch or catch rates are available for the pelagic longline fishery.

Observed bycatch has ranged from 1 to 18 seabirds observed dead per year and 0 to 15 seabirds observed released alive per year from 1992 through 2001. Approximately half of the seabirds observed have not been identified to species (n = 48). Of those seabirds identified, gulls represent the largest group (n = 22), followed by greater shearwaters (n = 15), and northern gannets (n = 7). Greater shearwaters experienced the highest mortality (100 percent), followed by gulls (86 percent), and unidentified seabirds (68 percent). Northern gannets had the lowest mortality rate (14 percent).

The Mid Atlantic Bight experienced the highest number of seabirds observed caught and killed (n = 42, 90 percent) (see Figure 1). The Northeast Coastal area had the second highest number observed (n = 34) but third highest bycatch mortality (47 percent) compared to the South Atlantic Bight, which had a lower number of seabirds observed caught (n = 16) but higher mortality (81 percent).

Table 1. **Seabird Bycatch in the Atlantic Pelagic Longline Fishery from 1992 to 2001.** Source: NMFS Pelagic longline fishery observer program.

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

2001	6	NEC	SHEARWATER GREATER	7	dead
2001	7	NEC	SHEARWATER GREATER	1	dead

MAB - Mid Atlantic Bight, SAB - South Atlantic Bight, NEC - Northeast Coastal, GOM - Gulf of Mexico

Atlantic bottom longline shark fishery

One pelican has been observed killed from 1994 through 2001. The pelican was caught in January 1995 off the Florida Gulf Coast (between 25 18.68 N, 81 35.47 W and 25 19.11 N, 81 23.83 W) (G. Burgess, University of Florida, Commercial Shark Fishery Observer Program, pers. comm., 2001). No expanded estimates of seabird bycatch or catch rates are available for the bottom longline fishery.

Description of Fisheries

Atlantic pelagic longline fishery

There are approximately 80 to 100 active pelagic longline vessels currently operating in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. Fishermen target either swordfish (at night) or yellowfin and bigeye tuna (during the day). The nighttime fishery utilizes frozen bait (mackerel or squid, predominantly) and lightsticks. The daytime fishery uses frozen bait predominantly along the east coast and live bait in the Gulf of Mexico. In 2000, NMFS prohibited the use of live bait on pelagic longline vessels in the Gulf of Mexico to minimize bycatch mortality of billfish. Additionally, NMFS prohibited pelagic longline fishing in the Florida East Coast, Charleston Bump, DeSoto Canyon, and Grand Banks areas in 2000 and 2001 to reduce bycatch of swordfish, billfish, and sea turtles.

NMFS attempts to achieve five percent observer coverage (by number of sets) and has achieved approximately three to five percent annually between 1992 and 2000. Increased sampling in 2001 is expected to increase the sampling fraction to about eight percent. Observers collect information about seabird bycatch by species and also take photographs of the birds. In addition, fishermen are required to submit logbooks for every trip made. Logbooks do not collect specific information about seabird bycatch at this time. Commercial pelagic longline fishing occurs throughout the North and South Atlantic, and the Gulf of Mexico. NMFS expects to estimate seabird bycatch from the pelagic longline observer program in the coming year (extrapolating reported effort with observed catch rates).

Atlantic bottom longline shark fishery

There are approximately 250 bottom longline shark vessels currently operating in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. The Atlantic bottom longline fishery targets large coastal sharks, with landings dominated by sandbar and blacktip sharks. Gear characteristics vary by region, but in general, a ten-mile long monofilament bottom longline, containing about 750 hooks is fished overnight. Skates, sharks, or various finfishes are used as bait. This fishery operates subject to a limited large coastal shark quota, with a typical two to three-month long season starting in January and July. Commercial shark bottom longline fishing is concentrated in the southeastern United States and Gulf of Mexico. Vessel owners must submit logbooks for each shark fishing trip and are subject to observer coverage.

NMFS attempts to achieve five percent observer coverage and has achieved approximately three percent annually between 1995 and 2001 by weight of sharks landed. Increased sampling in 2001 is expected to increase the sampling fraction. Observers collect information about seabird bycatch. Starting in 2001, 20 percent of shark fishermen will be selected to submit a supplemental discard form, which includes information on seabird bycatch, as part of their standard logbook submissions.

Current Seabird Mitigation Efforts

No management measures are currently in place for seabird protection in either of these fisheries. Time/area closures for the pelagic longline fishery are in place in the Gulf of Mexico, along the east coast of Florida, in the Charleston Bump, in the Northeast Distant area, and in the Mid-Atlantic Bight (Figure 2). Such closures may positively affect seabirds.

Conclusion

Bycatch of seabirds in Atlantic HMS pelagic and bottom longline fisheries is minimal and there does not appear to be a problem with seabird bycatch in these fisheries. Accordingly, no mitigation measures are necessary at this time. NMFS intends to continue to collect data on seabird bycatch through observer programs and supplemental logbooks programs and to increase the species-specific identification of seabirds observed. NMFS will reassess seabird bycatch in these fisheries as expanded bycatch estimates are generated and/or new information becomes available.

Figure 1. Geographic areas used in the Atlantic pelagic longline fishery observer program.

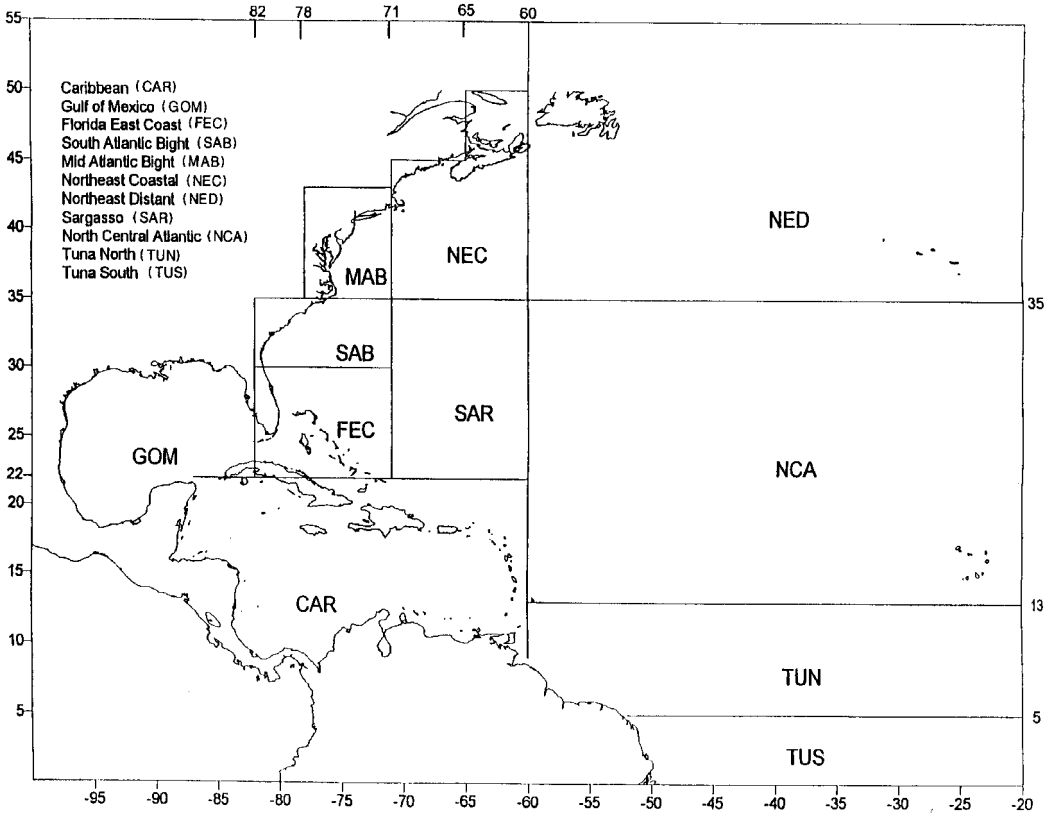
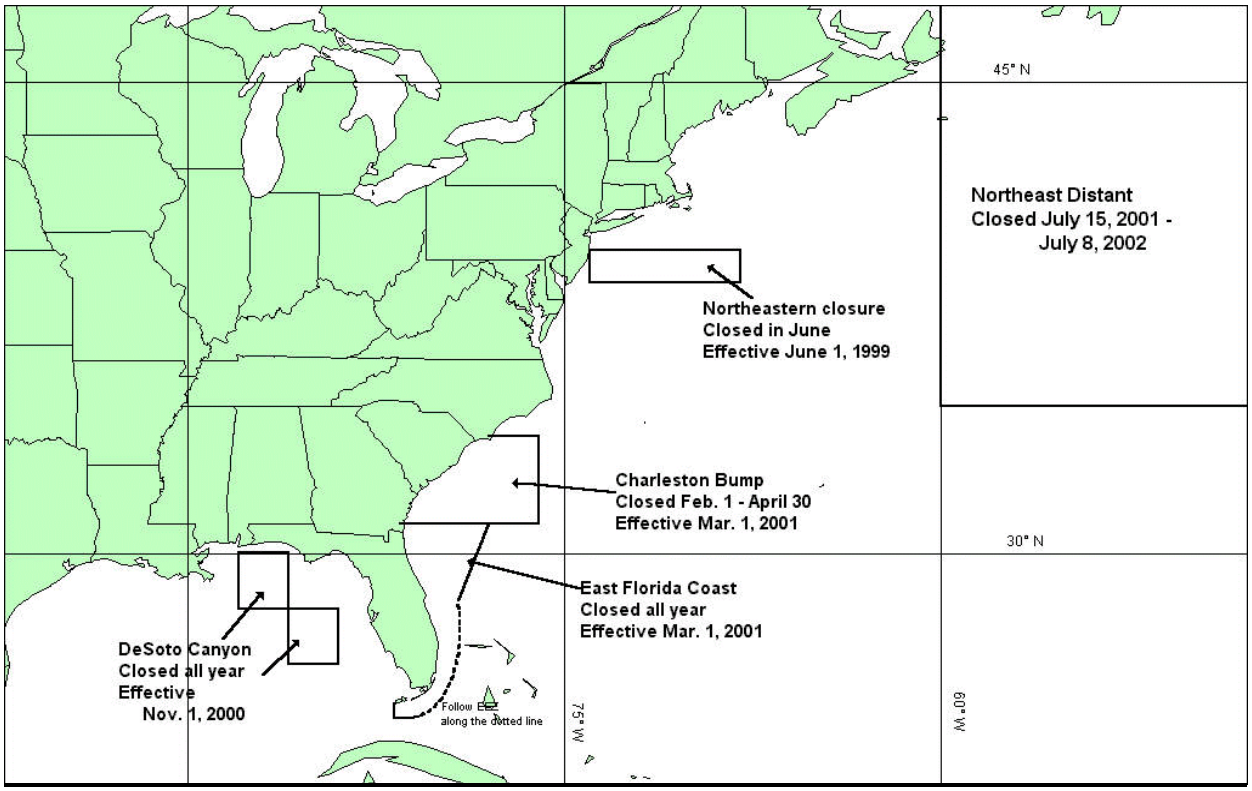
Figure 2. Map of closed areas for Atlantic pelagic longline fishermen.