Pre-Draft of

Amendment 2 to the Consolidated Atlantic Highly Migratory Species Fishery Management Plan

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Highly Migratory Species Management Division
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1.0 INTRODUCTION

This document is the Pre-Draft for Amendment 2 to the Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP). The Pre-Draft document allows the National Marine Fisheries Service (NMFS) to obtain additional information and input from Consulting Parties on potential alternatives prior to development of the formal draft Environmental Impact Statement (DEIS) for Amendment 2 of the Consolidated HMS FMP and proposed rule. Consulting Parties for HMS fisheries are defined under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as affected Fishery Management Councils, International Commission for the Conservation of Atlantic Tunas (ICCAT) commissioners and advisory groups, and the HMS Advisory Panel (AP). The Magnuson-Stevens Act requires NMFS to consult with Consulting Parties regarding amendments to the FMP. As such, we are requesting comments on this Pre-Draft document for Amendment 2 of the Consolidated HMS FMP. An electronic version of the Pre-Draft is also available on the website of the HMS Management Division at: http://www.nmfs.noaa.gov/sfa/hms.

NMFS anticipates that a proposed rule and a DEIS will be available in the summer of 2007 and anticipates completing Amendment 2 to the Consolidated HMS FMP and its related documents by January 1, 2008. Given the short time frame, NMFS requests receipt of any comments on this document by **March 31, 2007**.

This Pre-Draft includes a summary of the purpose and need (Chapter 1) and tables summarizing the ecological, social, and economic impacts of management alternatives that NMFS is considering at this time (Chapter 2). The alternatives outlined in Chapter 2 may be modified, removed, or supplemented based on any comments received and additional analyses.

NMFS specifically solicits opinions and advice on the range of alternatives and if there are additional alternatives that should be addressed. Additionally, NMFS solicits opinions and advice on the impacts described for each alternative.

Any written comments on the Pre-Draft should be submitted to Michael Clark, HMS Management Division, F/SF1, Office of Sustainable Fisheries, 1315 East-West Highway, Silver Spring, MD 20910 or faxed to (301) 713-1917 by **March 31, 2007**. For further information, contact Michael Clark at 301-713-2347 or Jackie Wilson at 404-806-7622.

1.1 Management History

On November 28, 1990, the President of the United States signed into law the Fishery Conservation Amendments of 1990 (Pub. L. 101-627). This law amended the Magnuson Fishery Conservation and Management Act (later renamed the Magnuson-Stevens Fishery Conservation and Management Act or Magnuson-Stevens Act) and gave the Secretary of Commerce (Secretary) the authority (effective January 1, 1992) to manage HMS in the exclusive economic zone (EEZ) of the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea under authority of the Magnuson-Stevens Act (16 U.S.C. §1811). This law also transferred from the Fishery Management Councils to the Secretary, effective November 28, 1990, the management authority for HMS in the Atlantic

Ocean, Gulf of Mexico, and Caribbean Sea (16 U.S.C. §1854(f)(3)).[1] At this time, the Secretary delegated authority to manage Atlantic HMS to NMFS.

The HMS Management Division within NMFS develops regulations for HMS fisheries, although some actions (*e.g.*, Large Whale Take Reduction Plan) are taken by other NMFS offices if the main legislation (*e.g.*, Marine Mammal Protection Act) driving the action is not the Magnuson-Stevens Act or the Atlantic Tunas Convention Act (ATCA). NMFS manages HMS species at the international, national, and state levels because of the highly migratory nature of these species. NMFS primarily coordinates the management of HMS fisheries in Federal waters (domestic) and the high seas (international) while individual states establish regulations for HMS in their own waters. There are exceptions to this generalization. For example, Federal bluefin tuna regulations apply in most state waters, and Federal shark and swordfish fishermen, as a condition of their permit, are required to follow Federal regulations in all waters unless that state has more restrictive regulations. Additionally, in 2005, the Atlantic States Marine Fisheries Commission (ASMFC) agreed to develop an interstate coastal shark FMP. Once complete, this interstate FMP would coordinate management measures among all states along the Atlantic coast (Florida to Maine). NMFS is participating in the development of this interstate FMP.

Generally, on the domestic level, NMFS implements international agreements, as appropriate, and management measures that are required under domestic laws such as the Magnuson-Stevens Act. While NMFS does not generally manage HMS fisheries in state waters, states are invited to send representatives to AP meetings and to participate in stock assessments, public hearings, and other fora. NMFS is working to improve its communication and coordination with state agencies. In 2006, NMFS reviewed the shark regulations of several states and asked some states to consider changing their regulations to be consistent with Federal regulations. As of May 2006, this request resulted in changes and dialogues with certain states regarding the regulations such as the Commonwealth of Virginia and the State of Florida. Additionally, as a result of ASMFC's decision to develop an interstate FMP, the State of Maine opened a dialog with NMFS regarding shark regulations.

1.1.1 Up to 1999 Atlantic Shark Fisheries and Management

Recreational fishing for Atlantic sharks occurs in Federal and state waters from New England to the Gulf of Mexico and Caribbean Sea. In the past, sharks were often called "the poor man's marlin." Recreational shark fishing with rod and reel is now a popular sport at all social and economic levels, largely because of accessibility to the resource. Sharks can be caught virtually anywhere in salt water, with even large specimens available in the nearshore area to surf anglers or small boaters. Most recreational shark fishing takes place from small to medium-size vessels. Mako, white, and large pelagic sharks are generally accessible only to those aboard ocean-going vessels. Recreational shark fisheries are exploited primarily by private

[1] The Magnuson-Stevens Act, at 16 U.S.C. 1802(14), defines the term "highly migratory species" as tuna species, marlin (*Tetrapturus* spp. and *Makaira* spp.), oceanic sharks, sailfishes (*Istiophorus* spp.), and swordfish (*Xiphias gladius*). Further, the Magnuson-Stevens Act, at 16 U.S.C. 1802(27), defines the term "tuna species" as albacore tuna (*Thunnus alalunga*), bigeye tuna (*Thunnus obesus*), bluefin tuna (*Thunnus thynnus*), skipjack tuna (*Katsuwonus pelamis*), and yellowfin tuna (*Thunnus albacares*).

vessels and charter/headboats although there are some shore-based fishermen active in the Florida Keys.

In the early 1900s, a Pacific shark fishery supplied limited demands for fresh shark fillets and fish meal as well as a more substantial market for dried fins of soupfin sharks. In 1937, the price of soupfin shark liver skyrocketed when it was discovered to be the richest source of vitamin A available in commercial quantities. A shark fishery in the Caribbean Sea, off the coast of Florida, and in the Gulf of Mexico developed in response to this demand (Wagner, 1966). At this time, shark fishing gear included gillnets, hook and line, anchored bottom longlines (BLL), floating longlines, and benthic lines for deepwater fishing. These gear types are slightly different than the gears used today and are fully described in Wagner (1966). By 1950, the availability of synthetic vitamin A caused most shark fisheries to be abandoned (Wagner, 1966).

A small fishery for porbeagle sharks existed in the early 1960s off the U.S. Atlantic coast involving Norwegian fishermen. Between the World Wars, Norwegians and Danes had pioneered fishing for porbeagle sharks in the North Sea and in the region of the Shetland, Orkney, and the Faroe Islands. In the late 1940s, these fishermen caught from 1,360 to 2,720 metric tons (mt) yearly, with lesser amounts in the early 1950s (Rae, 1962). The subsequent scarcity of porbeagle sharks in their fishing area forced the Norwegians to explore other grounds, and around 1960, they began fishing the Newfoundland Banks and the waters east of New York. Between 1961 and 1964, their catch increased from 1,800 to 9,300 mt, then declined to 200 mt (Casey *et al*., 1978).

The U.S. Atlantic shark fishery developed rapidly in the late 1970s due to increased demand for their meat, fins, and cartilage. At the time, sharks were perceived to be underutilized as a fishery resource. The high commercial value of shark fins led to the controversial practice of finning, or removing the valuable fins from sharks and discarding the carcass. Growing demand for shark products encouraged expansion of the commercial fishery throughout the late 1970s and the 1980s. Tuna and swordfish vessels began to retain a greater proportion of their shark incidental catch and to conduct some directed fishing. The Secretary of Commerce published the Preliminary Fishery Management Plan for Atlantic Billfish and Sharks in 1978, which noted, among other things, the need for international management regarding sharks. Catches accelerated through the 1980s, with peak commercial landings of large coastal and pelagic sharks reported in 1989.

In 1989, the five Atlantic Fishery Management Councils asked the Secretary of Commerce to develop a Shark FMP. The Councils were concerned about the late maturity and low fecundity of sharks, the increase in fishing mortality, and the possibility of the resource being overfished. The Councils requested that the FMP cap commercial fishing effort, establish a recreational bag limit, prohibit "finning," and begin a data collection system.

In 1993, the Secretary of Commerce, through NMFS, implemented the FMP for Sharks of the Atlantic Ocean. At that time, NMFS identified large coastal sharks (LCS) as overfished and pelagic and small coastal sharks (SCS) as fully fished. The quotas were 2,436 mt dressed weight (dw) for LCS and 580 mt dw for pelagic sharks. No quota was established for SCS. Under the rebuilding plan established in the 1993 FMP, the LCS quota was expected to increase

every year up to the maximum sustainable yield estimated in the 1992 stock assessment, which was 3,787 mt dw.

A number of difficulties arose in the initial year of implementation of the Shark FMP that resulted in a short season and low ex-vessel prices. To address these problems, a commercial trip limit of 4,000 lb dw for permitted vessels for LCS was implemented on December 28, 1993 (58 FR 68556), and a control date for the Atlantic shark fishery was established on February 22, 1994 (59 FR 8457). A final rule to implement additional measures authorized by the FMP published on October 18, 1994 (59 FR 52453).

In 1994, under the rebuilding plan implemented in the 1993 Shark FMP, the LCS quota was increased to 2,570 mt dw. However, a new stock assessment was completed in March 1994 that indicated rebuilding LCS could take as long as 30 years and suggested a more cautious approach for pelagic sharks and SCS. A final rule that capped quotas for LCS and pelagic sharks at the 1994 levels was published on May 2, 1995 (60 FR 21468).

In June 1996, NMFS convened another stock assessment to examine the status of LCS stocks. The 1996 stock assessment found no clear evidence that LCS stocks were rebuilding and concluded that "[a]nalyses indicate that recovery is more likely to occur with reductions in effective fishing mortality rate of 50 [percent] or more." In response to these results, in 1997, NMFS reduced the LCS commercial quota by 50 percent to 1,285 mt dw and the recreational retention limit to two LCS, SCS, and pelagic sharks combined per trip with an additional allowance of two Atlantic sharpnose sharks per person per trip (62 FR 16648, April 2, 1997). In this same rule, NMFS established an annual commercial quota for SCS of 1,760 mt dw and prohibited possession of five species (sand tiger, bigeye sand tiger, whale, basking, and white sharks). As a result of litigation, NMFS prepared additional economic analyses on the 1997 LCS quotas and was allowed to maintain those quotas during resolution of the case.

In June 1998, NMFS held another LCS stock assessment. The 1998 stock assessment found that LCS were overfished and would not rebuild under the 1997 harvest levels. Based in part on the results of the 1998 stock assessment, in April 1999, NMFS published the 1999 FMP, which included numerous measures to rebuild or prevent overfishing of Atlantic sharks in commercial and recreational fisheries. The 1999 FMP replaced the 1993 Atlantic Shark FMP. Management measures related to sharks that changed in the 1999 FMP included:

- Reducing commercial LCS and SCS quotas;
- Establishing ridgeback and non-ridgeback categories of LCS;
- Implementing a commercial minimum size for ridgeback LCS;
- Establishing blue shark, porbeagle shark, and other pelagic shark subgroups of the pelagic sharks and establishing a commercial quota for each subgroup;
- Reducing recreational retention limits for all sharks;
- Establishing a recreational minimum size for all sharks except Atlantic sharpnose;
- Expanding the list of prohibited shark species to 19 species;
- Implementing limited access in commercial fisheries;

- Establishing a shark public display quota;
- Establishing new procedures for counting dead discards and state landings of sharks after Federal fishing season closures against Federal quotas; and
- Establishing season-specific over- and underharvest adjustment procedures.

The implementing regulations were published on May 28, 1999 (64 FR 29090). However, in 1999, a court enjoined implementation of the 1999 shark regulations, because of the ongoing litigation on the 1997 quotas. A year later, on June 12, 2000, the court issued an order clarifying that NMFS could proceed with implementation and enforcement of the 1999 prohibited species provisions (64 FR 29090, May 28, 1999).

In addition to shark regulations, the 1999 FMP incorporated all existing management measures for Atlantic tuna and north Atlantic swordfish that have been issued previously under the authority of the ATCA. It also incorporated all existing management measures for North Atlantic swordfish and Atlantic sharks that had previously been issued under the authority of the Magnuson-Stevens Act. South Atlantic swordfish and South Atlantic albacore tuna continue to be managed only under ATCA.

Some of the non-species specific management measures of the 1999 FMP included vessel monitoring systems for all pelagic longline (PLL) vessels; gear and vessel marking requirements; moving PLL gear after an interaction with a protected species; a requirement for charter/headboats to obtain an annual vessel permit; tournament registration for all HMS tournaments; time limits on completing a vessel logbook; and expanded observer coverage. The 1999 FMP also established the threshold levels to determine if a stock is overfished, if overfishing is occurring, or if the stock is rebuilt. Finally, the 1999 FMP identified essential fish habitat (EFH) for all Atlantic tunas, swordfish, and sharks. As part of the 1999 FMP, the regulations for all Atlantic HMS, including billfish, were consolidated into one part of the Code of Federal Regulations, 50 CFR Part 635. Before then, each species had its own part. This often led to confusion and, in some cases, conflicting regulations.

1.1.2 Amendment 1 to the FMP for Atlantic Tunas, Swordfish, and Sharks

As noted in Section 1.1.1, in 1999 a court enjoined the Agency from implementing many of the shark-specific regulations of the 1999 FMP. In 2000, the injunction was lifted when a settlement agreement was entered to resolve the 1997 and 1999 lawsuits. The settlement agreement required, among other things, an independent (*i.e.*, non-NMFS) review of the 1998 LCS stock assessment. The settlement agreement did not address any regulations affecting the pelagic shark, prohibited species, or recreational shark fisheries. Once the injunction was lifted, on January 1, 2001, the pelagic shark quotas adopted in the 1999 FMP were implemented (66 FR 55). On March 6, 2001, NMFS published an emergency rule implementing the settlement agreement (66 FR 13441). This emergency rule expired on September 4, 2001, and established the LCS and SCS commercial quotas at 1997 levels.

In late 2001, the Agency received the results of the peer review of the 1998 LCS stock assessment. These peer reviews found that the 1998 LCS stock assessment was not the best available science for LCS. Taking into consideration the settlement agreement, the results of the

peer reviews of the 1998 LCS stock assessment, catch rates, and the best available scientific information (not including the 1998 stock assessment projections), NMFS implemented another emergency rule for the 2002 fishing year that suspended certain measures under the 1999 regulations pending completion of new LCS and SCS stock assessments and a peer review of the new LCS stock assessment (66 FR 67118, December 28, 2001; extended 67 FR 37354, May 29, 2002). Specifically, NMFS maintained the 1997 LCS commercial quota (1,285 mt dw), maintained the 1997 SCS commercial quota (1,760 mt dw), suspended the commercial ridgeback LCS minimum size, suspended counting dead discards and state landings after a Federal closure against the quota, and replaced season-specific quota accounting methods with subsequent-season quota accounting methods. That emergency rule expired on December 30, 2002.

On October 17, 2002, NMFS announced the availability of the 2002 LCS stock assessment and the workshop meeting report (67 FR 64098). The results of this stock assessment indicated that the LCS complex was still overfished and overfishing was occurring. Additionally, the 2002 LCS stock assessment found that sandbar sharks were no longer overfished but that overfishing was still occurring and that blacktip sharks were rebuilt and overfishing was not occurring.

Based on the results of both the 2002 SCS and LCS stock assessments, NMFS implemented an emergency rule to ensure that the commercial management measures in place for the 2003 fishing year were based on the best available science (67 FR 78990, December 27, 2002; extended 68 FR 31987, May 29, 2003). Specifically, the emergency rule implemented the LCS ridgeback/non-ridgeback split established in the 1999 FMP, set the LCS and SCS quotas based on the results of stock assessments, suspended the commercial ridgeback LCS minimum size, and allowed both the season-specific quota adjustments and the counting of all mortality measures to go into place.

In December 2003, NMFS implemented the regulations in Amendment 1 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (68 FR 74746). These regulations were based on the 2002 small and large coastal shark stock assessments. Some of the measures taken in Amendment 1 included revising the rebuilding timeframe for LCS; re-aggregating the LCS complex; establishing a method of changing the quota based on maximum sustainable yield (MSY); updating some shark EFH identifications; modifying the quotas, seasons, and regions; adjusting the recreational bag limit; establishing criteria to add or remove species to the prohibited shark list; establishing gear restrictions to reduce bycatch and bycatch mortality; establishing a time/area closure off North Carolina for BLL fishermen; and establishing VMS requirements for BLL and gillnet fishermen.

In 2004, ICCAT adopted a recommendation concerning management of Atlantic sharks by contracting parties. The recommendation included measures regarding shark finning, research on gears and shark nursery areas, stock assessment schedules for shortfin mako and blue sharks, and submission of shark data. ICCAT completed stock assessments for shortfin mako sharks and blue sharks in 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 sharks seems to be above MSY ($B>B_{MSY}$), however, these results were conditional and based on assumptions that were made by the

committee. These assumptions indicate that blue sharks are not currently overfished. This conclusion is conditional and based on limited landings data. The North Atlantic shortfin mako population has experienced some level of stock depletion as suggested by the historical catch-per-unit-effort (CPUE) trend and model outputs. The current stock may be below MSY ($B<B_{MSY}$), suggesting that the species may be overfished (SCRS, 2004).

1.1.3 Consolidated HMS FMP

NMFS issued two separate FMPs in April 1999 for the Atlantic HMS fisheries. The 1999 Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, combined, amended, and replaced previous management plans for swordfish and sharks, and was the first FMP for tunas. Amendment 1 to the Billfish Management Plan updated and amended the 1988 Billfish FMP.

During the five-and-a-half years that these two FMPs had co-existed, there had been a growing recognition by the Agency of the interrelated nature of these fisheries and the need to consider management actions together. In addition, the Agency had identified some adverse ramifications stemming from separation of the plans, including unnecessary administrative redundancy and complexity, loss of efficiency, and public confusion over the management process. Therefore, NMFS proposed to improve coordination of the conservation and management of the domestic fisheries for Atlantic swordfish, tunas, sharks and billfish by consolidating the management of all HMS into one FMP. In 2005, NMFS released the draft Consolidated HMS FMP. The final Consolidated HMS FMP was completed in July 2006 and the implementing regulations were published on October 2, 2006 (71 FR 58058).

The final Consolidated HMS FMP changed certain management measures, adjusted regulatory framework measures, and continued the process for updating HMS EFH. Measures that are specific to the shark fisheries include mandatory workshops and certifications for all vessel owners and operators that have PLL or BLL gear on their vessels and that have been issued or are required to be issued any of the HMS limited access permits (LAPs) to participate in HMS longline and gillnet fisheries. These workshops would provide information and ensure proficiency with using required equipment to handle, release, and disentangle sea turtles, smalltooth sawfish, and other non-target species. The Consolidated HMS FMP also requires Federally permitted shark dealers to attend Atlantic shark identification workshops to train shark dealers how to properly identify shark carcasses. Additional measures specific to sharks include the differentiation between PLL and BLL gear based upon the species composition of the catch onboard or landed, the requirement that the 2nd dorsal fin and the anal fin remain on all sharks through landing, and a new prohibition making it illegal for any person to sell or purchase any HMS that was offloaded from an individual vessel in excess of the retention limits specified in § 635.23 and 635.24. The Consolidated HMS FMP also implemented complementary HMS management measures in Madison-Swanson and Steamboat Lumps Marine Reserves and established criteria to consider when implementing new time/area closures or making modifications to existing time/area closures.

The 2002 SCS stock assessment found that finetooth sharks were not overfished but that overfishing was occurring. The final Consolidated HMS FMP included a plan for preventing overfishing by expanding observer coverage, collecting more information on where finetooth sharks are being landed, and coordinating with other fisheries management entities that are

contributing to finetooth shark fishing mortality. A stock assessment for SCS (December 7, 2006, 71 FR 70965) is currently underway following the Southeast Data Assessment and Review (SEDAR) process and NMFS expects the SEDAR workshops to be completed in late 2007. Additional management measures concerning finetooth sharks and other SCS may be implemented, if necessary, upon completion of the current assessment in a separate rulemaking.

Recent actions taken by NMFS affecting the Atlantic shark fishery include a combined emergency and final rule (December 14, 2006, 71 FR 75122) that adjusted the 2007 first season commercial quotas for LCS, SCS, and pelagic sharks based on over- or underharvests from the 2006 fishing season, and that announced the season opening and closing dates for the first season 2007. During the first season of 2006, the South Atlantic and Gulf of Mexico regions both experienced significant overharvests of LCS as well as the Gulf experienced overharvests of SCS. The South Atlantic landed 278.2 percent (393.1 mt dw) of their LCS quota (141.3 mt dw) and 15.6 percent (44.5 mt dw) of their SCS quota (284.6 mt dw). The Gulf of Mexico also landed 151.1 percent (336.6 mt dw) of their LCS quota (222.8 mt dw) and 527 percent (78 mt dw) of the SCS quota (14.8 mt dw). The North Atlantic region experienced underharvests for both their LCS and SCS quotas (landing approximately 3.8 percent and 0 percent, respectively). As a result of these extensive over- and underharvests in the South Atlantic and Gulf of Mexico in 2006, NMFS closed the South Atlantic region to directed LCS fishing during the 2007 first season and considerably shortened the Gulf season. NMFS transferred 63.2 mt dw of the South Atlantic's regional SCS underharvest in the 2006 first season to the Gulf of Mexico, allowing a first season SCS fishery in both regions. This afforded the Gulf of Mexico region its baseline SCS quota of 15.1 mt dw in the 2007 first season. The rule also provided NMFS with the flexibility to open the mid-Atlantic shark closed area during the month of July in 2007, pending available quota. Although the South Atlantic region is closed to LCS fishing in the first season of 2007, closing the season will still not account for all of the overharvest that occurred during the first season in 2006, and the remaining overharvest will need to be addressed in this rulemaking.

NMFS recently expanded the equipment required for the safe handling, release, and disentanglement of sea turtles caught in the Atlantic shark BLL fishery (72 FR 5633, February 7, 2007). As a result, equipment required for BLL vessels is now consistent with the requirements for the PLL fishery. Furthermore, this action implemented several year-round BLL closures to protect EFH to maintain consistency with the Caribbean Fishery Management Council.

1.1.4 Recent Stock Assessments

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 (71 FR 65086, November 7, 2006).

Also according to this stock assessment, sandbar sharks are overfished (SSF_{2004}/SSF_{MSY} = 0.72; SSF is spawning stock fecundity and was used as a proxy for biomass), and overfishing

is occurring (F_{2004} / F_{MSY} = 3.72). Spawning stock fecundity, which is the sum of number mature at age times pup-production at age, is used instead of biomass because biomass does not influence pup production in sharks. 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.

The 2005/2006 stock assessment assessed blacktip sharks for the first time as two separate populations: Gulf of Mexico and Atlantic populations. Blacktip sharks were assessed separately in the two regions based on tagging studies that suggested the stocks are geographically distinct and isolated. NMFS has declared that the status of the Gulf of Mexico blacktip shark population is not overfished with no overfishing occurring (71 FR 65086). The results indicate that the Gulf of Mexico population is healthy and that current catches should not increase in order to keep this population at a sustainable level. This assessment also indicated that the current status of the blacktip shark population in the South Atlantic region is unknown. The assessment was unable to provide estimates of stock status or reliable population projections, but indicated that current catch levels should not change. NMFS has declared the status of the South Atlantic blacktip shark population to be unknown (71 FR 65086).

The first dusky-specific shark assessment was released in May 2006 (71 FR 30123). The 2006 dusky shark 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 – 1,810). 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 (71 FR 65086).

Canada has conducted stock assessments on porbeagle sharks in 1999, 2001, 2003, and 2005. Based on the 2001 stock assessment, the Committee on the Status of Endangered Wildlife in Canada designated the porbeagle shark as endangered. 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 it to be the best available science and appropriate to use for U.S. domestic management purposes because porbeagle sharks are a unit stock that extends into U.S. waters. 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).

1.2 Purpose and Need for Action

Based on the results of the 2005 Canadian porbeagle shark stock assessment, the 2006 dusky shark stock assessment, and the 2005/2006 LCS stock assessment, NMFS has determined that a number of shark stocks and/or species are overfished and an amendment to the final Consolidated HMS FMP is needed to implement management measures to rebuild overfished stocks and prevent overfishing consistent with the mandates of the Magnuson-Stevens Act.

NMFS anticipates significant changes to shark management measures in this amendment. The purpose of this amendment is to enact management measures that will rebuild sandbar, dusky and porbeagle shark populations, provide an opportunity for the sustainable harvest of blacktip sharks, particularly in the Gulf of Mexico where the stock has been declared rebuilt, and to end and/or prevent overfishing of Atlantic sharks. The changes to the shark management structure will likely be implemented by January 1, 2008.

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2.0 RANGE OF POTENTIAL ALTERNATIVES

2.1 Effort Controls

2.1.1 Quotas and Species Complexes

The seventy-two species of sharks managed by the HMS Management Division are divided into four species groups for management: LCS, SCS, pelagic sharks, and prohibited sharks. The LCS complex is comprised of 11 species including sandbar, silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead sharks. SCS consist of finetooth, Atlantic sharpnose, blacknose, and bonnethead sharks. Pelagic sharks consist of blue, oceanic whitetip, porbeagle, shortfin mako, and thresher sharks. Prohibited sharks consist of sand tiger, bigeye sand tiger, whale, basking, white, dusky, bignose, Galapagos, night, Caribbean reef, smalltail, Caribbean sharpnose, narrowtooth, Atlantic angel, longfin mako, bigeye thresher, sevengill, sixgill, and bigeye sixgill sharks. Sharks may be added to the prohibited list if they meet at least two of the following criteria: (1) there is sufficient biological information to indicate the stock warrants protections, such as indications of depletion or low reproductive potential or the species is on the Endangered Species Act (ESA) candidate list, (2) the species is rarely encountered or observed caught in HMS fisheries, (3) the species is not commonly encountered or observed caught as bycatch in fishing operations, or (4) the species is difficult to distinguish from other prohibited species (*i.e.*, look-alike issue).

As described in the Table 2.4, NMFS is considering a broad range of alternatives to address the results of the 2005/2006 stock assessments. Below, NMFS describes the results of the 2005/2006 stock assessments and provides relevant data. Consulting Parties should keep in mind that alternatives chosen in this section are related to, and could impact, available alternatives in other sections (*e.g.*, quotas could impact retention limits, gear restrictions, and time/area closures).

LCS Complex

Since the 1993 Shark FMP, LCS have been considered overfished, and management has been based on the results of assessments on the complex as a whole. Based on the 2002 LCS stock assessment, the 2003 Amendment to the 1999 Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (Amendment 1) established the commercial LCS quota as 1,017 mt dw (2,242,078 lb dw).

Given the results of the latest shark stock assessments and the recommendations by the peer reviewers (see Chapter 1, Section 1.1.4), NMFS will be establishing new quotas in order to rebuild sandbar, dusky, and porbeagle sharks. Unlike past assessments, the 2005/2006 LCS stock assessment determined that it is inappropriate to assess the LCS complex as a whole. Therefore, NMFS is examining alternative options to managing the LCS complex as a whole. Consequently, some of the alternatives presented in this section move towards more species-specific management. Such alternatives could involve removing the most commonly caught species in the LCS complex and

establishing species-specific quotas based either on the stock assessment recommendations or on current landings of different species. Other alternatives, including potentially prohibiting the commercial and recreational harvest of all LCS, will be considered, as appropriate.

According to BLL observer data (NMFS, 2006a), the three most commonly caught LCS on BLL gear are sandbar, blacktip, and tiger sharks. These species typically comprise about 80 percent of the catch on BLL (NMFS, 2006a), and the average total annual commercial harvest of sandbar, blacktip, and tiger sharks from 2002 through 2004 were 683, 556.3, and 9.9 mt dw, respectively. These data are important when considering the implementation of species-specific quotas. In addition, they highlight the difference between current landings and the total allowable catch (TAC) that was recommended by the stock assessment for sandbar sharks (158.3 mt dw).

Sandbar Sharks

According to the 2005/2006 LCS assessment, sandbar sharks are overfished ($SSF_{2004}/SSF_{MSY} = 0.72$; SSF is spawning stock fecundity and was used as a proxy for biomass), and overfishing is occurring ($F_{2004} / F_{MSY} = 3.72$). The assessment indicated that sandbar sharks had a 70 percent probability of rebuilding by 2070 with a TAC across all fisheries (commercial, recreational, and scientific) of 220 mt whole weight (ww) (158.3 mt dw) each year and a fishing mortality (F) between 0.009 and 0.011. Similarly, they have a 50 percent probability of rebuilding by 2070 with a TAC of 240 mt ww (172 mt dw) each year.

Currently, approximately 67 percent of the annual commercial landings of LCS are sandbar sharks (approximately 683 mt dw annually; Table 3.68 in NMFS, 2006a). Sandbar sharks comprise the majority of LCS landings in the South Atlantic region and are the second most commonly harvested species (behind blacktip sharks) in the Gulf of Mexico region. Recreational catch of sandbar sharks has decreased over time (NMFS, 2006b); however, the average annual recreational catch of sandbar sharks from 2002 through 2004 is approximately 27 mt dw (Cortés and Neer, 2005). Assuming recreational landings remained the same in the future, this would result in approximately 131 mt dw for a combined commercial fishery (in both directed and incidental landings and discards) and scientific research/public display (*e.g.*, display permits for aquaria, discards during scientific research activities, etc.), which is an approximate 80 percent reduction in what the commercial fishery is currently landing.

NMFS is also considering reducing the current 60 mt ww exempted fishing program shark quota. The 60 mt ww set aside was established in Amendment 1 to the 1999 FMP. However, it has never been fully harvested under the exempted fishing program (at most, approximately 16 mt ww or 27 percent of the quota was harvested in 2004). However, since NMFS is re-evaluating all quotas for sharks, NMFS will also re-evaluate the exempted fishing program shark quota. This set aside is approximately four percent of the current commercial quota. Under this alternative, NMFS may also consider limiting the number of overfished species (such as sandbar sharks) or prohibited species (such as dusky sharks) that can be collected under these types of permits.

Landings of sandbar sharks under exempted fishing permits (display, exempted fishing, letters of acknowledgement, and scientific research permits) have ranged from 57-110 sandbar sharks/year between 2004 and 2006.

NMFS is currently determining the incidental catch and discards of sandbar sharks in other fisheries. For instance, approximately 465 sandbar sharks are caught and killed in the Gulf of Mexico menhaden fishery. Assuming the same weight as caught in the commercial fishery (on average, 40.5 lb dw; Cortés and Neer, 2005), this equates to 8.5 mt dw. However, assuming the same weight as caught in the recreational fishery (on average, 10.3 lb dw; Cortés and Neer, 2005), this equates to 2.2 mt dw. Table 2.1 shows the percentage of sandbar commercial landings by region and gear. Observer data from the BLL observer program between 2005 and 2006 indicates that in the Gulf of Mexico and South Atlantic regions, species composition of BLL sets are comprised of a mixture of blacktip and sandbar sharks, indicating that fishermen are not able to selectively target either species (Smith *et al*., 2006; Hale *et al.*, 2007).

Dusky Sharks

Despite dusky sharks being placed on the prohibited species list since 1999, the 2006 dusky shark assessment determined that this species is overfished (B_{2003}/B_{MSY} = 0.15 – 0.47) with overfishing occurring (F_{2004}/F_{MSY} = 1.68 – 1,810). The assessment recommends that rebuilding for dusky sharks could require 100 to 400 years. Given the fact that dusky sharks are prohibited, their status indicates that bycatch of this species continues to be a problem. According to 2005 observer data, approximately 43 percent of the observed dusky sharks caught on BLL gear in the Atlantic were discarded dead (Smith *et al*., 2006). In addition, a total of 4,537 dusky sharks were discarded between 2000 through 2005 in the PLL fishery. 3,944 of these sharks were discarded alive while 592 were discarded dead.

Additionally, recreational harvest of these species totaled 11,862 from 2000-2004 (2,372/year on average) (NMFS, 2006a). This data was collected through Marine Recreational Fishery Statistics Survey (MRFSS), the NMFS Headboat Survey (HBOAT) operated by the SEFSC Beaufort Laboratory, and the Texas Parks and Wildlife Department Recreational Fishing Survey (TXPWD), which includes state landings of these species (dusky sharks may not have been prohibited, and thus legally landed, in some state waters).

Blacktip Sharks

According to the 2005/2006 LCS assessment, the Gulf of Mexico blacktip shark population is healthy, whereas the status of the Atlantic population is unknown. However, the assessment recommended that catch levels of blacktip sharks should not increase in the Gulf of Mexico and should not change in the Atlantic. The challenge is allowing these catch levels for the blacktip shark fishery while limiting the catch and bycatch of dusky and sandbar sharks.

The top three species of sharks caught on BLL are sandbar sharks (~ 27 percent of catch), blacktip sharks (~14 percent), and tiger sharks (~ 12 percent) (NMFS, 2006a). In the Gulf of Mexico, between the second trimester season of 2005 and through the third trimester of 2006, on average, 62 blacktip sharks and 23 sandbar sharks were caught per observed set. In the Atlantic, on average, 14 blacktips sharks and 36 sandbars were caught per observed set (Smith *et al*., 2006; Hale *et al.*, 2007). Blacktip sharks are also caught in gillnet gear. According to observer reports, approximately 91 percent of the sharks caught in stikenets are blacktip sharks while only four percent of sharks caught in drift gillnets are blacktip sharks (Carlson and Baremore, 2003). Table 2.2 shows the breakdown of the percentage of blacktip shark commercial landings by region and gear. Table 2.3 shows the percentage of blacktip shark commercial landings by region and year from all gears combined.

Porbeagle Sharks

The 2005 Canadian stock assessment of porbeagle sharks determined that 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. NMFS has reviewed the Canadian stock assessment and deems it to be the best available science and appropriate to use for U.S. domestic management purposes because porbeagle sharks are a single stock that extends into U.S. waters. Porbeagle sharks were determined to be overfished (SSN_{2004}/SSN_{MSY} = 0.15 – 0.32; SSN is spawning stock number and used as a proxy for biomass), but overfishing is not occurring (F_{2004}/F_{MSY} = 0.83). The current quota for porbeagle sharks is 90.2 mt dw/year. Commercial landings of porbeagle sharks between 1999-2004 ranged from 0.5 – 2.62 mt dw/year (mean = 1.6 mt dw/year). In addition, data indicate that there has been nominal recreational harvest for this species since 1998 (Table 3.45 in NMFS, 2006a).

NMFS is considering a range of alternatives to rebuild these sharks with respect to quota allocation and species complexes. The quotas may be based, in part, on commercial and recreational shark management measures regarding time/area closures (see Section 2.3), retention limits (see Section 2.1.2), and gear modifications (see Section 2.1.3). In addition, the quotas would be appropriately split between the season and regions as described in Sections 2.2.1 and 2.2.2.

Table 2.1 Percentage of sandbar shark commercial landings by region and gear for all years combined. Years listed under each region indicate those used in the summary calculation. Source: Cortés and Neer, 2005.

Gear	Gulf of Mexico (1991-2004)	Mid-Atlantic (1989-2004)	South Atlantic (1991-2004)
Diving	0.08	0.00	0.00
Gillnets	0.10	34.12	3.02
Lines	3.59	1.31	1.33
Longlines	95.93	58.05	95.53
Other	0.27	0.00	0.00
Other nets	0.01	0.43	0.03
Other trawl	0.00	0.00	0.00

Gear	Gulf of Mexico (1991-2004)	Mid-Atlantic (1989-2004)	South Atlantic (1991-2004)
Otter trawl	0.01	4.54	0.09
Pots & Traps	0.00	0.00	0.00
Purse Seine	0.00	0.00	0.00
Unknown	0.00	1.55	0.00

Table 2.2 Percentage of blacktip shark commercial landings by region and gear for all years combined. Years listed under each region indicate those used in the summary calculation. Source: Cortés and Neer, 2005.

Gear	Gulf of Mexico (1991-2004)	Mid-Atlantic (1989-2004)	South Atlantic (1991-2004)
Diving	0.00	0.00	0.01
Gillnets	5.40	25.27	33.82
Lines	10.17	8.71	2.83
Longlines	47.79	62.48	62.85
Other	26.37	0.12	0.09
Other nets	0.07	0.02	0.05
Other trawl	0.04	0.00	0.00
Otter trawl	0.33	1.46	0.32
Pots & Traps	0.03	0.02	0.00
Purse Seine	0.01	0.08	0.00
Unknown	9.80	1.83	0.02

Table 2.3 Percentage of blacktip shark commercial landings by region and year for all gear combined. Source: Cortés and Neer, 2005.

Year	Gulf of Mexico	Mid-Atlantic	South Atlantic
1987	85.9	14.1	0.0
1988	100.0	0.0	0.0
1989	99.6	0.4	0.0
1990	94.3	5.7	0.0
1991	34.1	38.8	27.1
1992	35.4	28.6	36.0
1993	44.4	16.0	39.6
1994	55.2	3.0	41.9
1995	47.0	8.5	44.5
1996	49.6	2.9	47.4
1997	48.2	1.0	50.8
1998	58.4	4.7	36.9
1999	86.9	2.1	10.9
2000	82.0	2.7	15.3
2001	77.3	0.2	22.6
2002	58.4	1.6	40.0
2003	71.1	0.4	28.5
2004	70.5	5.5	24.0

Table 2.4 Potential quotas and species complexes alternatives.

Alternative	Ecological Impacts	Social/Economic Impacts
1. No Action. Maintain existing quotas and species complexes (LCS, SCS, pelagic sharks, and prohibited species)	-Continued fishing of overfished stocks; rebuilding plans for sandbar, dusky, and porbeagle sharks need to be implemented	-No change in current LCS annual commercial quota (1,017 mt dw) would not result in negative socioeconomic impacts in the short-term; in the long-term, certain species may not be available if other management measures fail to rebuild stock
Sandbar Shark Measures		
2. -Remove sandbar sharks from the LCS complex -Establish a separate sandbar quota as recommended by the 2005/2006 assessment (220 mt ww for commercial, recreational, and scientific fisheries). Once this quota is reached, close the BLL fishery and prohibit retention of sandbar sharks in all HMS fisheries.	-Reduce fishing pressure on sandbar sharks; sandbars could rebuild by 2070 -Dusky shark discards could still occur -Bycatch of sandbar sharks would still occur in other fisheries; need to account for these landings/discards in overall sandbar TAC	-Significant negative socioeconomic impacts, especially for commercial shark fishermen -Maintain a limited BLL shark fishery while sandbar shark quota available -Sandbar sharks look similar to other species and are difficult to identify; quota monitoring may be difficult -Fisheries for blacktip and other LCS species negatively impacted by sandbar induced closure
3. -Place sandbar sharks on the prohibited shark list -Establish a commercial quota of 0 mt dw (no retention).	-Reduce fishing pressure on overfished sandbar sharks -Dusky shark discards could still occur, but at lower level than what is currently occurring -Avoid misidentification (*i.e.*, look alike issue) in the recreational fishery between sandbar and dusky sharks	-Negative socioeconomic impacts due to prohibition of sandbar sharks -Quota monitoring may be difficult

Alternative	Ecological Impacts	Social/Economic Impacts
Blacktip Shark Measures		
4. -Remove blacktip sharks from the LCS complex -Establish a separate blacktip shark commercial quota based on current landings. Quota could be split between the Gulf of Mexico and South Atlantic based on stock assessment recommendations and historical landings.	-Bycatch of overfished sandbar and dusky sharks may still occur and slow rebuilding of these species -Would maintain landings of blacktip sharks at current levels, consistent with stock assessment	-Allow fishing for blacktip sharks -Quota monitoring may be difficult
Porbeagle Shark Measures		
5. -Keep porbeagle sharks in the pelagic shark management unit -Reduce quota for porbeagle sharks to what is currently landed (currently quota is 92 mt dw/year)	-Prevent expansion of fishing effort (prevent potential overfishing) -Could create dead discards if quota is exceeded	-Minimal negative socioeconomic impacts since the quota would not be reduced below what is currently landed
6. -Remove porbeagle sharks from pelagic sharks management unit and place this species on the prohibited shark species list -Establish a commercial quota of 0 mt dw (no retention).	-Reduce fishing pressure on porbeagle sharks and facilitate rebuilding -Increase discards of this species, especially in PLL fishery	-Negative socioeconomic impacts on commercial PLL fishermen -Negative socioeconomic impacts on recreational fishermen, especially during tournaments
LCS Measures		
7. -Close all LCS fisheries (0 mt dw quota for shark BLL gear) pending results of the next stock assessment; prohibit retention of LCS in gillnet, PLL, and other commercial fisheries	-Increased likelihood of rebuilding overfished sandbar and dusky sharks -Increase dead discards of LCS in PLL, gillnet, and non-HMS BLL fisheries	-Significant negative socioeconomic impacts to BLL, gillnet, and PLL

Alternative	Ecological Impacts	Social/Economic Impacts
8. -Remove the most commonly landed species in the shark BLL fishery from the LCS complex; the remaining LCS complex would be comprised of less commonly caught species in this fishery -Establish species-specific quotas for the most commonly caught species in the LCS complex (*e.g.*, blacktip and tiger sharks) based on current landings (except sandbar sharks); the quota for the remaining LCS complex would be based on current landings of the less commonly caught species (*e.g.*, nurse and bull sharks)	-Discards/catches of dusky and sandbar sharks could still occur	-Mitigate negative socioeconomic impacts by allowing fishing to continue for other species in the LCS complex that are not overfished and no overfishing occurring -Shark fishery may still be limited to accommodate reduced sandbar TAC -Quota monitoring may be more difficult because more emphasis on species identification -Move towards species specific management
9. - Provide incidental LCS quota to establish catch limits of LCS in other BLL, PLL, and gillnet fisheries; no directed commercial LCS fishery	-Reduce dead discards in other fisheries -Reduce fishing pressure on sandbar and dusky sharks as well as other shark species	-Negative economic impact due to no directed shark fishery -Difficult to track landings and enforce because there is no means of designating target species prior to embarking
10. -Establish a LCS quota for the recreational fishery; catch and release fishery once the quota has been met	-Control fishing pressure on overfished stocks in recreational fishery -May increase dead discards of sharks once the quota has been met	-Difficult to enforce/monitor -Negative socioeconomic impacts for tournaments and anglers that participate later in the year when the recreational quota may be met

Alternative	Ecological Impacts	Social/Economic Impacts
Exempted Fishing Program		
11. -Reduce exempted fishing quota for display and scientific research, as appropriate	-Reduce the number of overfished and/or prohibited species collected under these types of permit -Limited quota could restrict research on certain species	-Negative socioeconomic impacts for those that collect for public display -Negative socioeconomic impacts for aquariums and other institutions if sharks can not be collected for public display -Public may not see certain shark species in aquariums if sharks can not be collected for public display

2.1.2 Retention Limits

Currently the commercial shark fishery is under a limited access permit program. There are directed and incidental commercial shark permits that have different trip limits associated with each type of permit. A directed shark permit currently has a 4,000 lb dw LCS trip limit with no limits on the number of SCS or pelagic sharks that can be landed on a given trip. The commercial 4,000 lb dw LCS trip limit was established to limit derby-style fishing and lengthen the period of time the quota would remain available. The incidental shark permit trip limit is 5 LCS and 16 SCS and pelagic sharks, combined. Currently, there is no minimum size for the commercial shark fishery due to concerns regarding dead discards of undersized sharks.

The following alternatives define the range of alternatives NMFS is considering to rebuild sandbar, dusky, and porbeagle sharks with respect to commercial and recreational retention limits for LCS. This section addresses retention limits (trip limits for the commercial sector and bag limits for the recreational sector) as well as size limits for the recreational sector. As stated earlier, the alternatives presented here depend on, and could change, depending on the alternatives considered in other sections.

Table 2.5 Potential commercial and recreational retention limit alternatives.

Alternative	Ecological Impacts	Social/Economic Impacts
1. No Action: Maintain current commercial and recreational LCS retention limits	-Continued fishing of overfished stocks; rebuilding plans for sandbar, dusky, and porbeagle sharks need to be implemented	-No negative socioeconomic impacts for the commercial or recreational sector in the short-term; in the long-term fisheries may face more restrictive regulations if stocks do not rebuild; -maintain the current commercial and recreational retention limits
Commercial Measures		
2. Reduce commercial trip limits for directed and incidental permit holders	-Reduce fishing pressure on sandbar sharks and help rebuild stock -May increase dead discards of sandbars and other LCS if fishermen exceed reduced trip limit or increase effort to compensate	-Significant negative socioeconomic impacts if reduced trip limits increase the number of trips fishermen need to make
3. Remove commercial trip limit for directed permit holders	-Limit the number of dead discards -Quota could be reached quickly; overharvests may be likely	-Could create a derby-style fishery -Quota monitoring may be difficult
4. Allow the commercial harvest of only male sandbar sharks; maintain existing regulations for other species (*e.g.*, possession of males and females allowed)	-Leave adult sandbar females in the population to reproduce -May increase discards of female sandbar sharks -Removing large males from the population may effectively remove large females from the population if there is size-selective breeding	-Negative socioeconomic impacts since large female sandbar fins have some of the highest values -Mitigate negative socioeconomic impacts by allowing some harvest of sandbar sharks
Recreational Measures		
5. Prohibit retention of sandbar and porbeagle sharks in recreational fisheries (catch and release only)	-Avoid misidentification issues between sandbar and prohibited dusky sharks -Help rebuild overfished stocks	-Minimum socioeconomic impacts since most recreational fishermen do not target these species

Alternative	Ecological Impacts	Social/Economic Impacts
6. Limit the retention of LCS sharks in recreational fisheries to only certain species that can be positively and easily identified (bull, tiger, hammerheads, bonnethead, sharpnose, mako, thresher, and blue sharks)	-Avoid misidentification issues between sandbar and prohibited dusky sharks and other species -Help rebuild overfished stocks	-Minimum socioeconomic impacts since recreational fishermen will be able to retain the majority of the species that they already target
7. Increase the minimum recreational size (currently 54 inches) and/or introduce a slot limit where smaller or larger individuals can be landed	-Increasing minimum size would protect smaller sharks from being landed -A slot limit could protect sub-adults, which are important to the stock, depending on the slot limit chosen and whether or not you prohibit/allow possession of animals within the slot limit	-Neither an increase in minimum size or the slot limit proposed should affect tournaments in a negative way -Increase in minimum size may have some negative socioeconomic impacts on charter/headboats if fishermen cannot land smaller sharks
8. Allow the recreational harvest of only male sandbar sharks; maintain existing regulations for other species (*e.g.*, possession of males and females allowed)	-Leave adult sandbar females in the population to reproduce -May increase discards of female sandbar sharks -Removing large males from the population may effectively remove large females from the population if there is size-selective breeding	-Minimum socioeconomic impacts since recreational fishermen will be able to retain the majority of the species that they already target

2.1.3 Gear Restrictions

LCS are primarily caught with BLL and gillnet gear in the commercial fishery. However, pelagic sharks and some LCS are also caught on PLL gear. Table 2.1 and Table 2.2 show the percentage of sandbar and blacktip shark commercial landings by region and gear. BLL vessels must carry corrodible hooks and practice the necessary protocols and possess the recently updated release equipment for the safe handling, release, and disentanglement of sea turtles and other non-target species. PLL gear has several gear requirements, including circle hooks, corrodible hooks, hook size, bait restrictions, gangion length requirements, and required equipment and protocols for the safe handling, release, and disentanglement of sea turtles and other non-target species. BLL consists of a longline with hooks that is not suspended in the water with floats. BLL gear uses weights or anchors to ensure that the gear is placed on or close to the ocean bottom. J-hooks and circle hooks are both currently allowed in the shark BLL fishery. Monofilament and steel line is used for the bottom mainline, with approximately 72 percent of fishermen using monofilament for the mainline, 24 percent using steel mainline, and four percent using a mixture (Smith *et al*., 2006). BLL participants use 5 to 15 miles of longline per set with 500 to 1,500 hooks per set (Smith *et al*., 2006).

In addition to longline gear, gillnets are also deployed for the commercial harvest of SCS and LCS. Gillnets are panels of netting suspended vertically in the water with floats at the top and weights along the bottom. Gillnets are fished either as strikenets or driftnets, with driftnets being placed near the bottom or higher in the water column. Gillnets 2.5 km or longer are prohibited, gillnets must be attached to a vessel except during net checks, and net checks must occur every 0.5 to two hours. Strikenets target a group of fish and then surround the school with the gillnet. Strikenets are generally 500 to 1,600 m long, 4 to 30 m deep, with 22.9 cm stretched mesh (Carlson and Bethea, 2006). Usually little bycatch is associated with strikenets (NMFS, 2006a). Approximately 91 percent of the LCS catch in strikenets are blacktip sharks. Driftnets are usually set in the water for a certain amount of time. They are generally 547 to 2,736 m long, 9 to 13.7 m deep, with stretched mesh of 12.7 to 25.4 cm (Carlson, 2005) and result in higher bycatch than strikenets (NMFS, 2006a). Rod and reel is the main gear used in the recreational fishery and there are currently no gear restrictions for the recreational shark fishery.

Given the number of restrictions that are currently in place for PLL gear and because most LCS are not landed via PLL gear, additional gear restrictions for the PLL fishery are not considered at this time. Measures aimed at reducing landings of dusky sharks in the PLL fishery are considered in Section 2.3 (time/area closures).

The following alternatives define the range of alternatives NMFS is considering for gear restrictions in the shark BLL and gillnet fisheries. As stated earlier, the alternatives presented here depend on, and could change, depending on the alternatives considered in other sections. Such restrictions could help reduce dead discards of overfished sandbar and dusky sharks. In addition, this section considers gear restrictions for the recreational sector.

Table 2.6 Potential commercial and recreational gear restriction alternatives.

Alternative	Ecological Impacts	Social/Economic Impacts
1. No Action. Maintain current gear restrictions for gillnet and BLL gear	-Dead discards of dusky sharks and juvenile sandbar sharks will continue	-No added costs to commercial and recreational shark fishermen
Commercial Measures		
2. Close gillnet fishery; remove gillnet gear from authorized gear type for commercial shark fishing consistent with requests from the State of Georgia	-Reduce bycatch and interactions with marine mammals and sea turtles associated with gillnet gear -Dead discards of sharks from other South Atlantic Region gillnet fisheries will still occur (*e.g.*, menhaden, whiting, and croaker fisheries); may increase effort in other fisheries if fishermen need to make up for lost shark profits	-Prohibition would comply with request from State of Georgia to remove gillnet gear from the authorized gear list -Significant negative socioeconomic impacts for existing commercial gillnet fishermen
3. Ban shark drift gillnets; allow shark strikenets	-Reduce bycatch associated with drift gillnets -Minimal catch of sandbar and dusky sharks with strikenets; should not increase catch or discards of these species -Dead discards of sharks from other South Atlantic gillnet fisheries will still occur (*e.g.*, menhaden, whiting, and croaker fisheries); may increase effort in other fisheries if fishermen need to make up for lost shark profits	-Mitigate negative socioeconomic impacts for remaining five directed shark gillnet fishermen -Negative socioeconomic impacts on driftnet fishermen, including those that land sharks incidentally to other species; could increase their costs if they decide to re-rig for strikenets -Negative economic impacts for other BLL fishermen that currently use gillnet gear

Alternative	Ecological Impacts	Social/Economic Impacts
4. Gillnet Endorsement: limit use of gillnets to remaining five directed shark gillnet vessels	-Prevent increasing effort in gillnet fishery -Reduce bycatch associated with expanding gillnet fishery -Dead discards of sharks from other South Atlantic gillnet fisheries will still occur (*e.g.*, menhaden, whiting, and croaker fisheries); may increase effort in other fisheries if fishermen need to make up for lost shark profits	-Negative economic impacts for other fishermen that currently use gillnet gear to target other species but land sharks -Restricts flexibility of all fishermen with commercial shark permit
5. Close the shark BLL fishery; remove BLL as an authorized gear type for the shark fishery.	-Reduce discards and bycatch of protected species associated with the BLL gear -Dead discards of sharks from other BLL fisheries will still occur (*e.g.*, tilefish, snapper/grouper); may increase effort in other fisheries if fishermen need to make up for lost shark profits	-Significant negative socioeconomic impacts for existing commercial BLL fishermen
6. Limit shark BLL gear to five miles of gear and/or 500 hooks per set	-Limit dead discards; promote the live release of bycatch -Fewer hooks; may reduce fishing pressure for overfished stocks	-Some negative socioeconomic impacts if reduced number of hooks and/or longline length significantly reduces catch -Difficult to enforce the length of longline
7. Limit soak time of shark BLL gear	-Limit dead discards; promote the live release of bycatch	-Some negative socioeconomic impacts if reduced soak time significantly reduces catch -Difficult to enforce soak time; safety concerns if fishermen need to leave gear because of weather

Alternative	Ecological Impacts	Social/Economic Impacts
8. Require circle hooks on shark BLL gear	-May increase post-release survival of bycatch -Presumed benefits for post-release survival for sharks, however, shark specific research lacking	-Increased cost to commercial fishermen to change from J hooks to circle hooks -Enforcement issues for other BLL fisheries that may incidentally catch sharks but are not required to have circle hooks
Recreational Measures		
8. Require circle hooks in shark recreational fishery	-May increase post-release survival of bycatch -Presumed benefits for post-release survival for sharks, however, shark specific research lacking	-Increased cost to recreational fishermen - Enforcement issues if recreational fishermen targeting other species and incidentally catching sharks

2.2 Fisheries Re-Characterization

2.2.1 Regions

Amendment 1 to the 1999 FMP (December 24, 2003, 68 FR 74746) established three regions for the management of LCS and SCS. The purpose of these regions was to provide managers with flexibility to adjust regional quotas to reduce mortality of juveniles and reproductive female sharks, provide fishing opportunities when sharks are present in the various regions, account for regional differences in catch per unit effort, and account for differences between species' utilization of various pupping grounds. The three management regions are: the Gulf of Mexico (GOM) region (Texas to Key West, FL), South Atlantic (SA) region (Key West, FL to North Carolina/Virginia border), and North Atlantic (NA) region (Virginia to Maine). Pelagic sharks are not managed on a regional basis. Table 2.7 shows the landings/quotas of LCS by regions and season between 2001 and 2007.

Amendment 2 to the Consolidated HMS FMP would explore alternatives to the existing regional management structure. The 2005/2006 blacktip shark stock assessment found they are rebuilt in the Gulf of Mexico region and unknown in the South Atlantic region. Maintaining distinct regions for the Gulf of Mexico and South Atlantic regions may be appropriate for these species due to the different stock status for blacktip sharks in these regions. NMFS is considering alternatives ranging from no action (maintaining the current three regions) to integrating the three regions and returning to pre-2004 management (without regions).

Table 2.7 Large Coastal Shark (LCS) seasons, quotas, and preliminary landings from the Quota Monitoring System 2001 – 2007. Trimester and regional seasons were implemented in 2004. Prior to 2004, LCS were managed on a semi-annual basis with no regions. Gulf of Mexico=GOM, South Atlantic=SA, and North Atlantic=NA.

Year	Semi-Annual/Trimester Season	Quota (mt dw)	Landings (% of Quota)
2001	Jan. 1 - Mar. 24	642	587.5 (91 %)
	July 1 - Sept. 4	697	603.8 (86 %)
2002	Jan. 1 - April 15	735.5	722.5 (98 %)
	July 1 - Sept. 15	655.5	589 (89 %)
2003	Jan. 1 - April 15 (Ridgeback LCS) Jan. 1 - May 15 (Non-ridgeback LCS)	857	912 (106 %)
	July 1 - Sept. 15 (All LCS)	922	746 (80 %)
2004	GOM: Jan. 1 - Feb. 29 SA: Jan 1 - Feb. 15 NA: Jan 1 - April 15	190.3 244.7 18.1	230 (120 %) 255.8 (104 %) 7 (39 %)
	GOM: July 1 - Aug. 15 SA: July 1 - Sept. 30 NA: July 1 - July 15	287.4 369.5 39.6	304.3 (105 %) 272.4 (74 %) 41.5 (104 %)

Year	Semi-Annual/Trimester Season	Quota (mt dw)	Landings (% of Quota)
2005	GOM: Jan 1 - Feb 28 SA: Jan. 1 - Feb 15 NA: Jan. 1 - April 30	156.3 133.3 6.3	109.6 (70 %) 130.9 (98 %) 3.8 (60 %)
	GOM: July 6 - July 23 SA: July 6 - Aug 31 NA: July 21 - Aug 31	182.2 148 65.2	123.4 (68 %) 169.2 (114 %) 61.3 (94 %)
	GOM: Sept. 1 - Oct. 31 SA: Sept 1 - Nov. 15 NA: Sept 1 - Sept. 15	167.7 187.5 4.9	218.3 (130 %) 270.2 (144 %) 7.2 (146 %)
2006	GOM: Jan 1 - April 15 SA: Jan 1 - Mar. 15 NA: Jan 1 - April 30	222.8 141.3 5.3	103.1 (46 %) 326.1 (230 %) 0.3 (5.7 %)
	GOM: July 6 – July 31 SA: July 6 – Aug. 16 NA: July 6 – Aug. 6	201.1 151.7 66.3	343.9 (171 %) 207.4 (136.7 %) 59.9 (90.3 %)
	GOM: Sept.1 – Nov. 7 SA: Sept.1 – Oct. 3 NA: Closed	225.6 50.3 3.3	351.8 (155.9 %) 108.7 (216.1%) 5.8 (175.8 %)
2007	GOM: January 1 – January 15 SA: Closed NA: January 1 – April 30	62.3 7.9	

Table 2.8 Potential region alternatives.

Alternative	Ecological Impacts	Social/Economic Impacts
1. No Action. Maintain existing three regions	-Maintains consistency with stock assessment for region specific species (*i.e.*, blacktips) -Allows for region specific harvest	-Maintains current management system for commercial fisheries -Decreased flexibility for fishermen -More, shorter seasons because quotas are separated by region -Allocation concerns, especially for SCS in GOM -Provides more fishing opportunities for areas that are dependent on shark migration -Seasons could be staggered across regions to control supply/prices
2. Combine three regions into one region for commercial shark fishery management	-Some regions/species may have heavier exploitation rates than other regions depending on what time of year quota is available and presence of sharks -Stock assessment indicates that blacktip sharks have biological differences between Gulf of Mexico and Atlantic stocks	-Potentially longer seasons because regional quotas would be combined -No mis-allocation/confusion regarding landings location -Some regions and fishermen in those regions may not be able to land sharks if quota is filled before sharks are present
3. Combine North Atlantic and South Atlantic regions (*i.e.*, create two regions; GOM and Atlantic)	-Some regions/species may have heavier exploitation than other regions depending on what time of year quota is available -To date, no biological differences found among sharks between the North and South Atlantic	-Does not maintain quota for times when sharks may be present (*i.e.*, sharks present in NA at different times than in SA) -Allow for longer seasons than status quo

2.2.2 Seasons

Commercial fisheries for pelagic sharks, SCS, and LCS are currently managed on a trimester basis and NMFS is considering alternatives that would modify this system. The trimester seasons were established in Amendment 1 to the 1999 FMP to provide additional fishing opportunities later in the year and to reduce fishing effort during months when LCS are pupping. The three trimesters are January through April, May through August, and September through December. Generally, seasons for SCS and pelagic sharks open at the start of each trimester (*i.e.*, January 1, May 1, and September 1), whereas the second trimester for LCS has been delayed until July to minimize interactions with pups and pregnant females. Currently, the trimester seasons are established via a proposed and final rule. The proposed rule gathers public comment on season length, potential start date, and available quota. The final rule establishes the final season length and available quota, at least 30 days in advance of the trimester. Table 2.7 shows the LCS landings by region (if applicable) and season (trimester or semi-annual) between 2001 and 2007. NMFS is considering a number of alternatives in Table 2.9 ranging from no action (maintaining the current three seasons) to having only one season with closure dates dependent on available quota or historical landings.

Table 2.9 Potential season alternatives.

Alternative	Ecological Impacts	Social/Economic Impacts
1. No Action. Maintain three seasons.	-Seasons are maintained to reduce fishing effort during peak LCS pupping months	-Potentially three openings/year -Shorter seasons -Allows fishermen to plan for different times throughout the year -Provides fishing opportunities throughout the year
2. Establish semi-annual seasons; two openings/year	-Reduced fishing effort during the start of the pupping seasons (April-June) and later in the year for LCS (Sept.-Dec.) (depending on when seasons occur)	-Two openings/year -Longer seasons -Reduced fishing opportunities during certain parts of the year
3. One season/year; open and close season when quota achieved with 5 days notice	-Increased likelihood of overharvesting quota -Most of the year closed; commercial data available only for a short season	-Longer individual season -Season may not coincide with other complementary fisheries -Difficult for planning -Derby-style fishing
4. One season/year; open and close season based on historical landings	-Increased likelihood of overharvesting quota -Most of the year closed; commercial data available only for a short season	-Longer individual season -Season may not coincide with other complementary fisheries -Derby fishing

2.3 Time/Area Closures

This rulemaking is examining time/area closures to reduce bycatch of dusky sharks, sandbar sharks, and porbeagle sharks, as well as protected species and non-target HMS. Time/area closures could affect BLL, gillnet gear, and PLL gear.

A number of time/area closures have been implemented to reduce bycatch of protected species as well as target and non-target HMS in recent years. The first time/area closure was implemented in the 1999 FMP with the Northeastern U.S. closure off New Jersey in June 1999 to reduce bluefin tuna discards. Since then, additional closures have been implemented in the DeSoto Canyon (2000), East Florida Coast (2001), Charleston Bump, and Northeast Distant (2001) to PLL gear, the mid-Atlantic shark closed area (2005) to BLL gear, the Steamboat Lumps and Madison Swanson closed areas (2007) for all HMS gears except for trolling from May through October, and the year-round BLL closures to protect reef fish EFH in specific areas in the Caribbean region (2007). There are also restrictions in place for gillnet gear that limits fishing with gillnet gear in Atlantic Ocean waters west of 80°00′ W. long. between 29°00′ N. lat. (just south of New Smyrna Beach, Fla.) and 32°00′ N. lat.(the approximate state boundary between Georgia and South Carolina) and within 35 nautical miles of the South Carolina coast during certain times of the year. These restrictions are in place to prevent endangered right whales from entanglement in gillnet gear in the core right whale calving area.

The mid Atlantic shark closed area, implemented for the shark fishery in 2005, has reduced landings of sandbar and dusky sharks (NMFS, 2006b); however, several shark species continue to interact with HMS gears and current stock assessments indicate that porbeagle sharks are overfished and sandbar and dusky sharks are overfished with overfishing occurring. Both targeted and incidental landings, using a variety of gear types in recreational and commercial fisheries, may contribute to overfishing. As a result, NMFS is considering additional closures or modifications to existing closures to further reduce these interactions. The goal of all HMS time/area closures is to: (1) maximize the reduction in bycatch; (2) maintain catch levels of target species; (3) consider impacts on the incidental catch of other species to minimize or reduce incidental catch levels; and (4) optimize survival of bycatch and incidental catch species.

Figure 2.1 and Figure 2.2 show the marine protected areas (MPAs) in the South Atlantic Fishery Management Council's Amendment 14A, which are being considered for a BLL gear prohibition. In this rulemaking, NMFS will also be considering closing these MPAs to shark BLL gear. Figures 2.3 and 2.4 show interactions of dusky sharks with BLL gear in the Atlantic and Gulf of Mexico as well as seasonal interactions around the mid-Atlantic shark closed area. Figures 2.5 and 2.6 show sea turtle and smalltooth sawfish interactions with BLL gear. NMFS will be evaluating these types of data for BLL, PLL, and gillnet gears when determining if new time/area closures are needed or if modifications to current time/area closures are warranted. Table 2.10 shows the range of alternatives NMFS will be considering for time/area closures.

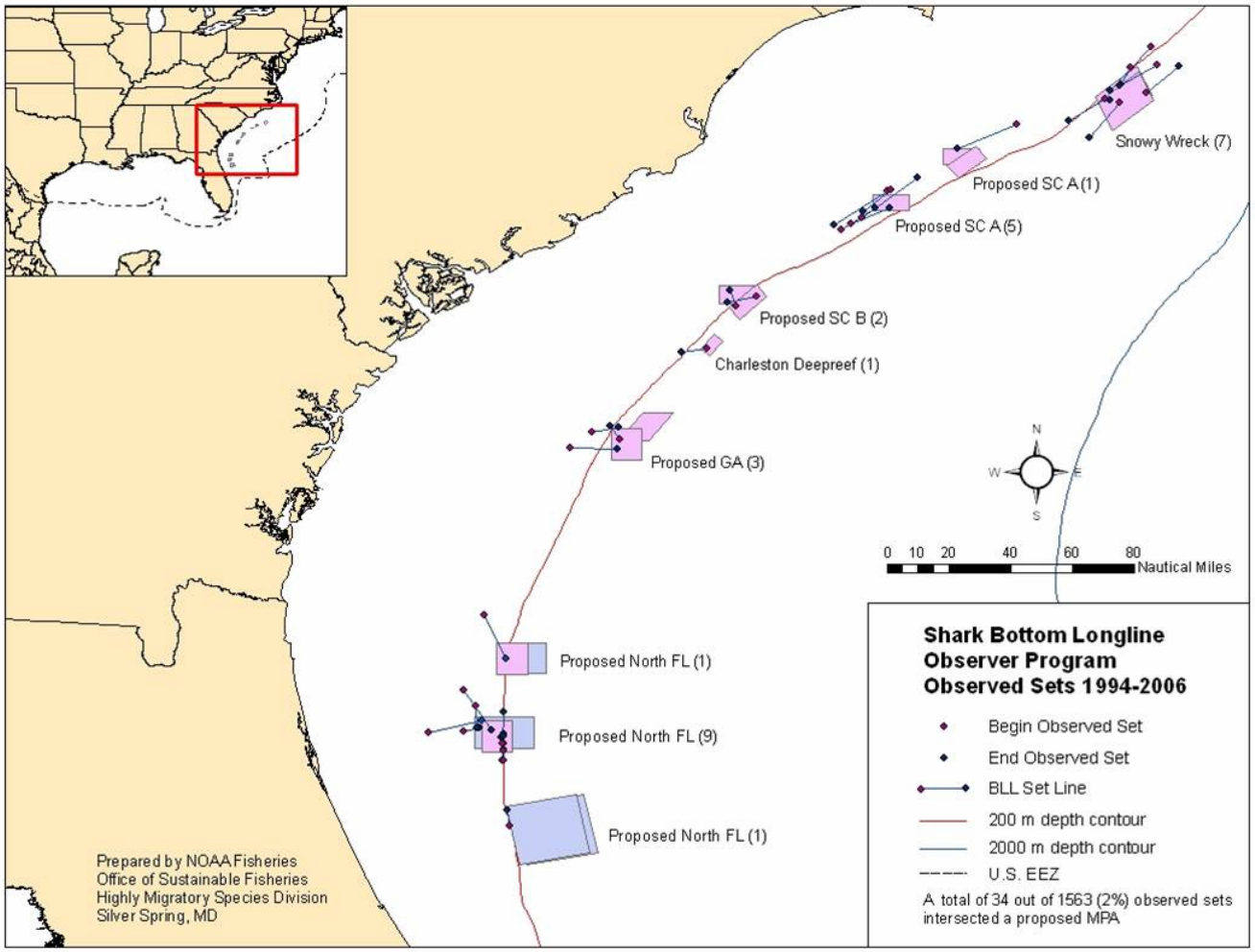

Figure 2.1 **Shark bottom longline observed sets from 1994-2006 that intersect nine of the proposed MPAs in Amendment 14A. The number of observed sets intersecting each MPA is given in parentheses.** Source: Shark Bottom Longline Observer Program data 1994-2006.

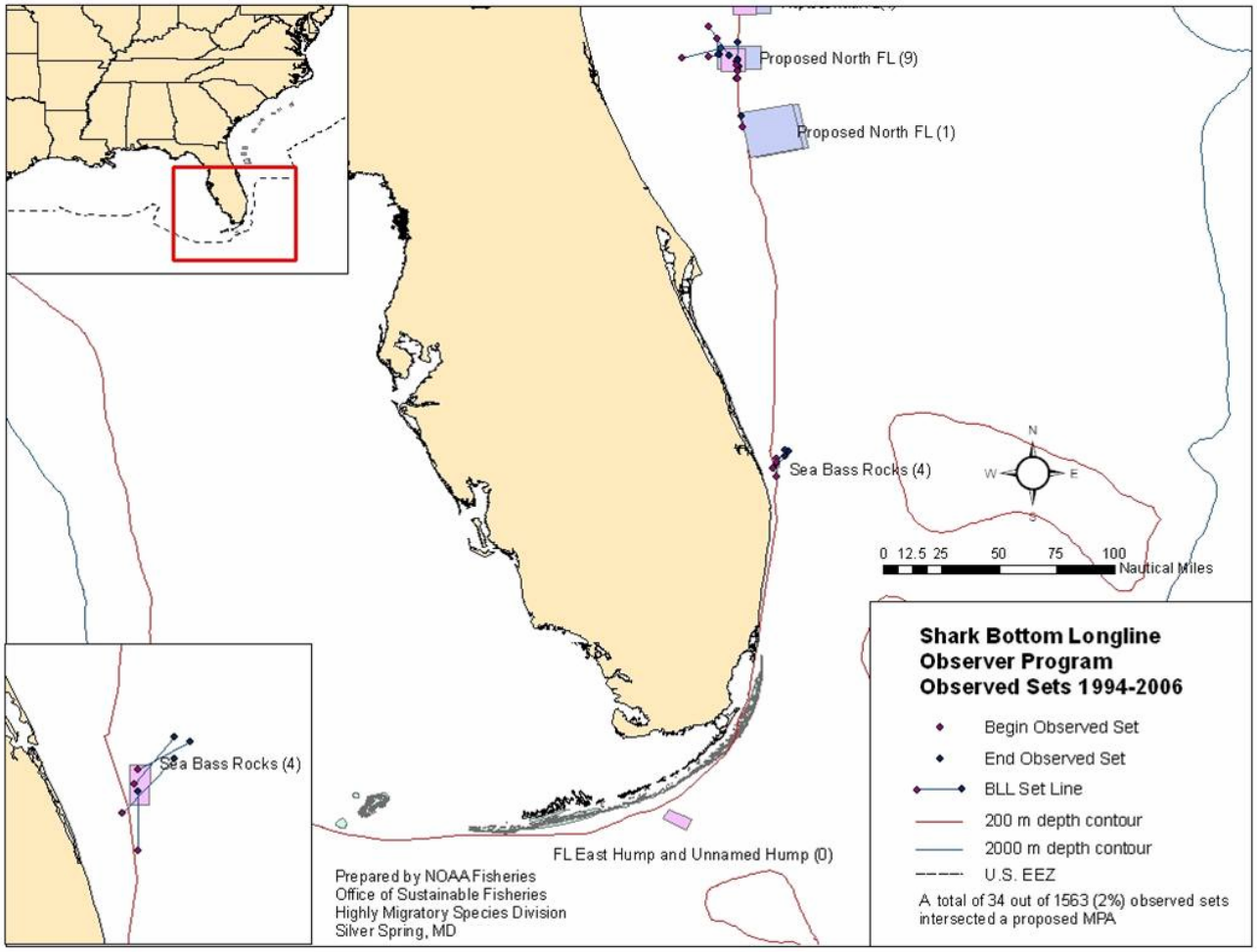

Figure 2.2 **Shark bottom longline observed sets from 1994-2006 that intersect the two most southern proposed MPAs in Amendment 14A. The number of observed sets intersecting each MPA is given in parentheses.** Source: Shark Bottom Longline Observer Program data 1994-2006.

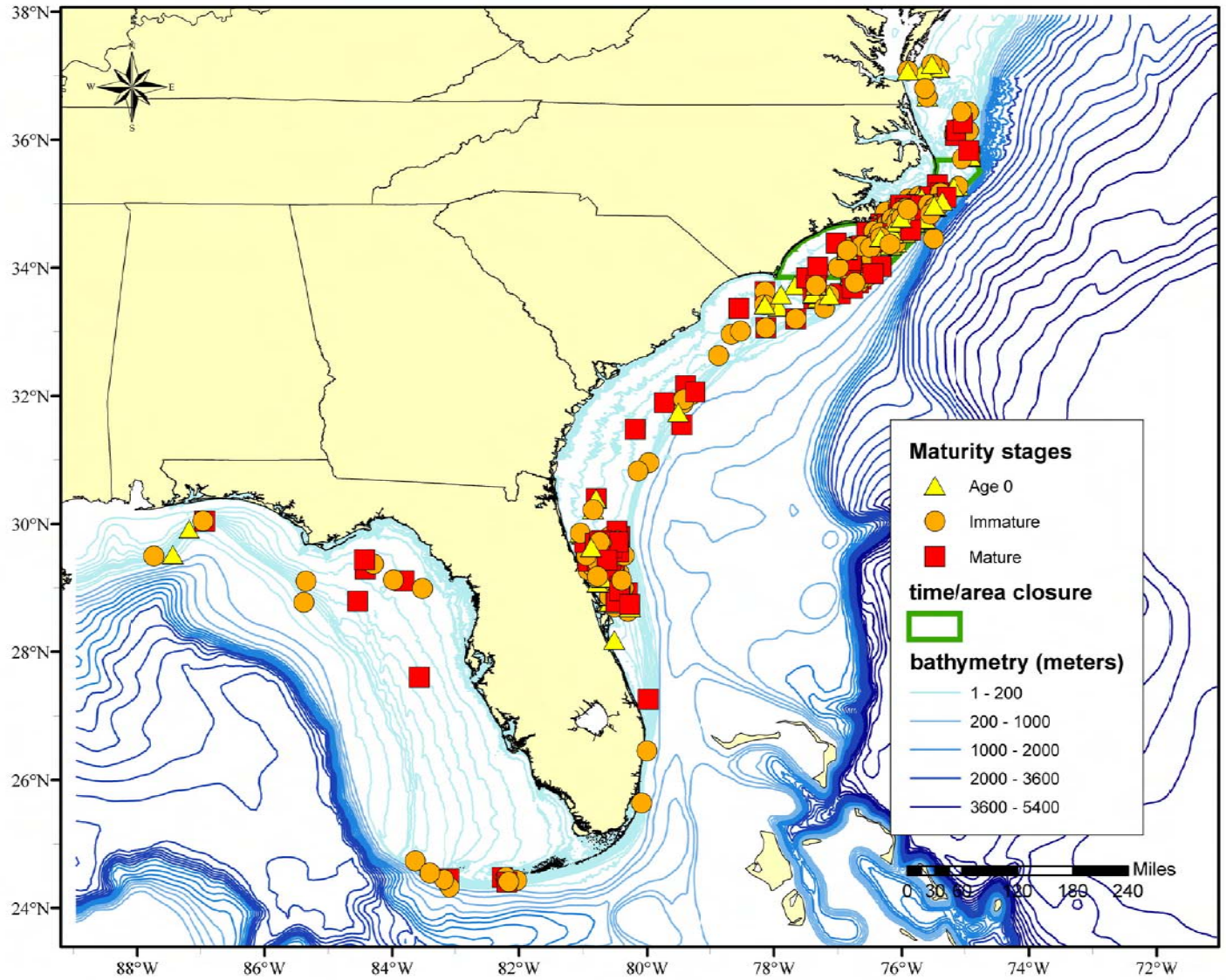

Figure 2.3 **Individual dusky sharks observed caught off the U.S. east coast in the Bottom Longline Observer Program from 1994-2003. Maturity stage of individual animals and bathymetry associated with catches are indicated.** Source: Cortés *et al.*, 2006.

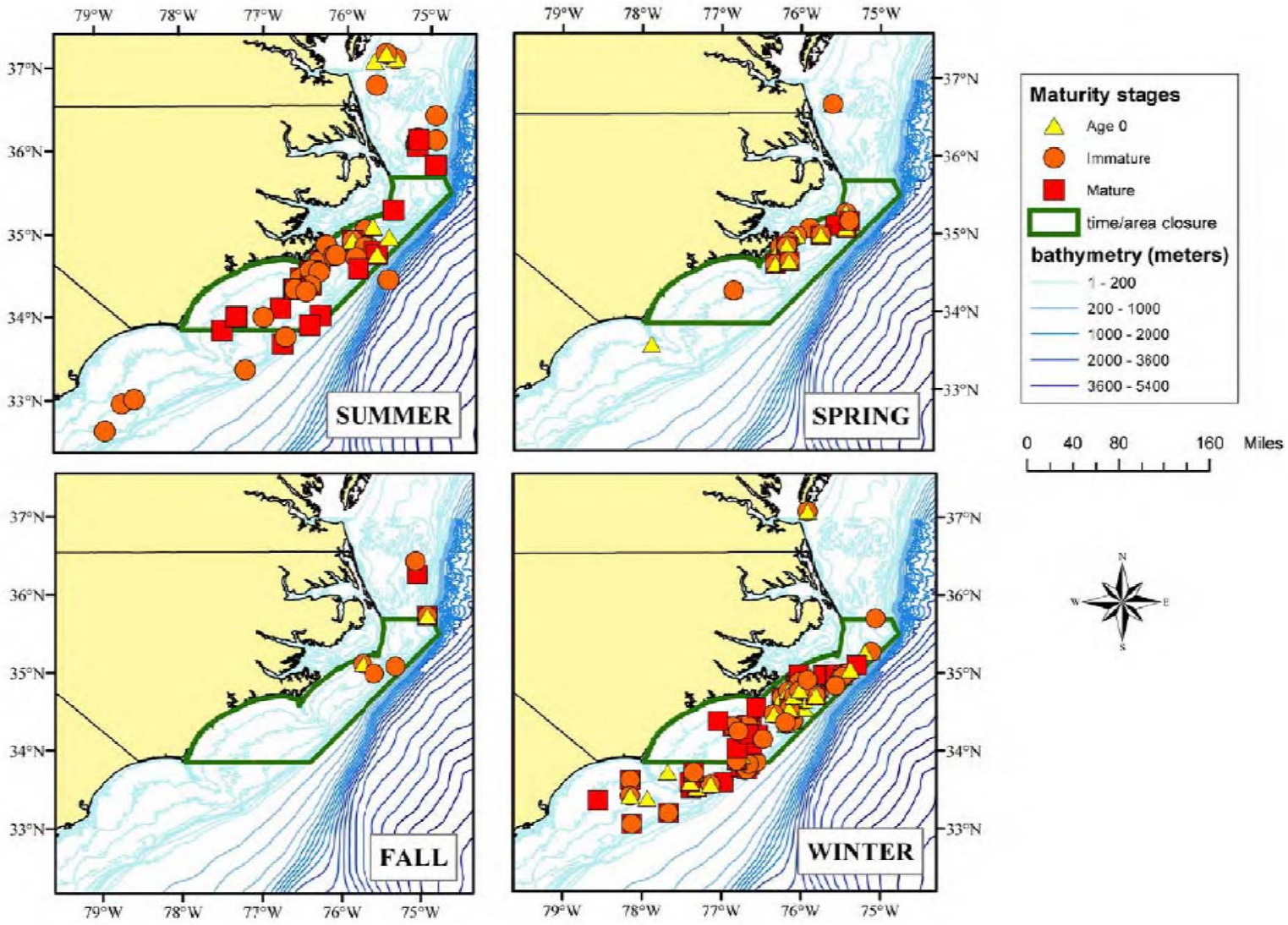

Figure 2.4 **Individual dusky sharks observed caught off the U.S. mid-Atlantic shark closed area (South Carolina, North Carolina, and Virginia) in the Bottom Longline Observer Program from 1994-2003. Maturity stage of individual animals, bathymetry associated with catches, and the mid-Atlantic shark closed area are indicated.** Source: Cortés *et al.*, 2006.

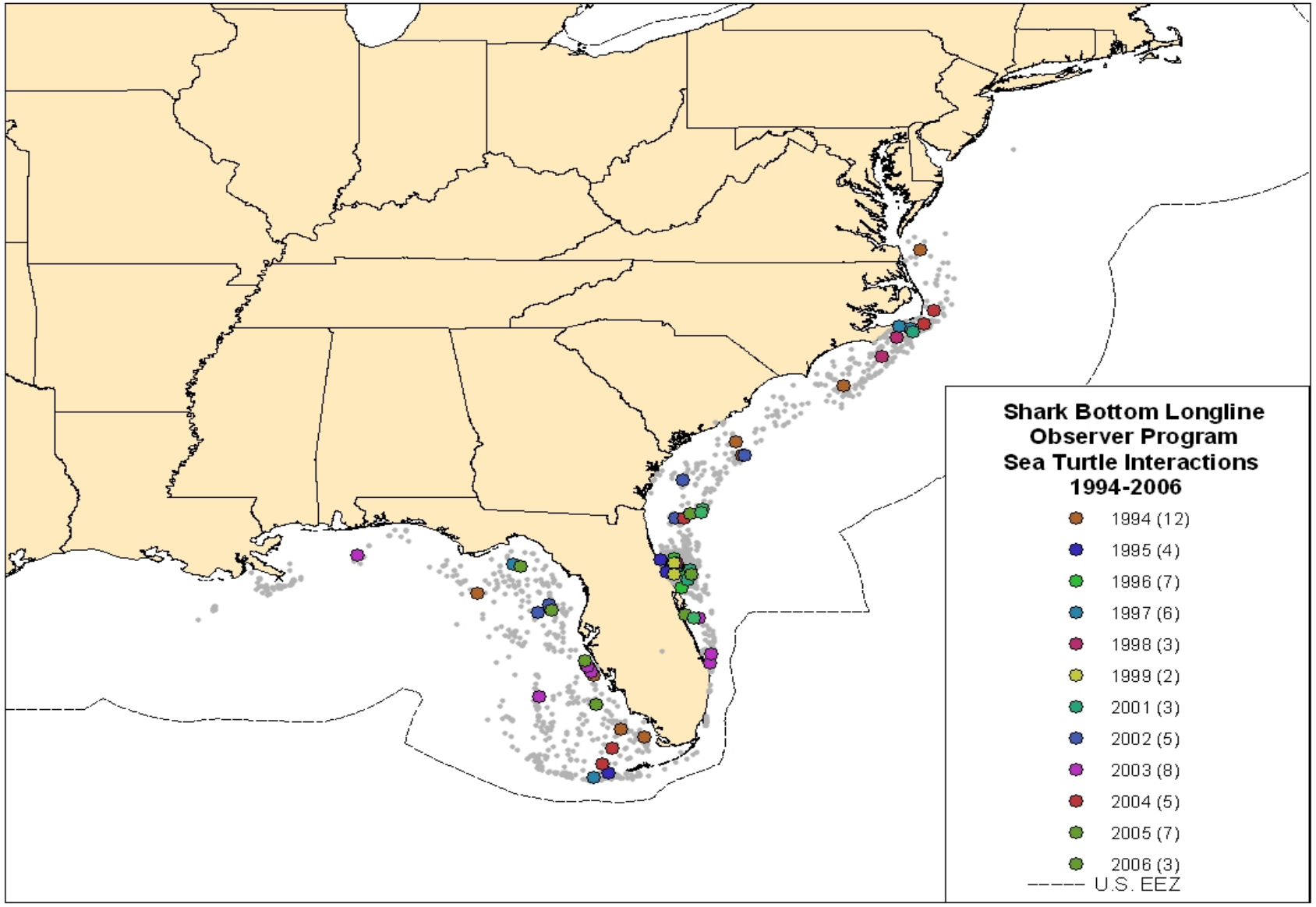

Figure 2.5 **Observed sea turtle interactions and observed sets (smaller grey circles) in the shark bottom longline fishery from 1994-2006.** Source: Shark Bottom Longline Observer Program 1994-2006.

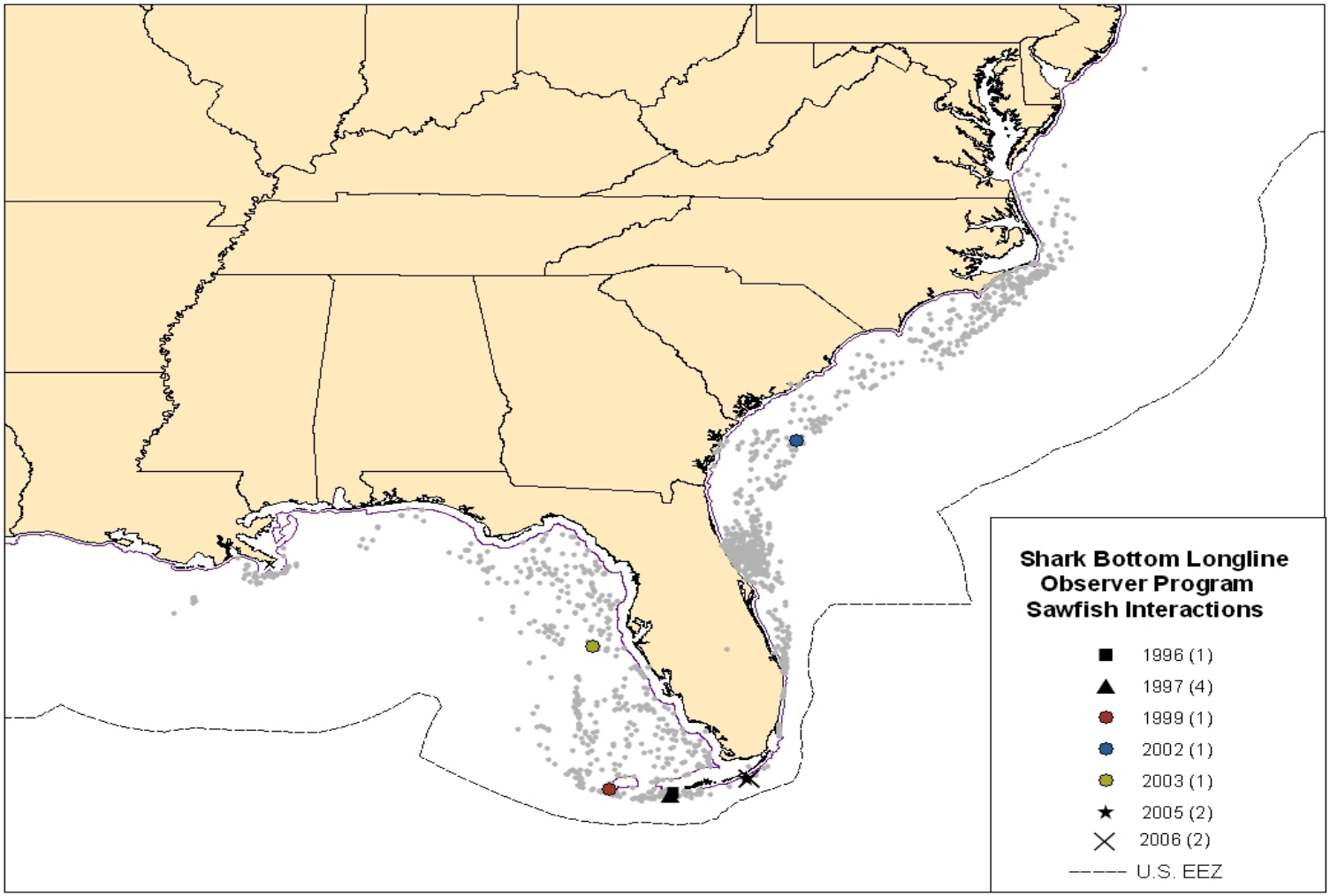

Figure 2.6 **Observed smalltooth sawfish interactions and observed sets (smaller grey circles) in the shark bottom longline fishery from 1994-2006.**
Source: Shark Bottom Longline Observer Program 1994-2006.

Table 2.10 Potential time/area closure alternatives.

Alternative	Ecological Impacts	Social/Economic Impacts
1. No Action: Maintain existing time/area closures; no new time/area closures	-Existing time/area closures have been effective at reducing bycatch of prohibited and protected species and non-target HMS -No new time/area closures could lead to a further decline of dusky sharks; this species was put on the prohibited list in 1999 but is still overfished with overfishing occurring -No new time/area closures could lead to a further decline of sandbar sharks -No new time/area closures could lead to a further decline of porbeagle sharks -New time/area closures may not be needed for blacktip sharks in the Gulf of Mexico since the stock there is healthy	-No new closures could result in positive socioeconomic impacts in the short-term; in the long-term, certain species may not be available if other management measures fail to rebuild stock -No reduction in the size of current closures may result in negative socioeconomic impacts on commercial fishermen

Alternative	Ecological Impacts	Social/Economic Impacts
Commercial Measures		
2. Reduce or increase existing time/area closures	-This alternative would include re-evaluating the existing closures for BLL -Removing or reducing the extent of existing closures could increase bycatch and dead discards of dusky sharks, other prohibited species, and protected species as well as catch of overfished species. -Removing or reducing the extent of mid-Atlantic shark closed area could increase catch of juvenile sandbar sharks and bycatch of dusky sharks -Increasing existing time/area closures may reduce landings of dusky and sandbar sharks and may decrease interactions with protected resources	-Reduction or removal of existing closure could have positive socioeconomic impacts in the short-term for commercial fishermen; in the long-term, certain species may not be available if other management measures fail to rebuild stock -Increasing existing time/area closures would have significant negative economic impacts on commercial fishermen in the short-term by reducing areas where fishermen can deploy gear
3. Establish new time/area closures for BLL gear to reduce bycatch of dusky sharks, juvenile sandbar sharks, smalltooth sawfish, and sea turtles.	-Decrease bycatch of overfished species, such as dusky and sandbar sharks, with BLL gear -Decrease bycatch of protected species, such as sea turtles and smalltooth sawfish, with BLL gear -New closures could displace or shift fishing effort into other area(s) with potential increase in bycatch of other species	-New time/area closures may result in negative socioeconomic impacts on commercial fishermen -May reduce safety at sea by requiring fishermen to travel further offshore in pursuit of target species, depending on areas closed -Fishermen may transfer effort to other fisheries or gear types to account for lost profits

Alternative	Ecological Impacts	Social/Economic Impacts
4. Establish new time/area closures for gillnet and PLL gear to reduce bycatch of dusky sharks, juvenile sandbar sharks, smalltooth sawfish, and sea turtles.	-Decrease bycatch of overfished species, such as dusky and sandbar sharks, with gillnet and PLL gear -Decrease bycatch of protected species, such as sea turtles and smalltooth sawfish, with gillnet and PLL gear -This alternative would include re-evaluating the extent of the mid-Atlantic shark closed area for additional gears (*i.e.*, gillnet and PLL) -New closures could displace or shift fishing effort into other area(s) with potential increase in bycatch of other species -Reduced landings of SCS which are targeted by the gillnet fishery -Reduced landings of non-target HMS (*e.g.*, swordfish, billfish, tunas, etc.)	-New time/area closures may result in negative socioeconomic impacts on commercial fishermen; several time/area closures are already in place for these gears -May reduce safety at sea by requiring fishermen to travel further offshore in pursuit of target species, depending on areas closed -Fishermen may transfer effort to other fisheries or gear types to account for lost profits
5. Close the MPAs listed in the South Atlantic Fishery Management Council's Amendment 14A to shark BLL gear	-Reduce bycatch of the snapper/grouper complex by BLL gear in the 11 MPAs proposed in the South Atlantic Fishery Management Council's Amendment 14A -These closures could displace or shift fishing effort into other area(s) with potential increase in bycatch of other species	-New time/area closures may result in negative socioeconomic impacts on commercial fishermen

Alternative	Ecological Impacts	Social/Economic Impacts
6. Close all Federal waters in the Atlantic ocean to commercial shark fishing (*i.e.*, commercial shark gillnet and BLL gear) and prohibit the retention of LCS on PLL gear	-Decrease bycatch of overfished species such as dusky and sandbar sharks, with gillnet and BLL gear -Could increase discards of LCS on PLL gear -Allow for a shark fishery in the Gulf of Mexico where blacktip sharks are healthy -Could displace or shift fishing effort into other area(s) with potential increase in bycatch of other species, especially in the Gulf of Mexico	-New time/area closures may result in negative socioeconomic impacts on commercial fishermen
7. Close all Federal waters in the Gulf of Mexico to commercial shark fishing (commercial shark gillnet and BLL gear) and prohibit the retention of LCS on PLL gear	-Decrease bycatch of overfished species such as dusky and sandbar sharks, with gillnet and BLL gear -Could increase discards of LCS on PLL gear -Could displace or shift fishing effort into other area(s) with potential increase in bycatch of other species, especially in the Atlantic Ocean	-New time/area closures may result in negative socioeconomic impacts on commercial fishermen -Would not allow for a blacktip shark fishery in the Gulf of Mexico; Gulf of Mexico blacktip shark population are healthy

Alternative	Ecological Impacts	Social/Economic Impacts
8. Establish new time/Area closures for PLL gear to reduce catch and bycatch of dusky and porbeagle sharks	-Decrease catch of overfished porbeagle sharks on PLL gear -Decrease bycatch of dusky sharks on PLL gear	-New time/area closures may result in negative socioeconomic impacts on commercial fishermen; several time/area closures are already in place for these gear types -The United States lands a small percentage of its U.S. allocated quota for porbeagle sharks; such closures may not help rebuild the porbeagle stock -May reduce safety at sea by requiring fishermen to travel further offshore in pursuit of target species, such as swordfish, depending on location of time area closures

2.4 Monitoring and Compliance

2.4.1 Vessel Monitoring Systems

All PLL vessels in possession of HMS permits are currently required to possess and operate Vessel Monitoring Systems (VMS) units while conducting fishing activities, year-round, and in all areas. Amendment 1 to the 1999 FMP required vessels that possess a directed shark permit and have BLL gear onboard to have a VMS unit installed and operating in the vicinity (Federal waters adjacent to South Carolina, Virginia, and North Carolina) of the mid-Atlantic shark closed area from January 1 through July 31 every year. Furthermore, directed shark vessels with gillnet gear onboard, regardless of location, are also required to have a VMS unit installed and operating during the Atlantic right whale calving season (November 15 and March 31**)** every year. These requirements were implemented to monitor fishing activities in the vicinity of the mid-Atlantic shark closed area and the Atlantic right whale calving area/season.

In 2004, NMFS initiated a program that provided loaner units for participants in the commercial shark fishery that were going to be affected by the VMS requirements implemented in Amendment 1 to the 1999 FMP. Approximately 25 gillnet and BLL vessels participated in the program and received VMS units from the Agency. Vessel operators are responsible for all transmission costs associated with the use of these VMS units.

Implementation of additional time/area closures or other gear restrictions (*e.g.*, soak time) to reduce fishing effort and/or mortality of overfished or prohibited shark species might necessitate expanding the current universe of vessels required to possess and operate VMS. Furthermore, increasing the reporting frequency of VMS from one hour to more frequent transmissions (15-30 minutes) would improve enforcement of time/area closures and other regulations by providing more precise location information. Changing the reporting frequency would also make the existing regulations more consistent with those of Council-managed species that also deploy BLL and gillnet gear. In the Gulf of Mexico, vessels participating in the reef fish fishery are required to declare permitted activity and gear type to be deployed before/during fishing activities and then transmit VMS locations every hour (unless entering a closed area, then every 10 minutes), 24 hours/day, seven days a week. Finally, professional installation and repair of VMS units and a visual indicator that shows when the VMS unit is powered on and transmitting will improve monitoring by ensuring that units are correctly installed. The visual indicator would notify vessel operators of unit failure. Table 2.11 shows the range of alternatives NMFS is considering for VMS requirements.

Table 2.11 Potential vessel monitoring system alternatives.

Alternative	Ecological Impacts	Social/Economic Impacts
1. No Action		-No increase in cost to fishermen
2. Increased reporting frequency for gillnet/BLL vessels that are currently required to possess VMS (every 15-30 minutes, 24/7, except when in port)	-Improved monitoring	-Consistency with other management entities -Increased transmission costs -Increased reporting burden
3. Mandatory VMS for all BLL/gillnet vessels that possess directed shark permits and fish in the vicinity of new time/area closures implemented in this amendment (same reporting frequency as Alternative 2, however, expand universe of vessels to account for additional time/area closures implemented in Amendment 2)	-Improved monitoring	-Increased transmission costs to the fishermen -Increased reporting burden -Increased costs for vessels that do not already possess VMS units
4. Hail-in and Hail-out requirement to declare what fishing gear will be used on a given trip	-Time/area closure monitoring for specific gear types	-Increased reporting burden
5. Additional requirements to improve proper VMS unit operation including professional installation and repair of units and a visual indicator that shows when the VMS unit is powered on and transmitting	-Improved monitoring	-Potentially increased installation/repair costs -Minimal financial burden for purchase of power/transmission indicator for existing units

2.4.2 Dealer Reporting Requirements

NMFS is considering a range of alternatives that would modify the current shark dealer reporting requirements. These alternatives are germane in light of the extensive overharvests that occurred in LCS and SCS fisheries in 2006 as a result of dealer reports that were not received in a timely manner to allow NMFS to take the necessary corrective action. Furthermore, as quotas for overfished stocks are reduced to allow rebuilding and the Agency moves towards more species specific management (*i.e.*, separate regional quotas for blacktip sharks); more frequent dealer reporting would be critical to effective quota monitoring and preventing overfishing.

Fish dealers interested in buying shark products from Federal shark permit holders must obtain a shark dealer permit. Dealer permit holders must only purchase sharks harvested from a vessel that has a valid Federal commercial permit for shark unless that vessel fishes exclusively in state waters. Shark dealers must report all sharks to NMFS that are purchased from U. S. vessels via bimonthly reports that must be submitted within 10 days of the end of each biweekly period (*i.e.*, by the 25th and 10th of each month). Dealers may not purchase shark fins that are disproportionate to the weight of the shark carcasses being landed (*i.e.*, in excess of 5 percent fins compared to the total dressed weight of the carcasses) or purchase sharks in excess of the existing trip limits for incidental and directed permit holders. Table 2.12 shows the range of alternatives NMFS is considering for dealer reporting requirements.

Table 2.12 Potential dealer reporting requirement alternatives.

Alternative	Ecological Impacts	Social/Economic Impacts
1. No Action; Dealer reports on a bi-monthly basis	-Less frequent reporting and/or late reports could lead to overharvests because of a delay in NMFS' response to close the fishery	-Less frequent reporting and/or late reports lead to a delay in NMFS taking corrective action to prevent overfishing -Dealers are accustomed to current reporting schedules; changes may result in inadvertent noncompliance.
2. Dealer reports *received* by NMFS within 10 days of biweekly reporting period (currently required to have dealer reports *postmarked* within 10 days)	-More timely reporting would allow NMFS to take timely action to prevent overharvests	-Increase burden on dealers who submit their reports by mail by reducing the time during which reports must be completed and submitted -No increase in burden on dealers who submit reports via facsimile
3. Dealer reports received by NMFS within 5 days of receiving product	-More frequent reporting would allow NMFS to take timely action to prevent overharvests	-More burden on dealers to report more frequently
4. Dealer reports faxed/emailed to NMFS within 24 hours of receiving product	-More frequent reporting would allow NMFS to take timely action to prevent overharvests	-Additional burden on dealers to report more frequently

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