3. ESSENTIAL FISH HABITAT

3.1 Designations in the 2006 Consolidated Atlantic HMS FMP and its Amendments

The Magnuson-Stevens Act requires NMFS to identify and describe Essential Fish Habitat (EFH), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. In 2009, NMFS completed the five year review and update of EFH for Atlantic HMS with the publishing of Amendment 1 to the 2006 Consolidated HMS FMP (June 12, 2009, 74 FR 288018). In Amendment 1, NMFS updated and revised existing identifications and descriptions of EFH for Atlantic HMS, designated a Habitat Area of Particular Concern (HAPC) for bluefin tuna in the Gulf of Mexico, and analyzed fishing and non-fishing impacts on EFH pursuant to Section 305(b) of the Magnuson-Stevens Act.

In 2010, NMFS added the smoothhound management group (consisting of *Mustelus canis* or smooth dogfish, *M. Norrisi* or Florida smoothhound, and more recently *M. sinusmexicanus* or Gulf smoothhound) to the species under Secretarial management in Amendment 3 to the 2006 Consolidated HMS FMP (June 1, 2010, 75 FR 30484). As a Magnuson-Stevens Act condition of adding a species to federal management, NMFS designated EFH for smoothhound using the same methodology employed in Amendment 1. Details, including a map of the final EFH, are available in Chapter 11 of the Amendment 3 FEIS.

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

On March 24, 2014, NMFS published in the Federal Register (79 FR 15959) an announcement of its next 5-year review of EFH for Atlantic HMS as required under the Magnuson-Stevens Act. The 5-year review is based on the best data available regarding Atlantic HMS and their habitats; therefore, NMFS requested submission of any such information on Atlantic HMS EFH that has become available since publication of Amendment 1 in 2009; Amendment 3 in 2010; and the interpretive rule and final action that published on September 22, 2010 that defined EFH for roundscale spearfish (*Tetrapturus georgii*). On April 3, 2014 the HMS Management Division presented the EFH 5-Year Review Plan to the HMS AP and public and requested new information to support the review. NMFS anticipates publishing the draft 5-Year Review in early 2015.

EFH maps are presented in hard copy in Amendments 1 and 3 and electronically on the internet via spatial files in Adobe (.pdf) format. The electronic maps and downloadable spatial EFH files for HMS and all federally managed species are available on the NMFS EFH Mapper at: http://www.habitat.noaa.gov/protection/efh/habitatmapper.html. A summary of the management history of HMS EFH is given in Table 3.1.

Table 3.1 Management History for HMS Essential Fish Habitat

FMP or Amendment	EFH and Species
1999 FMP for Atlantic Tunas, Swordfish, and Sharks	EFH first identified and described for Atlantic tunas, swordfish and sharks; HAPCs designated for sandbar sharks
1999 Amendment 1 to the 1988 Billfish FMP	EFH first identified and described for Atlantic billfishes
2003 Amendment 1 to the FMP for Atlantic Tunas, Swordfish and Sharks	EFH updated for five shark species (blacktip, sandbar, finetooth, dusky, and nurse sharks)
2006 Consolidated Atlantic HMS FMP	Comprehensive review of EFH for all HMS. EFH for all Atlantic HMS consolidated into one FMP; no changes to EFH descriptions or boundaries
2009 Amendment 1 to the 2006 Consolidated Atlantic HMS FMP	EFH updated for all federally managed Atlantic HMS. HAPC for bluefin tuna spawning area designated in the Gulf of Mexico
2010 Amendment 3 to the 2006 Consolidated Atlantic HMS FMP	EFH first defined for smoothhound sharks (smooth dogfish, Florida smoothhound, and Gulf smoothhound)
2010 White Marlin/ Roundscale Spearfish Interpretive Rule and Final Action	EFH first defined for roundscale spearfish (same as white marlin EFH designation in Amendment 1 to the 2006 Consolidated Atlantic HMS FMP)

3.2 Shark Nursery Grounds and Essential Fish Habitat Studies

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

The COASTSPAN program, administered by the NMFS Northeast Fisheries Science Center's Narragansett, Rhode Island laboratory, has been collecting information on shark nursery areas along the U.S. Atlantic coast since 1998. It involves NMFS scientists along with state and university researchers in Massachusetts, Rhode Island, New York, New Jersey, Delaware, Virginia, North Carolina, South Carolina, Georgia, Florida and the U.S. Virgin Islands. NMFS initiated the GULFSPAN program in 2003 to expand upon the COASTSPAN Survey. This cooperative program, which is administered by the NMFS Southeast Science Center's Panama City, Florida laboratory, includes, in addition to NMFS scientists, the states of Florida, Alabama, and Mississippi. Following is a summary of the results from the 2013 COASTSPAN and GULFSPAN surveys (Bethea et al., 2013; McCandless pers. comm.).

Massachusetts

COASTSPAN sampling was conducted in Plymouth Bay in 2013. The shark catch consisted entirely of immature sand tiger sharks. This area continues to provide important summer nursery habitat for this prohibited species.

Rhode Island

Many young-of the-year sand tigers were caught off Point Judith, Rhode Island in June of 2013. These results continue to provide supporting evidence that Rhode Island waters are used at a minimum as transitional nursery habitat by this prohibited species during their migrations to northern waters.

New York

COASTSPAN sampling was conducted in Shinnecock Bay, New York in 2013. No sharks have been caught in this Bay during summer COASTSPAN sampling to date. Shinnecock Bay does not appear to provide sharks with nursery habitat or resources for any other life stage at this time. The COASTSPAN program previously provided sampling gear and tagging supplies for this survey, but the costs for running the survey are now covered by New York state COASTSPAN cooperators. Even though the Bay does not currently support shark populations, these cooperators will continue to provide data for as long as they run the survey to monitor Shinnecock Bay for potential changes in elasmobranch use with climate change.

New Jersey and Delaware (Delaware Bay)

COASTSPAN sampling encompassed the entire Bay from the mouth of the Delaware River to the mouth of Delaware Bay using a random stratified design based on depth and geographic location. Additional sampling was also conducted at historical fixed stations throughout the bay. Sandbar shark was the most abundant shark species caught in 2013, followed by smooth dogfish and sand tigers. One adult male Atlantic sharpnose shark was also caught in Delaware Bay in 2013. The majority of sandbar sharks caught were immature, with over a quarter of these as young-of the-year; the remaining sandbar sharks caught were considered mature females based on length and girth measurements. Smooth dogfish were represented nearly equally by juvenile and adult fish in 2013, with the overwhelming majority of immature and mature fish as young-of-the-year and females, respectively. The sand tigers caught in 2013 were primarily immature sharks, but nearly 30% were considered maturebased on clasper calcification for males and length and girth measurements for females.. Delaware Bay continues to provide important nursery habitat for sandbar sharks, smooth dogfish and sand tigers. The extensive use of the Bay by all life stages of sand tigers and smooth dogfish continues to highlight the seasonal importance of this essential shark habitat.

Virginia

COASTSPAN sampling encompassed the lower Chesapeake Bay and inlets along the Eastern Shore of Virginia using a random stratified design based on depth and geographic location. Additional sampling was also conducted at historical fixed stations near the mouth of Cheasapeake Bay and in coastal Virginia waters. Juvenile sandbar sharks dominated the catch in all areas sampled. Within the bay and inlets, the majority of sandbar sharks caught were young-

of-the-year. Other sharks caught within the inlets along the Eastern Shore of Virginia were two blacktip sharks, two Atlantic sharpnose sharks, and one smooth dogfish. Within Chesapeake Bay, six smooth dogfish were also caught. The second most abundant species caught in Virginia's coastal waters was the Atlantic sharpnose shark, consisting primarily of adult males. Other species caught in coastal waters, in order of abundance, were: spinner sharks, blacktip sharks, smooth dogfish, tiger sharks, dusky sharks, sand tigers, scalloped hammerheads, and one thresher shark. The majority of each species caught were immature, with the exception of the Atlantic sharpnose shark and the sand tiger. These findings highlight the importance of Virginia's coastal waters in providing nursery habitat for many coastal shark species. Virginia's estuarine waters continue to provide important nursery habitat for sandbar sharks.

North Carolina

Sampling occurred year round in inland (Pamlico Sound and Pungo, Neuse, New, and Cape Fear Rivers) and nearshore waters along the southern coast of North Carolina from New River Inlet to the South Carolina border. No sharks were captured in the Pamlico/Pungo and Neuse river systems in 2013. In the New and Cape Fear River systems, Atlantic sharpnose shark was the most abundant species, followed by bonnetheads and one blacktip shark was caught in 2013. In the Atlantic coastal waters, the catch was seasonally dominated by spiny dogfish and smooth dogfish in the cooler months. Atlantic sharpnose sharks dominated the catch in the warmer months, followed by bonnetheads. Blacktip sharks, blacknose sharks, scalloped hammerhead, finetooth sharks, and one tiger shark also occurred, but in much lower numbers.

South Carolina

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

Georgia

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

addition, the majority of blacknose sharks and bonnetheads were mature, indicating these waters continue to provide important adult habitat for these small coastal shark species.

Atlantic Coast of Florida

COASTSPAN sampling occurred within 2 km of Florida's north Atlantic coast in and around the following locations: Cumberland Sound, Nassau Sound, Tolomato River, St. Johns River, St. Augustine Inlet, and Matanzas Inlet. Species represented in the 2013 catch included, in order of abundance: Atlantic sharpnose, blacktip, sandbar, bonnethead, blacknose, finetooth, scalloped hammerhead, smooth dogfish, bull, and nurse sharks and one spinner and one tiger shark. Nassau and Cumberland Sounds continue to provide nursery habitat for juvenile Atlantic sharpnose, scalloped hammerhead, and blacktip sharks. Nassau and Cumberland Sounds also provided nursery habiat for juvenile sandbar, finetooth, and bull sharks in 2013. Cumberland Sound and northern Florida's nearshore waters continue to provide habitat for adult female bonnetheads and mature blacknose sharks, respectively, as well. The multi-year seasonal use of the waters around Pine Island in the Tolomato River by neonate scalloped hammerheads continues to provide supporting evidence of an inshore nursery area for this species. Additionally, Cumberland and Nassau Sound provided winter nursery habitat for young-of-the-year smooth dogfish in 2013.

U.S. Virgin Islands

COASTSPAN sampling took place in the waters surrounding the Buck Island Reef National Monument off St. Croix in June 2013. This sampling is part of a two-year pilot study to determine the potential for a multi-species, multi-age look at habitat use within a national monument. Four species of shark were captured, Caribbean reef, nurse, lemon, and blacktip sharks. All sharks captured were immature, but none were present as young-of-the-year. Sampling in 2014 will take place during the month of May.

Panhandle of Florida

GULFSPAN sampling covered 4 areas in the Florida panhandle: St. Andrew Bay, Crooked Island Sound, St. Joseph Bay, and the Gulf of Mexico side of St. Vincent Island. In 2013, nine species of sharks and three species of rays were captured; the most abundant of which was Atlantic sharpnose shark. Others included bonnethead, blacktip, scalloped hammerhead and finetooth shark, as well as cownose stingrays. The majority of the sharks captured were immature; indicating that areas along the Florida panhandle should still be considered potentially important nursery areas for both large and small coastal shark species as well as hammerhead species. Benthic habitats sampled included shallow seagrass beds, sand and mud.

Big Bend of Florida

2013 GULFSPAN sampling by Florida State University covered more than 300 km of Florida's coastline from St. George Sound to Anclote Keys. Longlines and gillnets were used to collect data. Seventeen elasmobranch species were caught; the majority of which was Atlantic sharpnose, bonnethead, and blacktip sharks. Others included blacknose, lemon, tiger, great hammerhead, nurse, and Florida smoothound sharks, as well as Atlantic stingrays, and cownose and southern rays. Sampling indicates that this region serves as nurseries for several species of

large coastal and small coastal sharks (Atlantic sharpnose, bonnethead sharksblacknose, and blacktip).

Florida-Alabama Border

GULFSPAN sampling by the University of West Florida took place from Big Lagoon to the west end of Santa Rosa Sound, and was limited to a pilot run of the program. In 2013, four species of elasmobranchs were caught (Atlantic sharpnose, blacktop, scalloped hammerhead shark, and Atlantic stingray). Of the seven sharks caught, all were juveniles. Data indicate that the Pensacola Bay may serve as nursery habitat for at least one species of small coastal shark (Atlantic sharpnose shark) and two species of large coastal sharks (blacktip and scalloped hammerhead shark).

Mississippi

In 2013, GULFSPAN sampling by the University of Southern Mississippi Gulf Coast Research Laboratory covered five regions of the Mississippi Sound in Mississippi state waters: west, central, east, inshore central and inshore east.. Five species of shark (finetooth (most abundant), blacktip, Atlantic sharpnose, bull, and bonnethead) were encountered. No rays were encountered during this sampling year. Over half of the sharks captured were of juvenile or young of the year stature indicating the region continues to be used as nursery habitat.

Conclusion

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

Chapter 3 References

Bethea, D.M., K. Smith, J. Carlson, J. Hendon, R. Grubbs, and T. Daly-Engel. 2013. Shark Nursery Grounds and Essential Fish Habitat Studies (GULFSPAN survey). An internal report to NOAA Fisheries, Highly Migratory Species Management Division.