3.0 ESSENTIAL FISH HABITAT

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

The Magnuson-Stevens Act requires NMFS to identify and describe 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 Essential Fish Habitat (EFH) for Atlantic HMS with the publishing of the Final Amendment 1 to the Consolidated HMS FMP (June 12, 2009, 74 FR 288018). On June 19, 2009, the Environmental Protection Agency (EPA) published a notice of availability (74 FR 29208) of the Final Environmental Statement (FEIS) for Amendment 1. In Amendment 1, NMFS updated and revised existing identifications and descriptions of EFH for Atlantic HMS, designated a new 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.

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

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

Table 3.1 Management history for HMS EFH.

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

Identification and Description of EFH

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

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

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

Habitat Areas of Particular Concern

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

Fishing and Non-fishing Impacts

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

3.2 Shark Nursery Grounds and Essential Fish Habitat Studies

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

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

the results from the 2009 COASTSPAN and GULFSPAN surveys (Bethea *et al*., 2010; McCandless *et al.*, 2010).

Massachusetts

COASTSPAN sampling was conducted in Duxbury Bay in 2009. The shark catch consisted entirely of immature sand tigers. The majority of the catch was young-of-the-year, strengthening previous year's work indicating the importance of these areas as potential nursery habitat for this prohibited species.

Rhode Island

Limited COASTSPAN sampling took place in Rhode Island estuarine waters in 2009. A total of five young-of-the-year sand tigers were caught, indicating the potential for Rhode Island waters to provide nursery habitat for this prohibited species.

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 2009, followed by smooth dogfish, sand tiger, and Atlantic sharpnose shark. The majority of sandbar sharks caught (99 percent) were immature, with 23 percent of these as young-of-the-year: the remaining one percent of sandbar sharks caught were mature females. Smooth dogfish were primarily represented by mature fish (82 percent), with adult females as the majority (86 percent). The immature smooth dogfish catch contained 57 percent young-of-the-year. Adult female and adult male sand tiger sharks were captured in the Bay, but the overwhelming majoritywere captured as immature. All Atlantic sharpnose sharks caught were mature males. Young-of-the-year sandbar sharks, smooth dogfish and sand tigers were primarily caught in the shallower regions of the bay along the Delaware and New Jersey coastlines. Delaware Bay provides important nursery habitat for these shark species and is currently listed as a Habitat Area of Particular Concern for the sandbar shark. The continued extensive use of the Bay by all life stages of sand tiger and smooth dogfish also highlight the seasonal importance of this habitat for these species.

North Carolina

COASTSPAN sampling occurred year round in inland (Pamlico Sound and Pungo, Neuse, New, and Cape Fear Rivers) and nearshore waters along the southern coast of North Carolina from New River Inlet to the South Carolina border. No sharks were captured during limited sampling in Pamlico Sound and the Pungo and Neuse Rivers. In the remaining inland waters, Atlantic sharpnose shark was the most abundant species caught along with bonnethead, sandbar, and blacktip sharks. In addition, one smooth hammerhead and one nurse shark were caught in inland waters. 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 bonnethead, blacktip, blacknose, finetooth, and spinner sharks, and one scalloped hammerhead shark.

South Carolina

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

Georgia

COASTSPAN sampling took place in both estuarine (Altahama River and St. Simon and St. Andrew sound systems) and nearshore waters along the Georgia coast from Sapelo Island to the Florida border. Of the ten species of shark captured, Atlantic sharpnose was the most abundant. Other sharks included bonnethead, blacknose, sandbar, blacktip, scalloped hammerhead, tiger, smooth dogfish, finetooth, spinner, nurse, and bull sharks. Six species captured were also present as young-of-the-year in estuarine waters: Atlantic sharpnose, blacktip, sandbar, scalloped hammerhead, and finetooth sharks. In addition, Atlantic sharpnose and blacknose sharks were present as young-of-the-year in Georgia's nearshore waters. The majority of sharks captured were immature (78 percent), indicating the importance of these areas as potential nursery habitat for both small and large coastal shark species. Also, the majority of blacknose sharks (75 percent) and bonnetheads (64 percent) were mature, indicating these waters likely also provide important habitat for the adult life stage of these small coastal shark species.

Atlantic coast of Florida

COASTSPAN sampling occurred within and no more than 2 km offshore of five primary sites on Florida's north Atlantic coast: Cumberland Sound, Nassau Sound, St. Johns River, St. Augustine Inlet, and Matanzas Inlet. Species represented in the catch included, in order of abundance: Atlantic sharpnose, blacktip, bonnethead, sandbar, blacknose, scalloped hammerhead, finetooth, and lemon sharks. The primary study sites (Nassau Sound, Cumberland Sound) may serve as potential nursery habitat for at least three of the species captured: Atlantic sharpnose, blacktip, and scalloped hammerhead sharks. Cumberland Sound also likely serves as essential fish habitat for adult bonnethead females. In addition, sampling in nearshore waters indicate that these areas likely provide important habitat for mature blacknose sharks.

U.S. Virgin Islands

COASTSPAN sampling took place in Coral Bay and Fish Bay of St. John in 2009. Two species of shark captured, blacktip and lemon sharks. All sharks captured were immature and were also present as young-of-the-year in both bays. Long-term passive tracking data indicates strong site fidelity towards these two bays but preliminary results also show some connectivity between areas with similar habitat composition (mangrove associated seagrass and macroalgae beds), such as Lameshure Bay and Hurricane Hole, St John. These results confirm previous year's work that identified Coral and Fish Bay as important nursery habitat for blacktip sharks, and highlights the potential of St John waters in providing additional nursery habitat for these species.

Gulf Coast of Florida

Under the GULFSPAN program a number of areas were sampled: St. Andrew Bay, Crooked Island Sound, St. Joseph Bay, the Gulf of Mexico side of St. Vincent Island, and Apalachicola Bay. Eleven species of sharks were captured the most abundant of which was Atlantic sharpnose. Others included bonnethead, spinner, scalloped hammerhead, blacktip, sandbar, blacknose, finetooth, Florida smoothhound, great hammerhead, and bull sharks. The majority of the sharks captured were immature, indicating that areas along the Florida Gulf coast remain important potential nursery areas for both large and small coastal shark species. In general, young-of-the-year sharks were more often collected in shallower water with higher temperature, lower salinity, and more turbid conditions compared to juveniles and adults. Benthic habitat included shallow seagrass beds, clay, sand, mud, hard-bottom reefs, and oyster shoals.

Alabama

GULFSPAN sampling took place in Mississippi Sound (Point Aux Pins, Dauphin island), Mobile Bay (Dog River, Fairhope and Cedar Point south to Pelican Bay)), and the Perdido system (Perdido Bay to Orange Beach and Perdido Pass). Seven species of sharks were collected, the most abundant of which was Atlantic sharpnose. Others included finetooth, blacktip, bull, bonnethead, scalloped hammerhead, and spinner sharks. Immature individuals made up 93 percent of the catch, indicating potential nursery areas for the species captured. Similar to previous surveys, western and southern sites of coastal Alabama (i.e., Mississippi Sound) had higher levels of observed shark abundance, occupying a wide range of habitats and environmental conditions within those areas.

Mississippi

A number of GULFSPAN sampling sites were located in Mississippi Sound around Cat Island, Horn Island, Round island, Deer Island, and Davis Bayou. Of the five species of sharks captured, Atlantic sharpnose was the most prevalent. Others included blacktip, finetooth, bonnethead, and scalloped hammerhead sharks. The majority of the sharks caught were immature, indicating the Mississippi Sound continues to be a potential nursery area for the species found there. Benthic habitat included sand, silt, mud, grassbeds, artificial reef and oyster reef.

Juvenile and young-of-the-year sharks appeared to prefer the shallow, warmer, lower salinity and more turbid waters compared to adult sharks.

Conclusion

The COASTSPAN survey has expanded into new areas during the 2009 sampling season. Over time, the data obtained from these new areas and the multi-year data gathered from previously sampled areas during both COASTSPAN and GULFSPAN surveys will provide the needed information to identify new EFH areas and to further refine areas already designated as EFH by determining specific habitat characteristics associated with these EFH. The existing time series for both surveys have been used in recent 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

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