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11.0 LIFE HISTORY ACCOUNTS AND ESSENTIAL FISH HABITAT DESCRIPTIONS

11.1 Habitat

Section 303(a)(7) of the Magnuson-Stevens Act, 16 U.S.C. §§ 1801 *et seq*., requires FMPs to describe and identify EFH, minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat. The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." (16 U.S.C. § 1802 (10)).

The EFH regulations require that EFH be described and identified within the U.S. EEZ for all life stages of each species in a fishery management unit. FMPs must describe EFH in text, tables, and figures that provide information on the biological requirements for each life history stage of the species. According to the EFH regulations, an initial inventory of available environmental and fisheries data sources should be undertaken to compile information necessary to describe and identify EFH and to identify major species-specific habitat data gaps. Habitats that satisfy the criteria in the Magnuson-Stevens Act have been identified and described as EFH in the 1999 FMPs and in Amendment 1 to the 1999 Tunas, Swordfish, and Shark FMP and were updated in Amendment 1 to the 2006 Consolidated HMS FMP.

NMFS originally described and identified EFH and related EFH regulatory elements for all HMS in the management unit in the 1999 FMPs, which were updated in Amendment 1 to the 1999 Tunas, Swordfish, and Shark FMP and implemented in 2003. The EFH regulations require NMFS to conduct a comprehensive review of all EFH related information at least once every five years and revise or amend the EFH boundaries if warranted. To that effect, NMFS undertook the comprehensive five-year review of information pertaining to EFH for all HMS in the management unit in the 2006 Consolidated HMS FMP. Based on the findings of this review, NMFS issued a Notice of Intent to amend EFH for HMS through Amendment 1 to the 2006 Consolidate HMS FMP on November 7, 2006 (71 FR 65087). In the Notice of Intent NMFS described its intent to prepare an Environmental Impact Statement (EIS) to examine alternatives for updating existing HMS Essential Fish Habitat (EFH), consider additional Habitat Areas of Particular Concern (HAPCs), analyze fishing gear impacts, and if necessary, identify ways to avoid or minimize, to the extent practicable, adverse fishing impacts on EFH consistent with the Magnuson-Stevens Act and other relevant federal laws. At that time, NMFS requested new information not previously considered in the 2006 Consolidated HMS FMP, comments on potential HAPCs, and information regarding potential fishing and non-fishing impacts that may adversely affect EFH.

On June 12, 2009, NMFS published a Notice of Availability of the Final Environmental Impact Statement for Amendment 1 to the 2006 Consolidated HMS FMP for Essential Fish Habitat (EFH) (74 FR 28018). This amendment updated and revised EFH boundaries for HMS, designated a new HAPC for bluefin tuna in the Gulf of Mexico, and analyzed fishing and non-fishing impacts on EFH. To facilitate public outreach, an internet-based mapping program (HMS EFH Evaluation Tool) was created to show the updated and revised EFH boundaries for HMS. Currently, there is no EFH designated for smooth dogfish and, therefore, no specific

management measures exist to mitigate adverse impacts, if any, to such EFH from fishing. EFH designation for smooth dogfish is detailed below.

11.2 Shark

As discussed in chapters 2 and 4, EFH must be designated as a statutory condition of establishing federal management for any species. Thus, NMFS is proposing EFH for smooth dogfish in this amendment. Amendment 1 to the 2006 Consolidated HMS FMP extensively analyzed methods for determining EFH, and NMFS considers the conclusions in Amendment 1 to the 2006 Consolidated HMS FMP to be the best available science. As such, no alternatives were considered for designating EFH other than the method used in Amendment 1 to the 2006 Consolidated HMS FMP as explained below.

11.2.1 Smooth Dogfish

Smooth Dogfish (*Mustelus canis*) Smooth dogfish is a common coastal shark species found in the Atlantic Ocean from Massachusetts to northern Argentina. They are primarily demersal sharks that inhabit continental shelves and are typically found in inshore waters down to 200m depth (Compagno, 1984). Smooth dogfish is a migratory species that responds to changes in water temperature. They primarily congregate between southern North Carolina and the Chesapeake Bay in the winter. In the spring, smooth dogfish move along the coast when bottom water warms up to at least 6 to 70°C. As temperatures get colder, smooth dogfish move offshore to their wintering areas (Compagno, 1984). Smooth dogfish have diets that are dominated by invertebrates (Scharf *et al.*, 2000). They primarily feed on large crustaceans, consisting mostly of crabs (Gelsleichter *et al.*, 1999), but also rely heavily on American lobsters. In the New England waters during the spring, smooth dogfish feed on small bony fish, including menhaden, stickleback, wrasses, porgies, sculpins, and puffers (Compagno, 1984).

Taxonomy: Emerging molecular and morphological research has determined that Florida smoothhounds have been misclassified as a separate species from smooth dogfish (Jones, pers. comm.). Thus, NMFS is considering Florida smoothhounds and smooth dogfish as one species for the purpose of designating EFH.

Reproductive potential: The maximum size limit for smooth dogfish is 150 cm TL. Males mature at 2-3 years old (about 82 cm TL) and females mature between 4-7 years old, which is about 90 cm TL (Compagno, 1984; Conrath *et al.*, 2002). The length at 50 percent maturity for females is 102 cm TL, while males reach 50 percent maturity at 86 cm TL. Female smooth dogfish have an 11–12 month gestation period with mating occurring between May and September. The fecundity of smooth dogfish ranges between 3 and 18 pups per litter (Conrath and Musick, 2002). The size range at birth is between 28 and 39 cm (Rountree and Able, 1996). Marsh creeks may be particularly important to newborn smooth dogfish during June and July. Young-of-year (YOY) pups grow rapidly in these areas to a size of 55-70 cm TL, prior to migration from the estuaries by the end of October. The abundance of YOY within estuaries strongly suggests that estuaries are critically important nursery habitats for smooth dogfish within the Mid-Atlantic Bight (Rountree and Able, 1996).

Impact of fisheries: Smooth dogfish are primarily caught in the northeast U.S. from Maine to South Carolina. They are primarily caught with gillnets, but are also captured in the longline fishery. Smooth dogfish are caught consistently throughout the year with peak catch rates in the late spring and early summer. According to the ACCSP, approximately 3,485,101 lb dw of smooth dogfish were landed from 2004-2007. The majority of these sharks were collected off the coast of North Carolina (1,796,867 lb dw). An average of about 213 vessels per year retained smooth dogfish according to VTR data, with an additional average of 10 vessels per year according to the Coastal Fisheries Logbook data, for a total estimate of 223 vessels per year that retain smooth dogfish. It is likely that less than a quarter of these vessels were directing effort on this species. This amendment would establish federal management.

***Essential Fish Habitat for Smooth Dogfish*:**

- **Neonate/YOY (≤59 cm TL):** At this time, available information is insufficient for the identification of EFH for this life stage, therefore all life stages are combined in the EFH designation. Please refer to Figure 11.2 for detailed EFH map.

- **Juveniles (60 to 80 cm TL):** At this time, available information is insufficient for the identification of EFH for this life stage, therefore all life stages are combined in the EFH designation. Please refer to Figure 11.2 for detailed EFH map.

- **Adults (≥81 cm TL):** At this time, available information is insufficient for the identification of EFH for this life stage, therefore all life stages are combined in the EFH designation. Please refer to Figure 11.2 for detailed EFH map.

11.2.2 Methodology for Determining Smooth Dogfish EFH

Smooth dogfish EFH boundaries are based on the 95 percent probability boundary using ESRI ArcGIS and Hawth's Analysis Tools (www.spatialecology.com) using data from fisheries independent surveys. The probability boundary was created by taking all of the available distribution points for the species at all life stage and creating a percent volume contour (PVC or probability boundary). A detailed description of the tool and the analytical approach used to create the boundary is provided in Amendment 1 to the 2006 Consolidated Atlantic HMS FMP. The probability boundary takes into account the distance between each point and the next nearest point, thereby excluding the least dense points (outliers) where the species occurred in relatively low numbers. The 95 percent probability boundary would include, on average, 95 percent of the points used to generate the probability boundary. Note that the specific EFH boundaries are the edited (*i.e.*, clipped) 95 percent probability boundaries. In some areas the 95 percent probability boundary overlapped with the shoreline due to buffers that are created while generating the probability boundaries. The EFH was further adjusted by including specific areas deemed important through a primary literature review.

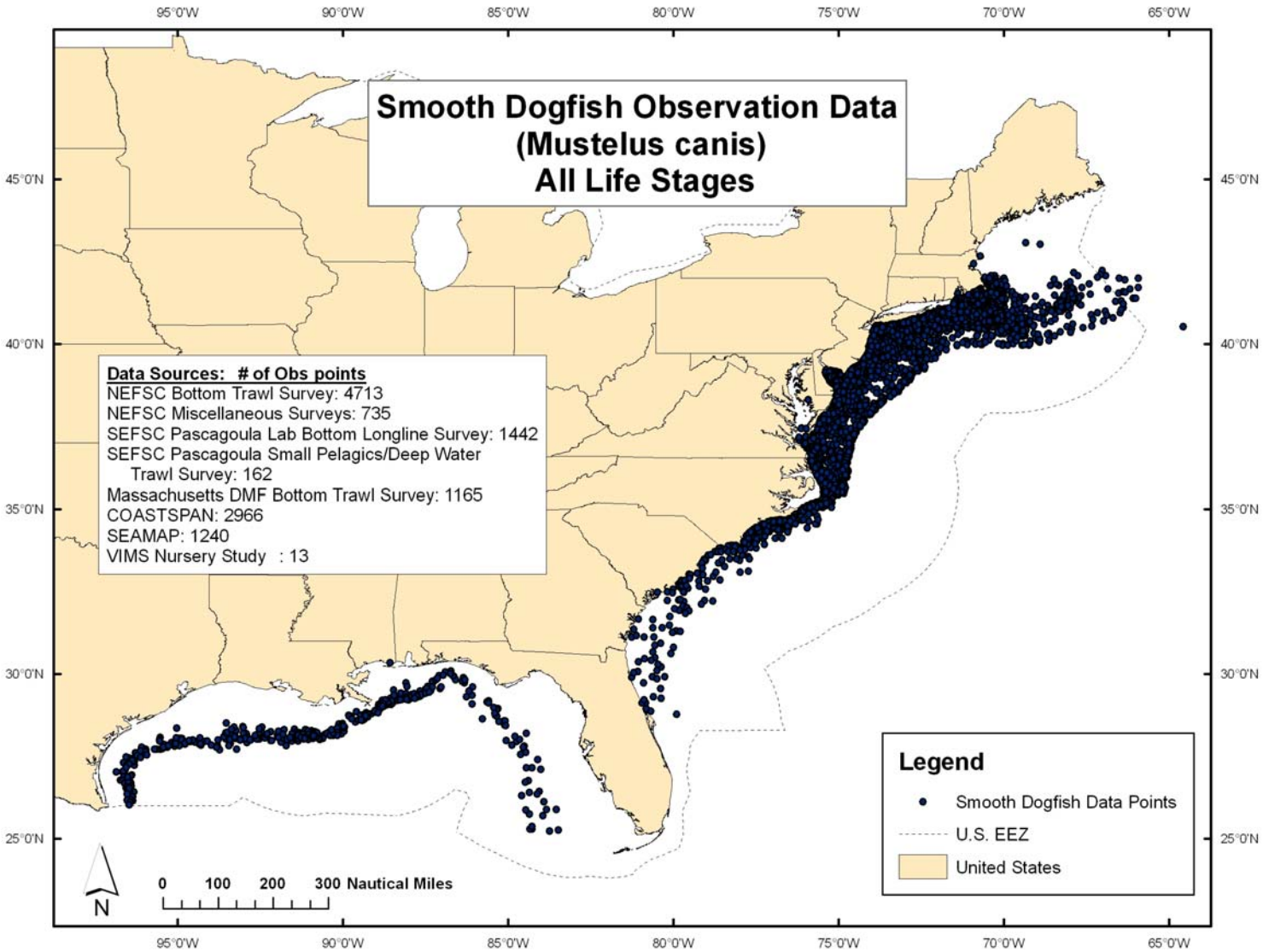

Figure 11.1 **Smooth dogfish observations from fisheries independent surveys.**
Note: The map includes data points for smooth dogfish and Florida smoothhounds. Data sources: SEFSC, COASTSPAN, SEAMAP, VIMS Nursery Study

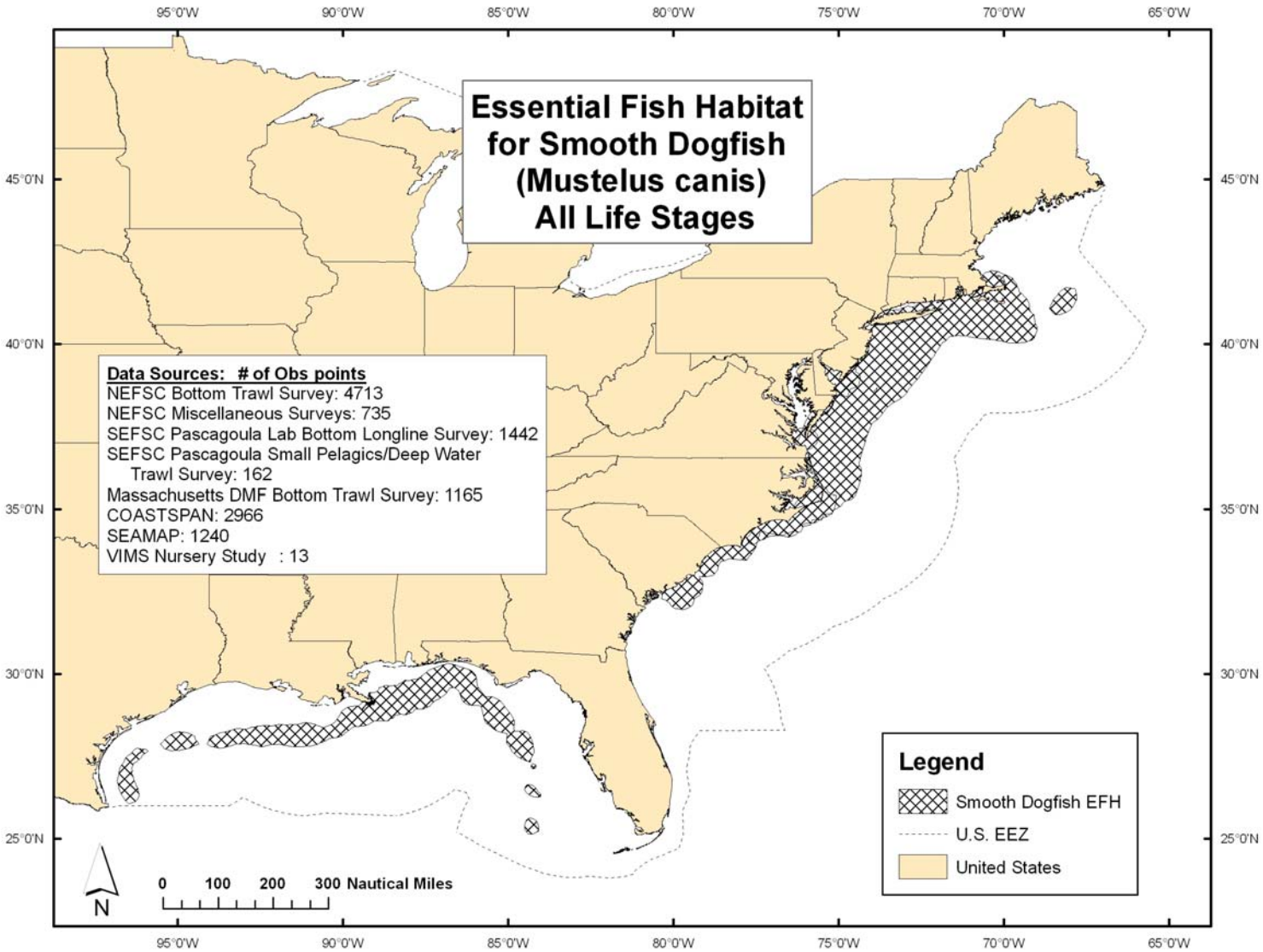

Figure 11.2 **Smooth dogfish EFH designation based on fisheries independent surveys.**
Note: all life stages combined; Florida smoothhound data points were included in EFH designation for smooth dogfish.

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