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## 11.0 LIFE HISTORY ACCOUNTS AND ESSENTIAL FISH HABITAT DESCRIPTIONS

### 11.1 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 draft 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.

#### 11.1.1 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 7°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).

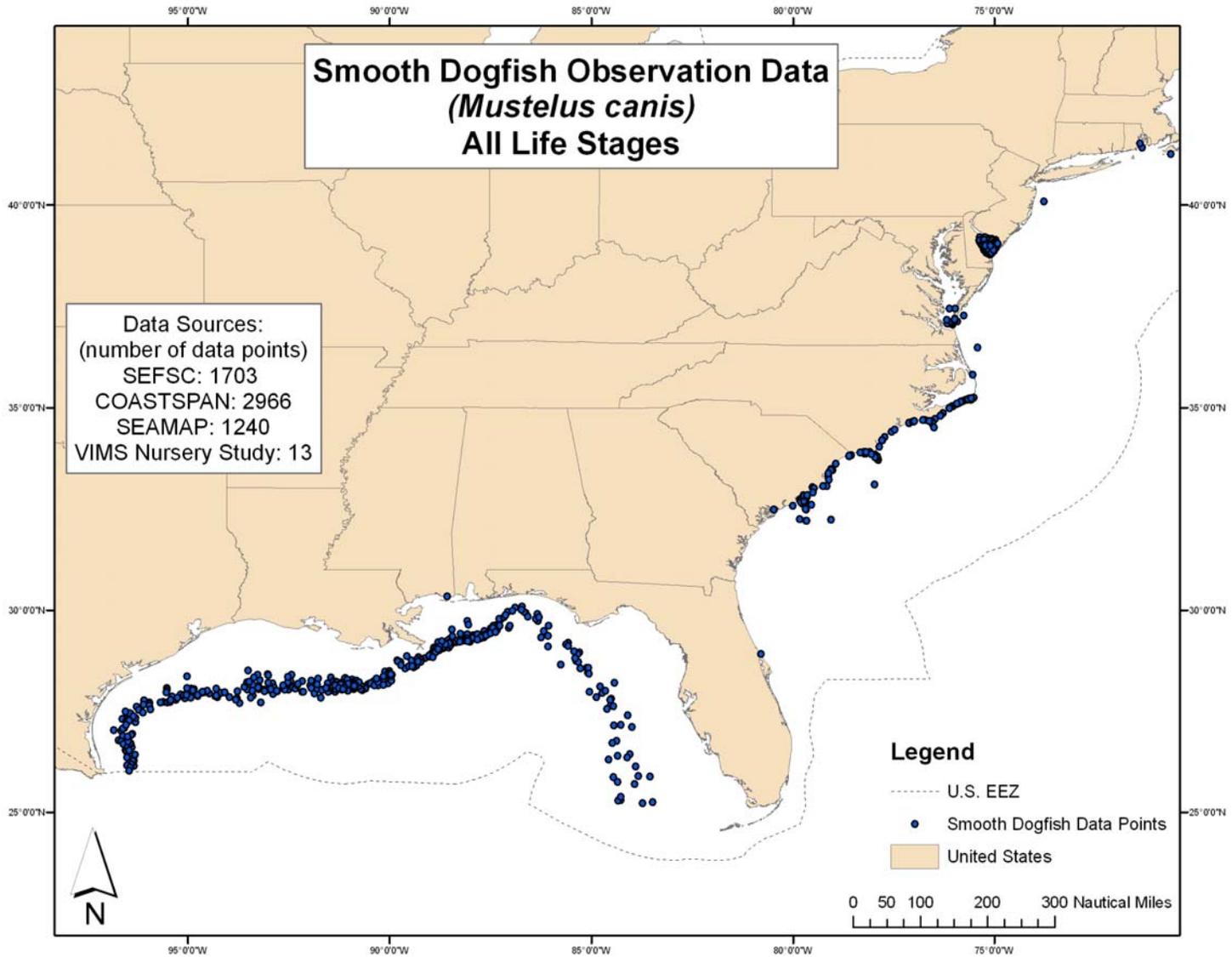
**Impact of fisheries:** Smooth dogfish are primarily caught in the northeast U.S. from Maine to South Carolina. They are primarily caught with gillnets, but are also captured in the longline fishery. Smooth dogfish are caught consistently throughout the year with peak catch rates in the late spring 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/year retained smooth dogfish according to VTR data, although most of these were the result of incidental landings. It is likely that less than a quarter of these vessels were directing effort on this species. Draft Amendment 3 proposes to establish federal management.

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

- **Neonate/YOY ( $\leq 59$  cm TL):** Coastal areas in the Atlantic Ocean from the Chesapeake Bay to South Carolina (Rountree and Able, 1996). 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 within the U.S. EEZ. Please refer to Figure 11.2 for detailed EFH map.
- **Adults ( $\geq 81$  cm TL):** At this time, available information is insufficient for the identification of EFH for this life stage within the U.S. EEZ. Please refer to Figure 11.2 for detailed EFH map.

**11.1.2 Methodology for Determining Smooth Dogfish EFH**

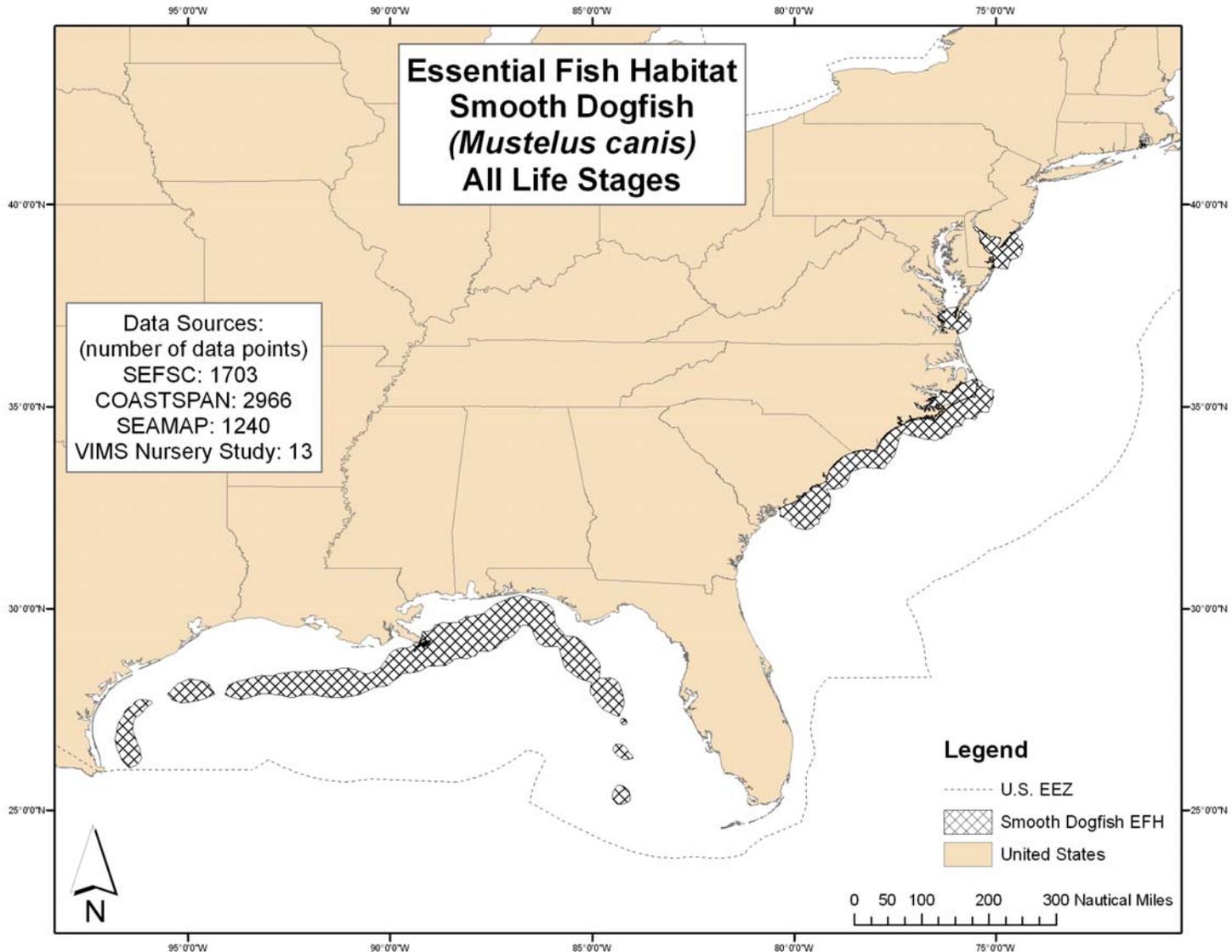
Smooth dogfish EFH boundaries are based on the 95 percent probability boundary using ESRI ArcGIS and Hawth's Analysis Tools ([www.spatial ecology.com](http://www.spatial ecology.com)) using data from fisheries independent surveys. The probability boundary was created by taking all of the available distribution 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.

## Chapter 11 References

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