Life History and Habitat Needs

Geographic Range

Atlantic coastal sharks are found throughout the United States Exclusive Economic Zone (EEZ) from Maine through Texas and the U.S. Caribbean, and from coastal and inshore estuarine habitats through pelagic and deepwater habitats of the outer continental shelf and abyssal plain.

Movement/Migration

Movement and migration patterns for species in the Coastal Sharks Fishery Management Plan (FMP) vary widely. Many species migrate either in groups or singly along the U.S. east coast seasonally, often in response to changing temperatures (e.g., lemon, sandbar, scalloped hammerhead, porbeagle, common thresher, basking, dusky, sand tiger, white). Tagging studies have indicated that some species undertake extremely long migrations, often oriented along dynamic current systems such as the Gulf Stream or variation in sea surface temperatures (e.g., tiger, blue, basking, whale, white). Other species instead display a high degree of site-fidelity (e.g., bonnethead, bull, nurse, Atlantic sharpnose). Some diel movement patterns may be related to predator avoidance or feeding efficiency (e.g., blacktip, bigeye thresher, sixgill), while drivers of diel vertical migrations are unknown for other species (e.g., bignose). Some species exhibit strong differentiation in habitat utilization by life stage (e.g., spinner). Onshore-offshore movement has been documented for several species at various points in their life history (e.g., bull, silky, smooth dogfish, angel). Still other species are known to undertake migrations, but the exact migration patterns are not well understood (e.g., spinner).

Habitat Use

Sharks are found in a wide variety of coastal and ocean habitats including estuaries, nearshore areas, structure (e.g., coral, hardbottom, or wreck), sea grass habitats, the continental shelf, continental slope, and the open ocean. Migratory species are affected by the condition of the habitat. Since coastal species frequently appear near shore and have pupping and nursery areas near shore, much more is known about their habitat requirements, particularly for early life history stages. Much less is known about the habitat requirements, pupping areas, and other details of pelagic and deep-dwelling species. Most pelagic sharks reside in the upper part of the water column and habitat preferences are likely influenced by oceanic factors such as current confluences, temperature edges, and surface structure. Deep-diving behavior has been documented in many species of sharks (e.g., tiger, smooth hammerhead, scalloped hammerhead, blue, porbeagle, dusky).

Reproduction/Pupping

Many Atlantic sharks are broadly distributed as adults but have been found to use specific estuaries as pupping and nursery areas. Examples include the Plymouth/Kingston/Duxbury Bay (MA), Great Bay (NJ), Chesapeake Bay (MD), and Delaware Bay (DE), which provide important nursery habitat for sandbar and sand tiger sharks; Bull's Bay (SC) and Terrebone Bay (LA), which are important blacktip shark nursery areas; and Cape Canaveral (FL), which provides important nursery and aggregation habitat for juvenile lemon sharks. Typically, shark pups (which can include neonates and young-of-the-year) remain in these same areas throughout their early life stages, which may vary from a few to many months. Recent tagging studies have shown that some sharks return to summer nursery areas in subsequent years, and/or exhibit a high-degree of site fidelity to pupping or nursery grounds (e.g., sandbar, sand tiger, blacktip, bull).

Threats to Habitat

- Coastal development
- Excess nutrients, sedimentation, water quality, and pollution
- Sediment dredging, dredge spoil placement
- Port and marina development, utilization, and maintenance
- Recreational boating in nursery areas
- Energy exploration and extraction, marine sand mining
- Climate change-induced ocean warming
- Interactions with fishing gear

ASMFC Fish Habitats of Concern

The National Marine Fisheries Service (NMFS) has identified several HAPCs for species within the ASMFC Coastal Sharks FMP based on the criteria outlined at (§600.815(a)(8)), including: 1) a sandbar shark HAPC that includes coastal areas of New Jersey and the Outer Banks (NC), and portions of Chesapeake Bay, Delaware Bay, and Great Bay (NJ); sand tiger shark HAPCs in Delaware Bay and in Plymouth, Kingston, Duxbury Bay (MA); and a lemon shark HAPC extending from areas surrounding Cape Canaveral to areas surrounding Jupiter Inlet (FL).

Recommendations to Improve Habitat Quality

- Vessels fishing with shark bottom longline gear should avoid or reduce effort on corals, gorgonians, or sponge habitat; take appropriate measures to identify bottom obstructions and avoid setting gear in areas where it may become entangled; and undertake diligent efforts to recover lost gear.
- Conservation measures to improve habitat quality are discussed at length for construction, flood control, watershed development, pollution, runoff, construction site, nutrient loading, infrastructure development (e.g., highways and bridges), dredging projects, sewage outflow, thermal pollution and water withdrawals for/from industrial sites in Amendment 10 to the 2006 Consolidated Atlantic HMS FMP.

Habitat Research Needs

- Examine the influence of climate change on range, migration, nursery/pupping grounds, and prey species.
- Identify key nursery, feeding, and mating habitats.
- Evaluate potential shark nursery habitats using the criteria established in Heupel et al. 2007 to more clearly determine and describe shark nursery habitat.
- Develop year-round abundance/distribution estimates of sharks in current closed areas or key habitats (e.g., mid-Atlantic shark closure, Charleston Bump); consider how and when sharks use certain key habitat areas.

Additional Information

In the early 1990s, the NMFS implemented a FMP for sharks of the Atlantic Ocean to rebuild overfished stocks and end or prevent overfishing. In 2006, the FMPs for Atlantic Highly Migratory Species (HMS) were combined into a single FMP that, along with subsequent amendments and complementary rulemakings, are used to manage sharks, swordfish, billfish, and tunas. In 2011, the Commission's Interstate FMP for Atlantic Coastal Sharks (and subsequently Addenda I-IV) to complement federal management actions and increase protection of pregnant females and juveniles in inshore nursery areas became effective.

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