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Tybee Island Shoreline Protection Project (TISPP) Periodic and Emergency Nourishments Draft Environmental Assessment and Finding of No Significant Impact
Tybee Island, Chatham County, GA

Appendix D
Magnuson-Stevens Fishery Conservation and Management Act (MSA)

January 2026

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Appendix D Table of Contents

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Appendix D.2 EFH Assessment Magnuson-Stevens Fishery Conservation and Management Act (MSA)

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Section 1. Introduction

The U.S. Army Corps of Engineers, Savannah District (USACE) is proposing to construct a hurricane and storm damage risk reduction project to reduce risk from waves, erosion, and inundation on Tybee Island, Georgia as part of the Tybee Island Shoreline Protection Project (TISPP). The proposed Federal action includes beach renourishments that will occur periodically or as needed under emergency conditions for the remaining duration of the TISPP (through 2036). Periodic renourishments would occur every seven years with the first anticipated in 2026-2027. Emergency nourishments would occur based on supplemental funding and authorizations provided as needed (i.e., in the event of damages incurred by a tropical storm system).

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires Federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), when their actions or the result of their actions may adversely affect essential fish habitat (EFH) or Federally managed fisheries. MSA defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” EFH is designated through Federal Fisheries Management Plans developed by Fisheries Management Councils (stewards of nearly all plans) or NMFS (stewards of the plan for Highly Migratory Species). USACE, pursuant to Section 305(b)(2) of the MSA, has prepared this assessment to support consultation with NMFS regarding the proposed Federal action that may adversely affect EFH.

The EFH Assessment includes a brief description of the proposed Federal action, an inventory of the habitats and managed fishery resources that are present within the project action area, and assessment of potential effects of the proposed Federal action on the resources.

Section 2. Project Description

The proposed Federal action is to directly place approximately 1.5 million cubic yards (MCY) of primarily sandy material from the Tybee Island Borrow Area onto the degraded shoreline on the eastern side of Tybee Island. The purpose of the proposed action is to replenish the volume of sand lost due to erosion and storm events, increase the storm protection functions of the beaches, and to maintain or improve resiliency of the beaches within the project limits and over the project’s lifetime. Placement of sediment in this area will provide valuable protection and attenuate wave energy along the shoreline. Figure 1 shows the proposed beach renourishment site along the shore of Tybee Island.

Initial placement is expected to occur in 2026-2027. This site will not receive any hardened structure after sediment placement completion as part of this effort; therefore, material is expected to migrate within the system over time from natural forces. The proposed locations were chosen with considerations for recreational, environmental, and economic resources.

Beach renourishments within the Federal template may occur periodically (every 7 years) or as needed under emergency conditions (i.e., post-tropical system) for the remaining duration of the TISPP (through 2036). Emergency nourishments will occur as supplemental funding and authorizations are provided.

Figure 1. Proposed Beach Renourishment Locations

Table 1. Proposed Action Location and Information

Name	Sand Source	Placement Location	Dimensions/Size (area)	Construction Method
Tybee Island Beach Renourishment	**Tybee Island Borrow Area** 2.1 km offshore of Tybee Island and 4 km south of the Savannah River navigation channel	**Beach Renourishment:** Front Beach, South Tip Beach, Back River Beach	**First Renourishment:** Upland: 85 acres Intertidal: 60 acres Subtidal: 80 acres	Placement using a cutterhead dredge, heavy equipment (e.g., bulldozers) used for design specifications

Direct Placement for Beach Renourishment

The Tybee Island shoreline has a history of erosional loss along the Atlantic Ocean, which has severely decreased the footprint of the shoreline within the Federal project template. Areas along the beach with an increased tendency for erosion are referred to as “hot spots” and are considered high risk to coastal storm damage (Figure 2). Recent surveys indicate that the shoreline loses approximately an average of 178,432 cy of material annually.

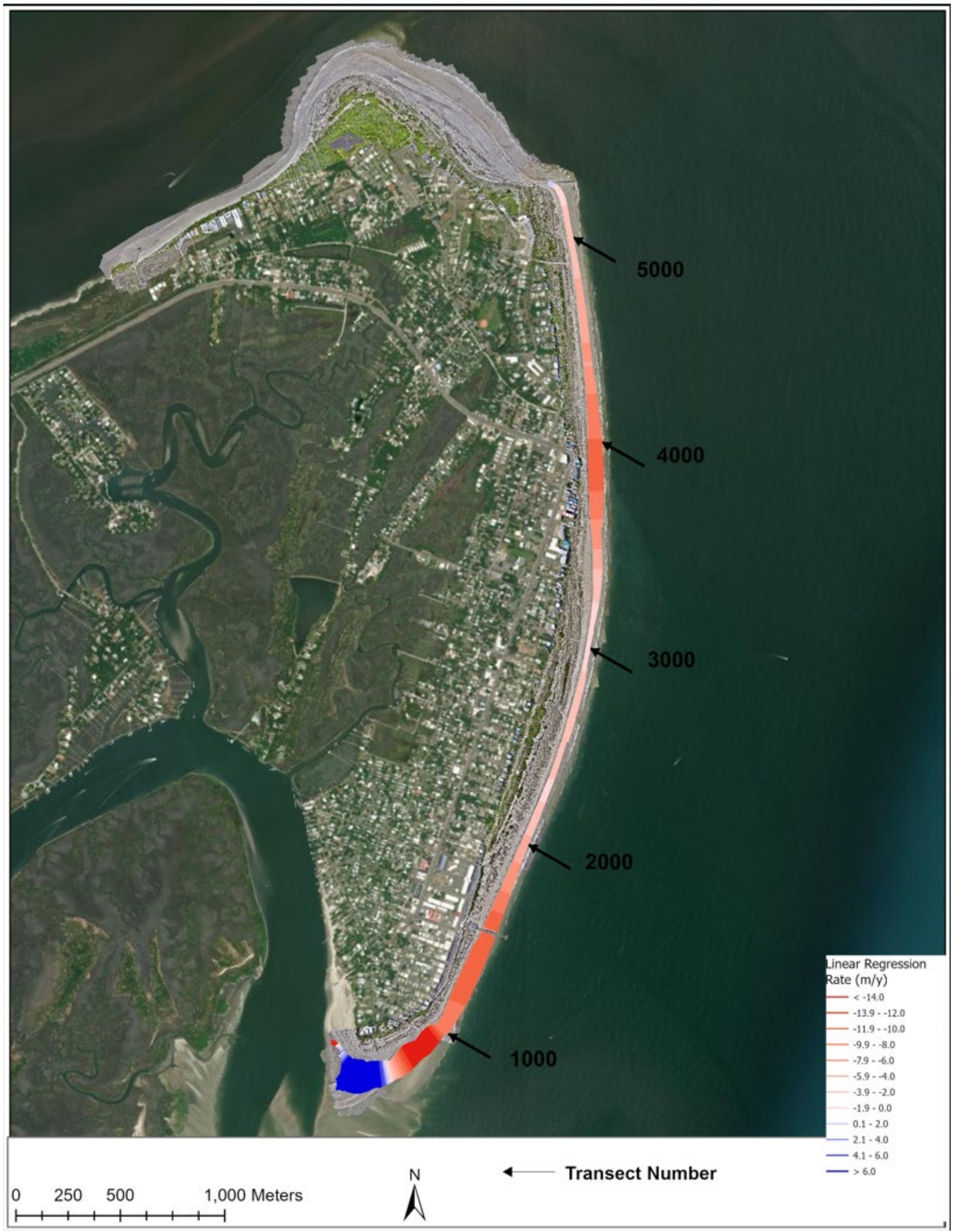

Figure 2. Skidaway Institute of Oceanography (SKiO) conducts annual shoreline change monitoring of the Tybee Island Federal template. Red is indicative of erosional hot spots and blue is indicative of accretionary areas.

Direct placement of sediment into the Federal template can have the effect of stabilizing areas that are susceptible to erosion. The purpose of direct placement is to renourish areas that have lost sediment from coastal storm events, tidal extremes, wave energy, and sea level rise. Renourishing these areas with sandy material can stabilize the eroding beach. The beach renourishment will be unconfined, and it is anticipated that the sediment would migrate due to natural processes.

Placement will occur within the intertidal zone up to the landward edge of the shoreline, avoiding impacts to dune systems and vegetation. Placement will occur with a pump-out cutterhead and heavy equipment such as bulldozers will be used to shape the material to design specifications. The authorized project for Tybee Island consists of renourishment of the federal template, as defined by the 13,200 linear feet of beach along Front Beach, 1,100 linear ft along the South Tip (South Tip Beach), and the 1,800 linear feet of the eastern bank of Tybee Creek to the city fishing pier (referred to as Back River Beach). The authorized design for the Front Beach is shown below (Figure 3). The design includes a berm at elevation 11.2 ft MLLW with a tolerance of +0.5 ft and a slope of 1:25 (vertical: horizontal). The authorized design for Back River and South Tip Beach is shown below (Figure 4). The design includes a berm at elevation 11.2 ft MLLW with a tolerance of +0.5 ft and a slope of 1:15 (vertical: horizontal). The tolerance allows the contractor to place material up to +0.5 ft above the lines and grades shown on the plans (Figure 5). The tolerance is included due to the large equipment required for this project and the dynamic shoreline conditions.

After fill placement is complete, the upper 18 inches of the beach fill (from the elevation of 7.13 ft MHW and above) must be tilled and sand compaction testing will be completed.

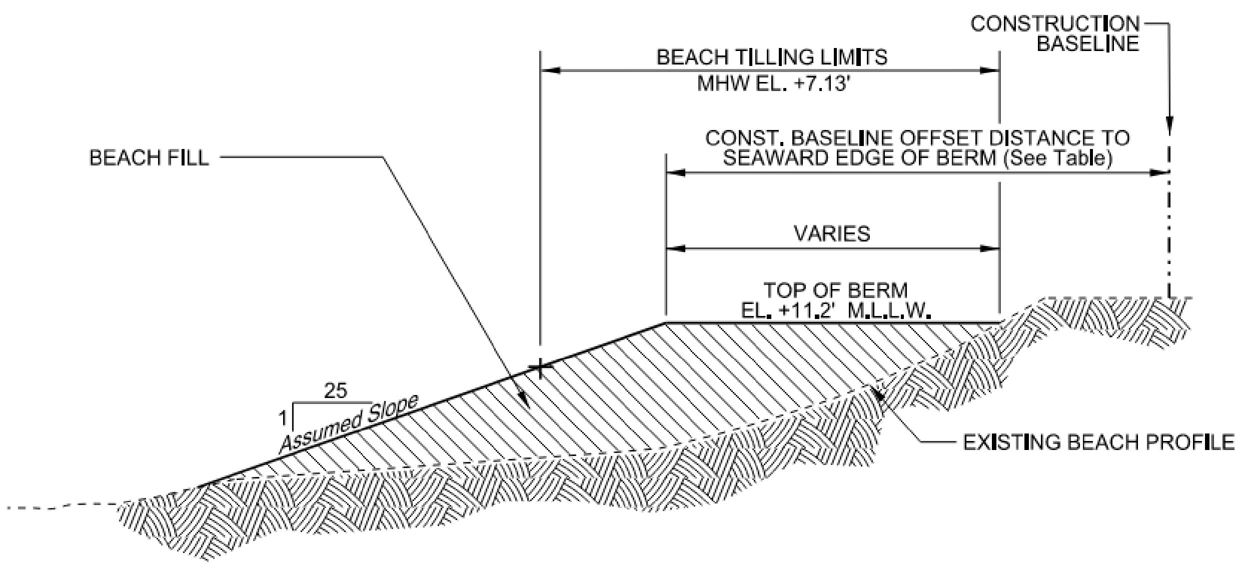

Figure 3. Beach nourishment cross-profile for the TISPP on Front Beach.

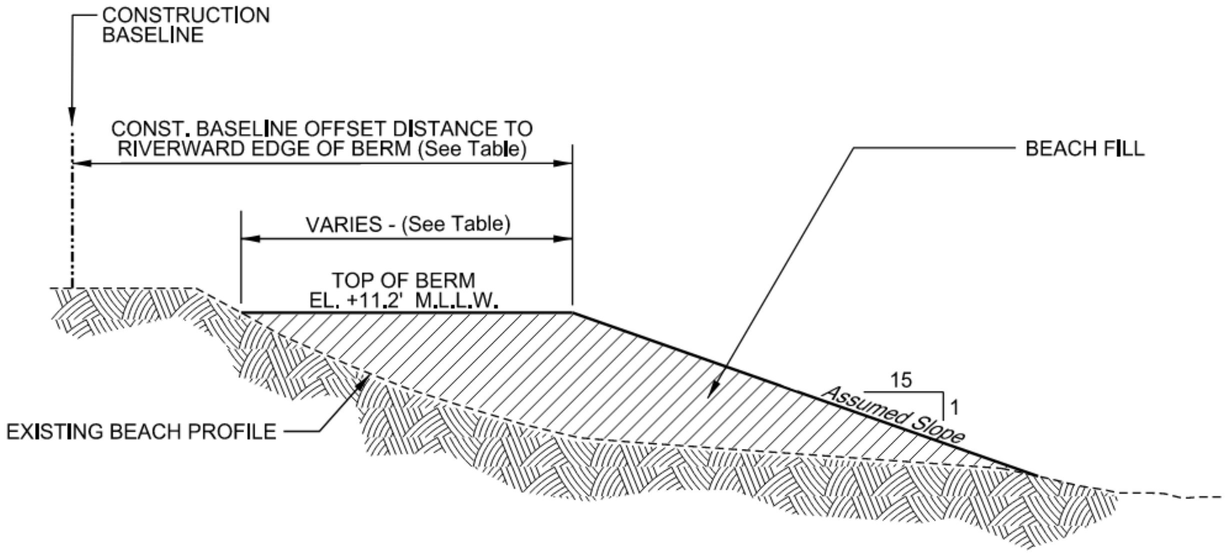

Figure 4. Beach nourishment cross-profile for the TISPP on Back River Beach and South Tip Beach.

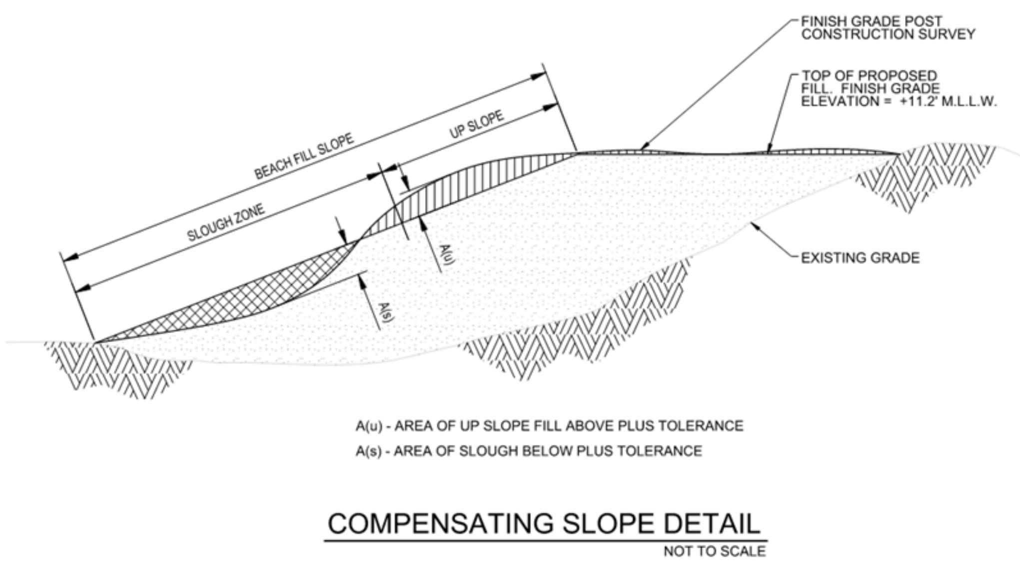

Figure 5. Beach fill tolerance cross profile for the Federal template.

With regard to sediment placement within intertidal zones, according to Piercy et al., (2023) coarse grained material will settle directly adjacent to the placement discharge point whereas finer-grained material will diffuse and travel further from the placement discharge point. The expectation in this case is, since the placement material will consist of mostly sandy material (90% sand or greater)from the Tybee Island Borrow

Area, that the material will mound close to the discharge point because there is a lack of fines which could diffuse from that location. This is beneficial because the constructed platform area and elevation will be much easier to achieve as sediment can be placed with more precision.

Tybee Island Offshore Borrow Area

The proposed sand source for this renourishment is the Tybee Island Borrow Area (Figure 6). The original borrow area is located approximately 4,000 feet southeast of the southernmost Federal terminal groin. The total area of the whole borrow area is ~1,340 acres. USACE expanded the offshore borrow area for Tybee Island three times as part of periodic renourishment projects in 1998, 2008, and 2019. In 2018, USACE conducted a study to determine the material characteristics of the borrow area. The study determined that there was approximately 5.72 MCY of beach-compatible sand readily available above an elevation of -16 ft MLLW. USACE also found that the beach-compatible sand identified and characterized during the investigation was suitable for future beach renourishment projects on Tybee Island.

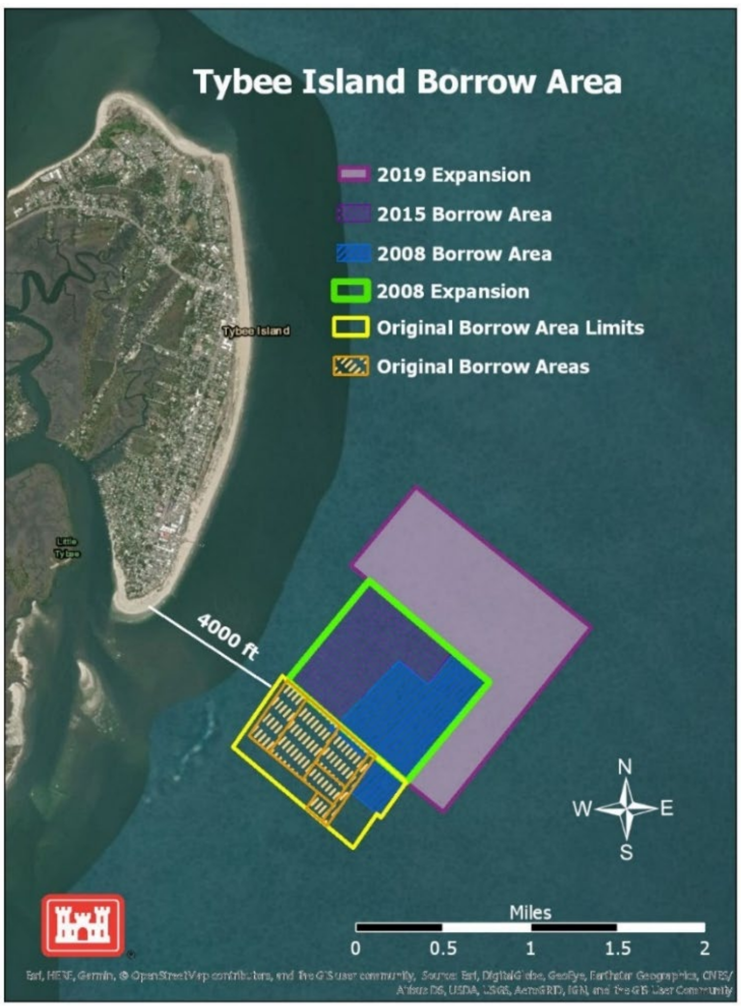

Figure 6. Tybee Island Offshore Borrow Site and Expansions

2.1 Description of the Action Area

The proposed action area is a barrier island located on the coast of Georgia, approximately 18 miles east of the city of Savannah and directly south of the Savannah River. It is bounded on the north by the Savannah Harbor, to the east by the Atlantic Ocean, and on the south and west by Tybee Creek and a vast tidal marsh system. The area experiences semi-diurnal tides and is heavily influenced by the ebb/flood tides from the Atlantic Ocean. The NOAA operates and maintains a nearby tide gauge which track tidal fluctuations in the area and is located approximately three miles from the top of the beach renourishment site. Datum information is provided in Table 3. The tidal range in this area is 0.00 ft (MLLW) and 7.50 ft (MHHW).

Table 2. Water Levels and Tide Ranges for the Nearby NOAA Station.

Station ID	Station Name	Mean Higher High Water (feet)	Mean High Water (feet)	Mean Tide Level (feet)	Mean Sea Level (feet)	Mean Low Water (feet)	Mean Lower Low Water (feet)
8670870	Fort Pulaski	7.50	7.13	3.67	3.82	0.21	0.00

Section 3. Essential Fish Habitat in Project Area

The final rule for implementing the EFH provisions of the MSA was released on 17 January 2002. Fishery Management Plans administered by the NMFS, South Atlantic Fishery Management Council (SAFMC), and the Mid-Atlantic Fishery Management Council (MAFMC) designate EFH in the project area. The EFH for a given species can include multiple habitats to support reproduction, juvenile and adult development, feeding, protection, and shelter during species' various life stages. This EFH assessment describes the habitat(s) and managed fishery resource(s) that may be present within the potential project footprint depending on time of year and life stage. The project footprint includes the Federal beach renourishment template and the borrow area site. If any activities could potentially affect EFH adversely, the applicable Federal agency must consult with the NMFS to develop measures to conserve EFH and support management of sustainable marine fisheries.

EFH in estuarine areas for fisheries that are managed by the NMFS, SAFMC, and MAFMC and occurring within the placement or project area are listed in Table 4. EFH was identified within the project area using NOAA Fisheries Essential Fish Habitat Mapper (https://coast.noaa.gov/digitalcoast/tools/efhmapper.html) along with the User's Guide to Essential Fish Habitat Designations by the South Atlantic Fisheries Management Council (SAFMC 2024). Table 5 provides the common species that may be located in the project area, as listed on the NOAA EFH Mapper (accessed 27 October 2025).

Table 3. EFH Categories Likely to be in the Project Area (NOAA 2025; NMFS Procedure 03-201-16).

Essential Fish Habitat	Potential Presence		Potential Effects
	Within Project Area	Within Placement Area	Proposed Action (Beach renourishment)
Estuarine and Marine Water Column	☑	☑	Adverse but not substantial
Unconsolidated Bottom	☑	☑	Adverse but not substantial
Intertidal Non-Vegetative Flats	☑	☑	Adverse but not substantial
Oyster Reefs	☑		Adverse but not substantial
Coastal Inlets	☑	☑	Adverse but not substantial

Table 5. NMFS, MAFMC, and SAFMC Managed Species Potentially Located in the Project Area (NOAA 2025).

Common Name	Scientific Name	Function	Life Stage Use(s)	Fisheries Management Plan
Atlantic Sharpnose Shark	*Rhizoprionodon terraenovae*	Refuge, Forage, Nursery	Juvenile, Adult, Neonate	NMFS Highly Migratory Species
Blacknose Shark	*Carcharhinus acronotus*	Refuge, Forage	Juvenile/Adult	NMFS Highly Migratory Species
Blacktip Shark	*Carcharhinus limbatus*	Refuge, Forage, Nursery	Juvenile, Adult, Neonate	NMFS Highly Migratory Species
Bluefish	*Pomatomus saltatrix*	Refuge	Eggs, Juvenile, Larvae	MAFMC Bluefish
Bonnethead Shark	*Sphyma tiburo*	Refuge, Forage, Nursery	Juvenile, Adult, Neonate	NMFS Highly Migratory Species
Bull Shark	*Carcharhinus leucas*	Refuge, Forage	Juvenile/Adult	NMFS Highly Migratory Species
Coastal Migratory Pelagics	*Scomberomorus maculatus* (Spanish Mackerel)	Refuge, Forage, Nursery	ALL	SAFMC Coastal Migratory Pelagics
Finetooth Shark	*Carcharhinus isodon*	Refuge, Forage	ALL	NMFS Highly Migratory Species
Lemon Shark	*Negaprion brevirostris*	Refuge, Forage	Adult, Juvenile	NMFS Highly Migratory Species
Penaeid Shrimp	*Penaeus aztecus* (Brown	Refuge, Forage,	ALL	SAFMC Shrimp

	Shrimp) *Penaeus duorarum* (Pink Shrimp) *Penaeus setiferus* (White Shrimp)	Nursery		
Sand Tiger Shark	*Carcharias taurus*	Refuge, Forage	Adult, Neonate/Juvenile	NMFS Highly Migratory Species
Sandbar Shark	*Carcharhinus plumbeus*	Refuge, Forage	Adult, Juvenile, Neonate	NMFS Highly Migratory Species
Scalloped Hammerhead Shark	*Sphyrna lewini*	Refuge	Neonate	NMFS Highly Migratory Species
Snapper Grouper Complex	*Lutjanus griseus* (Gray snapper) *Mycteroperca microlepis* (Gag grouper)	Forage	ALL	SAFMC Snapper Grouper
Spinner Shark	*Carcharhinus brevipinna*	Nursery	Juvenile/Adult	NMFS Highly Migratory Species
Summer Flounder	*Paralichthys dentatus*	Forage	Juvenile, Larvae	MAFMC Summer Flounder, Scup, Black Sea Bass
Tiger Shark	*Galeocerdo cuvier*	Forage	Juvenile, Adult, Neonate	NMFS Highly Migratory Species

3.1 Estuarine and Marine Water Column

The transient boundaries of the estuarine water column are variable due to wind- and tidal-driven inlet sea water mixing with upland freshwater sources and land surface runoff. With these mixing attributes, salinity levels vary within this estuarine EFH. Typically, the salinity groups include four ranges: oligohaline (< 5 Practical Salinity Units [PSU]), mesohaline (5 to 18 PSU), polyhaline (18 to 30 PSU), and euryhaline (>30 PSU). The saltwater tidal action and freshwater inflows are primary factors in estuarine circulation and nutrient/waste removal. Strong wind events and freshwater tributaries can increase turbidity, reducing light penetration, and adversely affect submerged aquatic vegetation and phytoplankton photosynthesis. Freshwater rivers and stream inflows provide estuarine EFH habitats organic matter, nutrients, and finer grained sediments, whereas ocean-driven tides provide coarser sediments and act as a transport mechanism for estuarine-dependent species (i.e., at least one life stage occurs in the estuary). The ocean waters within this EFH act as a temperature stabilizer that offsets seasonal temperature extremes that would reduce productivity and diversity in the shallow upstream waters. Salinity, temperature, dissolved organic matter, turbidity, dissolved inorganic nitrogen, and dissolved oxygen are components normally used to characterize the estuarine water column. Other descriptors, such as adjacent structures (shoals, channels, and marshes), water depth available fetch and light availability (K_d490) are also used to further describe this EFH. The estuarine water column provides both migrating and residential species of varying life stages the opportunity to survive in a productive, active, unpredictable, and at times strenuous environment. As the transport medium for nutrients and organisms between the ocean and the upstream rivers and inland freshwater systems, the estuarine water column is as essential a habitat as any marsh, seagrass bed, or reef (SAFMC 2009).

The marine water column can exhibit various changes throughout time and space in the physical and biological characteristics, such as temperature, salinity, density, nutrients, light and depth (SAFMC 2009). Therefore, there are numerous potentially distinct water column habitats for a broad array of species and life stages within species. In coastal waters, river discharge and estuarine tidal plumes contribute to the water column structure. Due to their important ecological function, areas of the offshore pelagic environments discussed above, and the associated benthic habitats, have been designated essential fish habitat-habitat and in some cases are considered habitat areas of particular concern (EFH-HAPC) (SAFMC 1998). These areas are productive and highly dynamic oceanic areas.

3.2 Unconsolidated Bottoms

Unconsolidated bottom is defined as all wetland and deep-water habitats with at least 25% cover of particles smaller than stones, and a vegetative cover less than 30%, where stone particle sizes range from 25.4 cm to 60.4 cm (Cowardin et al. 1985). Water regimens are restricted to subtidal, permanently flooded, intermittently exposed, and semi-permanently flooded. Diverse assemblages of fish and benthic macroinvertebrates, such as red drum, cobia, southern flounder, Atlantic croaker, spot, spotted seatrout, Atlantic menhaden, bay anchovy, striped mullet, weakfish, and blue crab, utilize these areas and serve as food sources for fish the SAFMC, MAFMC, or NMFS manage.

3.3 Intertidal Flats

The distribution and individual characteristics of intertidal flats are dynamic features of an estuarine system. An intertidal flat's shape and size varies by changing erosion and depositional rates influenced by tide ranges, coastal geology, freshwater inflow, weather patterns, and anthropogenic factors. Intertidal flat locations with minor tide variations are primarily influenced by wind and waves unless located near a tidal inlet or river mouth discharge. Tidal flats within systems of larger tidal fluctuations are principally formed and fashioned by the area's tidal action. Sediment size interacting with wind, wave, and tidal forces shape and manage intertidal flat development and movement. As the distance from an inlet increases, the intertidal flats' substrates become finer and more susceptible to wind fetch influences (SAFMC 2009).

Intertidal flats serve various functions for many species' life stages. Estuarine flats serve as a feeding ground, refuge, and nursery area for many mobile species, as well as the microalgal community that can function as a nutrient (e.g., nitrogen and phosphorus) stabilizer between the substrate and water column. The benthic community of an intertidal flat can include polychaetes, decapods, bivalves, and gastropods. This tidally influenced, constantly changing EFH provides feeding grounds for predators, refuge and feeding grounds for juvenile and forage fish species, as well as nursery grounds for estuarine-dependent benthic species (SAFMC 2009).

Species that move from a pelagic larval stage to benthic juveniles make use of flats during development. These flats can provide a comparatively low energy area with tidal phases that allow species to use shallow water habitat as well as relatively deeper water within small spatial areas. Many different species use this EFH as a nursery. These flats also serve as refuge areas for species avoiding predators, which use the tidal cycles to gain access to estuarine feeding grounds. In addition, these habitats are important for both migration routes and foraging for managed species. Frequently, nursery areas can include unvegetated soft bottom areas surrounded by salt/brackish emergent marsh (Street et al. 2005).

3.4 Oyster Reefs

Oyster reefs and shell banks are defined by SAFMC as being the "natural structures found between and beneath tide lines, which are composed of oyster shell, live oysters, and other organisms." This habitat is usually found adjacent to emergent marsh vegetation and provides the other three-dimensional structural relief in soft-bottom, benthic habitat (Wenner et al. 1996). Optimal salinity for *Crassostrea virginica* ranges from 12ppt to 25ppt, and in Georgia the majority of reefs are intertidal. Oyster reefs are extremely important to the aquatic ecosystem as they remove particulate matter, release inorganic and organic nutrients, stabilize sediments, provide habitat cover and serve as both indirect (i.e., house macroinvertebrates) and direct food sources for various fish species.

3.5 Coastal Inlets

Sand splits, jetties, islets, tidal flats, shoals, and sandbars are often associated with costal inlets which themselves are restricted areas of intense ebb and flow tidal changes. Inlets are often the bottlenecked area where the currents of the ocean are driven by tides and meet the freshwater flow from upland and upstream rivers, tidal creeks, and streams. Coastal inlets are areas of intense changes in energy caused by the daily tidal changes. Inlet habitats in the southeastern United States are frequently affected by waterway and beach renourishment projects. Coastal inlets provide protection and serve as nursery grounds for fish species.

Section 4. Habitat Areas of Particular Concern (HAPC)

Habitat Areas of Particular Concern (HAPC) are a subset of EFHs that are rare, stressed by development, provide important ecological functions for Federally managed species, or are especially vulnerable to anthropogenic (or human impact) degradation. HAPCs may include areas used for migration, reproduction, and development. HAPCs can include intertidal and estuarine habitats. The MSA does not provide any additional regulatory protection to HAPCs. However, if HAPCs are potentially adversely affected, additional inquiries and conservation guidance may result during the NMFS EFH consultation (NMFS 2008).

The SAFMC has designated coastal inlets as HAPCs for white, brown, and pink shrimp and the coastal inlets and oyster reefs as HAPCs for the snapper grouper complex. The EFH mapper identified the project area as HAPC for Submerged Aquatic Vegetation (SAV); however, the project footprint and the area of effect do not contain SAV. The project does not have any live oyster reefs within the placement areas, but they may be within the area of potential effect on the Back River. Therefore, the only HAPCs for this project would be coastal inlets and oyster reefs.

Section 5. Managed Species and Essential Fish Habitat Use

5.1 Penaeid Shrimp and Relevant EFH

White, brown, and pink shrimp (penaeids) are managed by the SAFMC. These and other managed species that may be found in the project area are listed in Table 5.

Environmental conditions are believed to primarily control shrimp population sizes even though fishing reduces the populations over the season. Shrimping is not thought to affect successive year totals, unless the reproduction stock is affected by environmental circumstances. Each species, due to their migratory nature and reproductive capability, are able to recover from a low population from one year to the next. The loss or degradation of salt marsh nursery habitat for juvenile white and brown shrimp is one of the most serious threats to southeastern United States stocks (SAFMC 1996). All coastal inlets and respective nursery habitats are of particular importance to shrimp.

The brown and white shrimp species' lifecycles are similar in that adults reproduce offshore, and eggs are hatched into free-swimming larvae. Both species undergo 11 larval stages to produce post-larvae. Within the estuary, post-larval shrimp grow rapidly; however, the rate is salinity- and temperature-dependent (SAFMC 2004). These shrimp species utilize related habitats with minor differences in substrate and salinity partiality. Once reaching a sub-adult size of three to five inches, the shrimp migrate seaward. Juvenile and adult shrimp are omnivores, feeding mostly at night on benthic organisms, algae, and detritus. Daytime feeding may occur in turbid waters rich in mysids, amphipods, polychaetes, and various types of organic debris (SAFMC 2004). As with brown shrimp, pink shrimp eggs are also demersal. Records suggest a larval period of

15 to 25 days. The mechanism by which post-larvae are brought from spawning areas to inside the estuaries is not well known. Post-larvae move into estuaries during late spring and early summer. In the South Atlantic, the nursery areas utilized within the estuaries are primarily dominated by the marsh grass *Spartina alterniflora.*

Shrimp have separate sexes (dioecious); females grow larger and are able to reproduce in less than 12 months and can expel between 500,000 and 1,000,000 eggs in a single event. Adult brown shrimp spawn in deep ocean waters over the continental shelf, while white shrimp remain nearshore. Larvae and post-larvae depend on ocean currents for transportation through inlets into estuarine nursery grounds. River mouths and inlet entrances are particularly important to estuarine shrimp recruitment. The majority of estuarine shrimp are found near shallow wetland systems. White shrimp may use freshwater submerged vegetation to some degree. However, brown shrimp primarily utilize estuarine submerged vegetation because of salinity inclinations. In North Carolina sounds/estuaries, juveniles and adult phases of pink shrimp appear in June and July, whereas, in the southern portion of their range this occurs in April and May. Pink shrimp leave Florida estuaries within two to six months after having arrived as post larvae. Smaller pink shrimp may remain in the estuary during winter. Pink shrimp that survive the winter grow rapidly during late winter and early spring before migrating to the ocean.

White Shrimp

White shrimp are found along the Atlantic coast from New York to Florida. Spawning along the south Atlantic coast occurs from March to November, while May and June are reported as peak months. Spawning takes place in water ≥ 30 feet deep and within five miles of shore where they prefer salinities of ≥ 27 ppt (Muncy 1984). The increase in bottom water temperature in the spring is thought to trigger spawning. After the demersal eggs hatch, the planktonic post-larvae live offshore for approximately 15 to 20 days. During the second post-larval stage, they move inshore on tidal currents and enter estuaries two to three weeks after hatching. Shallow muddy bottoms in low to moderate salinities are the optimum nursery areas for these benthic juvenile white shrimp. During this stage, the diet consists of zooplankton and phytoplankton. By June or July, the juveniles move to deeper creeks, rivers, and sounds. Juvenile white shrimp tend to migrate further upstream than do juvenile brown shrimp, as far as 130 miles in nearby northeast Florida (Pérez-Fartante 1969). Juveniles prefer to inhabit shallow estuarine areas with a muddy, loose peat, and sandy mud substrate with moderate salinities. Juvenile white shrimp are benthic omnivores (e.g., fecal pellets, detritus, chitin, bryozoans, sponges, corals, algae, and annelids) and feed primarily at night. White shrimp usually become sexually mature at age one during the calendar year after they hatch. The emigration of sexually mature adults to offshore waters is influenced primarily by body size, age, and environmental conditions. Studies have shown that a decrease in water temperature in estuaries triggers emigration in the south Atlantic (Muncy 1984). During fall and early winter, the south-migrating white shrimp provide a valuable fishery in southern North Carolina, South Carolina, and Georgia. White shrimp are omnivores preferring soft-muddy bottoms in areas of expansive brackish marshes (SAFMC 2004). The life span of white shrimp usually does not extend beyond two years.

Brown Shrimp

Brown shrimp occur from Massachusetts to the Florida Keys and west into the Gulf of Mexico. They support an important commercial fishery along the south Atlantic coast, primarily in North and South Carolina. This species spawns in deep ocean waters during late winter or early spring. Larvae migrate from offshore to inshore areas from February through April, frequently at night on incoming tides. Carried by currents and tides into estuaries, the larvae develop into post-larvae within 10 to 17 days. Once in the estuaries, post-larvae seek out the soft silty/muddy substrate common to vegetated and non-vegetated, shallow, estuarine environments. This environment yields an abundance of detritus, algae, and microorganisms that comprise their diet at this developmental stage. Post-larvae have been collected in salinities ranging from zero to 69 ppt with maximum growth reported between 18 degrees centigrade (°C) and 25°C, peaking at 32°C. Maximum growth, survival, and efficiency of food utilization have been reported at 26°C (Lassuy 1983). Juveniles develop in four to six weeks, continuing into rapid sub-adult development depending on salinities and temperatures. The density of post-larvae and juveniles is highest among emergent marsh and submerged aquatic vegetation (Howe and Wallace 2000), followed by tidal creeks, inner marsh, shallow non-vegetated water, and oyster reefs. The diet of juveniles consists primarily of detritus, algae, polychaetes, amphipods, nematodes, ostracods, chironomid larvae, and mysids (Lassuy 1983). Emigration of sub-adults from the shallow estuarine areas to deeper, open water takes place between May through August, with June and July reported as peak months. The stimulus behind emigration appears to be a combination of increased tidal height and water velocities associated with new and full moons. As individuals increase in size, they move to deeper and saltier waters of the inlets until exiting to the ocean in late fall. After exiting the estuaries, adults seek out deeper (60-foot) offshore waters. Brown shrimp are omnivores and prefer muddy and peat bottoms, but can be found on sand, silt, or clay mixed shell hash bottoms (SAFMC 2004). Adults reach maturity in offshore waters within the first year of life at 5.5 to 5.7 inches long. They have a maximum life span of 18 months.

Pink Shrimp

Pink shrimp occur on the Atlantic Coast from Chesapeake Bay south to the Florida Keys and are most abundant in water depths of 11-37 m. Pink shrimp reach sexual maturity at about 85 mm total length. Spawning occurs during the early part of the summer at depths of 3.7 to 15.8 m. During the larval stages, development is dependent on food availability, water temperature and quality of habitat. Depending on the environmental conditions, the larval period can last from 15-25 days. Post-larval movement from the spawning areas to estuaries are not well known, although some literature suggests that wind conditions and current movements assist in transport from the estuaries to offshore habitats. Migration offshore occurs during May/June off the Georgia coast (SAFMC 2009).

Penaeid Shrimp EFH in the Project Area

Of the shrimp EFH listed in the 2008 NMFS Essential Fish Habitat: A Marine Fish Habitat Conservation Mandate for Federal Agencies, those that exist within the placement area include: estuarine and marine water column, intertidal flats, and coastal inlets. These EFHs provide transport, refuge, and feeding/developmental areas for post- larval, juvenile, and sub-adult penaeid shrimp. Coastal inlets and state-designated nursery areas are considered HAPCs for white, pink, and brown shrimp species.

5.2 Snapper/Grouper Species Complex and Relevant EFH

Snapper/Grouper

Many deepwater snapper grouper species utilize both pelagic and benthic habitats during several stages of their life histories. Larval stages of these species live in the water column and feed on plankton. Most juveniles and adults are demersal (bottom dwellers) and associate with hard structures like artificial reef structures, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings). Juvenile stages of some snapper grouper species also utilize inshore seagrass beds, mangrove estuaries, lagoons, oyster reefs, and embayment systems. In many species, various combinations of these habitats may be utilized during daytime feeding migrations or seasonal shifts in cross-shelf distributions (Gore et al. 2013).

Gray Snapper

The project area is designated as EFH for the snapper grouper complex. Since there is limited data on species in the southeastern estuaries, the gray snapper is used as a proxy for other estuarine dependent species (SAFMC 1998). Gray snapper – a snapper species in the Lutianidae family- are one of the few estuarine dependent species in the snapper grouper complex (SAFMC 1998). EFH for gray snapper ranges from shallow estuarine areas (e.g., vegetated sand bottom, mangroves, jetties, pilings, bays, channels, and mud bottom) to offshore areas (e.g., hard and live bottom, coral reefs, and rocky bottom) as deep as 300 feet (Allen 1985; Bortone and Williams 1986). Like most snappers, these species participate in group spawning, which indicates either an offshore migration or a tendency for larger, mature individuals to take residency in deeper, offshore waters. Both the eggs and larvae of these snappers are pelagic (Richards et al. 1994). After an unspecified period in the water column, the planktivorous larvae move inshore and become demersal juveniles. Juvenile Gray Snapper are euryhaline and occur at salinities from 0-37 ppt (SAMFC 1998). The diet of these newly settled juveniles primarily consists of benthic crustaceans, but can also consume fish, mollusks, and polychaetes.

Juveniles inhabit a variety of shallow, estuarine areas including vegetated sand bottom, bays, mangroves, finger coral, and seagrass beds. As adults, most are common to deeper offshore areas such as live and hardbottoms, coral reefs, and rock rubble. However, adult gray snapper also inhabits vegetated sand bottoms but occur less frequently in estuaries and mangroves (Bortone and Williams 1986). Data suggests that adults tend to remain in one area. The diet of adult gray snappers includes a variety of fish, shrimp, crabs, gastropods, cephalopods, worms, and plankton. This species is of commercial and/or recreational importance (Bortone and Williams 1986).

NOAA's Estuarine Living Marine Resources (ELMR) database has identified Gray Snapper species as being present (rare, common, abundant, or highly abundant) or not present for the "Tidal Fresh", "Mixing," and "Seawater" salinity zones in the Savannah River. Since the Gray snapper is the only estuarine dependent species under the Snapper Grouper Fisheries Management Plan in the ELMR data set, it is used as a proxy for other estuarine dependent species, such as gag grouper (Nelson et al. 1991; SAFMC 1998).

Table 6. Spatial distribution and relative abundance of Gray Snapper (Nelson et al. 1991).

		Southeast Estuaries-Savannah River		
		Tidal Fresh	**Mixing**	**Seawater**
Gray Snapper ***Lutjanus griseus***	Adult	Not Present	Not Present	Not Present
	Spawning Adult	Not Present	Not Present	Not Present
	Juveniles	Rare	Rare	Rare
	Larvae	Not Present	Not Present	Not Present
	Eggs	Not Present	Not Present	Not Present

Snapper/Grouper Complex EFH in Project Area

EFH for the grouper/snapper complex species discussed above include the estuarine and marine water column, estuarine emergent wetlands, unconsolidated bottom, oyster reefs and coastal inlets. These habitats provide migration, refuge, and feeding/developmental areas for post-larval, juvenile, and/or adults of these species. Furthermore, Georgia tidal inlets, state-designated nursery areas, and oyster reefs are considered HAPCs for the grouper-snapper complex; however, the only HAPCs for the snapper/grouper complex within the project footprint are the tidal inlets and oyster reefs (NMFS 2008).

5.3 Coastal Migratory Pelagics and Relevant EFH

The coastal migratory pelagic (CMP) species are jointly managed by the Gulf of Mexico and the South Atlantic Fishery Management Councils. The area of management is from the Mexico/Texas border to New York. The mackerels in this management unit are often referred to as scombrids. The family Scombridae also includes tunas, mackerels, and bonitos. They are among the most important commercial and sport fishes. The habitat of adults in the coastal pelagic management unit is the coastal waters out to the edge of the continental shelf in the Atlantic Ocean. Within the area, the occurrence of coastal migratory pelagic species is governed by temperature and salinity. These species are seldom found in water temperatures less than 20°C. Salinity preference varies, but these species generally prefer high salinity, less than 36 ppt (Gore et al. 2013). Information captured in the NOAA's ELMR emphasized the importance and essential nature of estuarine habitat to all life stages of Spanish mackerel (SAFMC 1998).

Spanish Mackerel

The Spanish mackerel is important both commercially and recreationally. The Atlantic States Marine Fisheries Commission (ASFMC) and the SAFMC cooperatively manage Spanish mackerel, a member of the Scombridae family. Spanish mackerel management has resulted in a steady stock abundance increase since 1995; and based on 2002/2003 data, the population is not over-fished. Spanish mackerel are found within the coastal waters of the eastern United States and the Gulf of Mexico. NOAA's Estuarine Living Marine Resource Program, a cooperative effort of the National Ocean Service and NMFS, compiles regional information on estuarine habitat by select marine fish and invertebrates. The accumulated data emphasize the essential nature and extreme importance that estuarine habitats have on Spanish mackerel life stages.

Smaller than its congener the king mackerel (but have been reported to reach three feet in length), the Spanish mackerel's average adult weight is two to three pounds. Spanish mackerel are a fast- growing species, and both sexes are capable of reproduction by the second or third year (Mercer et.al. 1990). They have a life span of five to eight years (ASMFC 2009). Spanish mackerel form immense, fast-moving, and surface- feeding schools of comparable-sized individuals. The diet of scombrids consists primarily of fish and, to a lesser extent, penaeid shrimp and cephalopods. The fish that make up the bulk of their diet are small schooling clupeids [e.g., Atlantic menhaden, alewives (*Alosa pseudoharengus*), Atlantic thread herring (*Opisthonema oglinum*), anchovies], atherinids, and to a lesser extent jack mackerels (*Trachurus symmetricus*), snappers, grunts (*Haemulidae sp*.), and half beaks (*Hemiramphidae sp*.) (Collette and Nauen, 1983). Shrimp and jellyfish have also been reported in stomach contents (Mercer et.al. 1990).

As ocean temperatures warm, Spanish mackerel seasonally migrate along the western Atlantic coast. With increasing water temperatures, Spanish mackerel move northward from Florida to Rhode Island between late February and July and return in the fall (Collette and Nauen 1983). Spanish mackerel spawn in groups over the inner continental shelf, and spawning takes place May through September with peaks in July and August. Batch spawning takes place, frequently inshore. Females grow faster and larger than males; and by age two, females may release up to 1.5 million eggs (Mercer et al. 1990). The eggs are pelagic and hatch into planktonic larvae. Larvae grow quickly and may be found inshore at shallow depths less than 30 feet. There are indications of vertical larval migration during night-time hours (Mercer et al. 1990). Spanish mackerel are dependent on estuaries during larval and juvenile life stages (SAFMC 1998). Juveniles use estuaries as nursery areas. The continental shelf, tidal estuaries, and coastal waters are all habitats for adult Spanish mackerel. However, adults spend most of their life in the open ocean; but can be found over deep reefs, grass beds, and estuarine shallows (ASMFC 2009). Their distribution is considered primarily dependent on water salinity and temperature (ASMFC 2009; Mercer et al.1990).

Coastal Pelagic Species EFH in the Project Area

Coastal migratory pelagic species depend on estuarine systems for various life stages. Spanish mackerel juveniles depend on estuarine habitats. Estuarine EFHs provide transport, refuge, and feeding grounds, as well as developmental areas. Many important prey species for coastal pelagics are associated with estuarine areas. As the transport medium for nutrients and organisms between the ocean and inland freshwater systems, the estuarine water column is a very important essential habitat, and emergent salt marshes provide important refuge and foraging grounds. EFH for the coastal migratory pelagic species discussed above include the estuarine and marine water column, estuary emergent wetlands, unconsolidated bottom, and coastal inlets.

5.4 Other Managed Species

Other managed species like highly migratory species, bluefish, and those in the summer flounder, scup, and black sea bass fisheries are listed in Table 7. Of these species, sharks and summer flounder are most likely to use EFHs in the project area.

Table 7. Other Managed Species Likely to be Within the Project Area

Common Name	Scientific Name	Function	Life Stage Use(s)	Fisheries Management Plan
Atlantic Sharpnose Shark	*Rhizoprionodon terraenovae*	Refuge, Forage, Nursery	Juvenile, Adult, Neonate	NMFS Highly Migratory Species
Blacknose Shark	*Carcharhinus acronotus*	Refuge, Forage	Juvenile/Adult	NMFS Highly Migratory Species
Blacktip Shark	*Carcharhinus limbatus*	Refuge, Forage, Nursery	Juvenile, Adult, Neonate	NMFS Highly Migratory Species
Bluefish	*Pomatomus saltatrix*	Refuge	Eggs, Juvenile, Larvae	MAFMC Bluefish
Bonnethead	*Sphyma tiburo*	Refuge, Forage,	Juvenile, Adult,	NMFS Highly Migratory

Shark		Nursery	Neonate	Species
Bull Shark	*Carcharhinus leucas*	Refuge, Forage	Juvenile/Adult	NMFS Highly Migratory Species
Finetooth Shark	*Carcharhinus isodon*	Refuge, Forage	ALL	NMFS Highly Migratory Species
Lemon Shark	*Negaprion brevirostris*	Refuge, Forage	Adult, Juvenile	NMFS Highly Migratory Species
Sand Tiger Shark	*Carcharias taurus*	Refuge, Forage	Adult, Neonate/Juvenile	NMFS Highly Migratory Species
Sandbar Shark	*Carcharhinus plumbeus*	Refuge, Forage	Adult, Juvenile, Neonate	NMFS Highly Migratory Species
Scalloped Hammerhead Shark	*Sphyrna lewini*	Refuge	Neonate	NMFS Highly Migratory Species
Spinner Shark	*Carcharhinus brevipinna*	Nursery	Juvenile/Adult	NMFS Highly Migratory Species
Summer Flounder	*Paralichthys dentatus*	Forage	Juvenile, Larvae	MAFMC Summer Flounder, Scup, Black Sea Bass
Tiger Shark	*Galeocerdo cuvier*	Forage	Juvenile, Adult, Neonate	NMFS Highly Migratory Species

Summer Flounder

The summer flounder's range includes shallow estuarine and outer continental shelf waters from Nova Scotia to Florida and the northern Gulf of Mexico (NOAA 2025b) Summer flounder display intense seasonal inshore/offshore migration patterns. From late spring through early fall, summer flounder are concentrated in estuaries and sounds until migrating to the offshore outer continental shelf wintering grounds (NOAA 2025b; ASMFC 2009). During fall and early winter, offshore spawning occurs and the larvae are carried by wind currents into coastal areas. Most larvae and juvenile development occurs principally within the estuaries and sounds. Most individuals are sexually mature at age two. Growth rates and maximum ages vary substantially between sexes; adult females routinely grow larger and older than males (NOAA 2025b).

Summer flounder will begin spawning at age two or three. Summer flounder eggs are pelagic, buoyant, and most plentiful between Cape Cod and Cape Hatteras. The eggs are spherical with a transparent rigid shell, and the yolk occupies approximately 95 percent of the egg volume (ASMFC 2009). Larval free feeding is initiated once the yolk-sac material is consumed, which is a function of the incubation temperature.

The left-eyed flatfish begin with eyes on both sides of its body; the right eye migrating to the left side in 20 to 32 days post-emergence. Larvae migrate to inshore coastal areas from October to May where they burrow into the sediment and develop into juveniles. Late larval and juvenile summer flounder are active predators, preying on crustaceans, copepods, and polychaetes. Research indicates that appendages of benthic fauna are an important food source for post-larval summer flounders (NOAA 2025b). Burrowing behavior is influenced by predator and prey abundance, salinity, water temperature, tides, and time of day. Juveniles inhabit marsh creeks, mud flats, and seagrass beds; but prefer primarily sandy shell substrates. Juveniles often remain inshore for 18 to 20 months. Males reach maturity at approximately ten inches; while females reach maturity at approximately 11 inches (NOAA 2025b; ASMFC 2009).

Adults primarily inhabit sandy substrates, but have been documented in seagrass beds, marsh creeks, and sand flats. Summer flounders are quick, opportunistic predators that ambush their prey, making use of a well-developed dentition. Their camouflage and bottom positioning allow for efficient predation on small fish and squid; crustaceans make up a large percentage of their diet (ASMFC 2009; NOAA 2025b). Adults are active during daylight hours and normally inhabit shallow, warm, coastal estuarine waters before wintering offshore on the outer continental shelf. Some research suggests that some older individuals may remain offshore year- round (NOAA 2025b).

Other Managed Species EFH in the Project Area

Potential EFH locations for the species discussed above include estuarine and marine water column, unconsolidated bottoms, and coastal inlets. Sharks may utilize any of the EFHs in the project area, especially for foraging. Their use of tidal areas may be limited based on size of individuals and high tide water depths. Summer Flounder utilize the EFH in the project area during the juvenile and larval life stages as important nursery habitats. As adults, summer flounder utilize the EFH as important foraging grounds and habitat during warmer months.

All native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within the adult and juvenile summer founder EFH is HAPC. The proposed project area does not contain SAV and is therefore not HAPC for summer flounder.

Section 6. Assessment of Effects

6.1 Potential Effects to EFH

Estuarine and Marine Water Column

Placement of sediment for beach renourishment will cause short-term and minor impacts to turbidity within the estuarine and marine water column. Turbidity plumes associated with placement would be limited to a few hundred feet and most of the turbidity will settle out quickly once placement is completed. There would be only short-term and minimal effects from turbidity because sediment being proposed for placement activities is mostly sand. Due to the sediment being coarse-grained material, it will settle out quickly and not result in long lasting turbidity plumes. Material placement-generated turbidity plumes are limited to an area only a few hundred feet to a few thousand feet and most turbidity settles out quickly once material placement is complete (NMFS 2020; NOAA 2023). In a study conducted in the Savannah Harbor, it was found that after construction ends increases in total suspended solids (TSS) are negligible within 12 to 24 hours (Gailani et al. 2003).

Dredging within the offshore borrow area will cause adverse but not substantial effects to turbidity within the marine water column. Turbidity plumes associated with dredging and are only limited to a few hundred feet and most of the turbidity will likely settle out quickly once the dredging is completed (NMFS, 2020). There would only be short-term and non-substantial effects from turbidity because the dredged sediment is mostly sand. Due to the sediment being course-grained material, it will settle quickly and not result in long lasting turbidity plumes. TSS concentrations associated with cutterhead dredge sediment plumes typically range from 11.5 to 282.0 mg/L with the highest levels (550.0 mg/L) detected adjacent to the cutterhead dredge and concentrations decreasing with greater distance from the dredge. The TSS levels expected for cutterhead dredging (up to 550.0 mg/L) are below those shown to have adverse effect on fish (typically up to 1,000.0 mg/L) (NOAA, 2023). Additionally, the project area is naturally turbid because of the dynamic nature of the tidally influenced systems; species that inhabit these systems are acclimated to a highly turbid environment.

Short-term increases in turbidity will not have a measurable effect on the water temperature or dissolved oxygen concentrations. Turbidity plumes would occur during dredging and the placement of sediment and would quickly dissipate. No permanent or temporary impacts or changes in temperature, dissolved oxygen levels, salinity or pH would occur within the Atlantic Ocean or within the project area as a result of turbidity plumes from the placement activities.

Unconsolidated Bottom

The proposed footprint for the beach renourishment is in a very dynamic system. Current trends have shown a pattern of erosion and loss of habitat over time, with an average rate of 178,432 cy annually. The proposed placement activities associated with the project are designed to provide additional sediment to the beach to stabilize the habitat, increase storm resilience, and protect recreational resources.

The amount of unconsolidated bottom that would be impacted by the proposed placement activities would be temporary and, as the project does not include any hardened confinement structures, sediment would follow natural sediment movement within the system during normal tidal cycles. Early successional benthic organisms would rapidly colonize the placement footprint. Through primary and secondary succession, the reestablishment of the existing benthic communities or capacity of EFH will occur slowly over years as the placed material continues to erode. It is expected that species would colonize from abundant adjacent habitat (McCall 2012).

The amount of unconsolidated bottom that will be temporarily impacted by the beach renourishment will account for much smaller percentage of the total area supporting this

EFH type within the study area. The abundance of habitat adjacent to the proposed placement area will be available for species to use, therefore, the predicted temporary impacts from placement will have minor, short-term impacts to this EFH or dependent species.

The proposed dredging activities in the offshore borrow area would require removal of material from the open water habitat/unconsolidated EFH. Given the abundance of nearby habitats for organisms to recruit from, the newly dredged areas will likely recover quickly (NMFS, 2020). Any loss of habitat would be short-term, and through primary and secondary succession, would not cause substantial adverse effects to the reestablishment of the existing benthic communities or alter the capacity of the EFH to support healthy populations of managed species over the long-term. Early successional benthic organisms will likely rapidly colonize the dredged footprint (Van Dolah et al., 1984). Recolonization by opportunistic species would be expected to begin soon after the dredging activity stops. Because of the opportunistic nature of the species that inhabit the soft-bottom benthic habitats, recovery in the borrow area would be expected to occur within 1–2 years. Rapid recovery would be expected from recolonization from the migration of benthic organisms from adjacent areas and by larval transport.

Intertidal Flats

The proposed project will place beach quality sediment in some of Tybee Island's intertidal flats burying some organisms while others more motile will likely avoid and survive the dispersal event. Impacts to intertidal areas are expected to be temporary and minor in nature. Although intertidal areas will experience some negative effects the habitat will increase in size due to the fill placement resulting in an overall benefit. The additional sediment will provide substrate for intertidal flat habitat, and according to a study conducted by South Carolina Department of Natural Resources for the 2015 Tybee Island renourishment project, it was found that intertidal macrobenthic infauna recovered 4 months after renourishment and subtidal macrobenthic infauna showed signs of recovery by six months (SCDNR, 2016).
There will be no impacts to intertidal flats from dredging activities in the offshore borrow area.

Oyster Reefs

Oyster reefs are located approximately 1,600 feet west of the placement area. While there may be turbidity plumes created by construction activities, it is unlikely that the turbidity plumes would reach the active oyster reefs. If turbidity plumes extend to the reefs, the oysters may experience minor, indirect effects from sediment movement from the site during construction and long-term from natural processes.

The indirect impacts may occur from sedimentation from placement-generated turbidity plumes during construction. The plumes will settle out quickly and increases in TSS are negligible within 12 to 24 hours. Throughout their range, oysters occur in naturally turbid environments and have adapted a filtering mechanism for inorganic particulates. Oysters filter and reject the inorganic particulates through production of pseudofeces (Wilber and Clarke 2010). The filtration rate of oysters is similar under the optimal temperature range of approximately 62°F to 86°F (Casas et al. 2018). Minimum water temperature (56.5°F) near Tybee Island happens in February, maximum (83.7°F) in August. Therefore, the filtration rate of the oysters near Tybee Island would be expected to be similar year- round and can filter suspended solids due to adjacent placement activities. As oysters are adapted to naturally turbid environments and temperatures year-round near Tybee Island are generally within optimal range for filtration, impacts would be similar regardless of the time of year placement could occur. It is expected that the turbidity plumes generated during placement would have negligible temporary impacts to oyster reef EFH in the project vicinity.

Long-term indirect impacts from sediment movement from the site are expected to be negligible, as the coarse sand material is expected to migrate slowly over time from the site in response to the natural processes such as wind wave action, precipitation events and tidal flows. Given the slow migration of the coarser material southward, it is not anticipated that this sedimentation would be at rate that would affect the oyster's natural filtration of inorganics. Additionally, the extent of the oyster reefs adjacent to the placement site are minimal.

Overall, the predicted temporary indirect impacts from placement will not have substantial adverse effects to this EFH.

There will be no impacts to oyster reefs from dredging activities in the offshore borrow area.

Coastal Inlets

The impacts to the coastal inlets as a result of the proposed project include elevated turbidity during construction; however, the impacts are expected to be short-term and minor in nature. The short-term increases in turbidity will not have a measurable effect on the water temperature or dissolved oxygen concentrations. Turbidity plumes would occur during placement of sediment and would quickly dissipate. No permanent or temporary impacts or changes in temperature dissolved oxygen levels, salinity, or pH would occur once placement activities are complete.

There will be no impacts to coastal inlets from dredging activities in the offshore borrow area.

6.2 Potential Effects to Managed Species

Effects to Penaeid Shrimp Species

EFH-HAPCs for brown, pink and white shrimp include coastal inlets (SAFMC 2009).

Over-wintering areas and nursery habitats inside inlets are also important. The project area includes productive estuarine habitats that may be used by brown and white shrimp, such as unconsolidated bottom. Localized temporary turbidity would occur during dredging and placement activities. This could potentially have adverse effects on shrimp physiology and behavior. However, the locations being proposed for dredging and placement activities are in already naturally turbid environments and due to the high sand content of the material being proposed for placement activities, turbidity levels will rapidly return to background levels after construction efforts are completed. The food-base of shrimp within the potential project footprint would likely be affected by changes in water quality. However, the food-base would recover rapidly as turbidity rebounds quickly following construction and salinity and temperature are not likely to be impacted. Individuals would likely forage in adjacent areas that have not been physically affected.

Effects to Snapper Grouper Complex

The project area includes estuarine resources that may be used by snapper species and their prey. Adult, juvenile, and post-larval snapper may be directly taken through dredging and placement activities. The project would potentially cause localized turbidity from suspended materials, which would be minor and temporary. More developed and mobile life stages would migrate to other suitable area habitats avoiding localized construction, but adjacent habitats to the dredging and placement location may still be temporarily affected by changes in turbidity. There is abundant similar quality adjacent habitat around Tybee Island. These factors and any changes in prey fish populations would potentially cause temporary affects to the health and condition of juvenile and adult snapper in the area; however, because these fish can migrate away from the dredging and placement activities, the effects of any turbidity plumes, which are transient and temporary, would be minimal. Additionally, the suspended solid levels expected for cutterhead dredging (up to 550.0 mg/L) are below those shown to have adverse effect on fish (typically up to 1,000.0 mg/L) (NOAA 2023). Overall impacts associated with the proposed placement activities to the grouper-snapper complex would occur only during construction activities and would be temporary and minor in nature.

Effects to Costal Migratory Pelagics

Juvenile and adult individuals of the coastal migratory pelagic species complex, like spanish mackerel, utilize estuarine habitats in the project area. Inlet habitats are particularly important for feeding and refuge/development. More developed and mobile life stages would migrate to other suitable area habitats avoiding localized construction, but adjacent habitats to the dredging and placement locations may still be temporarily affected by changes in turbidity. These factors and any changes in prey fish populations would potentially cause temporary affects to the health and condition of mackerel in the area. However, because these fish can migrate away from the dredging and placement activities, the effects of any turbidity plumes, which are transient and temporary, would be minimal. Overall impacts associated with the proposed placement activities to the coastal migratory pelagic complex would occur during construction activities and would be temporary and minor in nature.

<u>Effects to Other Managed Species</u>

Other managed species potentially using the project area include summer flounder during almost all their life stages. For these species, foraging and other behaviors may be altered as a result of placement activities. However, summer flounder are opportunistic feeders and can adapt their diet based on the availability of prey (NOAA 2025b). Indirect effects on summer flounder may result if prey habitat is removed or prey populations decline in the project area. However, these migratory species are likely to move to another area where suitable prey would be found, or the species would adapt their diet. There is abundant similar adjacent habitat around Tybee Island. In addition, because summer flounder have the ability to migrate away from the dredging and placement activities, the effects of any turbidity plumes, which are transient and temporary, would be minimal. Summer flounder located in the tidal and intertidal marshes are not likely to be affected as placement will not impact tidal and intertidal marshes in the long-term. Therefore, overall impacts associated with the proposed placement activities to the managed species within the action area would only occur during construction activities and therefore, would be temporary and minor in nature.

Highly migratory species potentially using the project area include sharks, most of which use inshore/inlet areas as juveniles. It is highly unlikely that any individuals of these species would be taken by dredge equipment due to their high motility and the use of cutterhead dredging which is not known to result in take of mobile species, but foraging and other behaviors may be altered as a result of dredging activities. Indirect effects on these species may result if prey habitat is removed or prey populations decline in the project area. However, these migratory species are likely to move to another area where suitable prey would be found. In addition, because these fish can migrate away from the dredging activities, the effects of any turbidity plumes, which are transient and temporary, would be minimal. Therefore, overall impacts associated with the proposed dredging and placement activities to the highly migratory species within the action area would only occur during construction activities and would be adverse but not substantial.

Section 7. Summary of Effects and Determination

The proposed project would have potential direct and indirect effects on EFH, managed species, and habitat associated with managed species. During placement construction activities, there will be some direct and indirect effects to estuarine water column, unconsolidated bottom, intertidal flats, oyster reefs, and coastal inlet habitats.

Species and habitats associated with EFH for this project are affected temporarily when dredging and placement activities occur. Overall impacts associated with the proposed dredging and placement activities to shrimp species, the grouper snapper complex, coastal migratory pelagics, and other managed species, would occur only during construction activities and would be temporary and minor in nature. These species have the ability to migrate to other adjacent habitat to avoid direct impacts like construction and turbidity. Indirect placement impacts such as reduced water quality due to temporary increases in turbidity levels for activities such as feeding or spawning may also occur however these impacts would be short-term (within 12-24 hours) and minor in nature as Tybee Island is a naturally turbid area due to tidal influences. Once placement activities are completed, any turbidity will quickly dissipate given the tidal currents. Short-term increases in turbidity will not have a measurable effect on the water temperature or dissolved oxygen concentrations.

Placement of dredged material as part of the beach renourishment activity may adversely affect infaunal and bottom-dwelling organisms at the site by smothering immobile organisms, (e.g., invertebrate prey species) or forcing mobile animals (e.g., benthic oriented fish species) to migrate from the area. However, natural disturbances are common in coastal environments so faunal communities are resilient to many kinds of periodic disturbances. Recovery is normal for healthy salt marsh habitats if the disturbance event is under the critical threshold and if there are adjacent unaffected habitats that can serve as a source for colonists (McCall 2012). According to a study conducted by South Carolina Department of Natural Resources, it was found that intertidal macrobenthic infauna recovered 4 months after renourishment and subtidal macrobenthic infauna showed signs of recovery by six months (SCDNR, 2016).

Benthic organisms within the defined borrow area dredged for construction and periodic renourishment would be lost. However, recolonization by opportunistic species would be expected to begin soon after the dredging activity stops. Because of the opportunistic nature of the species that inhabit the soft-bottom benthic habitats, recovery would be expected to occur within 1–2 years. Rapid recovery would be expected from recolonization from the migration of benthic organisms from adjacent areas and by larval transport.

The proposed action is a periodic nourishment to occur approximately every seven years or under emergency situations. Because the recovery of macrobenthic infauna in the intertidal and subtidal area is four to six months, there is sufficient time between renourishments for recovery. Each renourishment would only have short term impacts to the species and their habitats.

Based on the analysis above, USACE has determined that the proposed action would not cause significant adverse impacts to EFH nor managed species located within the action area. Impacts to EFH and managed species that use this habitat would be temporary and minor in nature and do not reduce either the quality or quantity of EFH in the project area. USACE has used the best scientific and commercial data available to complete this analysis and looks forward to further discussion on this project and its potential impacts.

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