

3.0 PROJECT IMPACT ASSESSMENT

Primary (direct) impacts from the proposed work is expected to occur in the following habitats: the intertidal flats and subtidal environments in Bogue Inlet, the nearshore and beach environments of The Pointe shoreline; 6,096 m (20,000 linear feet) of the nearshore and beach environment of Emerald Isle; and 2,438 m (8,000 linear feet) along the nearshore environment of Bear Island.

Temporary secondary (indirect) impacts to the estuarine system surrounding Bogue Inlet are expected from the increase in turbidity due to the displacement of sediment. The grain size data collected from the proposed inlet location indicated an average mean grain size 0.27mm (fine to medium sand) with a low silt content of 1.25%. Analysis of this data indicates that the suspension time for the discharged sediment will be low. Therefore sediment transport to the estuarine systems along the west end of Bogue Sound, the landward side of Bear Island and Dudley Island is expected to be minimal.

Engineering and geotechnical studies of Islands 1 and 2 for the Bogue Inlet Channel Erosion Response Project indicate that the two islands appear to be eroding in response to the westward movement of the Eastern Channel as a result of the growth of the Bogue Banks Spit. Therefore, temporary or indirect impacts from the project on these features will be difficult to determine.

4.0 ESSENTIAL FISH HABITAT DESIGNATION

The Magnuson Fishery Conservation and Management Act of 1976, amended Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) on October 1996 and also referred to as the Sustainable Fisheries Act, was enacted by the U.S. Congress to protect marine fish stocks and their habitat, prevent and stop overfishing and minimize bycatch. Congress defined Essential Fish Habitat as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." The MSFCMA requires that EFH be identified for all fish species Federally managed by the Fishery Management Councils and the National Marine Fisheries Service (NMFS).

Eight Fishery Management Councils (FMCs) were established under the MSFCMA to manage living marine resources within the federal limit water boundary and are required to describe and identify EFH designations in their respective regions. Each of these councils are responsible for developing a Fishery Management Plan (FMP) to achieve specified management goals for fisheries. The FMP includes data, analyses, and management measures (including guidelines for harvest) for a fishery.

4.1 Fishery Management

The South Atlantic Fisheries Management Council (SAFMC) and the Mid-Atlantic Fisheries Management Council (MAFMC) manage marine fisheries in the federal water limits of the North Carolina coast. The federal water limit is referred to as the Exclusive Economic Zone (EEZ) to include the federal waters that extend offshore from the state water boundary (3 nautical miles offshore) to 200 nautical miles.

The SAFMC is responsible for the conservation and management of fish stocks within the federal limit of the Atlantic Ocean along the coasts of North Carolina, South Carolina, Georgia, and along the east coast of Florida south to Key West. The seven Fishery Management Plans developed by the Council include: Calico Scallop FMP; Coastal Migratory Pelagic (includes King and Spanish Mackerel) FMP; Coral FMP; Golden Crab FMP; Shrimp (including rock shrimp) FMP; Snapper/Grouper Complex FMP; and Spiny Lobster FMP. According to the MSFCMA, all FMC managed species under Federal FMPs must have EFH identified. The areas designated as EFH by the SAFMC are listed in Table 4.1.

The MAFMC is responsible for the conservation and management of fish stocks in the federal waters off the coasts of New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. The MAFMC has 25 members of the council representing both State and Federal agencies, as well as the public. The MAFMC has developed six FMPs to manage fisheries of the Mid-Atlantic States. The management plans include the following: Summer Flounder, Scup, Black Sea Bass FMP; Bluefish FMP; Dogfish FMP; Surfclam and Quahog FMP; Atlantic Mackerel, Squid and Butterfish FMP; Tilefish FMP. According to the MSFCMA, MAFMC must identify EFH for these 11 species. The EFH designated by the MAFMC are included in Table 4.1.

Table 4.1 identifies the EFH habitats identified by the SAFMC and the MAFMC within the federal waters of North Carolina.

Table 4.1
Essential Fish Habitat Identified in FMP Amendments of the
South Atlantic and Mid-Atlantic FMC's

SAFMC
Estuarine Areas
Estuarine Emergent Wetlands
Estuarine Scrub/Shrub Mangroves
Submerged Aquatic Vegetation
Oyster Reefs and Shell Banks
Intertidal Flats
Palustrine Emergent and Forested Wetlands
MAFMC
Estuarine Areas
Seagrass
Creeks
Mud Bottom
Estuarine Water Column
Marine Areas
Water Column

NMFS federally manages the classified "highly migratory species" (HMS) and has developed FMPs for each species. HMS include Atlantic tunas, billfish, coastal sharks, and swordfish. NMFS geographically defines EFH for each of the HMS species along the Atlantic coast. The defined EFH areas are species-specific and include: shallow coastal waters, offshore waters inside the EEZ, offshore waters outside the EEZ, and inshore waters along the Atlantic coast.

4.2 Managed Species

Bogue Inlet is located along the mid-Atlantic Ocean between two barrier island systems. The largest of the two barrier islands is the Bogue Banks to the east that is separated from the mainland by Bogue Sound. West of the inlet is Bear Island (Hammocks Beach State Park), a shorter barrier island feature approximately 3.2 miles long (4.8 km). A total of 89 fish species have been recorded from offshore coastal waters (including nearshore, surf zone and beach habitat); intertidal and shallow water environments; subtidal habitats (i.e., White Oak River); shellfish and seagrass habitats; bays and lagoon environments (including Bogue Sound); inshore sandy and/or muddy bottom habitats; and estuarine and salt marsh environments.

The fish species listed in Table 4.2 and their EFH are managed under MSFCMA and are species that can occur in, or in the vicinity of Bogue Inlet. Table 4.2 includes the affiliated management Council and/or Commission; expected life stage in the project area; fish habitat associated with the species; and associated habitat that may be found in the project area.

Tables 4.3 (A-F) lists fish species that are likely or expected to occur in the project area. These fish species and their habitats require special consideration to promote their viability and sustainability.

4.3 Habitat Areas of Particular Concern

Habitat Areas of Particular Concern (HAPC) are subsets of identified EFH based on one or more of the following considerations: 1) the importance of the ecological function, 2) extent to which the habitat is sensitive to human-induced degradation, 3) whether and to what extent, development activities are stressing the habitat type, or 4) rarity of habitat type (50 CFR 600.815(a)(8)). HAPC may include high value intertidal and estuarine habitats, offshore areas of high habitat value or vertical relief, and habitats used for migration, spawning and rearing of fish and shellfish.

HAPC have been identified in the project area and although not all of these species or habitats may be impacted by the project, they may occur in, or in the vicinity of the project area. The listed habitats and the likelihood of their occurrence are listed in Table 4.4.

TABLE 4.2
ESSENTIAL FISH HABITAT SPECIES OF THE ATLANTIC WATERS
BOGUE INLET, NORTH CAROLINA

NMFS - National Marine Fisheries Service; SAFMC - South Atlantic Fisheries Mangement Council; MAFMC - Mid-Atlantic Fisheries Management Council;;
 NM - Nautical Mile; / = not likely to occur in area

Taxa	Common Name	NMFS (Highly Migratory Species)	SAFMC (3- 200NM)	MAFMC (3-200 NM)	Probable Life Stage in Project Area	Fish Habitat Ecology	Estuarine Emergent Wetlands	Submerged Aquatic SAV (SAV) and Seagrass Beds	Oyster Reefs and Shell Banks	Inertial Flats	Estuarine, Marine Water Columns, and Creeks (Subtidal)	Shallow Sand and Muddy Bottoms	Feeding Habits
<i>Seriola rivoliana</i>	Almaco jack		X		/	Pelagic; rarely near shoreline, 15 to 160 m (49 to 525 ft); Juv: around floating objects (<i>Sargassum</i>)							fish, invertebrates
<i>Chaetodipterus faber</i>	Atlantic spadefish		X		Juvenile/ Adult	Juv: estuarine, shallow water; Adult: sandy beaches, shallow coastal waters, artificial reefs; 3-35 m (10-115 ft)	X			X	X		invertebrates, plankton
<i>Seriola zonata</i>	Banded rudderfish		X		Juvenile/ Adult	Coastal waters, inshore around structures, anywhere from surface to seafloor				X	X		fish, shrimps
<i>Centropristis ocyurus</i>	Bank sea bass		X		/	Hardbottom, shipwrecks to 55 m (180 ft), deep water							small fish, benthic invertebrates
<i>Thunnus obesus</i>	Bigeye tuna	X			/	Oceanic							fish, cephalopods, crustaceans
<i>Myceteroperca bonaci</i>	Black grouper		X		Juvenile	Adult: offshore, over 18 m (60 ft); Juv: may occur inshore in shallow water				X			fish, cephalopods, crustaceans
<i>Anisotremus surinamensis</i>	Black margate		X		Juvenile/ Adult	Over rocky bottoms, ledges, wrecks, nearshore reefs, surf areas, around groins					X		crustaceans, urchins, molluscs, fish
<i>Centropristis striatus</i>	Black sea bass		X	X	Juvenile	Adult: Offshore over wrecks, rubble, reefs, rocky bottoms; Juv: estuaries and offshore	X						fish, crustaceans, shellfish
<i>Apsilus dentatus</i>	Black snapper		X		Juvenile/ Adult	Rocky bottoms; Shallow waters around reefs and SAV		X					fish, cephalopods, tunicates
<i>Lutjanus buccanella</i>	Blackfin snapper		X		/	Deeper waters over rocky bottoms, near drop-offs and ledges							fish
<i>Callinectes sapidus</i>	Blue crab				Juvenile/ Adult	Highly migratory; ocean waters, freshwater, sounds, rivers					X		plankton, invertebrates, fish, plants, mollusks, crustaceans, organic debris
<i>Makaira nigricans</i>	Blue marlin	X			/	Oceanic							fish, cephalopods
<i>Haemulon sciurus</i>	Blue stripe grunt		X		Juvenile	Juv: <i>Thalassia</i> beds; Adults: migrate to offshore reefs		X					crustaceans, bivalves, small fish
<i>Thunnus thynnus</i>	Bluefin tuna	X			Juvenile/ Adult	Oceanic, seasonally comes close to shore					X		small schooling fish, squids, red crabs
<i>Pomatomus saltatrix</i>	Bluefish			X	Juvenile/ Adult	Juv: estuaries, bays, coastal waters Adult: open ocean, large embayments, estuaries	X				X		fish, crustaceans, polychaetes
<i>Caulolatilus microps</i>	Blueline tilefish		X		Juvenile/ Adult	Surf beaches, estuaries, brackish water, shallow coastal waters	X				X		benthic invertebrates, fish
<i>Scomberomorus regalis</i>	Cero		X		Juvenile/ Adult	Over wrecks, along ledges at depths 1-20 m (3.3 - 66 ft); over coral reefs							crabs, fish, squid
<i>Rachycentron canadum</i>	Cobia		X		Juvenile/ Adult	Over mud, sand, and gravel bottoms, inshore and offshore, estuaries	X			X	X	X	crabs, fish, squid
<i>Epinephelus fulvus</i>	Coney		X		/	Shallow and deep water, hides in caves or under ledges							small fish, crustaceans, shrimp
<i>Lutjanus cyanopterus</i>	Cubera snapper		X		Juvenile	Juv: inshore in SAV; adult: offshore or nearshore over wrecks, reefs, and ledges		X					fish, shrimps, crabs
<i>Lutjanus jocu</i>	Dog snapper		X		Juvenile	Juv: estuaries, rivers adult: offshore rocky reefs	X				X		fish, benthic invertebrates, gastropods, cephalopods
<i>Coryphaena hippurus</i>	Dolphin fish		X		Juvenile	Juvs: found near the coast, with floating <i>Sargassum</i> ; Pelagic, deep water, close to surface					X		fish, zooplankton, crustaceans, squid
<i>Haemulon flavolineatum</i>	French grunt		X		Juvenile	Juv: nearshore SAV; Adults: rocky reefs, under ledges		X					small crustaceans

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 NM - Nautical Mile; / = not likely to occur in area

Taxa	Common Name	NMFS (Highly Migratory Species)	SAFMC (3- 200NM)	MAFMC (3-200 NM)	Probable Life Stage in Project Area	Fish Habitat Ecology	Estuarine Emergent Wetlands	SAVs	Oyster Reefs and Shell Beds	Intertidal Flats	Estuarine, Marine Water Columns, and Creeks (Subtidal)	Shallow Sand and Muddy Bottoms	Feeding Habits
<i>Myceteroperca microlepis</i>	Gag grouper		X		Juvenile/ Adult	Juv, larvae: estuaries and SAV; Adults: offshore on rocky bottom, inshore on rocky or SAV bottom	X	X					fish, crabs, shrimp, cephalopods
<i>Chaceon feneri</i>	Golden crab		X		/	Deep ocean, waters over continental shelf, EFH areas							zooplankton
<i>Lopholatilus chamaeleonticeps</i>	Golden tilefish		X	X	/	Over mud, rock, sand bottom; continental shelf, 80-540 m (262-1772 ft), ledges							shrimp, crabs, fish, squid, bivalves, holothurians
<i>Epinephelus itajara</i>	Goliath grouper		X		/	Shallow, inshore areas, rock or mud bottoms, brackish estuaries; not common north of Florida							crustaceans, turtles, fish, stingrays
<i>Lutjanus griseus</i>	Gray snapper		X		Juvenile/ Adult	Coastal and offshore waters; rocky areas, estuaries, rivers (juv)	X				X		fish, shrimp, crabs, gastropods, cephalopods, plankton
<i>Balistes carolinensis</i>	Gray triggerfish		X		Juvenile/ Adult	Bays, harbors, lagoons, reefs; Juv: among <i>Sargassum</i>					X		benthic invertebrates; mollusks, crustaceans
<i>Epinephelus cruentatus</i>	Graysby		X		Juvenile/ Adult	Inhabits SAV, coral reefs, rocky reef ledges		X					shrimp, fish
<i>Seriola dummerili</i>	Greater amberjack		X		Juvenile/ Adult	Deep water, will enter coastal bays					X		fish, invertebrates
<i>Lachnolaimus maximus</i>	Hogfish		X		Juvenile/ Adult	Over open bottoms or coral reef areas; lagoons					X		molluscs, crabs, sea urchins
<i>Calamus bajonado</i>	Jolthead porgy		X		Juvenile/ Adult	Coastal waters, vegetated sand bottoms		X			X		sea urchins, crabs, molluscs
<i>Scomberomorus cavalla</i>	King mackerel		X		Juvenile/ Adult	Along beaches and near mouths of inlets and coastal rivers				X	X		fish, penaid shrimp, squid
<i>Calamus nodosus</i>	Knobbed porgy		X		/	Over reefs, ledges, wrecks and other hard bottom areas							gastropods, crabs, sea urchins, bivalves, other invertebrates
<i>Lutjanus synagris</i>	Lane snapper		X		Juvenile/ Adult	Over all types of bottoms, but mainly coral reefs and SAV sandy areas		X				X	fish, crabs, shrimp, worms, gastropods, cephalopods
<i>Seriola fasciata</i>	Lesser amberjack		X		/	Coastal pelagic or demersal							squid, fish
<i>Euthynnus alletteratus</i>	Little tunny		X		Juvenile/ Adult	Neritic waters close inshore					X		crustaceans, fish, squid, heteropods, tunicates
<i>Lutjanus mahogoni</i>	Mahogany snapper		X		Juvenile/ Adult	Shallow waters over rocky bottoms, sandy or SAV areas		X		X		X	fish, shrimps, crabs, cephalopods
<i>Haemulon album</i>	Margate		X		Juvenile/ Adult	SAV, sand flats, wrecks		X		X		X	benthic and subsurface invertebrates
<i>Epinephelus mystacinus</i>	Misty grouper		X		/	Deep water, 100-400 m (328-1312 ft); juv: sometimes 30m (98 ft)							fish, crustaceans, squid
<i>Lophius americanus</i>	Monkfish			X	Juvenile/ Adult	Inshore out to depths greater than 800 m (2625 ft); most common in depths 70 to 100 m (230-328 ft)					X		fish, sharks, sea birds
<i>Lutjanus analis</i>	Mutton snapper		X		Juvenile	Continental Shelf; Adults: among rocks; Juv: over sandy, SAV bottoms		X				X	fish, shrimp, crabs, cephalopods, gastropods
<i>Epinephelus striatus</i>	Nassau grouper		X		Juvenile/ Adult	From shoreline to at least 90 m (295 ft) depth, close to caves; Juv: SAV		X			X		fish, crabs, crustaceans, molluscs
<i>Canthidermis sufflamen</i>	Ocean triggerfish		X		Juvenile/ Adult	Over rocky reefs, sand and SAV areas		X				X	benthic invertebrates
<i>Penaeus setiferus</i>	White shrimp		X		Juvenile/ Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	X	X		X	X		algae, worms, fish, crabs, other shrimp
<i>Penaeus aztecus</i>	Brown shrimp		X		Juvenile/ Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	X	X		X	X		algae, worms, fish, crabs, other shrimp

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<i>Penaeus duorarum</i>	Pink shrimp		X		Juvenile/ Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	X	X		X	X		algae, worms, fish, crabs, other shrimp
<i>Etelis oculatus</i>	Queen snapper		X		/	Offshore over rocky bottoms of continental shelf to 137 m (450 ft)							small fish, squid
<i>Balistes vetula</i>	Queen triggerfish		X		Juvenile/ Adult	Rocky or coral areas, sand and SAV areas		X				X	benthic invertebrates
<i>Sciaenops ocellatus</i>	Red drum		X	X	Juvenile/ Adult	Sand and sandy mud bottoms in coastal waters and estuaries; surf zone; oyster reefs and shell banks	X		X		X	X	crustaceans, molluscs, fish
<i>Epinephelus morio</i>	Red grouper		X		Juvenile/ Adult	Rocky and muddy bottoms; juv: shallow water						X	fish, invertebrates
<i>Epinephelus guttatus</i>	Red hind		X		/	Shallow reefs and rocky bottoms; wrecks and ledges; 18 to 110 m (59-361 ft); rare north of Florida							crustaceans, fish, and octopods
<i>Pagrus pagrus</i>	Red porgy		X		Juvenile/ Adult	Rock, rubble, or sand bottoms; Juv: SAV		X				X	crustaceans, fish, molluscs
<i>Lutjanus campechanus</i>	Red snapper		X		Juvenile	Rocky bottoms; Juv: shallow waters, over sand or muddy bottoms						X	fish, shrimp, crabs, worms, cephalopods, plankton
<i>Epinephelus adscensionis</i>	Rock hind		X		/	Rocky inshore areas or deep reef bottoms, to depths of 76.2 m (250 ft); wrecks, ledges; rare north of Florida							crabs, fish
<i>Centropristis philadelphicus</i>	Rock sea bass		X		/	Offshore sandy and muddy bottoms; hardbottom, rocks, jetties, and ledges							invertebrates, fish, squid, plankton, crustaceans
<i>Sicyonia brevirostris</i>	Rock shrimp		X		/	Sand bottom habitats; 18 -182 m (59-597 ft) in depth							algae, worms, fish, crabs, other shrimp
<i>Istiophorus platypterus</i>	Sailfish	X			Juvenile/ Adult	Oceanic epipelagic; waters close to coasts					X		fish, crustaceans, cephalopods
<i>Calamus calamus</i>	Saucereye porgy		X		Juvenile	Juv: SAV sandy bottoms; Adults: coral areas		X				X	molluscs, benthic invertebrates, crustaceans
<i>Mycteroperca phenax</i>	Scamp		X		Juvenile	Adults: deeper waters; inshore and offshore reefs, ledges, <i>Oculina</i> coral reefs, depths of 30 to 100m (98-328 ft) in N. Carolina;	X				X		fish, squid, crustaceans
<i>Lutjanus apodus</i>	Schoolmaster		X		Juvenile	Shallow, clear water over coral reef, near corals / gorgonians; Juv: sand bottoms with or without SAV, muddy bottoms of lagoons,	X	X			X	X	crustaceans, fish, invertebrates
<i>Stenotomus chrysops</i>	Scup		X	X	Juvenile/ Adult	Intertidal and subtidal habitats, over sand, silty-sand, shell, mud, mussel beds and eelgrass, wrecks, artificial reefs, on or near			X	X	X	X	crustaceans, benthic invertebrates, squid, zooplankton, fish
<i>Carcharhinus obscurus</i>	Dusky shark	X			Juvenile/ Adult	Surf zone to well offshore; surface to 400 m (1312 ft) depths					X		bony fish, sharks
<i>Carcharhinus brevipinna</i>	Spinner shark	X			Juvenile/ Adult	Nearshore to offshore, over continental shelf					X		fish, octopods, squids, cuttlefish, small sharks
<i>Galeocerdo cuvier</i>	Tiger shark	X			Juvenile/ Adult	Near surface to depths of 140 m (459 ft), on or adjacent to continental shelves, river estuaries, lagoons	X				X		fish, sharks, rays, marine mammals, sea turtles, seabirds, more
<i>Carcharias taurus</i>	Sand tiger shark	X			Juvenile/ Adult	Nearshore from the surf zone, shallow bays to at least 191 m (627 ft) on the outer continental shelves					X		fish, small sharks, rays, squids, crabs, and lobsters
<i>Carcharhinus plumbeus</i>	Sandbar Shark	X	X		Juvenile/ Adult	Inshore and offshore, bays, river mouths, harbors					X		bony fish, sharks, cephalopods, shrimp
<i>Rhizoptironodon terraenovae</i>	Atlantic sharpnose	X			Juvenile/ Adult	Continental shelves, from the intertidal to deeper waters, surf zone off sandy beaches, estuaries, bays, river mouths	X			X	X		fishes, shrimps, crabs, segmented worms and molluscs
<i>Squalus acanthias</i>	Spiny dogfish			X	Juvenile/ Adult	Inshore and offshore, enclosed bays and estuaries, can enter freshwater					X		fish, mollusks, crustaceans, other invertebrates
<i>Archosargus probatocephalus</i>	Sheepshead		X		Juvenile/ Adult	Bays and Estuaries, brackish water, freshwater, around pilings, jetties	X				X		molluscs, crustaceans
<i>Lutjanus vivanus</i>	Silk snapper		X		/	Near edge of continental shelf, deeper waters, below 200 m (656 ft), shallow water at night							fish, crustaceans, gastropods, cephalopods, urochordates

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<i>Epinephelus niveatus</i>	Snowy grouper		X		Juvenile	Adults: well offshore on rocky bottoms, deep as 244 m (800 feet); Juv: can be found inshore							fish, gastropods, cephalopods, brachyuran crustaceans
<i>Paralichthys lethostigma</i>	Southern flounder				Juvenile/ Adult	Estuarine dependent, nearshore waters; Juv: inlets, muddy bottoms, estuaries	X			X	X	X	fish, crabs, shrimp
<i>Scomberomorus maculatus</i>	Spanish mackerel		X		Juvenile/ Adult	Inshore, nearshore, and offshore, especially over SAV beds and reefs		X			X		fish, shrimp, cephalopods
<i>Epinephelus drummondhayi</i>	Speckled hind		X		/	Offshore rocky bottoms, common between 60 and 120 m (197 and 394 ft)							fish, crabs, shrimp, molluscs
<i>Panulirus argus</i>	Spiny lobster		X		Juvenile/ Adult	Oceanic, shallow subtidal, seagrass, unconsolidated bottom, <i>Laurencia</i> algal communities, coral live hardbottom		X			X	X	benthic scavengers
<i>Paralichthys dentatus</i>	Summer flounder			X	Juvenile/ Adult	Estuarine dependent, coastal waters; Juv: inlets, sandy bottoms in higher-salinity areas of estuaries	X			X	X	X	fish and shrimp
<i>Xiphias gladius</i>	Swordfish	X			Juvenile/ Adult	Oceanic but sometimes found in coastal waters					X		fish, crustaceans, squid
<i>Mycteroperca tigris</i>	Tiger grouper		X		/	Coral reefs and rocky areas							fish, crustaceans
<i>Haemulon aurolineatum</i>	Tomtate		X		Juvenile/ Adult	SAV, sand flats, and patch reefs		X		X		X	crustaceans, molluscs and other invertebrates, plankton, algae
<i>Rhomboplites aurorubens</i>	Vermilion snapper		X		/	Moderately deep waters, over rock, gravel or sand bottoms near edge of cont. shelf; Juv: shallower depths below 25 m (82 ft)							fish, shrimp, crabs, benthic invert, cephalopods, plankton
<i>Acanthocybium Solanderi</i>	Wahoo		X		Juvenile/ Adult	Oceanic, epipelagic, coastal					X		fish, squid
<i>Epinephelus nigritus</i>	Warsaw grouper		X		/	Rocky bottoms; Juv: jetties, shallow reefs							crabs, shrimp, lobster, fish
<i>Haemulon plumieri</i>	White grunt		X		Juvenile/ Adult	Adults: patch reefs, coral heads, sandy bottoms; Juv: SAV		X				X	crustaceans, fish, molluscs
<i>Tetrapturus albidus</i>	White marlin	X			/	Deep water, over 100 m (328 ft)							fish, squid
<i>Calamus leucosteus</i>	Whitebone porgy		X		/	Fairly deep water, 10-100 m (33-328 ft), over rocks, reefs or patchy bottom							crustaceans, molluscs
<i>Polyprion americanus</i>	Wreckfish		X		/	Inhabit caves and shipwrecks; Juv: congregate below floating objects							crustaceans, cephalopods and benthic fishes
<i>Mycteroperca venenosa</i>	Yellowfin grouper		X		Juvenile/ Adult	Juv: shallow SAV ; Adults: rocky and coral reefs, mud bottoms, 2 to 137 m (6.6-450 ft)		X					fish, squid
<i>Thunnus albacares</i>	Yellowfin tuna	X			/	Oceanic							fish, crustaceans, squid
<i>Mycteroperca interstitialis</i>	Yellowmouth grouper		X		Juv/Sm Adult	Rocky or coral bottoms from shoreline to at least 55 m (509 ft) depth; smaller fish: lagoons					X		fish
<i>Ocyrus chrysurus</i>	Yellowtail snapper		X		Juvenile/ Adult	Coastal water, coral reefs; Juv: SAV		X			X		plankton, fish, crustaceans, worms, gastropods, cephalopods

Table 4.3 A
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
ESTUARINE EMERGENT WETLANDS

SAFMC - South Atlantic Fisheries Management Council; **ASMFC** - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Chaetodipterus faber</i>	Atlantic spadefish	SAFMC	Juvenile/Adult	Juv: estuarine, shallow water; Adult: sandy beaches, shallow coastal waters, artificial reefs; 3-35 m (10-114 ft)	invertebrates, plankton
<i>Centropomus striatus</i>	Black sea bass	SAFMC	Juvenile	Adult: Offshore over wrecks, rubble, reefs, rocky bottoms; Juv: estuaries and offshore	small fish, crustaceans, shellfish
<i>Pomatomus saltatrix</i>	Bluefish	N/A	Juvenile/Adult	Juv: estuaries, bays, coastal waters Adult: open ocean, large embayments, estuaries	fish, crustaceans, polychaetes
<i>Caulolatilus microps</i>	Blueline tilefish	SAFMC	Juvenile/Adult	Surf beaches, estuaries, brackish water, shallow coastal waters	benthic invertebrates, fish
<i>Rachycentron canadum</i>	Cobia	SAFMC	Juvenile/Adult	Over mud, sand, and gravel bottoms, inshore and offshore, estuaries	crabs, fish, squid
<i>Lutjanus jocu</i>	Dog snapper	SAFMC	Juvenile	Juv: estuaries, rivers adult: offshore rocky reefs	fish, benthic invertebrates, gastropods, cephalopods
<i>Myceteroperca microlepis</i>	Gag grouper	SAFMC	Juvenile/Adult	Juv: estuaries and seagrass bays; Adults: offshore on rocky bottom, inshore on rocky or grassy bottom	fish, crabs, shrimp, cephalopods
<i>Lutjanus griseus</i>	Gray snapper	SAFMC	Juvenile/Adult	Coastal and offshore waters; rocky areas, estuaries, rivers (juv)	fish, shrimp, crabs, gastropods, cephalopods, plankton
<i>Penaeus setiferus</i>	White shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, wetlands (intertidal marshes), SAV	algae, worms, fish, crabs, other shrimp
<i>Penaeus aztecus</i>	Brown shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, wetlands (intertidal marshes), SAV	algae, worms, fish, crabs, other shrimp
<i>Penaeus duorarum</i>	Pink shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, wetlands (intertidal marshes), SAV	algae, worms, fish, crabs, other shrimp
<i>Sciaenops ocellatus</i>	Red drum	SAFMC	Juvenile/Adult	Sand and sandy mud bottoms in coastal waters and estuaries; surf zone; oyster reefs and shell banks	crustaceans, molluscs, fish
<i>Mycteroperca phenax</i>	Scamp	SAFMC	Juvenile	Adults: deeper waters; inshore and offshore reefs, ledges, <i>Oculina</i> coral reefs, depths of 30-100 m (98-328 ft) in N.	fish, squid, crustaceans
<i>Lutjanus apodus</i>	Schoolmaster	SAFMC	Juvenile	Shallow, coral reefs, near elkhorn corals and gorgonians; Juv: sand bottoms with or without seagrass, muddy bottoms of	fish, shrimp, crabs, worms, gastropods, cephalopods
<i>Galeocerdo cuvier</i>	Tiger shark	N/A	Juvenile/Adult	Near surface to depths of 140 m (459 ft), on or adjacent to continental shelves, river estuaries, lagoons	fish, sharks, rays, marine mammals, sea turtles, seabirds, more
<i>Rhizoprionodon terraenovae</i>	Atlantic sharpnose shark	N/A	Juvenile/Adult	Continental shelves, from the intertidal to deeper waters, surf zone off sandy beaches, estuaries, bays, river mouths	fishes, shrimps, crabs, segmented worms and molluscs
<i>Archosargus probatocephalus</i>	Sheepshead	SAFMC	Juvenile/Adult	Bays and Estuaries, brackish water, freshwater, around pilings, jetties	molluscs, crustaceans
<i>Paralichthys lethostigma</i>	Southern flounder	N/A	Juvenile/Adult	Estuarine dependent, nearshore waters; Juv: inlets, muddy bottoms, estuaries	fish, crabs, shrimp
<i>Paralichthys dentatus</i>	Summer flounder	MAFMC	Juvenile/Adult	Estuarine dependent, coastal waters; Juv: inlets, sandy bottoms in higher-salinity areas of estuaries	fish and shrimp

TABLE 4.3 B
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
SUBMERGED AQUATIC VEGETATION (SAV) AND SEAGRASS BEDS

SAFMC - South Atlantic Fisheries Management Council; ASMFC - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Apsilus dentatus</i>	Black snapper	SAFMC	Juvenile/Adult	Rocky bottoms; Shallow waters around reefs and SAV	fish, cephalopods, tunicates
<i>Haemulon sciurus</i>	Blue stripe grunt	SAFMC	Juvenile	Juv: <i>Thalassia</i> beds; Adults: migrate to offshore reefs	crustaceans, bivalves, small fish
<i>Lutjanus cyanopterus</i>	Cubera snapper	SAFMC	Juvenile	Juv: inshore in SAV; adult: offshore or nearshore over wrecks, reefs, and ledges.	fish, shrimps, crabs
<i>Haemulon flavolineatum</i>	French grunt	SAFMC	Juvenile	Juv: nearshore SAV; Adults: rocky reefs, under ledges	small crustaceans
<i>Myceteroperca microlepis</i>	Gag grouper	SAFMC	Juvenile/Adult	Juv, larvae: estuaries and SAV; Adults: offshore on rocky bottom, inshore on rocky or SAV bottom	fish, crabs, shrimp, cephalopods
<i>Epinephelus cruentatus</i>	Graysby	SAFMC	Juvenile/Adult	Inhabits SAV (<i>Thalassia</i>), coral reefs, rocky reef ledges	shrimp, fish
<i>Calamus bajonado</i>	Jolthead porgy	SAFMC	Juvenile/Adult	Coastal Waters, SAV sand bottoms	sea urchins, crabs, molluscs
<i>Lutjanus synagris</i>	Lane snapper	SAFMC	Juvenile/Adult	Over all types of bottoms, but mainly coral reefs and SAV sandy areas	fish, crabs, shrimp, worms, gastropods, cephalopods
<i>Lutjanus mahogoni</i>	Mahogany snapper	SAFMC	Juvenile/Adult	Shallow waters over rocky bottoms, sandy or SAV	fish, shrimps, crabs, cephalopods
<i>Haemulon album</i>	Margate	SAFMC	Juvenile/Adult	SAV, sand flats, wrecks	benthic and subsurface invertebrates
<i>Lutjanus analis</i>	Mutton snapper	SAFMC	Juvenile	Continental Shelf; Adults: among rocks; Juv: over sandy, SAV bottoms	fish, shrimp, crabs, cephalopods, gastropods
<i>Epinephelus striatus</i>	Nassau grouper	SAFMC	Juvenile/Adult	From shoreline to at least 90m (295 ft) depth, close to caves; Juv: SAV	fish, crabs, crustaceans, molluscs
<i>Canthidermis sufflamen</i>	Ocean triggerfish	SAFMC	Juvenile/Adult	Over rocky reefs, sand and SAV areas	benthic invertebrates
<i>Penaeus setiferus</i>	White shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp
<i>Penaeus aztecus</i>	Brown shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp
<i>Penaeus duorarum</i>	Pink shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp

TABLE 4.3 B (cont.)
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
SUBMERGED AQUATIC VEGETATION (SAV) AND SEAGRASS BEDS

SAFMC - South Atlantic Fisheries Management Council; ASMFC - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Balistes vetula</i>	Queen triggerfish	SAFMC	Juvenile/Adult	Rocky or coral areas, sand and SAV areas	benthic invertebrates
<i>Pagrus pagrus</i>	Red porgy	SAFMC	Juvenile/Adult	Rock, rubble, or sand bottoms; Juv: SAV	crustaceans, fish, molluscs
<i>Calamus calamus</i>	Saucereye porgy	SAFMC	Juvenile	Juv: SAV (<i>Thalassia</i>) sandy bottoms; Adults: coral areas	molluscs, benthic invertebrates, crustaceans
<i>Lutjanus apodus</i>	Schoolmaster	SAFMC	Juvenile	Shallow, clear water over coral reef, near elkhorn corals and gorgonians; Juv: sand bottoms with or without SAV, muddy	crustaceans, fish, invertebrates
<i>Stenotomus chrysops</i>	Scup	SAFMC	Adult/Juvenile	Intertidal and subtidal habitats, over sand, silty-sand, shell, mud, mussel beds and eelSAV, wrecks, artificial reefs, on or	crustaceans, benthic invertebrates, squid, zooplankton, fish
<i>Scomberomorus maculatus</i>	Spanish mackerel	SAFMC	Juvenile/Adult	Inshore, nearshore, and offshore, especially over SAV beds and reefs	fish, shrimp, cephalopods
<i>Panulirus argus</i>	Spiny lobster	N/A	Juvenile/Adult	Oceanic, shallow subtidal, SAV, unconsolidated bottom, <i>Laurencia</i> algal communities, coral live bottom	benthic scavengers
<i>Haemulon plumieri</i>	White grunt	ASMFC	Juvenile/Adult	Adults: patch reefs, coral heads, sandy bottoms; Juv: SAV (<i>Thalassia</i>)	crustaceans, fish, molluscs
<i>Mycteroperca venenosa</i>	Yellowfin grouper	ASMFC	Juvenile/Adult	Juv: shallow SAV (<i>Thalassia</i>) beds; Adults: rocky and coral reefs, mud bottoms, 2 - 137 m (6.6 - 449 ft)	fish, squid
<i>Ocyrus chrysurus</i>	Yellowtail snapper	ASMFC	Juvenile/Adult	Coastal water, coral reefs; Juv: SAV	plankton, fish, crustaceans, worms, gastropods, cephalopods

TABLE 4.3 C
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
OYSTER REEFS AND SHELL BANKS

SAFMC - South Atlantic Fisheries Management Council; **ASMFC** - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Sciaenops ocellatus</i>	Red drum	SAFMC	Juvenile/Adult	Sand and sandy mud bottoms in coastal waters and estuaries; surf zone; oyster reefs and shell banks	crustaceans, molluscs, fish
<i>Stenotomus chrysops</i>	Scup	SAFMC	Juvenile/Adult	Intertidal and subtidal habitats, over sand, silty-sand, shell, mud, mussel beds and eelgrass, wrecks, artificial reefs, on or	crustaceans, benthic invertebrates, squid, zooplankton, fish
<i>Tautoga onitis</i>	Tautog	ASMFC	Juvenile/Adult	Adult: offshore and inshore hard-structure, shellfish beds; Juv: shallow, estuarine, SAV	gastropods, other mollusks, crustaceans

TABLE 4.3 D
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
INTERTIDAL FLATS

SAFMC - South Atlantic Fisheries Management Council; **ASMFC** - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Chaetodipterus faber</i>	Atlantic spadefish	SAFMC	Juvenile/Adult	Juv: estuarine, shallow water; Adult: sandy beaches, shallow coastal waters, artificial reefs; 3-35 m (10-114 ft)	invertebrates, plankton
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic sturgeon	ASMFC	Juvenile/Adult	Rivers, estuaries, shallow waters of continental shelf; Juv: brackish water, freshwater	molluscs, fish, worms, invertebrates, gastropods, shrimp
<i>Seriola zonata</i>	Banded rudderfish	SAFMC	Juvenile/Adult	Coastal waters, inshore around structures, anywhere from surface to seafloor	fish, shrimps
<i>Myceteroperca bonaci</i>	Black grouper	SAFMC	Juvenile	Adult: offshore, over 18 m (60 ft); Juv: may occur inshore in shallow water	fish, cephalopods, crustaceans
<i>Rachycentron canadum</i>	Cobia	SAFMC	Juvenile/Adult	Over mud, sand, and gravel bottoms, inshore and offshore, estuaries	crabs, fish, squid
<i>Lutjanus mahogoni</i>	Mahogany snapper	SAFMC	Juvenile/Adult	Shallow waters over rocky bottoms, sandy or SAV areas	fish, shrimps, crabs, cephalopods
<i>Haemulon album</i>	Margate	SAFMC	Juvenile/Adult	SAV, sand flats, wrecks	benthic and subsurface invertebrates
<i>Penaeus setiferus</i>	White shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp
<i>Penaeus aztecus</i>	Brown shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp
<i>Penaeus duorarum</i>	Pink shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp
<i>Stenotomus chrysops</i>	Scup	SAFMC	Juvenile/Adult	intertidal and subtidal habitats, over sand, silty sand, shell, mud, mussel beds and SAV, wrecks, artificial reefs, on or near structures	crustaceans, benthic invertebrates, squid, zooplankton, fish
<i>Rhizoprionodon terraenovae</i>	Atlantic sharpnose shark	N/A	Juvenile/Adult	Continental shelves, from the intertidal to deeper waters, surf zone off sandy beaches, estuaries, bays, river mouths	fishes, shrimps, crabs, segmented worms and molluscs
<i>Paralichthys lethostigma</i>	Southern flounder	N/A	Juvenile/Adult	Estuarine dependent, nearshore waters; Juv: inlets, muddy bottoms, estuaries	fish, crabs, shrimp
<i>Paralichthys dentatus</i>	Summer flounder	MAFMC	Juvenile/Adult	Estuarine dependent, coastal waters; Juv: inlets, sandy bottoms in higher-salinity areas of estuaries	fish and shrimp
<i>Haemulon aurolineatum</i>	Tomtate	SAFMC	Juvenile/Adult	SAV, sand flats, and patch reefs	crustaceans, molluscs and other invertebrates, plankton, algae

TABLE 4.3 E
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
ESTUARINE / MARINE WATER COLUMN AND CREEKS

SAFMC - South Atlantic Fisheries Mangement Council; **ASMFC** - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Chaetodipterus faber</i>	Atlantic spadefish	SAFMC	Juvenile/Adult	Juv: estuarine, shallow water; Adult: sandy beaches, shallow coastal waters, artificial reefs; 3-35 m (10-115 ft)	invertebrates, plankton
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic sturgeon	ASMFC	Juvenile/Adult	Rivers, estuaries, shallow waters of continental shelf; Juv: brackish water, freshwater	molluscs, fish, worms, invertebrates, gastropods, shrimp
<i>Seriola zonata</i>	Banded rudderfish	SAFMC	Juvenile/Adult	Coastal waters, inshore around structures, anywhere from surface to seafloor	fish, shrimps
<i>Anisotremus surinamensis</i>	Black margate	SAFMC	Juvenile/Adult	Over rocky bottoms, ledges, wrecks, nearshore reefs, surf areas, around groins	crustaceans, urchins, molluscs, fish
<i>Callinectes sapidus</i>	Blue crab	N/A	Juvenile/Adult	Highly migratory; ocean waters, freshwater, sounds, rivers	plankton, invertebrates, fish, mollusks, crustaceans and organic debris
<i>Thunnus thynnus</i>	Bluefin tuna	N/A	Juvenile/Adult	Oceanic, seasonally comes close to shore	small schooling fish, squids, red crabs
<i>Pomatomus saltatrix</i>	Bluefish	N/A	Juvenile/Adult	Juv: estuaries, bays, coastal waters Adult: open ocean, large embayments, estuaries	fish, crustaceans, polychaetes
<i>Caulolatilus microps</i>	Blueline tilefish	SAFMC	Juvenile/Adult	Surf beaches, estuaries, brackish water, shallow coastal waters	benthic invertebrates, fish
<i>Rachycentron canadum</i>	Cobia	SAFMC	Juvenile/Adult	Over mud, sand, and gravel bottoms, inshore and offshore, estuaries	crabs, fish, squid
<i>Lutjanus jocu</i>	Dog snapper	SAFMC	Juvenile	Juv: estuaries, rivers adult: offshore rocky reefs	fish, benthic invertebrates, gatropods, cephalopods
<i>Coryphaena hippurus</i>	Dolphin fish	SAFMC	Juvenile	Juvs: found near the coast, with floating <i>Sargassum</i> ; Pelagic, deep water, close to surface	fish, zooplankton, crustaceans, squid
<i>Lutjanus griseus</i>	Gray snapper	SAFMC	Juvenile/Adult	Coastal and offshore waters; rocky areas, estuaries, rivers (juv)	fish, shrimp, crabs, gastropods, cephalopods, plankton
<i>Balistes carolinensis</i>	Gray triggerfish	SAFMC	Juvenile/ Adult	Bays, harbors, lagoons, reefs; Juv: among <i>Sargassum</i>	benthic invertebrates; mollusks, crustaceans
<i>Seriola dummerili</i>	Greater amberjack	SAFMC	Juvenile/ Adult	Deep water, will enter coastal bays	fish, invertebrates
<i>Lachnolaimus maximus</i>	Hogfish	SAFMC	Juvenile/ Adult	Over open bottoms or coral reef areas; lagoons	molluscs, crabs, sea urchins
<i>Calamus bajonado</i>	Jolthead porgy	SAFMC	Juvenile/ Adult	Coastal waters, vegetated sand bottoms	sea urchins, crabs, molluscs
<i>Scomberomorus cavalla</i>	King mackerel	N/A	Juvenile/ Adult	Along beaches and near mouths of inlets and coastal rivers	fish, penaid shrimp, squid
<i>Euthynnus alletteratus</i>	Little tunny	N/A	Juvenile/ Adult	Neritic waters close inshore	crustaceans, fish, squid, heteropods, tunicates
<i>Lophius americanus</i>	Monkfish	N/A	Juvenile/ Adult	Inshore out to depths greater than 800 m (2625 ft); most common in depths 70 to 100 m (230-328 ft)	fish, sharks, sea birds
<i>Epinephelus striatus</i>	Nassau grouper	SAFMC	Juvenile/ Adult	From shoreline to at least 90 m (295 ft) depth, close to caves; Juv: SAV	fish, crabs, crustaceans, molluscs

TABLE 4.3 E (cont.)
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
ESTUARINE / MARINE WATER COLUMN AND CREEKS

SAFMC - South Atlantic Fisheries Mangement Council; **ASMFC** - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Sciaenops ocellatus</i>	Red drum	SAFMC	Juvenile/ Adult	Sand and sandy mud bottoms in coastal waters and estuaries; surf zone; oyster reefs and shell banks	crustaceans, molluscs, fish
<i>Istiophorus platypterus</i>	Sailfish	N/A	Juvenile/ Adult	Oceanic epipelagic; waters close to coasts	fish, crustaceans, cephalopods
<i>Mycteroperca phenax</i>	Scamp	SAFMC	Juvenile	Adults: deeper waters; inshore and offshore reefs, ledges, <i>Oculina</i> coral reefs, depths of 30 to 100m (98-328 ft) in N. Carolina; Juv: estuaries, bays	fish, squid, crustaceans
<i>Stenotomus chrysops</i>	Scup	SAFMC	Juvenile/Adult	Intertidal and subtidal habitats, over sand, silty-sand, shell, mud, mussel beds and SAV, wrecks, artificial reefs, on or near structures	crustaceans, benthic invertebrates, squid, zooplankton, fish
<i>Lutjanus apodus</i>	Schoolmaster	SAFMC	Juvenile	Shallow, clear water over coral reef, near corals / gorgonians; Juv: sand bottoms with or without SAV, muddy bottoms of lagoons, brackish water	crustaceans, fish, invertebrates
<i>Rhizoprionodon terraenovae</i>	Atlantic sharpnose shark	N/A	Juvenile/Adult	Continental shelves, from the intertidal to deeper waters, surf zone off sandy beaches, estuaries, bays, river mouths	fishes, shrimps, crabs, segmented worms and molluscs
<i>Carcharhinus obscurus</i>	Dusky shark	N/A	Juvenile/ Adult	Surf zone to well offshore; surface to 400 m (1312 ft) depths	bony fish, sharks
<i>Carcharius taurus</i>	Sand tiger shark	N/A	Juvenile/ Adult	Nearshore from the surf zone, shallow bays to at least 191 m (627 ft) on the outer continental shelves	fish, small sharks, rays, squids, crabs, and lobsters
<i>Carcharhinus plumbeus</i>	Sandbar Shark	N/A	Juvenile/Adult	Inshore and offshore, bays, river mouths, harbors	bony fish, sharks, cephalopods, shrimp
<i>Carcharhinus brevipinna</i>	Spinner shark	N/A	Juvenile/ Adult	Nearshore to offshore, over continental shelf	fish, octopods, squids, cuttlefish, small sharks
<i>Galeocerdo cuvier</i>	Tiger shark	N/A	Juvenile/Adult	Near surface to depths of 140m, on or adjacent to continental shelves, river estuaries, lagoons	fish, sharks, rays, marine mammals, sea turtles, seabirds, more
<i>Archosargus probatocephalus</i>	Sheepshead	SAFMC	Juvenile/ Adult	Bays and Estuaries, brackish water, freshwater, around pilings, jetties	molluscs, crustaceans
<i>Penaeus aztecus</i>	Brown shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp
<i>Penaeus duorarum</i>	Pink shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp
<i>Penaeus setiferus</i>	White shrimp	SAFMC	Juvenile/Adult	Estuarine, palustrine, intertidal marshes and flats, subtidal flats, SAV	algae, worms, fish, crabs, other shrimp
<i>Paralichthys lethostigma</i>	Southern flounder	N/A	Juvenile/ Adult	Estuarine dependent, nearshore waters; Juv: inlets, muddy bottoms, estuaries	fish, crabs, shrimp
<i>Scomberomorus maculatus</i>	Spanish mackerel	SAFMC	Juvenile/ Adult	Inshore, nearshore, and offshore, especially over SAV beds and reefs	fish, shrimp, cephalopods
<i>Panulirus argus</i>	Spiny lobster	N/A	Juvenile/Adult	Oceanic, shallow subtidal, seagrass, unconsolidated bottom, <i>Laurencia</i> SAV communities, coral live bottom	benthic scavengers

TABLE 4.3 E (cont.)
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
ESTUARINE / MARINE WATER COLUMN AND CREEKS

SAFMC - South Atlantic Fisheries Mangement Council; **ASMFC** - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Paralichthys dentatus</i>	Summer flounder	MAFMC	Juvenile/ Adult	Estuarine dependent, coastal waters; Juv: inlets, sandy bottoms in higher-salinity areas of estuaries	fish and shrimp
<i>Xiphias gladius</i>	Swordfish	N/A	Juvenile/ Adult	Oceanic but sometimes found in coastal waters	fish, crustaceans, squid
<i>Acanthocybium Solanderi</i>	Wahoo	N/A	Juvenile/ Adult	Oceanic, epipelagic, coastal	fish, squid
<i>Mycteroperca interstitialis</i>	Yellowmouth grouper	SAFMC	Juv/Sm Adult	Rocky or coral bottoms from shoreline to at least 55 m (509 ft) depth; smaller fish: lagoons	fish
<i>Ocyrus chrysurus</i>	Yellowtail snapper	SAFMC	Juvenile/ Adult	Coastal water, coral reefs; Juv: SAV	plankton, fish, crustaceans, worms, gastropods, cephalopods

TABLE 4.3 F
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
SHALLOW SANDY AND MUDDY BOTTOMS

SAFMC - South Atlantic Fisheries Management Council; ASMFC - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Myceteroperca bonaci</i>	Black grouper	SAFMC	Juvenile	Adult: offshore, over 18 m (60 ft); Juv: may occur inshore in shallow water	fish, cephalopods, crustaceans
<i>Apsilus dentatus</i>	Black snapper	SAFMC	Juvenile/Adult	Rocky bottoms; Shallow waters around reefs and SAV	fish, cephalopods, tunicates
<i>Caulolatilus microps</i>	Blueline tilefish	SAFMC	Juvenile/Adult	Surf beaches, estuaries, brackish water, shallow coastal waters	benthic invertebrates, fish
<i>Rachycentron canadum</i>	Cobia	SAFMC	Juvenile/Adult	Over mud, sand, and gravel bottoms, inshore and offshore, estuaries	crabs, fish, squid
<i>Lutjanus synagris</i>	Lane snapper	SAFMC	Juvenile/Adult	Over all types of bottoms, but mainly coral reefs and SAV sandy areas	fish, crabs, shrimp, worms, gastropods, cephalopods
<i>Lutjanus mahogoni</i>	Mahogany snapper	SAFMC	Juvenile/Adult	Shallow waters over rocky bottoms, sandy or SAV areas	fish, shrimps, crabs, cephalopods
<i>Haemulon album</i>	Margate	SAFMC	Juvenile/Adult	SAV, sand flats, wrecks	benthic and subsurface invertebrates
<i>Lutjanus analis</i>	Mutton snapper	SAFMC	Juvenile	Continental Shelf; Adults: among rocks; Juv: over sandy, SAV bottoms	fish, shrimp, crabs, cephalopods, gastropods
<i>Canthidermis sufflamen</i>	Ocean triggerfish	SAFMC	Juvenile/Adult	Over rocky reefs, sand and SAV areas	benthic invertebrates
<i>Balistes vetula</i>	Queen triggerfish	SAFMC	Juvenile/Adult	Rocky or coral areas, sand and SAV areas	benthic invertebrates
<i>Sciaenops ocellatus</i>	Red drum	SAFMC	Juvenile/Adult	Sand and sandy mud bottoms in coastal waters and estuaries; surf zone; oyster reefs and shell banks	crustaceans, molluscs, fish
<i>Epinephelus morio</i>	Red grouper	SAFMC	Juvenile/Adult	Rocky and muddy bottoms; juv: shallow water	fish, invertebrates
<i>Pagrus pagrus</i>	Red porgy	SAFMC	Juvenile/Adult	Rock, rubble, or sand bottoms; Juv: SAV	crustaceans, fish, molluscs
<i>Lutjanus campechanus</i>	Red snapper	SAFMC	Juvenile	Rocky bottoms; Juv: shallow waters, over sand or muddy bottoms	fish, shrimp, crabs, worms, cephalopods, plankton
<i>Lutjanus apodus</i>	Schoolmaster	SAFMC	Juvenile	Shallow water, coral reef, near corals / gorgonians; Juv: sand bottoms, SAV, muddy bottoms, lagoons, brackish water	crustaceans, fish, invertebrates

TABLE 4.3 F (cont.)
ESSENTIAL FISH HABITAT SPECIES IN BOGUE INLET, NORTH CAROLINA
SHALLOW SANDY AND MUDDY BOTTOMS

SAFMC - South Atlantic Fisheries Management Council; **ASMFC** - Atlantic States Marine Fisheries Council;
MAFMC - Mid-Atlantic Fisheries Management Council

Taxa	Common Name	HAPC Designation	Probable Life Stage in Project Area	Fish Habitat Ecology	Feeding Habits
<i>Stenotomus chrysops</i>	Scup	SAFMC	Juvenile/Adult	Intertidal and subtidal habitats, over sand, silty-sand, shell, mud mussel beds and SAV, wrecks, artificial reefs, on or near	crustaceans, benthic invertebrates, squid,
<i>Paralichthys lethostigma</i>	Southern flounder	N/A	Juvenile/Adult	Estuarine dependent, nearshore waters; Juv: inlets, muddy bottoms, estuaries	fish, crabs, shrimp
<i>Panulirus argus</i>	Spiny lobster	N/A	Juvenile/Adult	Oceanic, shallow subtidal, seagrass, unconsolidated bottom, <i>Laurencia</i> SAV communities, coral live bottom	benthic scavenger
<i>Paralichthys dentatus</i>	Summer flounder	MAFMC	Juvenile/Adult	Estuarine dependent, coastal waters; Juv: inlets, sandy bottoms in higher-salinity areas of estuaries	fish and shrimp
<i>Haemulon aurolineatum</i>	Tomtate	SAFMC	Juvenile/Adult	SAV, sand flats, and patch reefs	crustaceans, molluscs and other invertebrates, plankton,
<i>Cynoscion Regalis</i>	Weakfish	ASMFC	Juvenile/Adult	Shallow water over sand, sandy mud bottoms; In summer move to river estuaries	crustaceans, fish
<i>Haemulon plumieri</i>	White grunt	SAFMC	Juvenile/Adult	Adults: patch reefs, coral heads, sandy bottoms; Juv: SAV (<i>Thalassia</i>)	crustaceans, fish, molluscs

**Table 4.4
Geographically Defined Habitat Areas of Particular Concern (HAPC) Identified in
the FMP Amendments Affecting the South Atlantic¹**

South Atlantic HAPC Regions	Project Area Habitat
Council-Designated Artificial Reef Special Management Zones	N/A
Hermatypic Coral Habitat and Reefs	N/A
Hard Bottoms	N/A
Hoyt Hills	N/A
Sargassum Habitat	N/A
State-Designated Areas of Importance to Managed Species	Primary, Secondary and Special Nursery Areas north of the Project Area
Submerged Aquatic Vegetation	To Be Identified in June 2003 with Digital Imagery
North Carolina HAPC Regions	Project Area Habitat
Big Rock	N/A
Bogue Sound	Western edge of Project Area
Pamlico Sound at Hatteras/Ocracoke Inlets	N/A
Capes Fear, Lookout & Hatteras (sandy shoals)	N/A
New river	N/A
The Ten Fathom Ledge	N/A
The Point	N/A

¹ Areas listed above are identified in the Essential Fish Habitat: New Marine Fish Habitat Conservation Mandate for Federal Agencies

The SAFMC, MAFMC, and the ASMFC have designated HAPC areas to focus on conservation priorities on specific habitat areas that play a particularly important role in the life cycles of federally managed fish species.

4.4 Nursery Areas

The NCDMF has designated a total of 147,008 acres of fishery nursery areas throughout North Carolina. The state has developed three categories of nursery areas: Primary, Secondary and Special Secondary Nursery Areas. Figure 4.1 shows the Primary Nursery Areas northwest of the Swansboro bridge and in Dick's Creek. Secondary nursery areas are typically located in the lower portions of creeks and bays and have been identified in the creeks and bays of the project area. State designated secondary nursery areas are geographically defined as EFH for the blue crab.

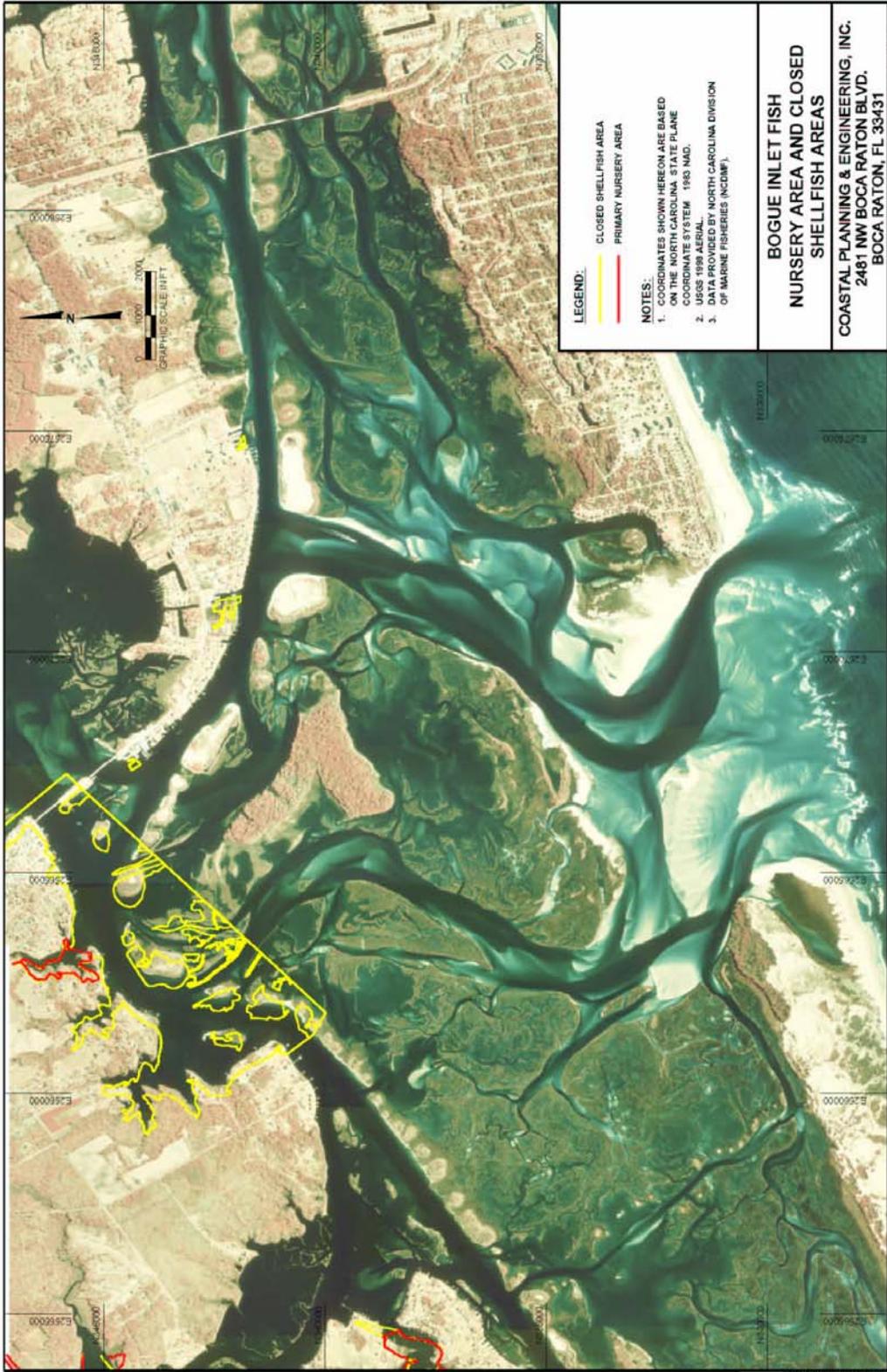


FIGURE 4.1