

**NEWBURYPORT HARBOR
PLUM ISLAND NORTH POINT
NEWBURYPORT, MASSACHUSETTS**

**§204 PROJECT
BENEFICIAL USE OF DREDGED MATERIALS**

**APPENDIX G
ESSENTIAL FISH HABITAT**

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Appendix G

Essential Fish Habitat Assessment

Atlantic Mackerel

The project areas are designated as EFH for all life stages of Atlantic mackerel (*Scomber scombrus*). EFH for the egg life stage is pelagic habitats in inshore estuaries and embayments from Great Bay, New Hampshire to the south shore of Long Island, New York, inshore and offshore waters of the Gulf of Maine, and on the continental shelf from Georges Bank to Cape Hatteras, North Carolina (mostly north of 38°N). EFH for Atlantic mackerel eggs is generally found over bottom depths of 100 meters or less with average water temperatures of 6.5-12.5°C in the upper 15 meters of the water column. For the juvenile life stage, EFH is pelagic habitats in inshore estuaries and embayments from Passamaquoddy Bay, Maine to the Hudson River, and on the continental shelf from Georges Bank to Cape Hatteras, North Carolina.

Atlantic Surfclam

The project areas is designated as EFH for all life stages of Atlantic surfclam (*Spisula solidissima*). This species is found throughout all substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of Georges Bank and the Gulf of Maine throughout the Atlantic. Surfclams generally occur from the shoreline to a depth of about 200 feet, but beyond about 125 feet abundance is low.

Atlantic Butterfish

The project areas are designated as EFH for the juvenile and adult life stages of Atlantic Butterfish (*Peprilus triacanthus*). EFH for the egg life stage is pelagic habitats in inshore estuaries and embayments from Massachusetts Bay to the south shore of Long Island, New York, in Chesapeake Bay, and on the continental shelf and slope, primarily from Georges Bank to Cape Hatteras, North Carolina.

EFH for juveniles is pelagic habitats in inshore estuaries and embayments from Massachusetts Bay to Pamlico Sound, North Carolina, in inshore waters of the Gulf of Maine and the South Atlantic Bight, and on the inner and outer continental shelf from southern New England to South Carolina. EFH for juvenile Atlantic butterfish is generally found over bottom depths between 10 and 280 meters where bottom water temperatures are between 6.5 and 27°C and salinities are above 5 ppt. Juvenile butterfish feed mainly on planktonic prey.

EFH for adult Atlantic butterfish is pelagic habitats in inshore estuaries and embayments from Massachusetts Bay to Pamlico Sound, North Carolina, inshore waters of the Gulf of Maine and the South Atlantic Bight, on Georges Bank, on the inner continental shelf south of Delaware Bay, and on the outer continental shelf from southern New England to South Carolina. EFH for adult Atlantic butterfish is generally found over bottom depths between 10 and 250 meters where bottom water temperatures are between 4.5 and 27.5°C and salinities are above 5 ppt.

Spiny Dogfish

The project areas are designated as EFH for female sub-adults and male/female adults of Spiny Dogfish (*Squalus acanthias*). EFH for sub-adults is pelagic and epibenthic habitats, primarily in deep water on the outer continental shelf and slope between Cape Hatteras and Georges Bank and in the Gulf of Maine. Young are born mostly on the offshore wintering grounds from November to January, but newborns (neonates or “pups”) are sometimes taken in the Gulf of Maine or southern New England in early summer.

EFH for adults is pelagic and epibenthic habitats throughout the region. Adult females are found over a wide depth range in full salinity seawater (32-35 ppt) where bottom temperatures range from 7 to 15°C. They are widely distributed throughout the region in the winter and spring when water temperatures are lower, but very few remain in the Mid-Atlantic area in the summer and fall after water temperatures rise above 15°C.

Bluefin Tuna

The project areas are designated as EFH for the adult life stage of bluefin tuna (*Thunnus thynnus*). EFH is located in offshore and coastal regions of the Gulf of Maine the mid-coast of Maine to Massachusetts; on Georges Bank; offshore pelagic habitats of southern New England; from southern New England to coastal areas between the mouth of Chesapeake Bay and Onslow Bay, North Carolina; from coastal North Carolina south to the outer extent of the U.S. EEZ, inclusive of pelagic habitats of the Blake Plateau, Charleston Bump, and Blake Ridge. EFH also consists of pelagic waters of the central Gulf of Mexico from the continental shelf break to the seaward extent of the U.S. EEZ between Apalachicola, Florida and Texas.

Porbeagle Shark

The project area (likely nearshore placement areas only) is designated as EFH for all life stages of porbeagle shark (*Lamna nasus*). At this time, available information is insufficient for the identification of EFH by life stage, therefore all life stages are combined in the EFH designation. EFH in the Atlantic Ocean includes offshore and coastal waters of the Gulf of Maine (not including Cape Cod Bay and Massachusetts Bay) and offshore waters of the Mid-Atlantic Bight from Georges Bank to New Jersey.

Atlantic Sea Scallops

The project area is designated as EFH for all life stages of Atlantic sea scallops (*Placopecten magellanicus*). Spawning occurs from May through October, with peaks in September and October. The eggs are found in bottom habitats where water temperatures are below 17° C. Scallop larvae are pelagic and are found in salinities between 16.9‰ to 30‰ until they metamorphose into spat and settle on bottom habitats with a substrate of gravelly sand, shell fragments, and pebbles. Juveniles and adults are found on bottom habitats with a substrate of cobble, shells and silt in water depths from 59 to 361 feet (18-110 m).

Haddock

The project areas are designated as EFH for juvenile and adult haddock (*Melanogrammus aeglefinus*) life stages. EFH for juveniles include sub-tidal benthic habitats between 40 and 140 meters in the Gulf of Maine, on Georges Bank and in the Mid-Atlantic region, and as shallow as 20 meters along the coast of Massachusetts, New Hampshire, and Maine. Essential fish habitat for adult haddock occurs on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel. Young-of-the-year juveniles settle on sand and gravel on Georges Bank, but are found predominantly on gravel pavement areas within a few months after settlement. As they grow, they disperse over a greater variety of substrate types on the bank. Young-of-the-year haddock do not inhabit shallow, inshore habitats. EFH for the adult life stages include sub-tidal benthic habitats between 50 and 160 meters in the Gulf of Maine, on Georges Bank, and in southern New England. Essential fish habitat for adult haddock occurs on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel substrates. They also are found adjacent to boulders and cobbles along the margins of rocky reefs in the Gulf of Maine.

Atlantic Wolffish

The project areas are designated as EFH for all life stages of Atlantic Wolffish (*Anarhichas lupus*). EFH for Atlantic wolffish eggs are sub-tidal benthic habitats at depths less than 100 meters. Wolffish egg masses are hidden under rocks and boulders in nests. EFH for larvae includes pelagic and sub-tidal benthic habitats. Atlantic wolffish larvae remain near the bottom for up to six days after hatching, but gradually become more buoyant as the yolk sac is absorbed. EFH for juveniles is sub-tidal benthic habitats at depths of 70-184 meters, this life stage does not have strong substrate preferences. EFH for the adult life stage includes sub-tidal benthic habitats at depths less than 173 meters. Adult Atlantic wolffish have been observed spawning and guarding eggs in rocky habitats in less than 30 meters of water in the Gulf of St. Lawrence and Newfoundland and in deeper (50-100 meters) boulder reef habitats in the Gulf of Maine. Egg masses have been collected on the Scotian Shelf in depths of 100- 130 meters, indicating that spawning is not restricted to coastal waters. Adults are distributed over a wider variety of sand and gravel substrates once they leave rocky spawning habitats, but are not caught over muddy bottom.

Atlantic Herring

The project areas are designated as EFH for all life stages of Atlantic herring (*Clupea harengus*). The Atlantic sea herring larvae are found in pelagic waters with sea surface temperatures below 16° C, water depths from 164 to 295 feet (50 - 90 m), and salinities around 32%. Atlantic herring larvae are observed between August and April, with peaks from September through November. Juveniles and adults are found in bottom habitats with depths of 49 to 443 feet (15-135 m) and water temperatures below 10° C.

Atlantic Cod

The project areas are designated as EFH for all Atlantic cod (*Gadus morhua*) life stages. Cod eggs are found in surface waters with sea surface temperatures below 12° C, water depths less than 361 feet (110 meters), and a salinity range from 32 to 33%.

Cod eggs are most often observed beginning in the fall, with peaks in the winter and spring. The larvae are also found in pelagic waters with sea surface temperatures below 10°

C, waters depths from 98 to 230 feet (30 -70 m), and a salinity range from 32 to 33%. Juveniles are found in bottom habitats with a substrate of cobble or gravel with water temperatures below 20° C, depths from 82 to 246 feet (25 -75 m), and a salinity range from 30 to 35%. Adult Atlantic cod are found in regions with bottom habitats having a substrate of rocks, pebbles, or gravel, water temperatures below 10° C, and depths from 32.8 to 492 feet (10 - 150 meters).

Silver Hake

The project areas are designated as EFH for all life stages of silver hake (*Merluccius bilinearis*). EFH for larvae includes pelagic habitats in the Gulf of Maine, on the southern portion of Georges Bank, and on the continental slope north of 37°38'N latitude. EFH for juvenile silver hake is sub-tidal coastal and offshore benthic habitats in the Gulf of Maine between 50 and 200 meters, and on the continental slope to a maximum depth of 600 meters north of 37°38'N latitude. Bottom habitats of complex rocky reef substrates with associated structure-forming epifauna (e.g., sponges, corals), and soft sediments with cerianthid anemones are essential fish habitat for juvenile redfish. Young-of-the-year juveniles are found on boulder reefs, while older juveniles are found in dense cerianthid habitats. Juvenile redfish expand their distribution to adjacent gravel habitats when local abundance on reefs is high. They do not use unstructured mud habitat. Areas of hard bottom in the deep basins are also good habitat for juveniles. EFH for adults includes offshore benthic habitats in the Gulf of Maine, primarily in depths between 140 and 300 meters, and on the continental slope to a maximum depth of 600 meters north of 37°38'N latitude.

Pollock

The project areas are designated as EFH for all life stages of pollock (*Pollachius virens*). EFH for eggs are pelagic inshore and offshore habitats in the Gulf of Maine, on Georges Bank, and in southern New England, including the bays and estuaries. EFH for Pollock larvae includes pelagic inshore and offshore habitats in the Gulf of Maine, on Georges Bank, and in the Mid-Atlantic region, including the bays and estuaries. EFH for juvenile pollock includes inshore and offshore pelagic and benthic habitats from the intertidal zone to 180 meters in the Gulf of Maine, in Long Island Sound, and Narragansett Bay, between 40 and 180 meters on western Georges Bank and the Great South Channel, and in mixed and full salinity waters in a number of bays and estuaries north of Cape Cod. Essential fish habitat for juvenile pollock consists of rocky bottom habitats with attached macroalgae (rockweed and kelp) that provide refuge from predators. Shallow water eelgrass beds are also essential habitats for young-of-the-year pollock in the Gulf of Maine. Older juveniles move into deeper water into habitats also occupied by adults. EFH for adult pollock include offshore pelagic and benthic habitats in the Gulf of Maine and, to a lesser extent, on the southern portion of Georges Bank between 80 and 300 meters, and in shallower sub-tidal habitats in Long Island Sound, Massachusetts Bay, and Cape Cod Bay. Essential habitats for adult pollock are the tops and edges of offshore banks and shoals (e.g., Cashes Ledge) with mixed rocky substrates, often with attached macro algae.

Red Hake

The project areas are designated as EFH for all life stages of red hake (*Urophycis chuss*). EFH for red hake eggs and larvae include pelagic habitats in the Gulf of Maine, on Georges Bank, and in the Mid-Atlantic. EFH for juveniles are intertidal and sub-tidal benthic habitats throughout the region on mud and sand substrates, to a maximum depth of 80

meters. Bottom habitats providing shelter are essential for juvenile red hake, including: mud substrates with biogenic depressions, substrates providing biogenic complexity (e.g., eelgrass, macroalgae, shells, anemone and polychaete tubes), and artificial reefs. Newly settled juveniles occur in depressions on the open seabed. Older juveniles are commonly associated with shelter or structure and often inside live bivalves. EFH for adult red hake are benthic habitats in the Gulf of Maine and the outer continental shelf and slope in depths of 50 – 750 meters and as shallow as 20 meters in a number of inshore estuaries and embayments as far south as Chesapeake Bay. Shell beds, soft sediments (mud and sand), and artificial reefs provide essential habitats for adult red hake. Adults are usually found in depressions in softer sediments or in shell beds and not on open sandy bottom. In the Gulf of Maine, they are much less common on gravel or hard bottom, but they are reported to be abundant on hard bottoms in temperate reef areas of Maryland and northern Virginia.

White Hake

The project areas are designated as EFH for all life stages of white hake (*Urophycis tenuis*). EFH for the egg life stage includes pelagic habitats in the Gulf of Maine, including Massachusetts and Cape Cod bays, and the outer continental shelf and slope. EFH for the larvae stage includes pelagic habitats in the Gulf of Maine, in southern New England, and on Georges Bank. Early stage white hake larvae have been collected on the continental slope, but cross the shelf-slope front and use nearshore habitats for juvenile nurseries. Larger larvae and pelagic juveniles have been found only on the continental shelf. EFH for juveniles include intertidal and sub- tidal estuarine and marine habitats in the Gulf of Maine, on Georges Bank, and in southern New England, including mixed and high salinity zones in a number of bays and estuaries north of Cape Cod, to a maximum depth of 300 meters. Pelagic phase juveniles remain in the water column for about two months. In nearshore waters, essential fish habitat for benthic phase juveniles occurs on fine-grained, sandy substrates in eelgrass, macroalgae, and un-vegetated habitats. Older young-of-the- year juveniles occupy the same habitat types as the recently-settled juveniles, but move into deeper water (>50 meters). EFH for adult white hake is sub-tidal benthic habitats in the Gulf of Maine, including depths greater than 25 meters in certain mixed and high salinity zones portions of a number of bays and estuaries, between 100 and 400 meters in the outer gulf, and between 400 and 900 meters on the outer continental shelf and slope. Essential fish habitat for adult white hake occurs on fine-grained, muddy substrates and in mixed soft and rocky habitats.

Yellowtail Flounder

The project areas are designated as EFH for the juvenile and adult yellowtail flounder (*Pleuronectes ferruginea*) life stages. EFH for juvenile yellowtail flounder is sub- tidal benthic habitats in coastal waters in the Gulf of Maine and on the continental shelf on Georges Bank and in the Mid-Atlantic, including the high salinity zones of the bays and estuaries. Juveniles are often found on sand and muddy sand between 20 and 80 meters. EFH for adults includes sub-tidal benthic habitats in coastal waters in the Gulf of Maine and on the continental shelf on Georges Bank and in the Mid-Atlantic, including the high salinity zones of the bays and estuaries. Essential fish habitat for adult yellowtail flounder occurs on sand and sand with mud, shell hash, gravel, and rocks at depths between 25 and 90 meters.

Monkfish

The project areas are designated as EFH for egg and larvae life stages of monkfish (*Lophius americanus*). EFH for egg and larval stages include pelagic habitats in inshore areas, and on the continental shelf and slope throughout the Northeast region. Monkfish eggs are shed in very large buoyant mucoidal egg “veils.” Monkfish larvae are more abundant in the Mid-Atlantic region and occur over a wide depth range, from the surf zone to depths of 1000 to 1500 meters on the continental slope.

Winter Skates

The project areas are designated as EFH for the juvenile and adult winter skate (*Leucoraja ocellata*) life stages. EFH for juvenile winter skate includes sub-tidal benthic habitats in coastal waters from eastern Maine to Delaware Bay and on the continental shelf in southern New England and the Mid-Atlantic region, and on Georges Bank, from the shoreline to a maximum depth of 90 meters, including the high salinity zones of the bays and estuaries. Essential fish habitat for juvenile winter skates occurs on sand and gravel substrates, but they are also found on mud. EFH for adult winter skate includes sub-tidal benthic habitats in coastal waters in the southwestern Gulf of Maine, in coastal and continental shelf waters in southern New England and the Mid-Atlantic region, and on Georges Bank, from the shoreline to a maximum depth of 80 meters, including the high salinity zones of the bays and estuaries. Essential fish habitat for adult winter skates occurs on sand and gravel substrates, but they are also found on mud.

Witch Flounder

The project areas are designated as EFH for the juvenile and adult life stage of witch flounder (*Glyptocephalus cynoglossus*). EFH for juvenile witch flounder is sub-tidal benthic habitats between 50 and 400 meters in the Gulf of Maine and as deep as 1500 meters on the outer continental shelf and slope, with mud and muddy sand substrates. EFH for the adult life stage includes sub-tidal benthic habitats between 35 and 400 meters in the Gulf of Maine and as deep as 1500 meters on the outer continental shelf and slope, with mud and muddy sand substrates.

American Plaice

The project areas are designated as EFH for eggs, juvenile, and adult American plaice (*Hippoglossoides platessoides*) life stages. EFH for American plaice eggs include pelagic habitats in the Gulf of Maine and on Georges Bank, including the high salinity zones of the bays and estuaries. EFH for the juvenile life stage includes sub-tidal benthic habitats in the Gulf of Maine and the western portion of Georges Bank, between 40 and 180 meters, including mixed and high salinity zones of the coastal bays and estuaries. Essential fish habitat for juvenile American plaice consists of soft bottom substrates (mud and sand), but they are also found on gravel and sandy substrates bordering bedrock. EFH for the adult life stage include sub-tidal benthic habitats in the Gulf of Maine and the western portion of Georges Bank, between 40 and 300 meters and including high salinity zones in the coastal bays and estuaries. Essential fish habitat for adult American plaice consists of soft bottom substrates (mud and sand), but they are also found on gravel and sandy substrates bordering bedrock.

Acadian Redfish

The project areas are designated as EFH for egg and larvae life stages of Acadian redfish (*Sebastes fasciatus*). EFH for the egg and larvae life stages are pelagic habitats in the Gulf of Maine, on the southern portion of Georges Bank, and on the continental slope north of 37°38'N latitude.

Winter Flounder

The project areas are designated as EFH for all life stages of winter flounder (*Pseudopleuronectes americanus*). EFH for winter flounder eggs are sub-tidal estuarine and coastal benthic habitats from mean low water to 5 meters from Cape Cod to Absecon Inlet (39° 22' N), and as deep as 70 meters on Georges Bank and in the Gulf of Maine, including mixed and high salinity zones in the bays and estuaries. The eggs are adhesive and deposited in clusters on the bottom. Essential habitats for winter flounder eggs include mud, muddy sand, sand, gravel, macroalgae, and submerged aquatic vegetation. Bottom habitats are unsuitable if exposed to excessive sedimentation which can reduce hatching success. EFH for winter flounder larvae includes estuarine, coastal, and continental shelf water column habitats from the shoreline to a maximum depth of 70 meters from the Gulf of Maine to Absecon Inlet (39° 22' N), and including Georges Bank, including mixed and high salinity zones in the bays and estuaries. Larvae hatch in nearshore waters and estuaries or are transported shoreward from offshore spawning sites where they metamorphose and settle to the bottom as juveniles. They are initially planktonic, but become increasingly less buoyant and occupy the lower water column as they get older.

EFH for the juvenile life stage includes estuarine, coastal, and continental shelf benthic habitats from the Gulf of Maine to Absecon Inlet (39° 22' N), and including Georges Bank, and in mixed and high salinity zones in the bays and estuaries. Essential fish habitat for juvenile winter flounder extends from the intertidal zone (mean high water) to a maximum depth of 60 meters and occurs on a variety of bottom types, such as mud, sand, rocky substrates with attached macroalgae, tidal wetlands, and eelgrass. Young- of-the-year juveniles are found inshore on muddy and sandy sediments in and adjacent to eelgrass and macroalgae, in bottom debris, and in marsh creeks. They tend to settle to the bottom in soft-sediment depositional areas where currents concentrate late-stage larvae and disperse into coarser-grained substrates as they get older. EFH for the adult life stage includes estuarine, coastal, and continental shelf benthic habitats extending from the intertidal zone (mean high water) to a maximum depth of 70 meters from the

Gulf of Maine to Absecon Inlet (39° 22' N), and including Georges Bank, and in mixed and high salinity zones in the bays and estuaries. Essential fish habitat for adult winter flounder occurs on muddy and sandy substrates, and on hard bottom on offshore banks. In inshore spawning areas, essential fish habitat includes a variety of substrates where eggs are deposited on the bottom.

Little Skate

The project areas are designated as EFH for juvenile and adult little skates (*Leucoraja erinacea*) life stages. EFH for juvenile life stages include intertidal and sub-tidal benthic habitats in coastal waters of the Gulf of Maine and in the Mid- Atlantic region as far south as Delaware Bay, and on Georges Bank, extending to a maximum depth of 80 meters, and including high salinity zones in the bays and estuaries. Essential fish habitat for juvenile little skates occurs on sand and gravel substrates, but they are also found on mud. Adults:

Intertidal and sub-tidal benthic habitats in coastal waters of the Gulf of Maine and in the Mid-Atlantic region as far south as Delaware Bay, and on Georges Bank, extending to a maximum depth of 100 meters, and including high salinity zones in the bays and estuaries. Essential fish habitat for adult little skates occurs on sand and gravel substrates, but they are also found on mud.

Ocean Pout

The project areas are designated as EFH for all life stages of ocean pout (*Macrozoarces americanus*). EFH for the egg life stage includes hard bottom habitats on Georges Bank, in the Gulf of Maine, and in the Mid-Atlantic Bight, as well as the high salinity zones of the bays and estuaries. Eggs are laid in gelatinous masses, generally in sheltered nests, holes, or rocky crevices. Essential fish habitat for ocean pout eggs occurs in depths less than 100 meters on rocky bottom habitats.

EFH for the juvenile life stage is intertidal and sub-tidal benthic habitats in the Gulf of Maine and on the continental shelf north of Cape May, New Jersey, on the southern portion of Georges Bank, and in the high salinity zones of a number of bays and estuaries north of Cape Cod, extending to a maximum depth of 120 meters. Essential fish habitat for juvenile ocean pout occurs on a wide variety of substrates, including shells, rocks, algae, soft sediments, sand, and gravel. Adults utilize sub-tidal benthic habitats between 20 and 140 meters in the Gulf of Maine, on Georges Bank, in coastal and continental shelf waters north of Cape May, New Jersey, and in the high salinity zones of a number of bays and estuaries north of Cape Cod. Essential fish habitat for adult ocean pout includes mud and sand, particularly in association with structure forming habitat types; i.e. shells, gravel, or boulders. In softer sediments, they burrow tail first and leave a depression on the sediment surface. Ocean pout congregate in rocky areas prior to spawning and frequently occupy nesting holes under rocks or in crevices in depths less than 100 meters.

Windowpane Flounder

The project areas are designated as EFH for the juvenile life stage of windowpane flounder (*Scopthalmus aquosus*). EFH for eggs and larvae are pelagic habitats on the continental shelf from Georges Bank to Cape Hatteras and in mixed and high salinity zones of coastal bays and estuaries throughout the region. EFH of the juvenile windowpane flounder life stage includes intertidal and sub-tidal benthic habitats in estuarine, coastal marine, and continental shelf waters from the Gulf of Maine to northern Florida, including mixed and high salinity zones in the bays and estuaries. Essential fish habitat for juvenile windowpane flounder is found on mud and sand substrates and extends from the intertidal zone to a maximum depth of 60 meters. Young-of-the-year juveniles prefer sand over mud.

Northern Shortfin Squid

The project areas are designated as EFH for juvenile and adult life stages of northern shortfin squid (*Illex illecebrosus*). EFH is pelagic habitats on the continental shelf and slope from Georges Bank to South Carolina, and in inshore and offshore waters of the Gulf of Maine. EFH for recruit Northern shortfin squid is generally found on the shelf over bottom depths between 41 and 400 meters where bottom temperatures are 4.5-14.5°C and salinities are 34.5-36.5 ppt. They have also been caught in bottom trawls as deep as 2,500 m in waters beyond the edge of the shelf and on Bear Seamount. Recruits make daily vertical migrations, moving up in the water column at night and down in the daytime.

Longfin Inshore Squid

The project areas are designated as EFH for juvenile and adult life stages of longfin inshore squid (*Doryteuthis pealeii*). EFH is pelagic habitats in inshore and offshore continental shelf waters from Georges Bank to South Carolina, in inshore waters of the Gulf of Maine, and in embayments such as Narragansett Bay, Long Island Sound, Raritan Bay, and Delaware Bay. EFH for recruit longfin inshore squid is generally found over bottom depths between 6 and 200 meters where bottom water temperatures are 8.5-14°C and salinities are 24-36.5 ppt. Recruits inhabit the continental shelf and upper continental slope to depths of 400 meters. They migrate offshore in the fall and overwinter in warmer waters along the edge of the shelf. Like the prerecruits, they make daily vertical migrations. Individuals larger than 12 cm feed on fish and those larger than 16 cm feed on fish and squid. Females deposit eggs in gelatinous capsules which are attached in clusters to rocks, boulders, and aquatic vegetation and on sand or mud bottom, generally in depths less than 50 meters.

Black Sea Bass

The project areas are designated as EFH for juvenile and adult life stages of black sea bass (*Centropristis striata*). EFH is offshore within demersal waters over the continental shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina. Inshore, EFH is the estuaries where black sea bass are identified as being common, abundant, or highly abundant in "mixing" and "seawater" salinity zones. Juveniles are found in the estuaries in the summer and spring. Black sea bass are generally found in estuaries from May through October. Wintering adults (November through April) are generally offshore, south of New York to North Carolina. Temperatures above 43°F seem to be the minimum requirements. Structured habitats (natural and man-made), sand and shell are usually the substrate preference.

Scup

The project areas are designated as EFH for juvenile and adult life stages of scup. EFH is offshore within demersal waters over the continental shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina. In general, juvenile scup are found during the summer and spring in estuaries and bays between Virginia and Massachusetts, in association with various sands, mud, mussel and eelgrass bed type substrates and in water temperatures greater than 45 °F and salinities greater than 15 ppt. Generally, wintering adults (November through April) are usually offshore, south of New York to North Carolina, in waters above 45 °F.

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