Appendix B - Essential Fish Habitat Assessment

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), New York District (District) is evaluating alternatives to reduce storm damage at Montauk Point. Montauk Point is located 125 miles east of New York City in the Township of East Hampton, Suffolk County, New York. Montauk Point is located on the extreme eastern tip of Long Island and separates the Atlantic Ocean to the south and Block Island Sound to the north. (Project Area, Figure 1).

Montauk Point is noted for its beauty and historic lighthouse. The Montauk Point Lighthouse, which President Washington commissioned in 1797, is included in the U.S. Department of the Interior's National Register of Historic Places. Despite previous protection projects at Montauk Point, the existing shoreline continues to erode. If there is no intervention, continued erosion will result in the continued loss of the bluff and the eventual loss of the lighthouse and adjacent historic structures.

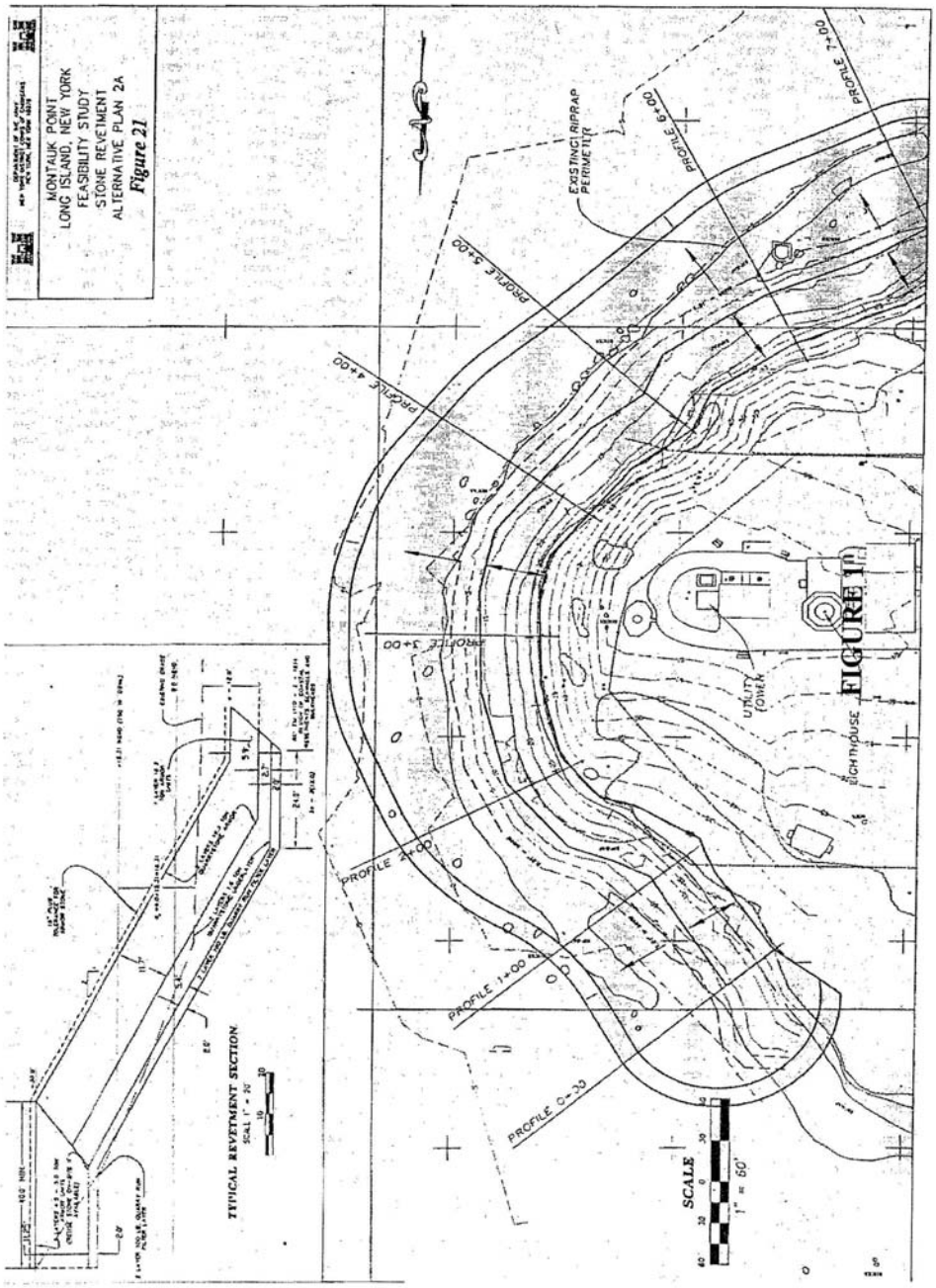
The New York District of the Army Corps of Engineers (the District) analyzed various project alternatives and planning constraints and selected construction of a stone revetment wall as the most effective. This would entail constructing an 840-foot riprap revetment wall, incorporating stones from the existing revetment and strengthening the toe to protect against breaking waves and scour at the base of the revetment.

In accordance with section 305 (b) (2) of the Magnuson-Stevens Fishery Conservation and Management Act (1996 amendments), this assessment identifies the potential impacts on designated essential fish habitats (EFH) during and following those proposed structural modifications designed to protect and support the Turtle Cove Plateau, the lighthouse and surrounding bluffs. The Magnuson-Stevens Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), set forth a number of new mandates for the U.S. Department of Commerce (USDOC) National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), regional fishery management councils (councils), and other Federal agencies to identify and protect important marine and anadromous fish habitat.

Federal agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH. However, measures recommended to protect EFH are advisory, rather than prescriptive.

According to NMFS, the contents of an EFH assessment should include:

- A description of the proposed action;
- Analysis of the effects of the proposed action on EFH, the managed fish species, and major prey species;
- The Federal agency's views regarding the effects of the action on EFH; and,
- Proposed mitigation, if applicable.


MONTAUK POINT
LONG ISLAND, NEW YORK
FEASIBILITY STUDY
STONE REVETMENT
ALTERNATIVE PLAN 2A
Figure 21
TYPICAL REVETMENT SECTION
SCALE 1" = 20'
PROFILE 0+00
PROFILE 1+00
PROFILE 2+00
PROFILE 3+00
PROFILE 4+00
PROFILE 5+00
PROFILE 6+00
PROFILE 7+00
EXISTING RIPRAP PERIMETER
UTILITY TOWER
LIGHTHOUSE
SCALE
1" = 60'
FIGURE 1

160

The following section includes: a brief description of the District's proposed revetment wall; identification of the existing environment of Montauk Point area; a listing of EFH–designated species identified in and around the Montauk Point area. It also includes an analysis of the potential impacts of, and mitigation for, construction activities of EFH in the near-shore habitats.

2.0 PROPOSED PROJECT ACTIVITIES

2.1 Authority and Purpose

The project was authorized by a resolution of the U.S. House of Representatives Committee on Environment and Public Works, adopted May 1991 to provide storm damage protection at Montauk Point.

2.2 Description of Proposed Plan of Improvement

The recommended plan will protect Montauk Point lighthouse and bluff complex by building an 840 feet riprap stone revetment. Some stone already on site will be reused. Revetments are proven methods of shore protection in the area and have historically been accepted by local and state agencies. The cross-section of the preliminary revetment has a crest width of 40-feet at elevation +25 feet NGVD, 1V:2H side slopes and 12.6 ton quarry stone armor units extending from the crest down to the embedded toe. A heavily embedded toe is incorporated to protect against breaking waves and scour at the toe of the structure. Three layers of 4-5 ton armor units are used atop the splash apron (Figure 2).

2.3 Construction Methods

The recommended plan proposes construction over a two-year period. Two cranes working from opposite ends will be employed to move existing revetment rock and newly quarried rock to construct the revetment. A temporary access road will be built to get from the road at the top of the bluff down to the shoreline staging areas just east and west of the revetment limits. From there the road will be extended to the construction berms starting at the eastern and western limits of the new revetment. The new revetment will be built within the footprint of the existing (1990) revetment. During construction there will be a temporary impact and habitat loss of 800 by 40 feet. The permanent impact and habitat loss will be 600 by 20 feet, due to the embedded toe. The habitat that will be lost is eroding rock and substrate, which will be exchanged with rocky intertidal habitat created by the new revetment.

3.0 ENVIRONMENT

3.1 History

In 1792 President George Washington authorized the construction of the Montauk Point Light Station for navigation purposes. When the lighthouse was completed it was 300 feet from the cliff's edge. Today the lighthouse is less than 120-feet from the edge of the bluff and other structures are within 50 feet of the edge. Throughout the years various efforts have been made to stabilize the shoreline from the effects of erosion. USACE built a 700-feet stone revetment that later failed in the 1940's, DOT placed rubble in the 1960's, local terracing and planting efforts were constructed in the 1970's and 1980's, and in 1990 another revetment was constructed (MHS, 2000 and NYS P&R, 2002). The 1990 revetment settled during the 1991 storm and is no longer adequate as a shore protection measure. Finally, in 1992 an emergency construction effort was made by the USCG and a new revetment was constructed landward of the old revetment. This revetment and the terracing efforts are currently providing shoreline protection. In 1993, a reconnaissance study was executed by the District, which determined that unless further protection efforts are made, upper bluff areas, the Turtle Cove Plateau and associated structures would be in danger of erosion by the year 2016.

3.2 Description

Montauk Point is located 125 miles east of New York City, in the Township of East Hampton, Suffolk County, New York. Montauk Point Lighthouse sits on a high bluff underlain with glacial till at 70 feet above MSL (Mean Sea Level). The lighthouse and surrounding Montauk Point State Park are one of the most highly visited recreational and tourist areas in Eastern Long Island. The shoreline of Long Island in the vicinity of Montauk Point is rugged, rocky and steep surrounding the bluffs that Montauk Point is known for. The project area is located in the Atlantic coastal plain province, which consists of loose, unconsolidated Cretaceous to Recent sediments resting on a deeply buried crystalline rock base. In the past 125 years the bluffs have retreated 150 feet and the beach has retreated 305 feet. The erosion of the bluff is a result of the combined effect of storm waves, ground water flow, wind and rain. Hurricanes or large storms can result in a combined storm surge and wave crest level approximately 30 feet above MSL.

3.3 Vegetation

Beaches to the north and south of the lighthouse are narrow and sparsely vegetated. The dunes are covered with American Beach grass *(Ammophila breviliqulata)* and wooly beach heather (*Hudsonia tomentosa*). The composition of dune vegetation varies depending on stability. Additionally, beach grass and salt-spray rose were added during terracing of the bluff face. .

3.4 Water Quality

The project area has good water quality. The waters are used for recreational and commercial fishing and contact recreation. The waters are also part of the extreme eastern extent of the Peconic Bay Estuary, which has excellent overall water quality.

3.5 Aquatic Resource

The quality of habitats in the project area is suited for a diverse group of species. The bottom composition is mainly rock along the revetment surrounded by intertidal gravel/sand beaches to the north and south of Montauk Point. The area is habitat for many benthic invertebrates' species, such as bee chitins, mussels, oysters, anemone, isopods, periwinkles, bryozoans, clams, barnacles, sea urchins, scuds, sea stars, lobsters, and crabs. In the sandy reaches are amphipods, horseshoe crabs, wedge-shaped clams, ghost crabs, isopods, and burrowing worms.

3.6 Finfish

Commercial and recreational finfish species found near the project area include: the American sandlance *Ammodytes americanus*, American shad *Alosa sapidissima*, Atlantic croaker *Micropogonias undulates*, Atlantic mackerel *Scomber scombrus*, Atlantic menhaden *Brevoortia tyrannus*, black sea bass *Centropristis striata*, bluefish *Pomatomus saltatrix*, butter fish *Porohotus triacanthos*, scup *Stenotomus chrysops*, spot *Leiostomas xanthurus*, winter flounder *Pseudopleuronectes americanus*, summer flounder *Paralichthys dentatus*, weakfish *Cynosion regalis*, and striped bass *Morone saxatilis*.

3.7 Migratory Finfish

Migratory finfish (alewife, American shad, Atlantic menhaden, Atlantic silverside, blueback herring, and striped bass) occur in seasonal abundance at Montauk Point.

4.0 EFH SPECIES

4.1 EFH-Designated Species

EFH is defined in the Magnuson-Stevens Act as: "waters" to include aquatic areas and their associated physical, chemical, and biological properties that are used by fish which may include areas historically used by fish where appropriate; "substrate" to include sediment, hard bottom and structures underlying the water, and associated biological contribution to a healthy ecosystem; and areas used for "spawning, breeding, and growth to maturity" to cover a specie's full life cycle. Prey species are defined as being a forage source for one or more designated fish species, and the presence of adequate prey can classify a habitat as essential.

As required by the Magnuson-Stevens Act, the National Marine Fisheries Service promulgated regulation to provide guidance to the regional fishery management council for EFH designation. EFH designation were based on the presence or absence, and, in some cases, on the relative abundance of eggs, larvae, juvenile, and adults fish in long-term survey datasets, and on information compiled by the National Oceanic Atmosphere Administration (NOAA)/National Ocean Services (NOS) Estuarine Living Marine Resource Program, from the U.S. Atlantic coast from the Gulf of Maine to Cape Hatteras, North Carolina per the New England Fisheries Management Council (NOAA, 1999). EFH designations for the 10' square of latitude and

longitude (Figure 2) that include the coastal waters of Montauk Point, New York, Table 1, are identified by species and life history stages in Table 2.

Table 1. 10' x 10' Square Coordinates				
Boundary	North	East	South	West
Coordinate	41° 10.0' N	71° 50.0' W	41° 00.0' N	72° 00.0' W

Grid Description (i.e. habitat, landmarks, coastline markers): Atlantic Ocean waters within the square affecting the northeast tip of Long Island from just west of Rocky Point on the north side around Fort Pond Bay, past Lake Montauk, Shagwong Pt., False Pt., Montauk Pt., and Montauk, NY, to just east of Hither Hills State Park.

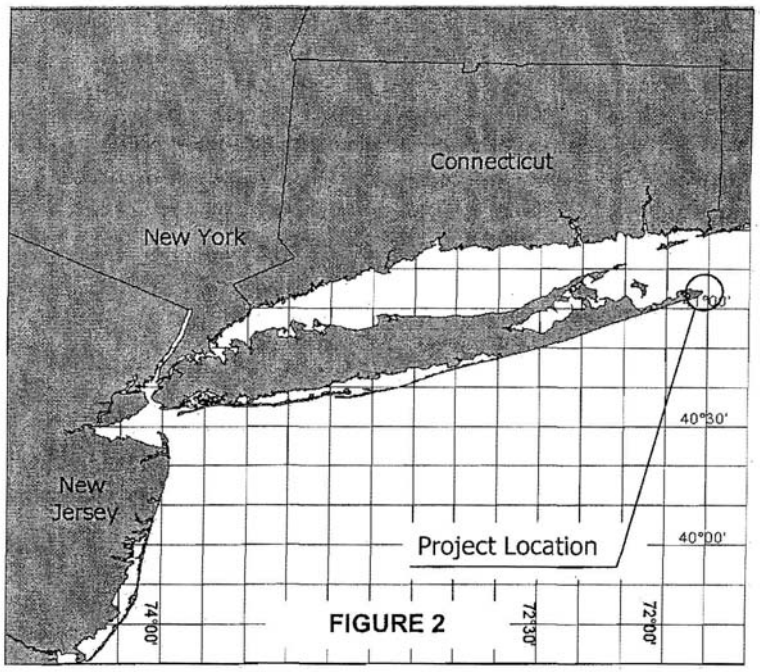


FIGURE 2

Table 2. EFH-Designated Species Reported for the Montauk Point Area.

Species	Eggs	Larvae	Juveniles	Adults
Whiting (*Merluccius bilinearis*)	X	X	X	
Winter flounder *Pleuronectes americanus*	X	X	X	X
Windowpane flounder *Scopthalmus aquosus*			X	X
Atlantic sea herring *Clupea harengu*	X	X	X	X
Bluefish *Pomatomus saltatrix*			X	X
Atlantic butterfish *Peprilus triacanthu*			X	X
Atlantic mackerel *Scomber scombrus*		X	X	X
Summer flounder *Paralicthys dentatus*			X	X
Scup *Stenotomus chrysop*			X	X
Black sea bass *Centropristus striata*			X	
King mackerel *Scomberomorus cavalla*	X	X	X	X
Spanish mackerel *Scomberomorus maculates*	X	X	X	X
Cobia *Rachycentron canadum*	X	X	X	X
Sand tiger shark *Odontaspis taurus*		X		
Ocean pout *Macrozoacres americanus*	X	X		X
Long finned squid *Loligo pealei*			X	
Spiny dogfish *Squalus acanthias*			X	X
Blue shark *Prionace glauca*			X	X
Dusky shark *Charcharinus obscurus*		X	X	
Shortfin mako shark *Isurus oxyrhyncus*			X	
Sandbar shark *Charcharinus plumbeus*		X	X	X
Bluefin tuna *Thunnus thynnus*			X	X

Source: NOAA 1999

Most habitat data was retrieved from NOAA habitat characteristic table found in the guide to essential fish habitat descriptions at http://www.nero.noaa.gov/hcd/list.htm. Otherwise data is referenced appropriately.

Table 5. Habitat utilization of identified EFH species for representative life stages in the SBOBA.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Whiting (*Merluccius bilinearis*) (Morse et al. 1998)	**Habitat:** Pelagic continental shelf waters in preferred depths from 50-150 m.	**Habitat:** Pelagic continental shelf waters in preferred depths from 50-130 m.	**Habitat:** Bottom (silt-sand) nearshore waters in preferred depths from 150-270 m in spring and 25-75 m in fall. **Prey:** Fish, crustaceans (euphausids, shrimp), and squids	

Table 5. Habitat utilization of identified EFH species for representative life stages in the SBOBA.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Winter Flounder (*Pseudopleuronectes americanus*) (Pereira et. al., 1998)	**Habitat:** Pelagic and bottom water at depths of less than 5 meters with a broad range of salinity, abundant February through July	**Habitat:** Pelagic and bottom water at depths less than 5 meters with a broad range of salinity, abundant February through July	**Habitat:** Young of the year (YOY) are demersal, nearshore low energy shallows with sand, muddy sand, mud and gravel bottoms (primarily inlets and coves). **Prey:** YOY -- Amphipods and annelids JUV – Sand dollars, bivalves siphons, annelids, amphipods	**Habitat:** Demersal offshore waters (in spring) except when spawning, where they are in shallow inshore waters (fall). **Prey:** Amphipods, polychaetes, bivalves or siphons, Capelin eggs, crustaceans
Windowpane (*Scopthalmus aquosus*) (Chang, 1998)	**Habitat:** Surface waters <70 m, Feb-July; Sept-Nov.	**Habitat:** Initially in pelagic waters, then bottom <70m, May-July and Oct-Nov **Prey:** Copepods and other zooplankton	**Habitat:** Bottom (fine sands) 5-125 m in depth, in nearshore bays and estuaries less than 75 m **Prey:** Small crustaceans (mysids and decapod shrimp), polychaetes and various fish larvae	**Habitat:** Bottom (fine sands), peak spawning in May, in nearshore bays and estuaries less than 75 m **Prey:** Small crustaceans (mysids and decapod shrimp), polychaetes and various fish larvae
Atlantic sea herring (*Clupea harengus*) (Reid et al., 1998)		**Habitat:** Pelagic waters and bottom habitats, < 10 C and 15-130 m depths.	**Habitat:** Pelagic waters and bottom, < 10 C and 15-130 m depths **Prey:** Zooplankton (copepods, decapod larvae, cirriped larvae, cladocerans, and pelecypod larvae)	**Habitat:** Pelagic waters and bottom habitats **Prey:** Chaetognath, euphausids, pteropods and copepods.
Bluefish (*Pomatomus saltatrix*) (USACE 2001)			**Habitat:** Pelagic waters of continental shelf and in Mid Atlantic estuaries and intertidal and nearshore zones May-Nov. Mixed and saline waters. **Prey:** Atlantic silversides, clupeids, striped bass, bay anchovy, others.	**Habitat:** Pelagic waters; found in Mid Atlantic estuaries April – Oct. Highly migratory and distribution varies greatly according to season and fish size. S < 25 ppt. Spawning occurs offshore in open waters. **Prey:** Sight feeders; prey on other fishes almost exclusively.
Atlantic butterfish (*Peprilus tricanthus*)			**Habitat:** 10 – 360 m in pelagic waters over the continental shelf **Prey:** Feed mainly on planktonic prey, including thaliaceans, squids, copepods, amphipods, decapods, coelenterates, polychaetes, small fishes, and ctenophores.	**Habitat:** 10 – 360 m in pelagic waters over the continental shelf **Prey:** Feed mainly on planktonic prey including thaliaceans, squids, copepods, amphipods, decapods, coelenterates, polychaetes, small fishes, and ctenophores.

Table 5. Habitat utilization of identified EFH species for representative life stages in the SBOBA.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Atlantic mackerel (*Scomber scombrus*)		**Habitat:** Pelagic waters over the Continental Shelf	**Habitat:** Schooling in pelagic waters over the Continental Shelf, >25 ppt, 0-320 m. Not typically associated with bottom or nearshore habitats. **Prey:** Principal prey include small crustaceans. Also small pelagic mollusks, chaetognaths, nematodes, ammodytes, other larval fish.	**Habitat** Schooling in pelagic waters over the Continental Shelf, >25 ppt, 0-320 m. Not typically associated with bottom or nearshore habitats. **Prey:** Includes euphausids, pandalid, and crangonid shrimps; chaetognaths, larvaceans, pelagic polychaetes, squids. Calanus and other copepods, amphipods, other planktonic organisms. Fishes: sand lances, herring, silver and other hakes, sculpins.
Summer flounder (Paralicthys dentatus)			**Habitat:** Demersal waters over Continental Shelf including estuaries, mud to sand substrates S 10-30 Ppt **Prey:** Primarily infaunal crustaceans, polychaetes	**Habitat:** Demersal waters (mud and sand substrates). Shallow coastal areas in warm months, deep (500 ft) offshore waters in cold months. **Prey:** Shrimp, weakfish, mysids, anchovies, squids, Atlantic silversides, herrings, hermit crabs, isopods.
Scup (Stenotomus chrysops)			**Habitat:** Demersal waters over Continental Shelf and estuary habitats; >15 ppt, 12o-22oC **Prey:** Small benthic invertebrates, fish eggs and larvae.	**Habitat:** Demersal waters over Continental Shelf from Nov – April, estuary habitats, >15 ppt **Prey:** Benthic and near bottom invertebrates, and small fish
Black sea bass (*Centropristus striata*)			**Habitat:** Demersal waters over rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas and winter off shore at depths of 1-38 m in shell beds and shell patches **Prey:** Small Epibenthic invertebrates, especially crustaceans and mollusks.	**Habitat:** Demersal waters over structured habitats (natural and man-made), and sand and shell areas and winters off shore at depths of 25-50 m in shell beds and shell patches. **Prey:** Benthic and near-bottom Invertebrates and small fish

Table 5. Habitat utilization of identified EFH species for representative life stages in the SBOBA.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
King mackerel (*Scomberomorus cavalla*)	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone.	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone **Prey:** Small epibenthic invertebrates, especially crustaceans and mollusks.	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone **Prey:** Benthic and near-bottom invertebrates and small fish
Spanish mackerel (*Scomberomorus maculates*)	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** Small epibenthic invertebrates, especially crustaceans and mollusks.	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** Benthic and near-bottom invertebrates and small fish
Cobia (*Rachycentron canadum*) Cobia (*Rachycentron canadum*) (continued)	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** Small epibenthic invertebrates, especially crustaceans and mollusks.	**Habitat:** Pelagic waters with sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone. Migratory **Prey:** Benthic and near-bottom invertebrates and small fish
Sand tiger shark (*Odontaspis taurus*)		**Habitat:** Shallow coastal waters from Barnegat Inlet, NJ to Cape Canaveral, FL out to the 25-meter isobath, entirely outside of the project area **Prey:** herring, eels, mackerels or other fish, and in rare cases, some smaller shark species		

Table 5. Habitat utilization of identified EFH species for representative life stages in the SBOBA.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Ocean pout (*Macrozoacres americanus*)	**Habitat**: Bottom habitats. Eggs are laid in gelatinous masses, generally in hard bottom sheltered nests. T <10 C, < 50 meters, and S 32-34 ppt.	**Habitat**: Bottom habitats Sea surface T < 10 degrees C, depths < 50 meters, and S > 25 ppt. **Prey:** Harpacticoid copepods		**Habitat**: Bottom habitats, <15 C, <110 meters, S 32-34 ppt. **Prey:** Benthic organisms, especially shelled, e.g., mollusks, crustaceans, echinoderms, especially sand dollars.
Long finned squid (*Loligo pealei*)			**Habitat:** Pelagic waters over the Continental Shelf from Maine to North Carolina from shore to 700 feet and T 39 - 91 degrees F. **Prey:** Fish prey includes silver hake, mackerel, herring, menhaden, sand lance, bay anchovy, menhaden, weakfish and silversides. Invertebrate prey includes crustaceans and squid.	
Spiny Dogfish (*Squalus acanthias*) Spiny Dogfish (*Squalus acanthias*) (continued)			Continental shelf from Maine to North Carolina. Inshore, EFH is the seawater portions of estuaries from Maine to Massachusetts. Depths of 33 to 1280 feet in water temperatures ranging between 37 to 82 F. **Prey:** mainly herring, Atlantic mackerel, squids, and to a lesser extent, haddock and cod.	Continental shelf from the Maine to North Carolina. Inshore, EFH is the seawater portions of estuaries from Maine to Massachusetts. Generally, dogfish are found at depths to 1476 feet in water temperatures ranging between 37 to 82 F. **Prey:** mainly herring, Atlantic mackerel, squids, and to a lesser extent, haddock and cod.
Blue Shark (*Prionace glauca*)			**Habitat:** Epipelagic in warm seas worldwide. Most wide-ranging of all sharks **Prey:** fish including hake, dogfish, mackerel, squid and pelagic crustaceans.	**Habitat:** Epipelagic in warm seas worldwide. Most wide-ranging of all sharks **Prey:** fish including hake, dogfish, mackerel, squid and pelagic crustaceans.

Table 5: Habitat utilization of identified EFH species for representative life stages in the SBOBA.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Dusky shark (*Charcharinus obscurus*)		**Habitat:** Shallow coastal waters, inlets, and estuaries to the 25-meter isobath. However life stages are primarily found in waters south of Long Island.	**Habitat:** Juveniles found in coastal and pelagic waters between the 25- and 200-meter isobath. However life stages are primarily found in waters south of Long Island.	
Sandbar shark (*Charcharinus plumbeus*)		**Habitat:** Shallow coastal waters from Barnegat Inlet, NJ to Cape Canaveral, FL out to the 25-meter isobath, e outside of the project area. **Prey:** Opportunistic bottom-feeder, relatively small fishes, mollusks and crustaceans. Include various bony fishes, eels, skates, rays, dogfish, octopus, squid, bivalves, shrimp and crabs.	**Habitat:** Found in coastal and pelagic waters north of 40°N and at the shelf break in the mid-Atl during winter. S >22 ppt and T > 70 F° **Prey:** Opportunistic bottom-feeder, relatively small fishes, mollusks and crustaceans. Include various bony fishes, eels, skates, rays, dogfish, octopus, squid, bivalves, shrimp and crabs.	**Habitat:** Demersal shallow coastal waters from the coast to the 50-meter isobath. **Prey:** Opportunistic bottom-feeder, relatively small fishes, mollusks and crustaceans. Include various bony fishes, eels, skates, rays, dogfish, octopus, squid, bivalves, shrimp and crabs.
Shortfin mako shark (*Isurus oxyrhyncus*) Shortfin mako shark (*Isurus oxyrhyncus*) (continued)		**Habitat:** Found offshore between the 25- and 50-meter isobath. **Prey:** mackerel, tuna, marine mammals, squid and other sharks		
Bluefin tuna (*Thunnus thynnus*)			**Habitat:** Primarily surface waters, also found in inshore and pelagic waters between the 25 and 200-meter isobath. **Prey:** Smaller fishes such as mackerel, herring, whiting, flying fish, and mullet as well as squid, eels, and crustaceans	

170

Table 5: Habitat utilization of identified EFH species for representative life stages in the SBOBA.

MANAGED SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Clearnose skate (*Raja eglanteria*) (NEFMC 2004), (Packer *et al.* 2003a)			**Habitat**: Soft bottom habitats along the continental shelf and rocky or gravelly bottom, from shore to 500 meters, most abundant at depths < 111 meters. T 9-30 □C, S 22-36 ppt. **Prey:** Polychaetes, amphipods, mysid shrimp, shrimp, crabs including bivalves, squid, and small fishes such as soles, weakfish, butterfish, and scup.	**Habitat**: Both soft bottom and rocky or gravelly bottom habitats, from the shore to 400 meters, most abundant at depths <111 meters. **Prey:** Polychaetes, amphipods, mysid shrimp, shrimp, crabs, bivalves, squid, and small fishes such as soles, weakfish, butterfish, and scup.
Little skate (*Leucoraja erinacea*) (NEFMC 2004), (Packer *et al.* 2003b)			**Habitat**: Sandy or gravelly substrate or mud, found from the shore to 137 meters, highest abundance from 73-91 meters, 4-15□C, S preferred 31-34ppt. **Prey:** opportunistic predator although inshore skates generally depend more on a few major prey species. Decapod crustaceans and amphipods are the most important prey items	**Habitat**: Similar to juvenile habitat. **Prey:** Similar to juvenile prey.
Winter skate (*Leucoraja ocellata*) (NEFMC 2004), (Packer *et al.* 2003c) Winter skate (*Leucoraja ocellata*)			**Habitat**: Primarily sand and gravel bottom but also found in mud bottoms, from shoreline to about 400 meters and are most abundant at depths less than 111 meters, most found from 4-16 □C, salinities as low as 23 ppt but prefer a salinity range of 32-34ppt. **Prey:** Polychaetes and amphipods most important prey in terms of numbers or occurrence, followed by decapods, isopods, bivalves, fishes.	**Habitat**: Similar to juvenile habitat. **Prey:** Same as for juveniles; however, note that larger skates consume more polychaetes and fish while crustaceans decline in the diet.

4.3 Analysis Of Effects On EFH Species

As discussed above, there are a number of Federally managed fish species where EFH was identified for one or more life stages within the project area. Fish occupation of waters within the impact area is highly variable both spatially and temporally. Some of the species are strictly offshore, while others may occupy both nearshore and offshore waters. In addition, some species may be suited for the open ocean or pelagic waters, while other species may be more oriented to bottom or demersal waters. This can also vary between life stages of Federally managed species. Also, seasonal abundances are highly variable, as many species are highly migratory.

In general, adverse impacts to Federally managed fish species may stem from alterations of the bottom habitat, which results from removing and replacing the revetment EFH can be adversely impacted temporarily through water quality impacts such as increased turbidity and decreased dissolved oxygen content. These impacts would subside upon cessation of construction activities. More long-term impacts to EFH typically involve physical changes to the bottom habitat, which involve changes to bathymetry, sediment substrate, and benthic community as a food source. Table 6 below discusses the direct and indirect impacts on identified EFH species for representative life stages

Table 3. Direct and indirect impacts on identified EFH species for representative life stages

SPECIES	EGGS	LARVAE	JUVENILES	ADULTS
Whiting (Merluccius bilinearis)	Eggs are pelagic and are concentrated in depth of 50 –150 meters; therefore no direct or indirect effects are expected.	Larvae are pelagic and are concentrated in depth of 50 –130 meters; therefore no direct or indirect effects are expected.	**Direct:** Physical habitat offshore of point should remain basically similar to pre-construction conditions. . **Indirect:** Temporary disruption of feeding due to disturbance caused by construction	
Winter flounder (Pseudopleuronectes americanus)	**Direct:** Placement of stone and the increased footprint of the project *may result in a small number of eggs being crushed* although strong currents in the area may sweep eggs from the area.	**Direct**: Larvae are initially planktonic, but become more bottom-oriented as they develop. There is potential for some to *become crushed during construction*.	The physical characteristic are not favorable to habit because of the high-energy environment habitat in borrow site	**Direct:** Typically habitat is offshore except when spawning when the possibility of being crushed is possible. However, high motility and disturbance caused by construction should result in flight. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.
Windowpane (Scopthalmus aquosus)	Eggs occur in surface waters; therefore, no direct or indirect effects are expected.	Larvae occur in pelagic waters; therefore, no direct or indirect effects are expected.	**Direct:** Physical habitat will typically remain the same, plus substrate is not preferred fine-grained sediments. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.	**Direct:** Physical habitat will typically remain the same, plus substrate is not preferred fine-grained sediments. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.

Table 3. Direct and indirect impacts on identified EFH species for representative life stages				
SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
Atlantic sea herring (Clupea harengus)			**Direct**: Occur in pelagic and near bottom waters. Physical habitat is not preferred habitat, additional high motility allows for prompt escape. **Indirect:** None, prey are planktonic	**Direct**: Occur in pelagic and near bottom waters. Physical habitat is not preferred habitat, additional high motility allows for prompt escape. **Indirect:** None, prey are planktonic
Bluefish (Pomatomus saltatrix)	Eggs occur in pelagic waters over the Continental Shelf. **No direct or indirect impact is expected.**	Larvae occur in pelagic waters over the Continental Shelf. **No direct or indirect impact is expected.**	**Direct**: Juvenile bluefish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.	**Direct:** Adult bluefish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.
Atlantic butterfish (Peprilus tricanthus)			**Direct:** Juvenile butterfish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.	**Direct:** Adult butterfish are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.
Atlantic mackerel (*Scomber scombrus*)			**Direct**: Juvenile Atlantic mackerel are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.	**Direct**: Adult Atlantic mackerel are pelagic species. No significant direct effects anticipated. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.
Summer flounder (Paralicthys dentatus) Summer flounder (Paralicthys dentatus) (continued)			**Direct:** Physical habitat will typically remain the same, plus substrate is not preferred fine-grained sediments. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.	**Direct:** Physical habitat will typically remain the same, plus substrate is not preferred fine-grained sediments. **Indirect:** Temporary disruption of feeding due to disturbance caused by construction.
Scup (Stenotomus chrysops)			**Direct**: Occur in demersal waters, but high motility should allow for prompt escape. **Indirect:** Temporary disruption of benthic prey within site.	**Direct**: Occur in demersal waters, but high motility should allow for prompt escape. **Indirect:** Temporary disruption of benthic prey within site.

Table 3. Direct and indirect impacts on identified EFH species for representative life stages				
SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
Black sea bass (Centropristus striata)			**Direct:** Physical habitat will be dismantled and rebuilt sequentially which allows habitat to remain basically similar to pre-construction conditions. Some mortality of juveniles could be expected but high motility should allow for prompt escape. **Indirect:** Temporary disruption of feeding.	**Direct:** Physical habitat will be dismantled and rebuilt sequentially which allows habitat to remain basically similar to pre-construction conditions. Some mortality of juveniles could be expected but high motility should allow for prompt escape. **Indirect:** Temporary disruption of feeding.
King mackerel (Scomberomorus cavalla)	**Direct Impacts:** Eggs are pelagic; therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic; therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Adults are pelagic and highly motile, therefore no adverse impacts are anticipated. **Indirect Impacts:** Temporary disruption of feeding.	**Direct Impacts:** Adults are pelagic and highly motile, therefore no adverse impacts are anticipated. **Indirect Impacts:** Temporary disruption of feeding
Spanish mackerel (Scomberomorus maculatus)	**Direct Impacts:** Eggs are pelagic; therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic; therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Juveniles are pelagic; therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly motile.	**Direct Impacts:** Adults are pelagic and highly motile, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on food chain through disruption of benthic community, however, mackerel are highly motile.
Cobia (Rachycentron canadum)	**Direct Impacts:** Eggs are pelagic; therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Larvae are pelagic; therefore no adverse impacts are anticipated. **Indirect Impacts:** None anticipated.	**Direct Impacts:** Juveniles are pelagic; therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on prey, however cobia are highly motile.	**Direct Impacts:** Adults are pelagic and highly motile, therefore no adverse impacts are anticipated. **Indirect Impacts:** Minor indirect adverse effects on prey, however cobia are highly motile.
Sand tiger shark (*Odontaspis taurus)* Sand tiger shark (*Odontaspis taurus)*(cont.)		No direct of indirect effects are expected because they live and feed outside of the study area.		
Ocean pout (*Macrozoacres americanus*)	**Direct Impacts:** Eggs may be in crevices in the crumbling revetment and bluffs The project site is on the northern border of life stage habitat, lessening chance of any impact. .	The project site is on the northern border of life stage habitat, lessening chance of any impact.	**Direct Impacts:** Adults are highly motile, therefore no adverse impacts are anticipated. **Indirect Impacts:** Temporary feeding disruption due to commotion from construction.	
Long finned squid (*Loligo pealei*)			**Direct Impacts:** Adults are pelagic and highly motile, therefore no adverse impacts are	

Table 3. Direct and indirect impacts on identified EFH species for representative life stages				
SPECIES	**EGGS**	**LARVAE**	**JUVENILES**	**ADULTS**
			anticipated. **Indirect Impacts:** Temporary feeding disruption due to commotion from construction.	
Spiny Dogfish (*Squalus acanthias*)			**Direct**: Site physical habitat is not preferred habitat, additionally high motility allows for prompt escape. **Indirect:** Temporary disruption of feeding	
Blue Shark (*Prionace glauca*)			Occur in pelagic waters; therefore, *no direct or indirect effects are expected.*	Occur in pelagic waters; therefore, *no direct or indirect effects are expected.*
Dusky shark (Charcharinus obscurus)			Primarily found in waters south of Long Island, therefore, *no direct or indirect effects are expected.*	Primarily found in waters south of Long Island, therefore, *no direct or indirect effects are expected.*
Sandbar shark (Charcharinus plumbeus)		**No Direct Indirect** Temporary disruption of feeding.	**No Direct Indirect** Temporary disruption of feeding.	**No Direct Indirect** Temporary disruption of feeding.
Shortfin mako shark (*Isurus oxyrhyncus*)		**No Direct Indirect** Temporary disruption of feeding.		
Bluefin tuna (*Thunnus thynnus*)			No more than minimal direct or indirect impact is expected because their vertical distribution (surface waters) and high motility would help this species avoid impact.	
Clearnose skate (*Raja eglanteria*)			**Direct:** Some skates may get crushed, but high motility would help this species avoid impact. Temporary disruption of feeding	**Direct:** Some skates may get crushed, but high motility would help this species avoid impact. Temporary disruption of feeding
Little skate (*Leucoraja erinacea*)			**Direct:** Some skates may get crushed, but high motility would help this species avoid impact. Temporary disruption of feeding	**Direct:** Some skates may get crushed, but high motility would help this species avoid impact. Temporary disruption of feeding
Winter skate (*Leucoraja ocellata*)			**Direct:** Some skates may get crushed, but high motility would help this species avoid impact. Temporary disruption of feeding	**Direct:** Some skates may get crushed, but high motility would help this species avoid impact. Temporary disruption of feeding

5.0 IMPACTS ON EFH

5.1 Direct Impacts

The proposed project will have no more than minimal impact on certain species due to preferred depths. These species include whiting, Atlantic sea herring, Atlantic butterfish, spiny dogfish, blue shark, shortfin mako shark and bluefin tuna. As a result, direct impacts should be no more than minimal.

The most obvious direct impact will be the potential for certain target species (bluefish, windowpane, Atlantic mackerel, summer flounder, migratory species (king mackerel, Spanish mackerel and cobia), ocean pout and long-finned squid to be crushed by quarry rock during the construction of the revetment. However, due to the slow nature of the work, this intrusion into potential habitat would forewarn designated species, allowing them to flee the area. Burial of the benthic community will have an immediate, albeit temporary, minimal effect on the feeding success of those species dependent upon benthic invertebrates. Once again, by sequentially rebuilding the revetment, impact will be minimized spatially and temporally. The District has determined that direct burial of EFH species is possible yet improbable and, therefore, will have no more than minimal impact on target species or their EFH.

Furthermore, recolonization of a healthier benthic community may occur through; 1) benthic infauna that are able to unbury themselves when rubble is removed, 2) migration of juvenile and adult sessile organisms from contiguous areas, and 3) larval sessile organisms that settle on the new substrate. Accordingly, direct impacts should be no more than minimal.

Other species with EFH-designated habitats (e.g. winter flounder) may find that the currents in the locale excessive for habitation or spawning. Furthermore, should winter flounder be present in the area during construction they are motile and should escape the activities. Consequently, direct impacts should be no more than minimal.

Black sea bass will most likely be found at the construction site. The District anticipates that this cryptic species will flee the revetment and rubble for concealment nearby. For this reason, direct impacts should be no more than minimal.

Some species may be included in the 10' by 10' grid which determines species for this report, however, several species including the sand tiger shark and, dusky shark need no further evaluation and direct impacts should be no more than minimal.

5.2 Indirect Impacts

The indirect impact of removal and replacement of stone and rubble from the point would be the loss of sessile invertebrate prey species. Small motile and sessile organisms would be most vulnerable to burial or removal. This would be a temporary condition, lasting only as long as it takes for recolonization of revetment by pioneering organisms. Moreover, winter flounder and windowpane may feed opportunistically, minimizing the impact. Scup and black sea bass may also be indirectly impacted by the reduction of prey. However, they would most likely relocate

to adjacent waters with adequate prey. Therefore, construction operations at Montauk Point should result in no more than minimal indirect impacts.

5.3 Cumulative Impacts

Over time, a stable revetment would provide the following:

- A hard substrate for benthic and sessile organisms to colonize, providing prey for many of the designated species,
- Nooks and crevices for species such as the ocean pout to lay their eggs in, or for cryptic species (e.g., black sea bass) to use for concealment.
- A stable environment for designated species due to the projected long-term durability of the proposed revetment.

Given the minimal impact to EFH-designated species and the expected recolonization rates of prey species, there would be no cumulative impacts from reconstruction of the revetment.

6.0 EFFECTS ON ENDANGERED SPECIES

6.1 Marine Mammals

Three endangered marine mammals have been identified by NMFS as occurring proximate to the construction site. These include the northern right whale, the humpback whale, and the finback whale. Due to the shallow nature of the inlet and the disturbance create by dredging operations, no direct or indirect impacts to marine mammals are expected as a result of maintenance dredging operations.

6.2 Marine Turtles

The disturbance of macroinvertebrate habitat in the area would indirectly impact marine turtles, since they feed on organisms such as crabs and some mollusks that inhabit these areas. However, these effects would be only temporary since the habitat is expected to return to pre-existing conditions over time. In the interim, marine turtles would tend to leave or avoid these less desirable areas. The very low occurrence of marine turtles will result in a very low impact potential related to maintenance dredging operations.

6.3 Fish

The shortnose sturgeon prefers deep channels and has been documented in the Hudson Raritan Estuary , but is not likely to be found in the project area. Its preference for less saline waters typically keeps the species clear of high salinity areas. Therefore, no direct impacts to shortnose sturgeon are projected as a result of scheduled operations.

7.0 CONCLUSIONS

The Corps of Engineers, New York District, concludes that there would be no more than minimal impact to Essential Fish Habitat for the species and life stages listed in Table 1 as a result of the Montauk Point Storm Damage reduction Project. Impact to winter flounder eggs is expected to be minimal, in essence those eggs that may drift under stones as they are emplaced. Those species with a designated EFH are overwhelmingly motile and thus able to move to contiguous waters for safety, feeding or shelter. The loss of benthic organisms in the area will be balanced by the following recolonization, which may result in a decreased but more diverse population.