Dan Van-Nostrand - NOAA Affiliate <dan.van-nostrand@noaa.gov>

Fwd: DWH-Early Restoration- Essential Fish Habitat Consultation Initiation-Swift Tract Living Shoreline Project-Alabama

Jamie Schubert-NOAA Federal <jamie.schubert@noaa.gov> Thu, Feb 20, 2014 at 5:32 PM
To: Dan Van-Nostrand - NOAA Affiliate <dan.van-nostrand@noaa.gov>

FYI. This one went also.

-------- Original Message --------
Subject: DWH-Early Restoration- Essential Fish Habitat Consultation Initiation-Swift Tract Living Shoreline Project-Alabama
Date: Thu, 20 Feb 2014 15:17:51 -0600
From: Jamie Schubert-NOAA Federal <jamie.schubert@noaa.gov>
To: Mark Thompson (NOAA Federal) <mark.thompson@noaa.gov>
CC: Rusty Swafford <Rusty.Swafford@noaa.gov>, Virginia Fay <virginia.fay@noaa.gov>, Leslie Craig <leslie.craig@noaa.gov>, Jamey Redding <Jamey.Redding@noaa.gov>, "Jeff Shenot (Jeff.Shenot@noaa.gov)" <Jeff.Shenot@noaa.gov>

Mr. Thompson,
Attached is the Essential Fish Habitat Assessment for the Swift Tract Living Shoreline Project in Alabama. This project is being proposed in the Deepwater Horizon Draft Phase III Early Restoration plan and Programmatic Environmental Impact Statement. Please consider this our initiation of our Essential Fish Habitat consultation. If you anticipate this consultation requiring more than 30 days (March 24, 2014) please let me know.

If you have any questions or require additional information, please contact me at 409-621-1248 or at jamie.schubert@noaa.gov.
Thanks,

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Essential Fish Habitat Assessment

for the Swift Tract Living Shoreline Project

1.0 INTRODUCTION

The purpose of this document is to present the findings of the Essential Fish Habitat (EFH) assessment conducted for the proposed Swift Tract living shoreline project as required by the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended through 1996 (Magnuson-Stevens Act). The objectives of this EFH Assessment are to describe how the actions proposed by the Swift Tract Project may affect EFH designated by the National Marine Fisheries Service (NMFS) and Gulf of Mexico Fisheries Management Council (GMFMC), for the area of influence of the project. According to the GMFMC, EFH within the Gulf of Mexico (Gulf) includes all estuarine and marine waters and substrates from the shoreline to the seaward limit of the Exclusive Economic Zone (EEZ). The area of influence of the Swift Tract project would be a 1,500 foot buffer surrounding the proposed submerged breakwater construction area. The 1,500 foot buffer encompasses the anticipated maneuvering area for construction vessels and the shoreline landward of the construction area. This assessment will include a description of the proposed action; a summary of EFH within the vicinity of the Swift Tract; a description of each Fishery Management Plan; an analysis of the direct, indirect and cumulative effects on EFH for the managed fish species and their major food sources; our views regarding the effects of the proposed action; and proposed minimization measures selected to minimize expected project negative effects.

2.0 PROJECT DESCRIPTION

The proposed Alabama Swift Tract Living Shoreline project is intended to employ living shoreline techniques that utilize natural and/or artificial breakwater material to reduce shoreline erosion along an area in the eastern portion of Bon Secour Bay, Alabama. This project would create breakwaters to dampen wave energy while also providing habitat that was once regionally present. The project would provide for construction of up to 1.6 miles of living shoreline.

The proposed Swift Tract Living Shoreline early restoration project is located in the eastern portion of Bon Secour Bay (part of Mobile Bay) approximately 6 miles northwest of Gulf Shores in Baldwin County, Alabama (see Figures 1 and 2). This living shoreline project area is adjacent to an area named Swift Tract, which is part of the Weeks Bay National Estuarine Research Reserve (NERR). Overall, the Weeks Bay NERR has a diverse set of habitats including tidal wetlands and swamps, salt marshes, aquatic grass beds, maritime and palustrine upland forests, a pitcher plant bog and benthic estuarine sediments. The Swift Tract is approximately 615 acres and is comprised of mesic and hydric pine savannahs, freshwater marshes, and saltwater marshes. The Swift Tract is associated with Essential Fish Habitat and (Gulf of Mexico Fishery Management Council, 2004) is within the Weeks Bay NERR management area, whose wetlands are considered a high priority area (Alabama Coastal Area Management Plan, 1999).

This 1.6-mile shoreline shows evidence of erosion over time and appears to be in a net loss that has been exacerbated over the last half century. A shoreline analysis of the Swift Tract property was

conducted in 2011 by The Nature Conservancy (TNC) indicating that the shoreline has retreated between 1934 and 1997. Further, recent hurricanes have inundated the adjacent forest with salt water, dramatically affecting the habitat and accelerating invasion of exotic floral species.

Natural and/or artificial breakwaters will be constructed to protect the shoreline, salt marsh habitat. Building upon knowledge gained from prior projects, a living shoreline approach will be employed along 1.6-miles of shoreline. Construction activities will include placement breakwaters that may utilize artificial and/or shell-based materials generally following a +0.5 to +1.0 ft Mean Lower Low Water target crest elevation. The breakwaters will likely have 10 ft crest widths, based on desired wave reduction and with a height that falls within the mean high and low water lines of the site. The specific breakwater elevations and technique designs will be selected to maximize shoreline protection and meet federal and state regulatory requirements.

Average water depth is assumed to be -2' below Mean Lower Low Water. Calculated volume of material is approximately 15,800 tons of riprap and 2,200 cubic yards of oyster shell. It is anticipated that a crane mounted on the barge will be used to distribute material to the design cross-section. A footprint of approximately 2.87 acres of fine-grained and/or soft bottom sediment will be covered with riprap and oyster shell. Additionally, up to 6 warning signs placed on 12-inch diameter wooden posts will be installed adjacent to the breakwaters with appropriate signage for marine traffic. No materials are anticipated for removal from the site.

The alignment and limits of the breakwaters will be surveyed in place with the outer limits of the being marked with poles driven into the bottom and extended approximately 3' above the water surface. Elevation controls along the alignment will be established. Prior to working in an area, existing bottom elevations along the alignment will be surveyed. Height of the breakwaters along the alignment will be constructed based on bottom elevations and the proposed crest elevation. Barriers, navigation warning signs (lighted and unlighted), etc. will be established along the work area to protect boaters. These barriers will be maintained throughout the project until permanent markers are established.

This area has shallow water (1.0' – 2.0' depth, on average) and a soft bottom. It is anticipated that a crane mounted on a barge will be used to distribute material to the design cross-section. The material barge will be positioned seaward of the breakwaters in sufficient depth of water, but within reach of the crane. The material barge will be loaded so as not to exceed the draft requirements in the work area. Barges will be placed and maintained in sufficient draft to the extent practical. As a construction access alternative due to the shallow depths, dredging may be required to allow access to the site for construction of the breakwaters. The dredged excavation and width will be minimized based upon the barge size and draft. The excavation depth should be limited to allow for 8 feet of draft.

Final construction of the breakwaters will be surveyed (alignment, elevation, representative cross-sections, settlement plates, etc.). Permanent navigation signage will be installed in accordance with safety requirements.

Assuming that the reef will have an initial settlement of 0.5', a work barge with backhoe or tracked backhoe will place loose rip rap according to the design cross-section. The rip rap will be placed on material barge(s) delivered to the work area. Placement of the rip rap will be monitored to insure the breakwaters dimensions, slopes and crest elevations are achieved.

After the rip rap core of the breakwaters have been confirmed to be complete, bags of shell will be placed over the rip rap core to provide the shell veneer. The bags of shell may be placed, by hand, from shallow draft boats. Bags of shell will be prepared on-shore in an off-site location, depending on the chosen source, and loaded onto material barges and delivered to the work area. The material barges will be anchored in deeper water. The skiffs will return to the work barge to obtain more bags of shell for deployment. Placement of bags of shell will be monitored to insure the bags are properly placed and the shell veneer requirements have been met.

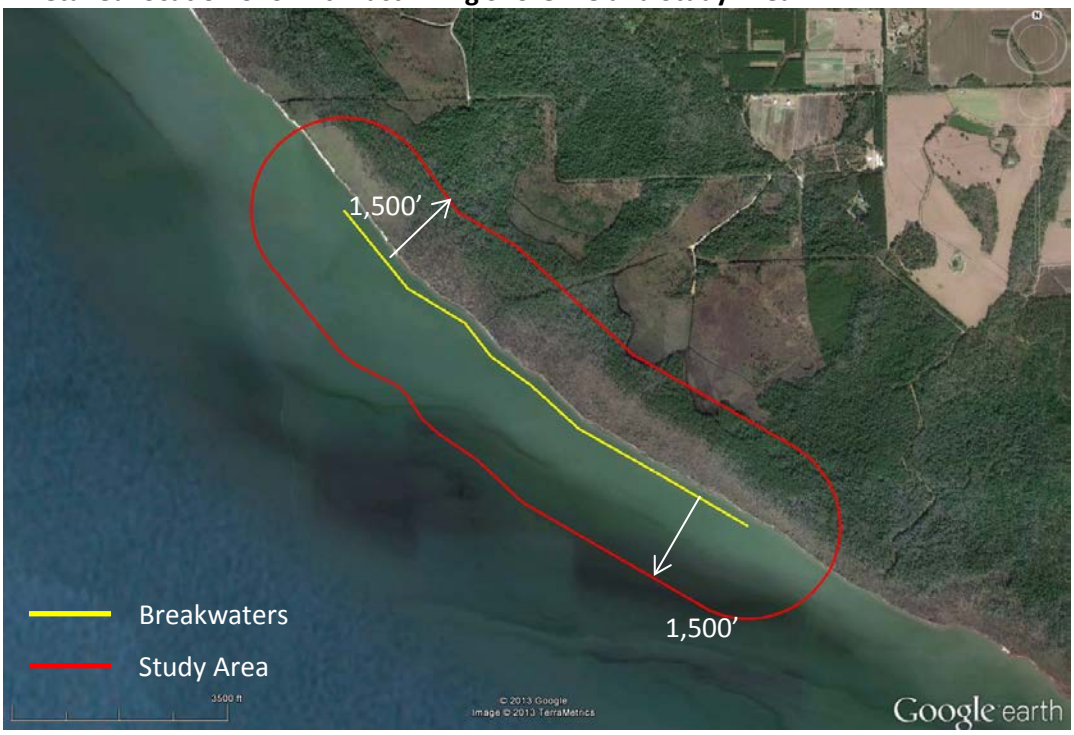
The logistics of the construction process are dependent upon the construction contractor. At this time, it is anticipated that the construction contractor will use existing land based docks and loading areas to stage rip rap and oyster materials along with construction equipment. There are several commercial sources of rip rap and shell, and no one source has been specified. Nearby small boat launches may be used for personnel access to the site. All the construction activities should be performed from water based resources with no activities on the shoreline adjacent to the site.

Final construction of breakwaters will be surveyed (alignment, elevation, representative cross-sections, settlement plates, etc.). Permanent navigation signage will be installed in accordance with safety requirements. The signs are anticipated to be installed on 12-inch diameter piles that are hydraulically pushed into place (rather than hammered or driver) to final elevation.

Monitoring will be conducted for a period of approximately 7 years following construction. Monitoring events are expected at least twice annually and access will be from the water. Existing local boat ramps (e.g. Weeks Bay) will be used. If the breakwater structures are not performing as designed or anticipated, then adaptive management procedures will be used to correct the structure. Adaptive management activities may include adding additional shell veneer to the surface of the reefs, adding additional hardened structure, and/or replacing warning signs. All monitoring and adaptive management procedures will follow the minimization measures as described below, especially as they relate to vessel use around the project area, and it is not anticipated that these actions will result in adverse impacts to EFH. If adaptive management procedures significantly differ from the construction methodologies described in this consultation, additional coordination with NMFS will be initiated

Figure 1. General Project Location

Figure 2. Detailed location of Swift Tract Living Shoreline and Study Area



3.0 ESSENTIAL FISH HABITAT

The 1996 amendments to the Magnuson-Stevens Act set forth a mandate for NMFS, regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. To achieve this goal, suitable fishery habitats need to be maintained. EFH in the project's area of effect is identified and described for various life stages of 55 managed fish and shellfish (GMFMC, 1998). A provision of the Magnuson-Stevens Act requires that FMC's identify and protect EFH for every species managed by a Fishery Management Plan (FMP) (U.S.C. 1853(a)(7)). There are FMP's in the Gulf region for shrimp, red drum, reef fishes, coastal migratory pelagics, and highly migratory species (e.g., sharks). Table 1 presents the EFH within the vicinity of the Swift Tract site.

EFH is separated into estuarine and marine components. The estuarine component is defined as "all estuarine waters and substrates (mud, sand, shell, rock and associated biological communities), including the sub-tidal vegetation (grasses and algae) and adjacent inter-tidal vegetation (marshes and mangroves)." The Swift Tract project is within a near-shore estuarine system; there is no marine component to this project. Estuarine fishes include species that inhabit the estuary for part of their life cycle and are commonly associated with seagrass beds, oyster reefs, and unvegetated soft bottom habitats.

Table 1. EFH within the vicinity of the Swift Tract Proposed Area of Effect

Management Unit	Lifestage(s) Found at Location	FMP^
Red Drum	ALL	Red Drum
Highly Migratory Species		
Scalloped Hammerhead Shark	Neonate, Juvenile	HMS*
Bonnethead Shark	Adult	HMS*
Blacktip Shark	Neonate, Juvenile	HMS*
Bull Shark	Juvenile, Adult	HMS*
Spinner Shark	Juvenile	HMS*
Atlantic Sharpnose Shark	Neonate	HMS*
Shrimp (4 Species) Brown shrimp (*Farfantepenaeus aztecus*) White shrimp (*Litopenaeus setiferus*) Pink shrimp (*Farfantepenaeus duorarum*) Royal red shrimp (*Pleoticus robustus*)	ALL	Shrimp
Coastal Migratory Pelagics King mackerel (*Scomberomorus cavalla)* Spanish mackerel (*Scomberomorus maculatus*) Cobia (*Rachycentron canadum*) Dolphin (*Coryphaena hippurus*) Little tunny (*Euthynnus alletteratus*)	ALL	Coastal Migratory Pelagics

Cero mackerel (*Scomberomorus regalls*) Bluefish (*Pomatomus saltatrix*)		
Reef Fish (43 Species) <u>Balistidae - Triggerfishes</u> Gray triggerfish (*Balistes capriscus*) <u>Carangidae - Jacks</u> Greater amberjack (*Seriola dumerili*) Lesser amberjack (*Seriola fasciata*) Almaco jack (*Seriola rivoliana*) Banded rudderfish (*Seriola zonata*) <u>Labridae - Wrasses</u> Hogfish (*Lachnolaimus maximus*) <u>Lutjanidae - Snappers</u> Queen snapper (*Etelis oculatus*) Mutton snapper (*Lutjanus analis*) Schoolmaster (*Lutjanus apodus*) Blackfin snapper (*Lutjanus buccanella*) Red snapper (*Lutjanus campechanus*) Cubera snapper (*Lutjanus cyanopterus*) Gray (mangrove) snapper (*Lutjanus griseus*) Dog snapper (*Lutjanus jocu*) Mahogany snapper (*Lutjanus mahogoni*) Lane snapper (*Lutjanus synagris*) Silk snapper (*Lutjanus vivanus*) Yellowtail snapper (*Ocyurus chrysurus*) Wenchman (*Pristipomoides aquilonaris*) Vermilion snapper (*Rhomboplites aurorubens*) <u>Malacanthidae – Tilefishes</u> Goldface tilefish (*Caulolatilus chrysops*) Blackline tilefish (*Caulolatilus cyanops*) Anchor tilefish (*Caulolatilus intermedius*) Blueline tilefish (*Caulolatilus microps*) (Golden) Tilefish (*Lopholatilus chamaeleonticeps*) <u>Serranidae – Groupers</u> Dwarf sand perch (*Diplectrum bivittatum*) Sand perch (*Diplectrum formosum*)	ALL	Reef Fish

Species/Management Unit	Lifestage(s) Found at Location	FMP
Rock hind (*Epinephelus adscensionis*)		
Speckled hind (*Epinephelus drummondhayi*)		
Yellowedge grouper (*Epinephelus flavolimbatus*)		
Red hind (*Epinephelus guttatus*)		
Goliath grouper (*Epinephelus itajara*)		
Red grouper (*Epinephelus morio*)		
Misty grouper (*Epinephelus mystacinus*)		
Warsaw grouper (*Epinephelus nigritus*)		
Snowy grouper (*Epinephelus niveatus*)		
Nassau grouper (*Epinephelus striatus*)		
Marbled grouper (*Epinephelus inermis*)		
Black grouper (*Mycteroperca bonaci*)		
Yellowmouth grouper (*Mycteroperca interstitialis*)		
Gag (*Mycteroperca microlepis*)		
Scamp (*Mycteroperca phenax*)		
Yellowfin grouper (*Mycteroperca venenosa*)		

^FMP-Fisheries Management Plan, *HMS- Highly Migratory Species

4.0 MANAGED FISH SPECIES

The seasonal and year-round locations of designated EFH for the managed fisheries are depicted on the figures available on the NMFS website (http://sero.nmfs.noaa.gov/hcd/efh.htm) and species abundance maps, both inshore and offshore, are available on the National Ocean Service (NOS) website (http://ccma.nos.noaa.gov/products/biogeography/gom-efh/). EFH figures for HMS are found in the 2009 amendments to the Consolidated Atlantic Highly Migratory Species Fisheries Management Plan. EFH for each managed fishery within the project's footprint is described below:

Red Drum FMP – EFH for red drum consists of all Gulf of Mexico estuaries; waters and substrates extending from Vermilion Bay, Louisiana to the eastern edge of Mobile Bay, Alabama out to depths of 25 fathoms; waters and substrates extending from Crystal River, Florida to Naples, Florida between depths of 5 and 10 fathoms; waters and substrates extending from Cape Sable, Florida to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council between depths of 5 and 10 fathoms.

Highly Migratory Species – HMS may be found in large expanses of the world's oceans, straddling jurisdictional boundaries. Although many of the species frequent other oceans of the world, the Magnuson Stevens Act only authorizes the description and identification of EFH in federal, state, or territorial waters, including areas of the U.S. Caribbean, the Gulf of Mexico and the Atlantic coast of the United States, to the seaward limit of the U.S. Exclusive Economic Zone (waters 3 to 200 miles offshore).

These areas are connected by currents and water patterns that influence the occurrence of HMS at particular times of the year. Due to habitat specific requirements of each species, EFH for each HMS potentially occurring in the vicinity of the Swift Tract is described below (EFH information from NMFS, 2009):

Scalloped Hammerhead Shark:

•Neonate/YOY (≤60 cm TL): Coastal areas in the Gulf of Mexico from Texas to the southern west coast of Florida. Atlantic east coast from the mid-east coast of Florida to southern North Carolina.

• Juveniles (61 to 179 cm TL): Coastal areas in the Gulf of Mexico from the southern to mid-coast of Texas, eastern Lousainia to the southern west coast of Florida, and the Florida Keys. Offshore from the mid-coast of Texas to eastern Louisiania. Atlantic east coast of Florida through New Jersey.

• Adults (≥180 cm TL): Coastal areas in the Gulf of Mexico along the southern Texas coast, and eastern Lousainia through the Florida Keys. Offshore from southern Texas to eastern Louisiania. Atlantic east coast of Florida to Long Island, NY.

Bonnethead Shark:

• Neonate/YOY (≤55 cm TL): Coastal areas in the Gulf of Mexico along Texas, and from eastern Mississippi through the Florida Keys. Atlantic east coast from the midcoast of Florida to South Carolina.

• Juveniles (56 to 81 cm TL): Coastal areas in the Gulf of Mexico along Texas, and from eastern Mississippi through the Florida Keys. Atlantic east coast from the midcoast of Florida to South Carolina.

• Adults (≥82 cm TL): Coastal areas in the Gulf of Mexico along Texas, and from eastern Mississippi through the Florida Keys. Atlantic east coast from the mid-coast of Florida to Cape Lookout.

Blacktip Shark:

• Neonate/YOY (≤75 cm TL): Coastal areas in the Gulf of Mexico from Texas through the Florida Keys. In Atlantic coastal areas from northern Florida through Georgia, and the mid-coast of South Carolina.

• Juvenile (76 to 136 cm TL): Coastal areas in the Gulf of Mexico from Texas through the Florida Keys. In Atlantic coastal areas localized off of the southeast Florida coast and from West Palm Beach, Florida to Cape Hattaras.

• Adult (≥137 cm TL): Coastal areas in the Gulf of Mexico from Texas through the Florida Keys. In Atlantic coastal areas southeast Florida to Cape Hattaras.

Bull Shark:

• Neonate/YOY (≤95 cm TL): Gulf of Mexico coastal areas along Texas, and localized areas off of Mississippi, the Florida Panhandle, and west coast of Florida;

as well as the Atlantic mid-east coast of Florida.
• Juveniles (96 to 219 cm TL): Gulf of Mexico coastal areas along the Texas coast, eastern Louisiana to the Florida Panhandle, and the west coast of Florida through the Florida Keys. Atlantic coastal areas localized from the mid-east coast of Florida to South Carolina.
• Adults (≥220 cm TL): Gulf of Mexico along the southern and mid-coast of Texas to western Louisiana, eastern Louisania to the Florida Keys. East coast of Florida to South Carolina in the Atlantic.

Spinner Shark:
• Neonate/YOY (≤70 cm TL): Localized coastal areas in the Gulf of Mexico along Texas, eastern Louisania, the Florida Panhandle, Florida west coast, and the Florida Keys; and in the Atlantic along the east coast of Florida to southern North Carolina.
• Juveniles (71 to 179 cm TL): Gulf of Mexico coastal areas from Texas to the Florida Panhandle, and the mid-west coast of Florida to the Florida Keys. Atlantic east coast of Florida through North Carolina.
• Adults (≥180 cm TL): Localized areas in the Gulf of Mexico off of southern Texas, Louisania trhough the Florida Panhandle, and from the mid-coast of Florida through the Florida Keys. In the Atlantic along the east coast of Florida, and localized areas from South Carolina to Virginia.

Atlantic Sharpnose Shark
• Neonate/YOY (≤60 cm TL): Gulf of Mexico coastal areas from Texas through the Florida Keys. In the Atlantic from the mid-coast of Florida to Cape Hattaras.
• Juveniles (61 to 71 cm TL): Gulf of Mexico coastal areas from Texas through the Florida Keys. In the Atlantic from the mid-coast of Florida to Cape Hattaras, and a localized area off of Delaware.
• Adults (≥72 cm TL): Gulf of Mexico from Texas through the Florida Keys out to a depth of 200 meters. In the Atlantic from the mid-coast of Florida to Maryland.

Shrimp FMP – EFH for shrimp consists of Gulf of Mexico waters and substrates extending from the US/Mexico border to Fort Walton Beach, Florida from estuarine waters out to depths of 100 fathoms; waters and substrates extending from Grand Isle, Louisiana to Pensacola Bay, Florida between depths of 100 and 325 fathoms; waters and substrates extending from Pensacola Bay, Florida to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council out to depths of 35 fathoms, with the exception of waters extending from Crystal River, Florida to Naples, Florida between depths of 10 and 25 fathoms and in Florida Bay between depths of 5 and 10 fathoms.

Coastal Migratory Pelagics FMP – EFH for coastal migratory pelagics consists of Gulf of Mexico waters and substrates extending from the US/Mexico border to the boundary between the areas covered by the Gulf of Mexico Fishery Management Council and the South Atlantic Fishery Management Council

from estuarine waters out to depths of 100 fathoms. Managed fish in this fishery include king mackerel, Spanish mackerel, and cobia. Non-managed fish in this fishery include cero mackerel, little tunny, dolphin, and bluefish.

Reef Fish FMP – EFH for reef fish consists of Gulf of Mexico waters and substrates extending from the US/Mexico border to the boundary between the areas covered by the Gulf of Mexico Fishery anagement Council and the South Atlantic Fishery Management Council from estuarine waters out to depths of 100 fathoms.

4.1 ECOLOGICAL NOTES ON THE EFH FISHERIES AND SPECIES

4.1.1 Red Drum

In the Gulf, red drum occur in a variety of habitats, ranging from depths of about 130 feet offshore to very shallow estuarine waters. They commonly occur in all of the Gulf's estuaries where they are associated with a variety of substrate types including sand, mud, and hardened bottom. Throughout the Gulf, red drum use seagrass meadows as nursery and foraging habitat (GMMFC, 2004). Estuaries are important to red drum for both habitat requirements and for dependence on prey species which include shrimp, blue crab, striped mullet, and pinfish (ADCNR, 2011). The GMFMC considers all estuaries to be EFH for the red drum. Schools of large red drum are common in the deep Gulf waters with spawning occurring in deeper water near the mouths of bays and inlets, and on the Gulf side of the barrier islands. Red drum use the Bon Secour Bay as adults year round and as nursery habitat (NOS, 1998a). Juvenile red drum are abundant in Mobile Bay and Bon Secour Bay year round (NOS, 1998)

4.1.2 Highly Migratory Species

Estuarine waters, like those found at the Swift Tract site, provide EFH resources for various life stages of HMS. Sharks enter the shallow estuarine bay waters to forage and feed. The shark species discussed in this assessment generally feed on a variety of small fish (such as menhaden, seatrout, croaker, and perch), shrimp, small sharks, crabs, and seagrass (most likely a result of foraging behavior) (Adams and Paperno, 2007; Barry, 1996; Curtis, No Date; Bethea et. al., 2007).

4.1.3 Shrimp

Shrimp use a variety of estuarine and marine habitats in the Gulf of Mexico. Brown shrimp are found within the estuaries to offshore depths of 110 meters (m) throughout the Gulf; white shrimp inhabit estuaries and to depths of about 40 m offshore in the coastal area extending from Florida's Big Bend area through Texas; pink shrimp inhabit the Gulf coastal area from estuaries to depths of about 65 m offshore and is the dominant species off southern Florida. Brown and white shrimp are generally more abundant in the central and western Gulf, whereas pink shrimp are generally more abundant in the eastern Gulf. Royal red shrimp are not estuarine-dependent and spend their lives in depths of 100 to 300 fathoms.

Brown Shrimp

"Brown shrimp range in the Gulf of Mexico from Florida to the northwestern coast of Yucatan. The range is not continuous but is marked by an apparent absence of brown shrimp along Florida's west coast between the Sanibel and the Apalachicola shrimping grounds. In the U.S. Gulf of Mexico, catches are high along the Texas, Louisiana, and Mississippi coasts. In estuarine areas, shrimp are typically found as postlarvae and juveniles in shallow vegetated habitats, but, occasionally, in silty sand and non-vegetated bottoms. Juveniles and sub-adults generally prefer shallow estuaries and marsh edges (plant-water interfaces). Sub-adults migrate from estuaries during outgoing high tides and adult brown shrimp typically inhabit Gulf waters from the Mean Low Water line to the continental shelf" (GMFMC, 2006). Brown shrimp use the Bon Secour Bay as a major nursery area (NOS, 1998).

White Shrimp

White shrimp are offshore and estuarine dwellers, and are pelagic or demersal depending on their life stage. The eggs are demersal and larval stages are planktonic, and both occur in nearshore marine eaters. Postlarval white shrimp become benthic upon reaching the nursery areas of estuaries, seeking shallow water with muddy-sand bottoms that are high in organic detritus. Juveniles move from estuarine areas to coastal waters as they mature. Adult white shrimp are demersal and generally inhabit nearshore Gulf waters in depths less than 100 ft on soft mud or silty bottoms. (GMFMC, 2006) White shrimp inhabit the Bon Secour Bay year round as adults and juveniles (NOS, 1998 & NOS, 1998a).

Pink Shrimp

Juvenile pink shrimp inhabit most estuaries in the Gulf but are most abundant in Florida. Juveniles are commonly found in estuarine areas with SAV (submerged aquatic vegetation). Postlarve, juvenile, and subadults may prefer coarse sand/shell/mud mixtures. Adults inhabit offshore marine waters, with the highest concentrations in depths of 30 to 144 feet (GMFMC, 2006). Pink shrimp use the Bon Secour Bay as a nursery area (NOS, 1998a) and juveniles are most abundant during the summer and spring; however, juveniles are present year round (NOS, 1998).

Royal Red Shrimp

Royal red shrimp is a deepwater species that is abundant east of the Mississippi River on the continental shelf in water depths ranging from 800 to 1,600 feet (GMFMC, 2007). These shrimp are only found within the EEZ and are managed cooperatively between state and federal partners (GMFMC, 2007). The northernmost fishing grounds of this species extends from the Mississippi River to the Perdido Bay (Alabmana-Florida border) and is strongly associated with the 500 meter contour line. It is unlikely that this species will be impacted by the work proposed at the Swift Tract site.

4.1.4 Coastal Migratory Pelagics FMP

The managed coastal migratory pelagics are Spanish mackerel, king mackerel, and cobia. The king and Spanish mackerel are jointly managed between the GMFMC and the South Atlantic Fisheries Management Council. The Swift tract is in the Western Zone of the king mackerel range, which extends from Texas to the Alabama/Florida border. The western zone group of king mackerel winter in south Texas / Mexican waters and migrate north in the summer to their spawning grounds (NMFS, 2013) Like

king mackerel, Spanish mackerel and cobia migrate south during the winter months and return north in the Spring to their spawning grounds (GMFMC & SAFMC, 1983). Mackerel tend to feed on other fishes while cobia feed on fish and crustaceans. The estuarine components of the EFH in the Mobile Bay are used for feeding, foraging, and resting during summer months. Bon Secour Bay is at the northernmost end of the coastal migratory pelagics range. Cobia are known to use the Bon Secour Bay as nursery habitat (NOS, 1998a). Spanish mackerel juveniles are common to abundant in Mobile Bay and Bon Secour Bay in spring, summer, and fall (NOS, 1998).

Non-managed coastal migratory pelagics include cero mackerel, dolphin, little tunny, and bluefish. Adult dolphin are known to use the Bon Secour Bay throughout the year (NOS, 1998) and, based on water temperature associations of larvae, spawning in the Northern Gulf likely occurs between April through December with a peak in early fall (Ditty et. al., 2004). Little tunny are schooling species that occur in tropical and subtropical waters. They are common offshore, but can be found in inshore waters over reefs (Robins et al. 1986). Little tunny larvae are often found in nearshore and offshore waters near shoals and banks (GMFMC 2004). Cero mackerel primarily occur in the Caribbean although some are caught in South Florida (Collette and Russo 1979). Bluefish occur in the Gulf of Mexico primarily from northwestern Florida to northeastern Texas (Heinemann 2002). Bluefish Larvae have been collected in the Gulf of Mexico in waters less than 100 meters deep (Ditty and Shaw 1995).

4.1.5 Reef Fish

The reef fishes FMP considers triggerfish, jacks, wrasses, snappers, tilefish and groupers. Reef fish are often found as adults associated with coral reef, limestone, hard bottom, and artificial reef substrates. Occasionally adults occur over sand, away from reefs, but these appear to be foraging individuals. There is some evidence that adults have restricted movement and do not display long migrations. Juveniles of many of the reef fish species are located in shallow, inshore areas associated especially with SAV beds and inshore reefs. There is a general tendency for older and larger fish to occur in deeper water extending to the edge of the continental shelf. Reef fish feed on a variety of invertebrates including shrimb, craps, amphipods, octopus, and squid. Larger reef fish also have a tendency to eat small fish and other larger food items. (GMFMC, 1981)

Reef fish utilize both pelagic and benthic habitats during their life cycle. A planktonic larval stage lives in the water column and feeds on zooplankton and phytoplankton. Juvenile and adult reef fish are typically demersal and usually associated with bottom topographies on the continental shelf that have high relief: i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. More detail on these habitat types is found in the Fishery Management Plan (FMP) for Corals and Coral Reefs (GMFMC and SAFMC, 1982). However, several species are found over sand and soft-bottom substrates. Juvenile red snapper are common on mud bottoms in the northern Gulf. Some juvenile snapper and grouper such as mutton, gray, dog, lane, and yellowtail snappers and jewfish, red, gag and yellowfin groupers have been documented in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems (GMFMC, 1981). Juvenile reef fish, especially those that are estuarine dependent such as grey grouper, use the EFH in the vicinity of the Swift Tract project for feeding, foraging, and resting year round, but primarily in the fall (NOS, 1998).

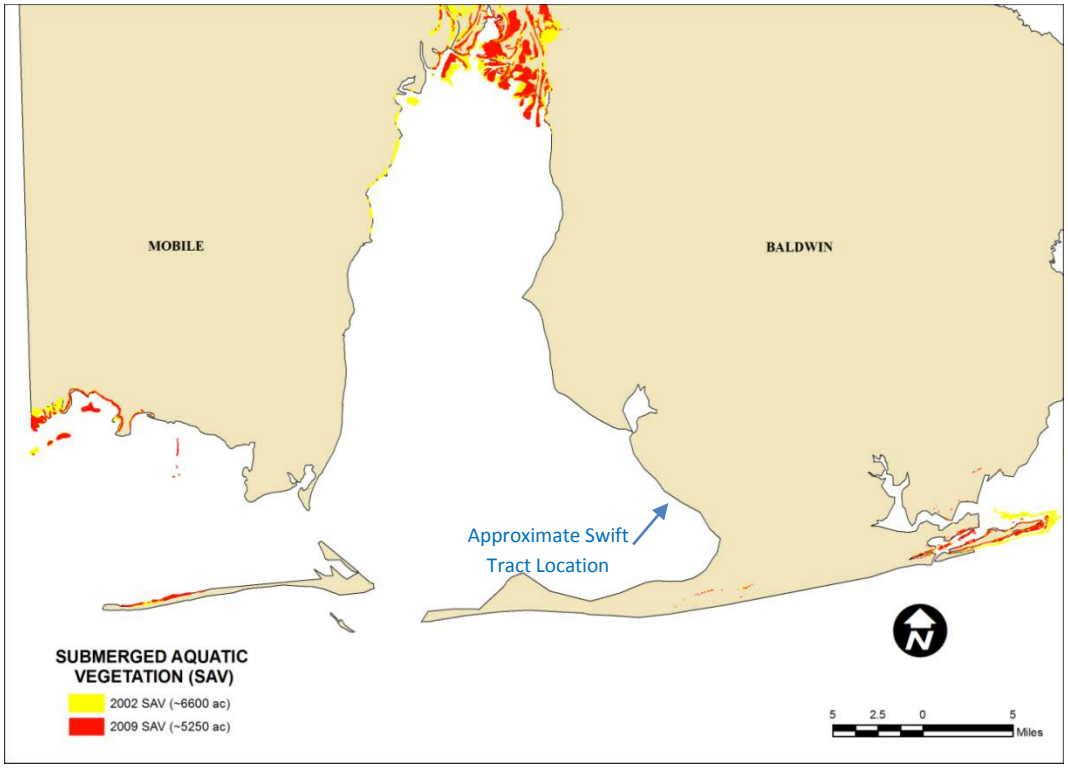
5.0 ASSESSMENT OF IMPACTS AND MITIGATIVE MEASURES

NOAA, in consultation with the contractors, will take all practicable precautions to minimize unavoidable negative impacts to EFH. The project will not result in adverse, direct impacts to emergent wetlands, existing oyster reefs, or Submerged Aquatic Vegetation (SAV). Most motile fauna such as crab, shrimp, and finfish will likely avoid the area of potential effect during the construction process. Following construction, there is expected to be increased habitat utilization of the breakwaters and near-shore environment by these species and a beneficial, long-term impact is anticipated. The project may result in minor, adverse short term impacts to benthic organisms and temporarily affect habitat utilization by individuals considered under EFH fishery management plans. The potential impacts and minimization/mitigative measure are discussed in greater detail below (Section 5.3).

5.1 IMPACTS TO EFH

Minor and temporally limited impacts to EFH components are expected to soft bottom substrates, since the Swift Tract project will be constructed in a near-shore, estuarine portion of the Mobile Bay that is considered EFH for various lifestages of the species managed under FMPs. Because of SAV's overall significance to nearly all managed fisheries, a brief description of effects is provided here. There would be no impacts to SAV expected, based on evaluations conducted for the Mobile Bay National Estuary Program in 2009.SAV in the Mobile Bay were systematically evaluated using aerial photographs in 2002, 2004, and 2009. Results of these surveys indicate that there are no known SAV beds in the vicinity of the Swift Tract Project Site (Vitter and Associates, 2009), see Figure 3. Pre-construction SAV surveys will be conducted prior to installation of breakwater materials to confirm the absence of SAV in the breakwater placement areas, flotation channel areas, and boat access areas.

Figure 3. SAV Distribution Comparison from 2002 and 2009 in the Mobile Bay



Bottom Disturbance and Turbidity

Structural Placement and Access Channels

The construction process involves placing hard structure on what is currently soft bottom in a shallow portion of Bon Secour Bay. Due to the shallow waters, it may be necessary to dredge access channels, which are not anticipated to be deeper than 8 feet, during construction. Both placement of hardened materials and dredging access channels will increase turbidity beyond existing ambient levels. Increasing turbidity will impact the water column. Impacts to the water column can affect the use of the "potential effects area" by estuarine dependent, juvenile and adult fish and adult shrimp species, which are common and highly abundant, respectively, in the Mobile Bay during most of the year (NOS, 2011). Any turbidity will be within Alabama regulatory limits for shellfish harvesting and fish and wildlife, which specify 50 Nephelometric units (NTUs) above background (ADEM, 2011).

Disturbance of the bottom sediment by dredging and placing hardened structure may affect prey availability in the project area for juvenile and adult fish. The adverse impacts from dredging and placing material will be localized and temporary, affecting individuals and not entire populations. Since potential impacts will be localized and temporary, there are no expected impacts to populations since spawning, feeding, and resting occurs over broad areas. Following construction and stabilization of the access channel areas, if constructed, and breakwaters, it is expected that the breakwaters will developd into reefs that attract transient fish, blue crabs, shrimp, and other shellfish (Gregalis et. al., 2009).

Increased Boat Traffic

Increased boat traffic in the vicinity of the Swift Tract project site may result in adverse impacts to soft bottom material through prop dredging. Prop dredging results when the outboard motor of a vessel or the hull of the vessel is operated in water too shallow resulting in dragging, or "scarring," along the bottom substrate. Prop scarring would have an adverse impact to bottom-dwelling organisms and fish in the area of potential effect. Impacts to bottom dwelling organisms would temporarily affect foraging and resting behavior of estuarine dependent fish species. These impacts would be temporary and the impacted area will be recolonized rapidly by benthic organisms.

Piling Installation

Installation of pilings can be accomplished using different methods including driving, jetting, or pushing. Pushing pilings has the least harmful effect to bottom substrates, water quality, and construction based acoustical noise and vibration. Pushing pilings is the installation method of choice at the Swift Tract site and is feasible due to the soft substrate. Driving pilings creates less turbidity than jetting pilings. If pilings are jetted, there may be a minor adverse impact to the water column due to increased turbidity. Driving and jetting piling installation techniques would result in minor adverse impacts to the benthic community and the use of the potential effects area by transient fish. These impacts would be temporary and small scale and will not have wide-ranging impacts to EFH beyond the piling installation footprint.

Natural Shell Sourcing

Adverse impacts to EFH may result depending on the source from which shell for the breakwaters is obtained. Shells are commonly acquired via two methods, dredging and purchase through shucking houses. Dredge shell programs obtain buried shells by dredging areas, which can cause short-term turbidity problems. In addition, any aquatic organisms in the area would be eliminated. The other method of obtaining shell is to purchase them through shucking houses. This method has no adverse impacts to the aquatic environment. In addition, shell should only be obtained from shucking houses where no impacts to habitat were made during shell acquisition. There are several commercial sources of rip rap and shell, and no one source has been specified for use at the Swift Tract site.

5.2 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

Direct

Direct impacts will be limited to the area directly around the construction site and piling installation areas where sediments will be disturbed by placement of hardened breakwater material, dredging access channels, if necessary, and installing pilings. These adverse direct impacts will be short term and it is expected that ambient conditions will be restored following cessation of work each day. Once the breakwaters are stabilized, a long-term beneficial impact is expected due to the newly created habitat that will attract infauna (aquatic animals that live in the sediment), shellfish, crustaceans, and transient fish.

Indirect

Indirect adverse impacts are not expected in the short or long term. Long-term indirect beneficial impacts are expected to EFH resources in close proximity to the Swift Tract project due to anticipated increases in use of this area by transient adult and juvenile fish as foraging grounds.

Cumulative

The Swift Tract living shoreline project will have a beneficial cumulative impact on the estuarine habitats managed by the Weeks Bay National Estuarine Research Reserve. This project, in conjunction with The Nature Conservancy's living shoreline to the south, will protect more than two miles of shoreline fronting the State owned Swift Tract property. The cumulative impact of these structures and the anticipated calm water conditions landward of the breakwaters are expected to create conditions favorable to SAV colonization and to generally improve water quality. Increases in SAV coverage, structural habitat, and reducing shoreline erosion will improve EFH in Bon Secour Bay.

5.3 PROPOSED MITIGATIVE MEASURES AND GUIDELINES FOR EFH PROTECTION

1. Use of Best Management Practices (BMP)

Best management practices (BMPs) are measures to minimize and avoid all potential adverse impacts to EFH during Swift Tract project construction and monitoring. This conservation measure requires the use of BMPs during construction to reduce impacts from project implementation. BMPs shall include but are not limited to:

a. Using floating turbidity screens if there is a "substantial visible contrast with the natural appearance of waters or interfere with any beneficial uses which they serve" (ADEM, 2011) or if in-water readings are greater than 50 NTUs above background conditions.
b. Locating staging areas in the vicinity of boat ramps that will be used for loading and unloading breakwater and shell materials to minimize placement of material in an area larger than the potential effect area.
c. If access channels are not dredged, barges will only be loaded so the draft of each vessel is no deeper than the water in which they are operating

2. Pushed piling installation
Pilings will be pushed into place rather than driving or jetting pilings.

3. Follow Manatee and Sea Turtle Standard FWS conditions
The contractor will follow the FWS' standard manatee construction conditions and NMFS standard sea turtle and smalltooth sawfish conditions, as required under Endangered Species Section 7 consultations. The construction procedures outlined in these documents require boats to operate at idle speeds, ensure that contractors observe the construction area for manatees and sea turtles, and require regular monitoring and maintenance of turbidity barriers, if used. Following these guidelines will help minimize potential prop dredging, and subsequent bottom disturbance, and will help minimize impacts to individual fish species since boats will be moving slowly through the construction zone.

4. Obtain Shell from Shucking Houses Instead of From Dredged Sites
Where practicable, only shell obtained from shucking houses that did not impact the aquatic environments will be utilized for reef construction.

5. Monitor Structure & Adaptively Manage Structure
Monitoring will be conducted before, during, and after project implementation to ensure compliance with project design and restoration success. If immediate post-construction monitoring reveals that unavoidable impacts to EFH have occurred, appropriate coordination with regional EFH personnel will take place to determine appropriate response measures, possibly including mitigation. If additional adaptive management of the breakwater structure is necessary after monitoring evens, all minimization measures discussed above will be followed.

6. Post-Project Implementation Removal
Any temporary access channels will be filled in following construction to re-establish baseline elevations. Monitoring will assess whether unexpected impacts to EFH have occurred.

6.0 CONCLUSIONS

Overall, there will not be a substantial adverse impact to EFH. The potential adverse impacts related to the Swift Tract project construction will be minimal and temporary. The potential long-term benefits to EFH, especially for shrimp, red drum, and juvenile coastal pelagics and reef fish include increased

foraging habitat, increased cover for juveniles, improved water quality, and the potential for conditions favorable to SAV colonization (due to decreased wave energy).

7.0 REFERENCES/LITERATURE CITED

Alabama Department of Conservation and Natural Resources . 2011. Red Drum. <http://www.outdoor alabama.com/fishing/freshwater/fish/drum/red/>. Accessed September 9, 2013

Alabama Department of Environmental Management, Administrative Code Chapter 335-6-10 "Water Quality Criteria, Amended January 18, 2011 .

Barry, P.K. 1996. Feeding Habits of Blacktip Sharks, *Carcharhinus limbatus*, and Atlantic Sharpnose Sharks, *rhizoprionodon* terraenovae, in Louisiana Coastal Waters. A ThesisSubmitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College, Department of Oceanography and Coastal Science. Baton Rouge, Louisiana.

Bethea, D.M., L. Hale, J.K. Carlson, E. Cortés, C. A. Manire, and J. Gelsleichter. 2007. Geographic and ontogenetic variation in the diet and daily ration of the bonnethead shark, *Sphyrna tiburo*, from the eastern Gulf of Mexico. Mar. Biol. 152:1009-1020.

Collette, B.B., and J.L. Russo. 1979. An introduction to the Spanish mackerels, genus Scomberomorus. In: Nakamura and Bullis (eds.), Proceedings: Colloquium on the Spanish and king mackerel resources of the Gulf of Mexico. Gulf States Marine Fisheries Commission, No. 4. p. 3-16.

Curtis, T. No Date. Bull Shark.<http://www.flmnh.ufl.edu/fish/Gallery/Descript/bullshark/bullshark.htm >. Accessed September 16, 2013

Ditty, J.G. and R.F. Shaw. 1995. Seasonal occurrence, distribution, and abundance of larval bluefish, Pomatomus saltatrix (family: Pomatomidae) in the northern Gulf of Mexico. Bull. Mar. Sci. 56:592-601.

Ditty J.G., R.F. Shaw, C.B. Grimes, and J.S. Cope. 1994. Larval development, distribution, and abundance of common dolphin, *Coryphaena hippurus*, and pompano dolphin, *C. equiselis* (family: Coryphaenidae), in the northern Gulf of Mexico. Fish. Bull. 92:275-291.

Godcharles, M. F. , and M. D. Murphy. 1986. Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (south Florida) -- king mackerel and Spanish mackerel. U. S. Fish Wildl. Serv. Biol. Rep. 82(11.58). U. S. Army Corps of Engineers, TR EL-82-4. 18 pp.

Gregalis, K.C., Johnson, M.W., and Powers, S.P. 2009. Restored Oyster Reef Location and Design Affect Responses of Resident and Transient Fish, Crab, and Shellfish Species in Mobile Bay, Alabama. Transactions of the American Fisheries Society 138:314-327.

GMFMC. 2004. Final Environmental Impact Statement for the Generic Essential Fish Habitat Amendment to the following fishery management plans of the Gulf of Mexico (GOM): Shrimp Fishery of the Gulf of Mexico, Red Drum Fishery of the Gulf of Mexico, Reef Fish Fishery of the

Gulf of Mexico, Stone Crab Fishery of the Gulf of Mexico, Coral and Coral Reef fishery of the Gulf of Mexico, Spiny Lobster Fishery of the Gulf of Mexico and South Atlantic, Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic. GMFMC, Tampa, Florida. 118 p.

Gulf of Mexico Fishery Management Council. 1998. Generic Amendment for Addressing Essential Fish Habitat Requirements in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery of the Gulf of Mexico, United States Waters, Red Drum Fishery of the Gulf of Mexico, Reef Fish Fishery of the Gulf of Mexico, coastal Migratory Pelagic Resources (Mackerels) in the Gulf of Mexico and South Atlantic, Stone Crab Fishery of the Gulf of Mexico, Spiny Lobster in the Gulf of Mexico and South Atlantic, Coral and Coral Reefs of the Gulf of Mexico. Gulf of Mexico Fishery Management Council, 3018 U.S. Highway 301 North, Suite 100, Tampa, Florida. October 1998.

Gulf of Mexico Fishery Management Council and South Atlantic Fishery Management Council. 1983. Fishery Management Plan, Final Environmental Impact Statement Regulatory Impact Review, Final Regulations for the Coastal Migratory Pelagic Resources in Gulf of Mexico and South Atlantic Regions. GMFMC, Tampa, FL & SAFMC, Charleston, SC. February, 1983.

Gulf of Mexico Fishery Management Council. 1981. Final Environmental Impact Statement and Fisheries Management Plan for the Reef Fish Resources of the Gulf of Mexico. GMFMC, Tampa, FL. August 1981.

Heinemann, D. 2002. Preliminary assessment of bluefish, Pomatomus saltatrix, in the Gulf of Mexico. NMFS-SEFSC, Miami, Florida. Sustainable Fisheries Division Contribution SFD-01/02-159.

NMFS. 2013. "Making sense of Mackerel Zones. <http://sero.nmfs.noaa.gov/sustainable_fisheries /gulf_sa/cmp/documents/pdfs/making_sense_of_mackerel_081213.pdf>. Accessed September 10, 2013

NMFS. 2009. Final Amendment 1 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan, Essential Fish Habitat. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, Silver Spring, MD. Public Document. pp. 395.

National Ocean Service (NOS). 1998. Gulf of Mexico Essential Fish Habitat, LA/MS/AL. Center for Coastal Monitoring and Assessment. <http://ccma.nos.noaa.gov/products/biogeography/gom-efh/lma.aspx>. Accessed September 9, 2013.

NOS, 1998a. Gulf of Mexico Essential Fish Habitat: Offshore Products. Center for Coastal Monitoring and Assessment. < http://ccma.nos.noaa.gov/products/biogeography/gom-efh/offshore.aspx#red>. Accessed September 11, 2013.

Robins, C.R., G.C. Ray, and J. Douglass. 1986. Peterson field guides: Atlantic coast fishes. Houghton Mifflin Company, Boston. 354 p.

Vittor, B.A. and Associates. 2009. Submerged Aquatic Vegetation Mapping in Mobile Bay and Adjacent Waters of Coastal Alabama in 2008 and 2009. A report to the Mobile Bay National Estuary Program. Mobile, Alabama.