United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/DH NRDAR

JAN 13 2014

Memorandum

To: Field Supervisor Mississippi Field Office

From: Deputy Deepwater Horizon Department of the Interior Natural Resource Damage Assessment and Restoration (NRDAR) Case Manager

Subject: Informal Consultation Request for the proposed Hancock County Marsh Living Shoreline Restoration, Mississippi

As you are no doubt aware, on or about April 20, 2010, the mobile offshore drilling unit *Deepwater Horizon* experienced an explosion, leading to a fire and its subsequent sinking in the Gulf of Mexico (the Gulf). These events resulted in the discharge of an estimated 5 million barrels (210 million gallons) of oil into the Gulf over a period of approximately 3 months. In addition, various response actions were undertaken in an attempt to minimize impacts from spilled oil. These events are hereafter collectively referred to as the Oil Spill.

The Department of the Interior (DOI), acting through the U.S. Fish and Wildlife Service (the Service) and other Bureaus, is a designated natural resource trustee agency authorized by the Oil Pollution Act of 1990 (OPA) and other applicable federal laws to assess and assert a natural resource damages claim for this Oil Spill. DOI is only one of several Trustees, including the state of Mississippi Trustee, Mississippi Department of Environmental Quality, so authorized. Consistent with their federal and state authorities, the Trustees are investigating the resource injuries and losses that occurred as a result of the Oil Spill and have initiated restoration planning to identify the actions that will be needed or appropriate to restore injured resources and to make the public whole for the injuries and losses that occurred. This process is known as a Natural Resource Damage Assessment (NRDA).

On April 20, 2011, DOI, the National Oceanic and Atmospheric Administration and the Trustees for the five Gulf states affected by the Oil Spill entered into an agreement with BP, a responsible party for the Oil Spill, under which BP agreed to provide $1 billion for early restoration projects in the Gulf to address injuries to natural resources caused by the Oil Spill. The early restoration project has been proposed in a draft early restoration plan that was released for public comment and review on December 6, 2013. If the Trustees select the project after consideration of public comment and a stipulated agreement is reached with BP, the early restoration project will be implemented by the Mississippi Department of Environmental Quality. DOI, acting through the Service, will be a co-Trustee for the project, if it is selected and implemented.

The above facts lead us to the conclusion that consultation (and conference) under Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), is required for this project and we wish to engage in such consultation. Accordingly, we have reviewed the proposed Hancock County Marsh Living Shoreline Restoration, Mississippi for potential impacts to listed, proposed, and candidate species and proposed and designated critical habitats in accordance with section 7 of the ESA. We have determined that the proposed project may affect, but is not likely to adversely affect West Indian manatee (*Trichechus manatus*). We have also reviewed the proposed project for impacts to bald eagles and migratory birds in accordance with the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703–712), respectively. Consultation will also be initiated with National Marine Fisheries Service for species where ESA regulatory authority is shared and in regards to Marine Mammal Protection Act (MMPA) of 1972, as amended (16 U.S.C. 1461 *et seq.*).

We request your review of and concurrence/conference with the attached intra-Service Section 7 Biological Evaluation form describing the proposed project, potential effects, conservation measures and justifications for our determinations. If you have questions or concerns regarding this request for consultation, please contact Holly Herod, Fish and Wildlife Biologist, at 404-679-7089 or holly_herod@fws.gov.

Attachment

SOUTHEAST REGION
INTRA-SERVICE SECTION 7
BIOLOGICAL EVALUATION FORM

Originating Person: Holly Herod; prepared by Stephen Parker (representing MS DEQ)
Telephone Number: Holly Herod: 404-679-7089; Stephen Parker 228-224-9057
E-Mail: holly_herod@fws.gov; sparker@adaptivemngmt.com
Date: December 31, 2013

PROJECT NAME (Grant Title/Number): Hancock County Marsh Living Shoreline (Early Restoration Project)

I. Service Program:

_X_ **NRDAR**
___ **Ecological Services**
___ **Federal Aid**
- ___ **Clean Vessel Act**
- ___ **Coastal Wetlands**
- ___ **Endangered Species Section 6**
- ___ **Partners for Fish and Wildlife**
- ___ **Sport Fish Restoration**
- ___ **Wildlife Restoration**

___ **Fisheries**
___ **Refuges/Wildlife**

II. State/Agency: Mississippi Department of Environmental Quality

III. Station Name: DOI Deepwater Horizon Case Management Team, USFWS Southeast Regional Office, Atlanta, Georgia 30345

IV. Location (attach map): *See Figure 1*

A. **Ecoregion Number and Name:** 4/Southeast

B. **County and State:** Hancock County, Mississippi

C. **Section, township, and range (or latitude and longitude):** Centroid = -89.457, 30.19

D. **Distance (miles) and direction to nearest town:** Approximately 3.5 miles NNW to Ansley, MS from project centroid.

V. Description of Proposed Action and Habitats in the Action Area (attach additional pages as needed):

Introduction and Background

The restoration activities proposed for this project would be located in western Hancock County, Mississippi, between Bayou Caddy and the mouth of the East Pearl River (Figure 1). This marsh complex is part of the extensive Pearl River estuary where the land is largely in public ownership

and managed by the Mississippi Department of Marine Resources (MDMR) as part of the Coastal Preserves of the State of Mississippi. The 13,570-acre preserve consists of marsh, including tidal channels, lagoons, and bays, representing one of the largest marsh habitats in Mississippi. Historically, there were extensive, prolific reefs of the American oyster (*Crassostrea virginica*) in the shore zone and nearshore areas of lower Hancock County that provided natural protection to the shore from erosion. High erosion rates particularly at St. Joseph's Point make this shoreline a priority for protection and marsh creation. Both the *Mississippi Coastal Improvement Plan* and the *Project Management Plan for Beneficial Use Projects along Coastal Mississippi* cite this area as a priority project site.

The Hancock County Marsh Living Shoreline project will include shoreline/marsh protection, marsh creation, restoration and increased benthic secondary productivity. Specifically, the proposed project consists of three restoration components:

- Use of living shoreline techniques that utilize natural and artificial breakwater material to stabilize eroding shorelines by dampening wave energy while encouraging reestablishment of habitat that was once present in the region.
- Creation of 46 acres of salt marsh habitat in areas that have experienced high rates of shoreline and marsh habitat erosion.
- Placement of 46 acres of oyster cultch in areas that have historically supported oyster habitat.

Living Shorelines (Breakwaters)

For this project, the living shoreline is defined as a breakwater made of limestone with oyster shell veneer that provides erosion control benefits and enhances natural shoreline habitat. The breakwaters would be constructed at two locations: along St. Joseph's Point (eastern reach) and Pearl River to Heron Bay (western reach).

- **St. Joseph's Point Breakwater (eastern reach):** This breakwater would be approximately 4 miles long, extending from Heron Bay to approximately 4 miles to the northeast, with a crest width of 15 feet and total height of approximately 4 feet (to +0.87 ft., North American Vertical Datum [NAVD]). The breakwater would have a footprint of approximately 14.4 acres and would be placed on a substrate of fine-grained sediment. It would be composed of a core of limestone riprap covered by a 9-inch thick layer of bagged oyster shell.

- **Pearl River to Heron Bay Breakwater (western reach):** This breakwater would be approximately 1.9 miles long with a crest width of 15 feet and a total height of approximately 4.0 feet (to +0.87 ft., NAVD). Its design and sediment substrate are to be similar to the St. Joseph's Point breakwater, described above. The Pearl River to Heron Bay breakwater project area footprint will be approximately 5.5 acres consisting of fine-grained sediment.

Creation of Marsh in the Vicinity of St. Joseph's Point

A total of 46 acres of marsh would be created in one to several locations. Salt marshes are defined as transitional marsh areas between land and water that occur in coastal areas at salinities at or approaching that of ocean water. Typical vegetation in salt marsh habitat includes species such as *Spartina alterniflora*, *Juncus romerianus*, and *Distichlis spicata.* The area behind the constructed breakwater at St. Joseph's Point would be backfilled with dredged material and allowed to re-vegetate by natural colonization of estuarine marsh species. Dredged fill material would be obtained through the Mississippi Beneficial Sediment Use Program as available or excavated from a suitable, nearshore/offshore borrow source. Dredged material would be hydraulically placed to obtain the target elevation.

Placement of Oyster Reef Cultch in Heron Bay

Oyster cultch would be deployed over 46 acres in Heron Bay in areas that currently support or previously supported oyster production. Oyster reefs are defined as large colonial aggregations of living oysters and other bivalves that can have subtidal as well as intertidal portions, and provide habitat for a community of other species (e.g., tunicates, fish, crabs, worms, mussels, bryozoans, and barnacles). Oyster cultch deployment would occur generally in water depths of -3 to -5 feet Mean Lower Low Water (MLLW). The reef(s) would be sited based on data gathered from an oyster presence survey, and would consist of a 6 to 9-inch thick layer of oyster shell. marsh platform.

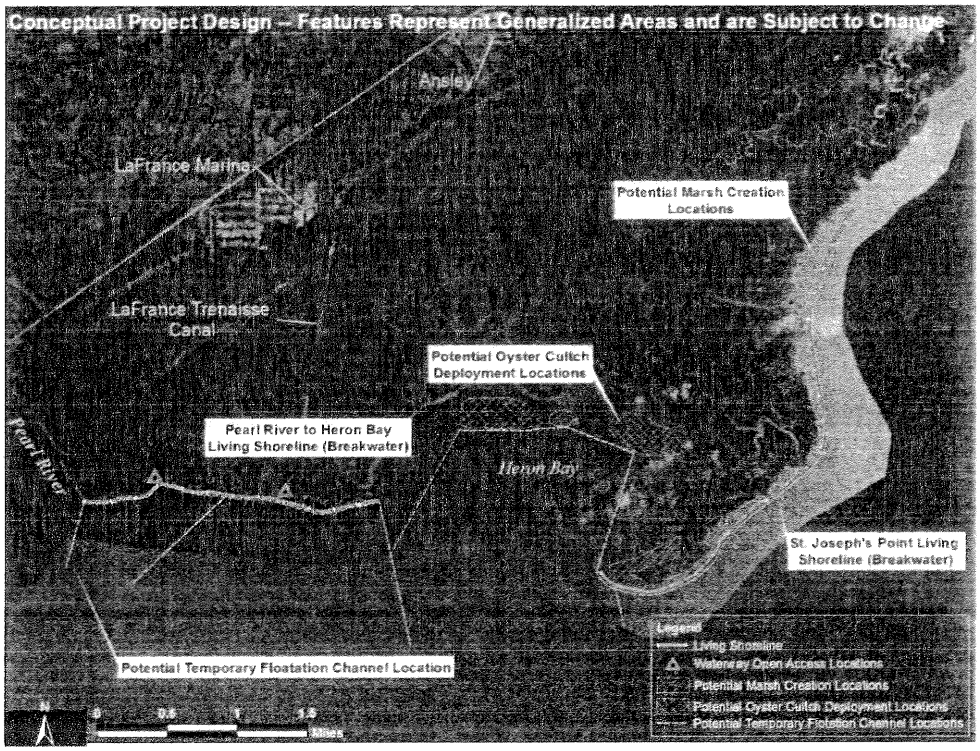

Figure 1: Conceptual Hancock County Marsh Living Shoreline Project Components

Project Location

The proposed project is located in Hancock County, Mississippi (Bounding Coordinates: West -89.530339 W, 30.184 N; South: -89.462 W, 30.169 N; East: -89.415 W, 30.233 N; North: -89.53 W, 30.184 W. Centroid = -89.457 W, 30.19 N). The Hancock County marsh is a 13,570-acre preserve managed by the MDMR and is the second largest continuous marsh area in the state. The preserve includes adjoining marshlands bordering the Mississippi Sound from the Pearl River to St. Joseph's Point. The project area includes the shoreline of the Hancock County marsh from the mouth of the Pearl River on the west to approximately 1.86 miles past the heel of St. Joseph's Point, including Heron Bay. On the seaward side, the project area extends approximately to the -8 ft. contour from the proposed breakwater to incorporate temporary flotation channels that will be utilized by work barges during construction.

Construction and Installation

Living Shorelines (Breakwaters)

The specific breakwater elevation and design was selected to maximize shoreline protection and meet individual state regulatory requirements. Construction would include placement of linear structures that would utilize artificial and/or shell based materials at approximately the -3.5 ft msl contour.

The alignment and limits of the breakwaters would be surveyed with the outer limits of the breakwaters being marked with poles driven into the bottom and extended approximately 3 feet above the water surface. The height of the breakwaters along the alignment would be constructed based on bottom elevations and the reef's crest elevation (0.87 foot NAVD88 – Mean Tide Level). Barriers, navigation warning signs (lighted and unlighted), and other safety devices would be installed along the work area to protect boaters.

The breakwaters would be approximately 30 feet wide at the base, 15 feet wide at the crest, to approximately 4 feet thick. The riprap core of the breakwaters would either be constructed using loose boulders or 'marine mattresses', consisting of 2 to 6 inch diameter rocks assembled on land. The core material would be transported to the work area on barges and installed by a crane located on a separate barge. Placement of the riprap core would be monitored to ensure the breakwater dimensions, slopes, and crest elevations are achieved. After installation of the riprap core, it would be covered with bags of shell. The deployment of the breakwaters may extend over a period of ten to twelve months. Total installed volumes would be as follows:

- *St. Joseph's Point Breakwater (Eastern Reach):* The target depth for deployment is approximately -3.5 MLLW. The volume of placed material would be approximately 51,600 cubic yards of riprap and 16,400 cubic yards of shell. The breakwater would cover a footprint of approximately 14.4 acres of fine-grained sediment.

- *Pearl River to Heron Bay Breakwater (Western Reach):* The target depth for deployment is between approximately -3.5 MLLW. The volume of placed material would be

approximately 16,900 cubic yards of riprap and 6,300 cubic yards of shell. The breakwater would cover a footprint of approximately 5.5 acres of fine-grained sediment.

The project is designed to use temporary flotation channels (Figure 1) to facilitate access for work barges into the work area. A channel will be excavated parallel to the alignments of the two breakwaters (Figure 1). Additional channels will be excavated perpendicular to these channels to provide access from the Mississippi Sound to allow work barges entry and exit for the project area. The excavated dredged material would be cast on the seaward side of the channels so that they would naturally fill back in after construction. The depth of the channels would be 8 feet below MLLW to accommodate barge draft. The bottom width of the channels would be approximately 80 feet with 3H:1V side slopes. The entry locations for the channels would be determined by analyzing the shortest distance from the breakwaters to the appropriate depth on -8 ft. and excavated using best management practices to minimize environmental impacts. The preliminary flotation channel footprint for the purposes of project planning was calculated based on an estimate of a heavy loaded barge. Proposed flotation channel dimensions are summarized in Table 1.

Table 1 – Preliminary Temporary Flotation Channel Footprint

Component	Dimension
Channel Length	55,008 ft.
Barge Draft	8 ft.
Channel Width	80 ft.
Area Temporarily Impacted	101 acres

After completion of construction, the breakwater structure would be surveyed and permanent navigation signs would be installed in accordance with safety requirements.

Creation of Marsh in the Vicinity of St. Joseph's Point

After the breakwater along St. Joseph's Point has been installed, selected areas landward of the breakwater would be filled with dredged material obtained from the MDMR Beneficial Use of Sediment Program if material is available, or a suitable nearshore/offshore borrow source. A dike would be constructed at the seaward extent of the marsh. The dike would be constructed by excavating existing material from the landward side of the dike. Once an area of the marsh is diked, the area landward of the dike would be filled with dredged material until final marsh grades are achieved. Sediment would be pumped through a floating pipeline from a hydraulic dredge located where suitable fill material is available. Pumps and sediment controls would remain in place throughout the dredging and filling process, and after initial settling has occurred. Once the entire marsh area(s) is constructed, the area would be monitored for natural re-vegetation.

Placement of Oyster Cultch Reefs in Heron Bay

Oyster cultch would be deployed in Heron Bay in water depths of -3 to -5 feet MLLW in areas that currently support or previously supported oyster production. An oyster presence survey has been completed that identified suitable areas. The cultch would be deployed as a 6 to 9-inch thick layer of oyster shell. Prior to deployment, the limits of the oyster cultch deployment area(s) would be marked with buoys or poles. Oyster shells would be deployed by a barge-mounted crane with a clam shell bucket. A material barge loaded with oyster shells would be moored to the crane barge. As a construction alternative, water jetting of loose shell off of a material barge may be used in case of water depth constraints. Upon completion, the deployment area would be surveyed.

Best Management Practices

Construction timing would be limited to the May to October timeframe to avoid disturbance to Gulf Sturgeon migration patterns in the area. Work barges would be moored for overnight and weekends/holidays in areas where previous impacts have occurred (flotation channels, deployment areas). Spoil from flotation channels will be placed on the seaward side of the channel to facilitate current-driven backfilling of channels.

Operations and Maintenance

Anticipated pre- and post-construction monitoring activities

Monitoring activities would be performed prior to construction as well as for up to seven years after construction. Monitoring activities would include:

- Topographic/bathymetric surveys
- Vegetation surveys (species composition and percent cover)
- Oyster and invertebrate monitoring (density and biomass)

The project will incorporate a mix of monitoring efforts to ensure project designs are correctly implemented during construction and in a subsequent period, where corrective action could be taken.

Post-construction performance monitoring will be conducted to observe the performance of the physical breakwater structures (breakwater height, structural integrity, settling rate, etc.), and marsh (elevation, settling rate, etc.) to allow for corrective action, if needed in the opinion of the MDEQ..

Post-construction performance monitoring would also evaluate the project's performance over time with respect to the restoration goals and objectives. Specifically, this monitoring would evaluate the production and support of organisms on the breakwater (e.g., secondary production) and the performance of the created marsh. Monitoring parameters would include the following: water quality (e.g., salinity, dissolved oxygen); vegetative monitoring; and invertebrate infauna and epifauna composition and biomass.

Anticipated short-term maintenance activities

The breakwater is anticipated to experience the greatest consolidation of the subgrade in the first years following construction. Within four years following construction, a maintenance activity on the breakwater structure may be necessary to add more riprap or shell material. Need for additional placement of rock and/or shell on the breakwater would be assessed during the regular monitoring. Maintenance construction methods would be similar to the construction methods of the original breakwater structure as described in Section 1.3.

Anticipated long-term maintenance activities

No other operations or maintenance activities are anticipated.

VI. Federally Listed Species and Critical Habitat in Project County (Hancock, MS species list and habitat descriptions dated Feb 2013 obtained from Mississippi Ecological Services Field Office website):

SPECIES/CRITICAL HABITAT	STATUS[1]	HABITAT PREFERENCE	HABITAT OR PCE'S PRESENT
Green turtle (*Chelonia mydas*) **Also Consulting with NOAA NMFS**	T	Shallow coastal waters with SAV and algae, nests on open beaches	Terrestrial – No Aquatic - Yes
Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) **Consulting with NOAA NMFS**	T	Migrates from large coastal rivers to coastal bays, estuaries, and barrier islands	Yes
Critical Habitat Gulf sturgeon **Consulting with NOAA NMFS**	CH	PCEs as summarized: include abundant food items within riverine habitats for larval and juvenile life stages; and estuarine and marine habitats and substrates for subadult and adult life stages; riverine spawning sites with substrates suitable for egg deposition and development; riverine aggregation areas; a flow regime necessary for normal behavior, growth, and survival of all life stages in the riverine environment; water quality chemical characteristics necessary for normal behavior,	Yes

SPECIES/CRITICAL HABITAT	STATUS[1]	HABITAT PREFERENCE	HABITAT OR PCE'S PRESENT
		growth, and viability of all life stages; sediment quality necessary for normal behavior, growth, and viability of all life stages; and safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats.	
Hawsbill turtle (*Eretmochelys imbricata*) **Also Consulting with NOAA NMFS**	E	Coral reefs, open ocean, bays, estuaries, nests on open beaches; not on Hancock Co. species list, included for consideration with other sea turtles.	Terrestrial – No Aquatic - Yes
Kemp's ridley turtle (*Lepidochelys kempii*) **Also Consulting with NOAA NMFS**	E	Nearshore and inshore coastal waters; neritic zones with muddy or sandy substrate, nests on open beaches	Terrestrial – No Aquatic - Yes
Leatherback turtle (*Dermochelys coriacea*) **Also Consulting with NOAA NMFS**	E	Open ocean, coastal waters, nests on open beaches	Terrestrial – No Aquatic - Yes
Loggerhead turtle (*Caretta caretta*) **Also Consulting with NOAA NMFS**	T	Open ocean; also inshore areas, bays, salt marshes, ship channels, and mouths of large rivers, nests on open beaches	Terrestrial – No Aquatic - Yes
West Indian manatee (*Trichechus manatus*)	E	Fresh, brackish, and salt water in large coastal rivers, bays and estuaries	Yes
Piping Plover (*Charadrius melodus*)	T	Beaches and mudflats in southeastern coastal areas	nearby
Critical Habitat Piping plover	CH	PCEs: Sand or mud flats (or both) with no or sparse emergent vegetation.; Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers; Important components of the beach/dune ecosystem include surf-cast algae, sparsely	nearby

SPECIES/CRITICAL HABITAT	STATUS[1]	HABITAT PREFERENCE	HABITAT OR PCE'S PRESENT
		vegetated back beach and salterns, spits, and washover areas; Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action.	
Red knot (*Calidris canutus rufa*)	P	Sandy beaches, tidal mudflats, salt marshes, and peat banks. May forage along beaches, oyster reefs, and exposed bay bottoms while roosting on high sand, flats, reefs, and other sites protected from high tides.	Nearby
Inflated heelsplitter (*Potamilus inflatus*)	T	Riverine, Lower Pearl River, Noxubee, and Tombigbee watersheds in areas with moderate to swift currents, riffle/shoals areas with stable bottoms of sandy gravel or firm mud, gravel, and cobble.	No
Pearl darter (*Percina aurora*)	C	Stable gravel riffles or sandstone exposures with large sized gravel or rock; freshwater riverine in the Pearl and Pascagoula river systems.	No
Louisiana quillwort (*Isoetes louisianensis*)	E	Mineral soil, usually light gray in color, in bottomlands that are periodically washed free of leaves and debris, lives in water or in very wet habitats	No
Louisiana black bear (*Ursus americanus luteolus*)	T	Bottomland Hardwood and flooplain Forest; habitats must contain hard mast, soft mast, escape cover, denning sites, forested dispersal corridors, and limited human access	No
Ringed map turtle (*Graptemys oculifera*)	T	Riverine, river stretches with moderate currents, abundant	No

SPECIES/CRITICAL HABITAT	STATUS[1]	HABITAT PREFERENCE	HABITAT OR PCE'S PRESENT
		basking sites, and sand bars for nesting	
Gopher tortoise (*Gopherus polyphemus)*	T	Open canopy longleaf pine/scrub oak habitats with well-drained sandy soils	No

[1]STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VII. Determination of Effects:

A. Explanation of effects of the action on species and critical habitats in item VI. (attach additional pages as needed):

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Gulf sturgeon	Impacts to Gulf sturgeon and Gulf sturgeon critical habitat in the estuarine and marine environments will be analyzed by National Marine Fisheries Service (NMFS) in coordination with the USFWS. Information presented in this consultation is meant to facilitate NMFS review. Numerous studies in the northern Gulf have documented habitat use and seasonality of Gulf sturgeon movement from spawning areas in riverine habitat to foraging grounds in the nearshore environment (Fox et al., 2002; Heise et al., 2004, 2005; Rogillio et al., 2007; Ross et al., 2009; Havrylkoff et al., 2012). Telemetry data from Gulf sturgeon that are natal to the Pearl River drainage system show clear seasonal migration patterns. Movement chronologies show summer habitat use upriver to take place between April and November and winter habitat use at Cat, Ship, Horn, and Petit Bois islands in the Mississippi Sound to occur between November and early March (Rigillio et al., 2007). Data from two separate telemetry studies in the Pearl River area (Rigillio et al., 2007; Ross et al., 2009) document Gulf sturgeon migrating to and from the Rigolets Pass to the west of the Pearl River mouth in high concentrations before heading toward spawning and foraging grounds upriver and nearshore at the barrier islands, respectively (Figure 3). Ross et al. (2009) noted that in March and April, the majority of tagged fish began to move from offshore waters to the Rigolets Pass near the mouth of the Pearl River, their movement continuing upstream into the river system through June. Telemetry data from 2010 and 2011

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	extracted from the GulfTOPP (Tagging of Pelagic Predators Gulf of Mexico) website show Gulf sturgeon movement in waters off of the Hancock County Pearl River marsh in March and November at depths greater than six feet. Given the dates associated with the tags, the fish were likely migrating to the Rigolets Pass in March before heading upriver and to the Mississippi barrier islands in November for foraging on sandy substrates. Though sturgeon are present seasonally, we expect no effects to sturgeon from the proposed project in the riverine ecosystems as no work will occur in these habitats. Furthermore, to avoid migration disturbance, the project aims to construct restoration features from May-October while the species occupies riverine habitat, prior to the onset of migration. Moreover, if any Gulf sturgeon species are observed in the project area, a stop work order will be implemented until the species leaves the area.
Critical Habitat Gulf sturgeon	Impacts to Gulf sturgeon and Gulf sturgeon critical habitat in the estuarine and marine environments will be analyzed by National Marine Fisheries Service (NMFS) in coordination with the USFWS. Information presented in this consultation is meant to facilitate NMFS review. Gulf sturgeon critical habitat exists in the project area and is represented on the habitat resources map (Figure 1). However, no effects to PCEs from the proposed project are expected in the riverine ecosystems as no work will occur in these habitats. PCEs include abundance of prey items, water quality, sediment quality, and safe and unobstructed migratory pathways. All restoration activities will take place in shallow estuarine waters near the shoreline allowing sufficient area for passage of individuals if present during implementation. Additionally, the benthic habitat in the project area is not preferred foraging habitat for Gulf sturgeon. Well oxygenated, clear water with sandy substrates are primarily used for feeding by the species (Fox et al., 2002; Ross et al., 2009). Benthic habitat in the project footprint is largely composed of soft, silty substrates with turbid waters. Potential water quality impacts as a result of dredging and disposal have also been considered. Dredging and disposal is expected to produce turbidity levels in excess of natural conditions, however sediment disturbance during these operations are expected to be temporary and minimal. If floatation channels are created for work barges, dredging will likely impact benthic invertebrates. These impacts are primarily short-term in nature, consisting of a temporary loss of populations in the footprint of the channel. The shallow areas and substrate type that the channels may be constructed in are not considered suitable foraging habitat for sturgeon, therefore we do not expect any effect to abundance of prey items for the Gulf sturgeon.

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Green turtle; Hawksbill turtle; Kemp's ridley turtle; Leatherback turtle; Loggerhead turtle	NMFS will consult on potential impacts to sea turtles in the estuarine and marine environments. The five sea turtles species on the list are rarely observed in Mississippi waters (MDWFP 2001). Most of these species nest in locations far from Mississippi although it is possible that both Kemp's ridley and loggerhead sea turtles could use the offshore barrier islands for nesting (NOAA Fisheries 2012; NOAA Fisheries 2013a; NOAA Fisheries 2013b; NOAA Fisheries 2013c). Both the Kemp's ridley and loggerhead have been caught close to the shoreline by land-based fishermen indicating use of the Mississippi nearshore areas for foraging and/or movement (MDWFP 2001). The shoreline habitat in the action area is unsuitable for sea turtle nesting (i.e., no sandy beach above high tide) and we do not expect nesting in the action area. Therefore, we anticipate no effects to sea turtles in terrestrial habitats from the proposed project.
West Indian manatee	The West Indian manatee occasionally occurs in Mississippi coastal habitats and these visits are becoming more common (Fertl et al. 2005). The manatee migrates from wintering habitats in Florida and possibly Mexico to Mississippi and Alabama waters from spring through fall, when project implementation is expected. Although the West Indian manatee could be present in the project area in warmer months, their presence is uncertain as the migration of this species is still not well understood. One study did indicate that when manatees were observed outside of Florida they were most likely found near estuaries and the mouths of rivers (Fertl et al. 2005). Manatees forage on a variety of plants, including submerged aquatic vegetation (SAV), floating plants, and emergent plants (MDWFP 2001). The estuarine shallow water habitat of the project area supports sparse growth of *Ruppia maritima* around the marsh edge, but given the high erosion rates of the headland area and wave fetch dynamics, it is unlikely that any large patches exist. Since the manatee may feed up to five hours per day, it is unlikely that any would stay in the area for a prolonged period of time. If manatees were present, in-water work could startle an individual or project debris or vessels could strike a manatee. Striking a manatee generally results in harm or mortality. We expect conservation measures listed below to minimize risk of startle and strike to an insignificant and discountable level.
Piping Plover and Red Knot	Piping Plover populations winter on the Gulf and Atlantic coasts. In Mississippi piping plover are commonly observed on barrier islands and beaches, both manmade and natural (MDWFP 2001) and are generally present between August and May. Red knots may stop over on the Gulf coast during their winter and spring migrations, but are generally not resident. They are also commonly found on the barrier islands (www.ebird.org as of August 23, 2013). Therefore, project

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
	implementation may overlap with departure and arrival of wintering birds. The habitats in the action area surrounding the Pearl River to Heron Bay, Heron Bay proper, and St. Joseph's shoreline are estuarine marshes which piping plover and red knot do not use for resting or feeding. In addition, the closest observations of piping plover and red knot to these areas are over 2 kilometers away (see www.ebird.org as of August 27, 2013). Because there is no suitable habitat present within the action area and individuals are not known to use the action area, no effects to this species are anticipated.
Critical Habitat Piping plover	Figure 2 depicts Piping Plover critical habitat in the vicinity of the project area (http://www.fws.gov/plover/#maps) showing the habitat is over 2 kilometers from the edge of the construction footprint and not within the action area. Project implementation will change the way the shoreline accretes and erodes in the action area but will not affect PCEs in critical habitat due to the distance between the critical habitat and action area. Therefore no destruction or adverse modification of critical habitat will occur.
Inflated heelsplitter; Pearl darter; Louisiana quillwort; ringed map turtle	No suitable habitat for these species is present in or near the action area and these species are not known from the action area. Therefore no effects to these species are anticipated.
Louisiana black bear	No suitable habitat is present in or near the action area and this species is not known to occur within the action area. Therefore, no effects to this species are anticipated.
Gopher tortoise	No suitable habitat is present in or near the action area and this species is not known to occur within the action area. Therefore, no effects to this species are anticipated.

B. Explanation of actions to be implemented to reduce adverse effects:

SPECIES/ CRITICAL HABITAT	ACTIONS TO MINIMIZE IMPACTS
Green turtle; Hawksbill turtle; Kemp's ridley turtle; Leatherback turtle; Loggerhead turtle	Awareness of potential turtle presence. If any sea turtles are found to be present in the immediate project area during restoration activities, construction will be halted until species moves away from project area.
West Indian manatee	Awareness of manatee presence. If manatee(s) are found to be present in the immediate project area during restoration activities, construction will be halted until species moves away from project area. Will follow USFWS guidelines according to *STANDARD MANATEE CONDITIONS FOR IN-WATER WORK, 2011* (Attachment 1).

SPECIES/ CRITICAL HABITAT	ACTIONS TO MINIMIZE IMPACTS
Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)	Project restoration features will be built close the shoreline in shallow water (1-4 feet) and will not impede any migratory paths. Project components will be constructed in the months of May-October to avoid inter-riverine migration movements. Project construction activities will be subject to a stop work order if the species is observed in the project footprint. Work will continue once the species leaves the area.

VIII. Effect Determination and Response Requested:

SPECIES/ CRITICAL HABITAT	DETERMINATION[1]			RESPONSE[1] REQUESTED
	NE	NLAA	AA	
Green turtle – terrestrial habitats only	X			Concurrence for terrestrial; consulting with NOAA NMFS for aquatic
Gulf sturgeon	—	—	—	Consulting with NOAA NMFS
Critical Habitat Gulf sturgeon	—	—	—	Consulting with NOAA NMFS
Hawsbill turtle	X			Concurrence for terrestrial; consulting with NOAA NMFS for aquatic
Kemp's ridley	X			Concurrence for terrestrial; consulting with NOAA NMFS for aquatic
Leatherback turtle	X			Concurrence for terrestrial; consulting with NOAA NMFS for aquatic
Loggerhead turtle	X			Concurrence for terrestrial; consulting with NOAA NMFS

SPECIES/ CRITICAL HABITAT	DETERMINATION[1]			RESPONSE[1] REQUESTED
	NE	NLAA	AA	
				for aquatic
West Indian manatee		X		concurrence
Piping Plover	X			concurrence
Critical Habitat Piping plover	X			concurrence
Red knot	X			Conference
Inflated heelsplitter (*Potamilus inflatus*)	X			concurrence
Pearl darter (*Percina aurora*)	X			Conference
Louisiana quillwort	X			concurrence
Louisiana black bear	X			concurrence
Ringed map turtle	X			concurrence
Gopher tortoise	X			concurrence

[1]DETERMINATION/ RESPONSE REQUESTED:

IX. Bald Eagles

Are bald eagles present in the action area? ___No X__

If "Yes", can you implement the conservation measures below? ____Yes ____ No

1. If bald eagle breeding or nesting behaviors are observed or a nest is discovered or known, all activities (walking, camping, cleanup, use of a UTV, ATV, or boat) should avoid the nest by a minimum of 660 feet. If the nest is protected by a vegetated buffer where there is *no* line of sight to the nest, then the minimum avoidance distance is 330 feet. This avoidance distance shall be maintained from the onset of breeding/courtship behaviors until any eggs have hatched and eaglets have fledged (approximately 6 months).
2. If a similar activity (like driving on a roadway) is closer than 660 feet to a nest, then you may maintain a distance buffer as close to the nest as the existing tolerated activity.
3. If a vegetated buffer is present and there is no line of sight to the nest and a similar activity is closer than 330 feet to a nest, then you may maintain a distance buffer as close to the nest as the existing tolerated activity.
4. In some instances activities conducted within 660 feet of a nest may result in disturbance, particularly for the eagles occupying the Mississippi barrier islands. If an activity appears to cause initial disturbance, the activity shall stop and all individuals and equipment will be moved away until the eagles are no longer displaying disturbance behaviors.

If not, contact the Service's Migratory Bird Permit Office to determine how to avoid impacts or if a permit may be needed.

X. Migratory Birds

A. Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation.

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
Wading birds (herons, egrets, ibises)	Foraging, feeding, resting, roosting, nesting	Wading birds primarily forage and feed at the water's edge. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily nest and roost in trees or shrubs (e.g. pines, *Baccharis*), which occur outside the project area.
Shorebirds (plovers, oystercatchers, stilts, sandpipers)	Foraging, feeding, resting, roosting, nesting	Shorebirds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. The project will be constructed in areas where shorelines are substantially eroded. In the project area, there is limited natural beach and mudflat where shorebirds would nest.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting, nesting	Seabirds forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. Nesting habitat does not exist in the project area; therefore it is not anticipated to impact nesting.
Waterfowl (ducks, loons, and grebes)	Foraging, feeding, resting, roosting, nesting	Waterfowl forage, feed, rest, and roost in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. These birds primarily roost and nest in low vegetation, which is not directly inside the project area; therefore it is not anticipated to impact nesting.
Raptors (osprey, hawks, eagles, owls)	Foraging, feeding, resting, roosting, nesting	Raptors forage, feed, and rest in the project area. As such, they may be impacted locally and temporarily by the project. It is expected that they would be able to move to another nearby location to continue foraging, feeding and resting. Most raptors are aerial foragers and soar long distances in search of food. Locations where these birds roost and nest are not within the project area.
Rails and coots	Foraging, feeding, resting, roosting, nesting	Rails and coots forage, feed, rest, or roost in the project area. As such, they may be impacted locally and temporarily by the project. However they are most likely to favor marshy areas. It is expected that they would be able to move to another nearby location to

SPECIES	BEHAVIOR	SPECIES/HABITAT IMPACTS
		continue foraging, feeding and resting if disturbed by the project. These birds primarily roost and nest in marshes, which are not directly within the project area; therefore it is not anticipated to impact nesting.

B. If species or habitat impacts could occur, identify avoidance and minimization measures to prevent incidental take. Incidental take of Migratory Birds cannot be authorized.

SPECIES/SPECIES GROUP	CONSERVATION MEASURES TO MINIMIZE IMPACTS
Wading birds (herons, egrets, ibises)	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only. These birds primarily roost in trees or shrubs, but project components will not impact these habitats. Nesting will not be impacted because the project will occur only in-water and there are no rookeries or habitat to establish rookeries in the area.
Shorebirds (plovers, oystercatchers, stilts, sandpipers)	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only. Nesting will not be impacted because the project will occur only in-water. If construction will occur during the nesting season within 300 feet of potential nesting habitat, pre-construction surveys could be conducted to ensure either no nesting birds are present in habitat adjacent to construction areas or to develop meaningful avoidance measures.
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only. Nesting will not be impacted because the project will occur only in-water. If construction will occur during the nesting season within 300 feet of potential nesting habitat, pre-construction surveys could be conducted to ensure either no nesting birds are present in habitat adjacent to construction areas or to develop meaningful avoidance measures.
Raptors (osprey, hawks, eagles, owls)	No work will occur within 660 feet of any bald eagle nests. Care will be taken to avoid working near other raptor nests, and to minimize noise and vibration in their vicinities. Roosting should not be impacted because the project will occur during daylight hours only, and because the areas where these birds nest are not within the project area. A staff biologist will advise

	the contractor of the nesting status of all identified raptor nests near the project area and approve of work in the vicinity. Nesting will not be impacted because the project will occur only in-water. If construction will occur during the nesting season within 300 feet (660 ft for eagles) of potential nesting habitat, pre-construction surveys could be conducted to ensure either no nesting birds are present in habitat adjacent to construction areas or to develop meaningful avoidance measures.
Waterfowl (ducks, loons, and grebes)	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only. Nesting will not be impacted because the project will occur only in-water. If construction will occur during the nesting season within 300 feet of potential nesting habitat, pre-construction surveys could be conducted to ensure either no nesting birds are present in habitat adjacent to construction areas or to develop meaningful avoidance measures.
Rails and coots	Care will be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance will be localized and temporary. The general behavior of these birds is to mediate their own exposure to human activity when given the opportunity. Roosting should not be impacted because the project will occur during daylight hours only. Nesting will not be impacted because the project will occur only in-water. If construction will occur during the nesting season within 300 feet of potential nesting habitat, pre-construction surveys could be conducted to ensure either no nesting birds are present in habitat adjacent to construction areas or to develop meaningful avoidance measures.

XI. Signatures from the station preparing the Intra-Service Biological Evaluation:

/s/ Holly N. Bialock-Herod 12/31/2013
Signature (originating station - preparer) **date**
DOI Case Management Team, ESA Coordinator

Deborah L McCal 1/9/14
Signature (originating station) **date**
Deputy Case Manager

This analysis resulted in a determination that no "take" of a federally listed species would occur. If any of the following occur, then there must be reinitiation on this action:

(1) any incidental take occurs

(2) new information reveals effects of the Service's action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion;

(3) **the Service's action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or**

(4) **a new species is listed or critical habitat designated that may be affected by the action.**

In instances where any incidental take occurs, the operations causing such take must cease until reinitiation.

If reinitiation is required, contact the Mississippi Ecological Services Field Office **about the action.**
Mississippi Ecological Services Field Office, 6578 Dogwood View Parkway, Suite A, Jackson, Mississippi 39213, (p) 601-965-4900, (f) 601-965-4340

XII. Reviewing Ecological Services Office Evaluation:

A. Concurrence _____ Nonconcurrence _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

_____ _____
Signature date

_____ _____
Title office

ATTACHMENT 1: STANDARD MANATEE CONDITIONS FOR IN-WATER WORK, 2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation.Animals must not be herded away or harassed into leaving.

e. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission may be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½ " by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/ manatee_sign_vendors.htm.

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Hancock County Marsh Living Shoreline

(3) **the Service's action is later modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or**

(4) **a new species is listed or critical habitat designated that may be affected by the action.**

In instances where any incidental take occurs, the operations causing such take must cease until reinitiation.

If reinitiation is required, contact the Mississippi Ecological Services Field Office **about the action.**
Mississippi Ecological Services Field Office, 6578 Dogwood View Parkway, Suite A, Jackson, Mississippi 39213, (p) 601-965-4900, (f) 601-965-4340

XII. Reviewing Ecological Services Office Evaluation:

A. Concurrence X **Nonconcurrence** _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

RECEIVED 2/21/14 HBO

[signature] 1/24/2014
Signature **date**

Biologist MS Field Office
Title **office**

David Felder
601 321 1131