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National Oceanic and Atmospheric Administration
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MEMORANDUM FOR: F/HC3 – Jamie Schubert

FROM: F/SE – Roy E. Crabtree, Ph.D. FOR

SUBJECT: Deepwater Horizon-Early Restoration Plan
Phase III, Endangered Species Act Section 7 Consultations
for Hancock County Marsh Living Shoreline Project: Re-Initiation
of ESA Consultation

This memorandum responds to your memo dated August 14, 2015, requesting National Marine Fisheries Service (NMFS) concurrence under Section 7 of the Endangered Species Act (ESA) with your project-effects determinations associated with a habitat restoration project in Hancock County, Mississippi. The Hancock County Marsh Living Shoreline project is part of a suite of projects approved for implementation in the Final Phase III Early Restoration Plan (ERP) for the Deepwater Horizon Oil Spill (Final Phase III ERP/ Programmatic Environmental Impact Statement [PEIS]). The NOAA Restoration Center and Mississippi Department of Environmental Quality (MDEQ) are action agencies for implementation of this project. The U.S. Army Corps of Engineers (Corps) has also initiated consultation on this project related to Department of the Army permit application number SAM-2013-00088-MJF. This memorandum provides NMFS' concurrence with both the NOAA Restoration Center and the Corps determinations that their respective actions are not likely to adversely affect listed species or designated critical habitat under NMFS' jurisdiction.

Consultation History

In 2014, the NOAA Restoration Center initiated an ESA consultation with us for this project, along with 3 other living shoreline projects, as then proposed for inclusion in the Phase III Early Restoration Plan. On April 11, 2014, we issued a letter of concurrence (SER-2014-15033) which concluded that implementation of the Hancock County project would not be likely to adversely affect 3 species of sea turtles (green, Kemp's ridley, and loggerhead), Gulf sturgeon, and designated Gulf sturgeon critical habitat. It was also determined that the proposed project would not affect hawksbill or leatherback sea turtles or smalltooth sawfish as these species are not expected to occur in the action area. Because the April 11, 2014 concurrence letter had erroneously included the use of floating turbidity curtains for this project, we issued a revised letter of concurrence (SER-2014-15033) on September 26, 2104, which concluded again that the Hancock County project may affect, but is not likely to adversely affect, 3 species of sea turtles and the Gulf sturgeon.

Additional surveys, engineering, and design activities since the 2014 letter of concurrence have resulted in minor modifications to the Hancock County project (described in detail below). The NOAA Restoration Center has determined that these proposed modifications warrant re-initiating

ESA consultation on the project and it intends to adhere to all of the precautionary measures, best management practices, and other requirements included in previous letters of concurrence from the Southeast Regional Offices' Protected Resources Division. The NOAA Restoration Center has determined that the Hancock County project, if implemented as modified during detailed engineering and design, may affect, but is still not likely to adversely affect, 4 species of sea turtles (green, Kemp's ridley, leatherback, and loggerhead), Gulf sturgeon, or Gulf sturgeon critical habitat.

Project Description

The Final Phase III ERP/PEIS and the Biological Assessment submitted to initiate the original consultation stated that the Hancock County project in Mississippi included construction of 3 components: 46 acres (ac) of marsh, 46 ac of submerged reef, and 5.9 miles of intertidal breakwaters. Based on the information acquired during final engineering and design for the project, the NOAA Restoration Center and MDEQ determined the breakwater height and base width would have to increase to provide the desired level of shoreline protection. Also, sediment cores taken in Heron Bay revealed the most desirable bottom substrate for the subtidal reef construction in the northwestern portion of Heron Bay. On that basis, the submerged reef footprint was shifted from the northeastern portion of the bay to the northwestern portion of the bay. The construction methodology for the breakwater and sub-tidal reef components were further refined and the temporary flotation channel/sidecasting of sediments became unnecessary and was eliminated from the project, which resulted in a significant reduction in the potential construction impacts to species and critical habitats. The marsh creation footprint has also been refined and will now be located entirely within Heron Bay and the tidal creeks between Heron Bay and the Mississippi Sound. The 2014 ESA consultation anticipated the marsh footprint would be both in Heron Bay and also on the landward side of the breakwater. The following summarizes the specific design changes:

- The breakwater height has been increased from mean low water to mean higher high water to facilitate increased shoreline protection.
- Commensurate with breakwater height increase, the breakwater base width has been increased from 30 feet (ft) to 60 ft, resulting in a net increase in the breakwater footprint of 23 ac.
- Approximately 123.1 ac of the flotation channels/sidecast sediments have been eliminated from the project.
- The Potential Subtidal Reef Deployment Area shown in the Final Phase III ERP/PEIS has been refined based on field studies. The Refined Subtidal Reef Deployment Area is a 200-ac area in the western portion of Heron Bay. Approximately 46 ac of cultch will be deployed in one to several locations within this area (Figure 1).
- The Potential Marsh Creation Area shown in the Final Phase III ERP/PEIS has been refined based on field studies. The Refined Marsh Creation Area is a 76-ac area in the southeastern portion of Heron Bay. Approximately 46 ac of marsh will be created in one to several locations within this area (Figure 1).

Figure 1 depicts the resulting modifications to the project's footprint, and Table 1 quantifies the specific increases and decreases in the overall footprint. These changes do not impact the project's overall objectives, which are to (1) construct reef structures to protect shoreline from erosion and support secondary productivity, (2) restore marsh habitat, and (3) restore subtidal reefs to support secondary productivity.

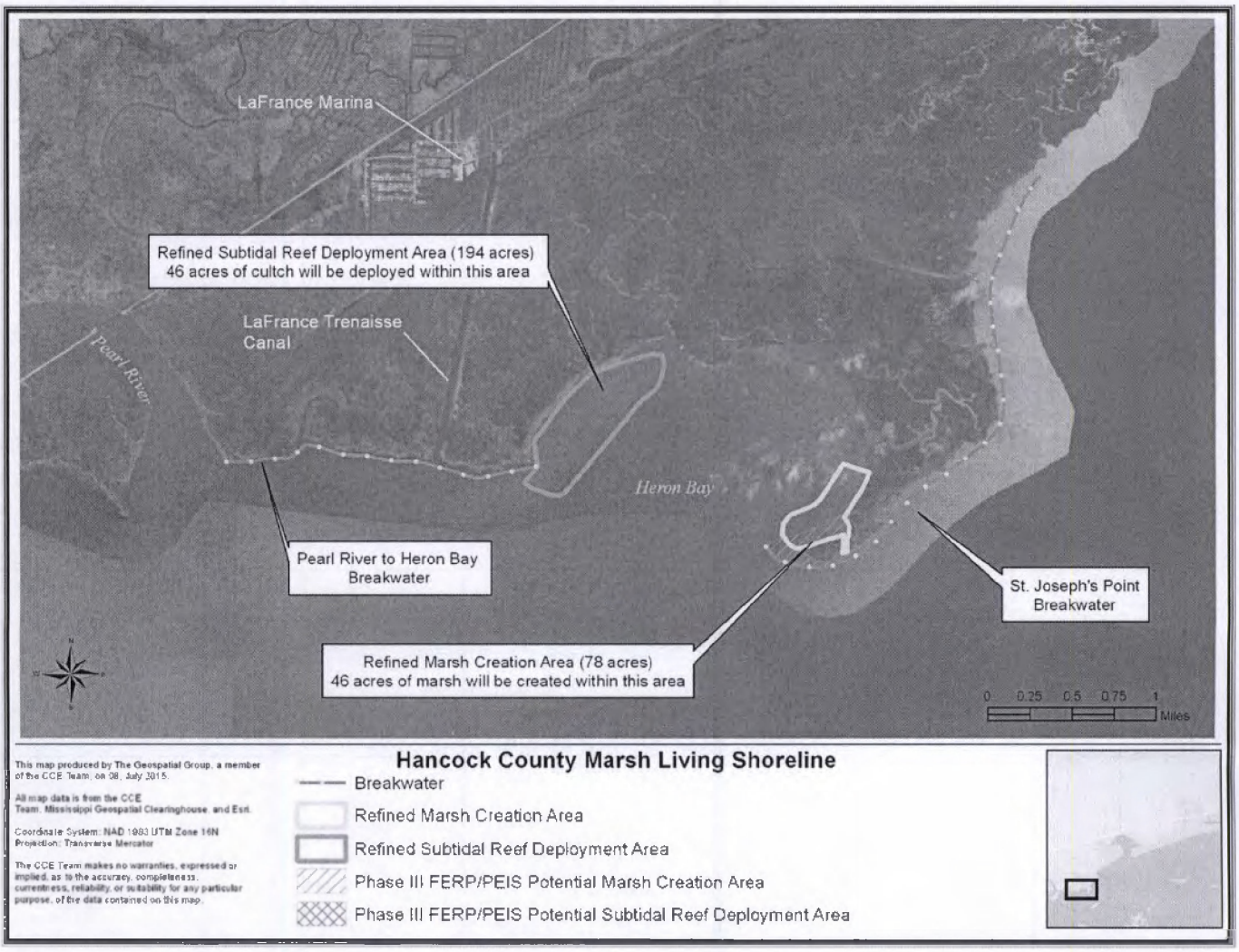

Figure 1. Modified Hancock County Marsh Living Shoreline Project footprint compared to previously evaluated component areas

Table 1. Summary of Originally Identified Impacts and Modified Impacts

Project Component	Impact Type	Revised Impact Type (per Design Change)	Duration of Impact	Habitat Type Impacted	Acreage of Impact (per Phase 3 PEIS)	Revised Acreage of Impact (per Design Change)	Increase/(Decrease) in Acreage of Impact (per Design Change)
St. Joseph's Point Area Breakwater Construction Activity Area	Filling fine-grained sediment with riprap, covered with bagged shell veneer	Filling fine-grained sediment with riprap over geotextile/geogrid layer	Long-Term	Shallow water/fine-grained sediment bottom	14.4	29.1	14.7
Pearl River to Heron Bay Breakwater Construction Activity Area	Filling fine-grained sediment with riprap, covered with bagged shell veneer	Filling fine-grained sediment with riprap over geotextile/geogrid layer	Permanent	Shallow water/fine-grained sediment bottom	5.5	13.8	8.3
Temporary Flotation Channels (breakwaters and subtidal reefs)	Excavation of sea bottom	None	Short-Term	Water depths of 2-8 ft with fine-grained sediment bottom	101	0	(101.0)
Temporary Flotation Channel Sidecast material	Placement of excavated sea bottom of seaward side of flotation channels or for use in marsh creation	None	Short-Term	Water depths of 2-8 ft with fine-grained sediment bottom	22.9	0	(22.9)
Subtidal Reefs in Heron Bay	Filling with cultch (shells, limestone)	Filling with cultch (shells, limestone); siting refined based on siting study	Long-Term	Shallow water/hard bottom	46	46	0.0

Project Component	Impact Type	Revised Impact Type (per Design Change)	Duration of Impact	Habitat Type Impacted	Acreage of Impact (per Phase 3 PEIS)	Revised Acreage of Impact (per Design Change)	Increase/(Decrease) in Acreage of Impact (per Design Change)
Marsh Creation (Inside Heron Bay)	Filling with suitable material	Filling with suitable material; site for marsh creation selected	Long-Term	Shallow water with fine-grained sediment bottom	46	46	0.0
Total Temporary Impacts					**123.9**	**0**	**(123.9)**
Total Permanent Impacts					**111.9**	**134.9**	**23.0**
Total Impacts					**242.2**	**134.9**	**(100.9)**

Construction Methodology

The project's final design construction methods and activities are described below.

A. Breakwaters

The specific breakwater construction elevation (mean higher high water [MHHW]) was selected to maximize shoreline protection (Table 2). Construction will include placement of linear structures that would utilize natural stone and/or shell-based materials. The alignment and limits of the breakwaters would be surveyed; the alignment of the breakwaters would be marked by rock "pods" that would be a minimum of 1 ft above the MHHW surface. The rock pods would be coordinated with the U.S. Coast Guard, although they have been used in other Gulf regions for habitat projects as a visual marker for recreational mariners. The height of the breakwaters along the alignment would be constructed based on bottom elevations and the initial crest elevation (2.0 ft NAVD 88; 2.4 ft mean lower low water). The initial constructed elevation includes an allowance for short term consolidation and sea level rise. Barriers, navigation warning signs (as required by the U.S. Coast Guard), and other safety devices would be required and utilized during construction.

Table 2. Updated Breakwater Specifications for the Hancock County Marsh Living Shoreline

Breakwater Design Criteria	St. Joseph's Point Breakwater (eastern reach)	Pearl River to Heron Bay Breakwater (western reach)
Total project length	Approximately 4 miles	Approximately 1.9 miles
Total project acreage	29.1 ac	13.8 ac
Crest width	15.0 ft	15.0 ft
Base width	60 ft (maximum)	60 ft (maximum)
Assumed bottom elevation	-3.5 NAVD 88	-3.5 NAVD 88
Total structure height	5.0-6.0 ft	5.0-6.0 ft
Riprap volume	132,000 cubic yards (yd^3)	58,000 yd^3
Thickness of material (riprap)	5.0-6.0 ft	5.0-6.0 ft

Breakwater Design Criteria	St. Joseph's Point Breakwater (eastern reach)	Pearl River to Heron Bay Breakwater (western reach)
Estimated initial settlement	0.5 ft	0.5 ft
Design side slopes (seaward face)	5v:1h	5v:1h
Design side slopes (landward face)	3v:1h	3v:1h
Breakwater distance from shoreline	20-400 ft	–40-150 ft
Reach of each breakwater	180 ft	180 ft
Design crest height	1.4 ft NAVD 88 (MHHW)	1.4 ft. NAVD 88 (MHHW)
Width of gaps at design crest height	25 ft	25 ft

The dimensions for the breakwaters would be approximately 60 ft wide (maximum) at the base and approximately 15 ft wide at the crest (Table 2). The breakwaters would be constructed using graded stone. The breakwater material would be transported to the work area on barges and installed by a crane located on a separate barge. Placement of the breakwater material would be monitored to ensure the breakwater dimensions, slopes, and crest elevations are achieved. The deployment of the breakwater material may extend over a period of 10-12 months. Major construction activities would adhere to the *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS 2006). Total installed volumes would be as follows:

- ***St. Joseph's Point Breakwater (eastern reach):*** The target depth for deployment is approximately -3.5 ft NAVD 88, but could be between -3.0 and -5.0 ft NAVD 88. The volume of placed material would be approximately 132,000 yd^3 of riprap. The breakwater would cover a footprint of approximately 29.1 ac of fine-grained sediment.

- ***Pearl River to Heron Bay Breakwater (western reach):*** The target depth for deployment is approximately -3.5 NAVD 88, but could be between -2.0 ft and -5.0 ft NAVD 88. The volume of placed material would be approximately 58,000 yd^3 of riprap. The breakwater would cover a footprint of approximately 13.8 ac of fine-grained sediment.

Temporary flotation channels for construction are no longer necessary and have been eliminated from the project. After completion of construction, the breakwater structure would be surveyed. It is not anticipated that permanent navigation signs would be required by the U.S. Coast Guard; visual features above mean high tide will be integrated into the rock structure.

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

After the breakwater along St. Joseph's Point has been installed, areas in Heron Bay would be filled with dredged material obtained from the Mississippi Department of Marine Resources Beneficial Use of Sediment Program if material is available, or a suitable, permitted borrow source or approved permitted dredging project. The marsh will mimic the adjacent marsh intertidal range. It is anticipated that an earthen 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 proposed dike location, but not borrowing from the existing marsh. 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. Dike and marsh fill sediments would be placed mechanically or pumped through a floating pipeline from a hydraulic dredge located where approved permitted

dredge material is available. Once the entire marsh area(s) is constructed, the area would be monitored for natural re-vegetation.

C. Placement of Subtidal Reef Cultch in Heron Bay

Crushed stone would be deployed in Heron Bay in water depths of -3 to -5 ft (NAVD 88) in areas that currently support or previously supported reef activities. A survey has been completed that identified suitable areas (Figure 1). The subtidal reefs materials would be deployed as a high-profile 6- to 9-inch-thick layer of crushed stone. Prior to deployment, the limits of the subtidal reef area(s) would be marked with buoys or poles. Crushed stone would be deployed by a barge-mounted crane with a clamshell bucket or other suitable method. A material barge would be moored to the crane barge. As a construction alternative, water jetting the material off of a barge may be used in case of water-depth constraints. Upon completion, the deployment area would be surveyed. Temporary flotation channels for this project component are no longer necessary and have been eliminated.

D. Best Management Practices

Throughout the design phase, every practical attempt has been and will continue to be made to avoid and minimize potentially adverse impacts to species. Additionally, all protection measures identified in the original Biological Assessment and approved in the prior concurrence letters will be followed.

Analysis of Effects

Sea turtles (the endangered Kemp's ridley; the threatened loggerhead,[1] and the threatened/endangered green[2]) and the threatened Gulf sturgeon may be present in the action area and may be affected by the project. Leatherback sea turtles are not expected to be affected by the project as they are deepwater, pelagic species and are not expected to occur in the action area. The proposed project falls within ESA-designated Gulf sturgeon critical habitat (Unit 8).

NMFS has identified the following potential effects to sea turtles and Gulf sturgeon and has concluded that the species are not likely to be adversely affected by the proposed action for several reasons. Possible effects include the risks of being struck by transiting vessels, cutterhead and mechanical dredge-related activities, and deployment of material from the barges. The project proponent has agreed to adhere to NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions* (STSSCC).[3] These criteria require that all vessels associated with the construction project operate at "no wake/idle" speeds at all times while in the construction area or other shallow water areas, and that operation of any mechanical construction equipment shall cease immediately if a sea turtle is seen within a 50-ft radius of the equipment. Due to the species' mobility and natural avoidance behaviors, and the project proponent's compliance with the STSSCC, the risk of injury directly related to construction activities is discountable. NMFS believes that the temporary pipeline that may be used to pump sediment to the marsh creation

[1] Northwest Atlantic Ocean distinct population segment

[2] Green turtles are listed as threatened except for the Florida and Pacific coast of Mexico breeding populations, which are listed as endangered.

[3] NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*, available on NMFS webpage at: http://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/sea_turtle_and_smalltooth_sawfish_construction_conditions_3-23-06.pdf

area will not adversely affect or impede the passage or transit of any listed species, as they can simply avoid it, or swim over, under, or around it. Thus, any effects of pipeline presence will be insignificant. Breakwaters also have the potential to affect listed species by restricting their movement and blocking access to foraging habitats along shorelines. However, the project design criteria call for segmented breakwaters (180 ft per segment) with large gaps (25 ft gaps) between each segment to allow free movement of listed species, flow, and nutrients between shoreline areas and open water. Thus, any effects of proposed breakwaters will be insignificant.

Sea turtles and Gulf sturgeon may be temporarily unable to use the sites for foraging or shelter habitat due to avoidance of construction activities and related noise. These effects will be temporary and insignificant, given the projects small footprints and the fact that there is ample suitable habitat directly adjacent to the proposed construction areas.

The essential features for the conservation of Gulf sturgeon present in Unit 8 are: (1) abundant prey items; (2) water quality and sediment quality necessary for normal behavior, growth, and viability of all life stages; and (3) safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats.

The prey abundance essential feature may be affected by burial of Gulf sturgeon foraging sites during breakwater construction, marsh creation, and oyster reef creation. The loss of prey species within the project area will not appreciably decrease the prey available to Gulf sturgeon as there are abundant, similar, nearby foraging habitats. Any decrease in numbers of these prey species would be minimal in relation to their numbers throughout the surrounding areas and prey species can quickly recolonize the project areas after construction; thus, effects to the prey abundance essential feature of critical habitat will be insignificant.

The marsh creation will likely also have a long-term beneficial impact on Gulf sturgeon by increasing prey abundance in adjacent areas. Partyka and Peterson (2008) found even the smallest patches of marsh habitat supported a larger diversity of fauna than nearby areas.[3] Therefore, it is likely that Gulf sturgeon prey species (e.g., amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks, and crustaceans) will benefit from the restoration of a marsh area with native vegetation. While some of this enhanced prey abundance will remain in the marsh and not be available to Gulf sturgeon for foraging, we believe that directly (through spillover) or indirectly (through trophic movement) prey abundance will be increased in areas accessible to foraging Gulf sturgeon. This spillover effect is supported by Whaley and Minello's (2002) findings of the strong trophic link between infauna and nekton near the marsh edge and the high fishery productivity derived from Gulf Coast marshes.[4]

Water quality may be temporarily affected by disturbance to the bottom sediments during construction activities. The effects are expected to be insignificant, given that any increases in turbidity will be temporary and minimized by the use of best management practices. In addition,

[3] Partyka, M.L. and M.S. Peterson. 2008. Habitat quality and salt-marsh assemblages along an anthropogenic estuarine shoreline. Journal of Coastal Research 24(6):1570-1581.
[4] Minello, T.J., K.W. Able, M.P. Weinstein, and C.G. Hays. 2003. Salt marshes as nurseries for nekton: testing hypotheses on density, growth, and survival through meta-analysis. Marine Ecology Progress Series 246:39-59.

sediments will settle out of the water column quickly, and/or tidal currents will disperse the disturbed sediments to baseline conditions.

Sediment quality may be affected by the creation of marsh, oyster reef, and living shoreline structures, which are expected to cover any sediments in the footprint of the features, and these sediments would no longer be accessible to Gulf sturgeon. The covering of these small areas of sediment within the project area will not appreciably decrease sediment quality for Gulf sturgeon critical habitat as there are abundant, similar, nearby sediments throughout this unit of critical habitat. Thus, any effects of the proposed action on sediment quality will be insignificant.

Construction of breakwaters could affect the safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats. However, the project design criteria call for segmented breakwaters (180 ft per segment) with large gaps (25 ft gaps) between each segment which will provide unobstructed passage for Gulf sturgeon. Thus, any effects of proposed breakwaters on this essential feature of critical habitat will be insignificant.

Based on the preceding analysis, we concur with your project-effect determination that the project for which you requested ESA consultation is not likely to adversely affect Kemp's ridley, loggerhead, or green sea turtles, Gulf sturgeon, or Gulf sturgeon critical habitat.

This concludes the NOAA Restoration Center's consultation responsibilities under the ESA for species under NMFS's purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat is designated that may be affected by the identified action.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions about this consultation, please contact Mike Tucker, Consultation Biologist, at (727) 209-5981, or by email at michael.tucker@noaa.gov.

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