United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/DH NRDAR

AUG 1 2 2015

Memorandum

To: Field Supervisor, Jackson Ecological Services Field Office, Mississippi

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

Subject: Informal Consultation Request for the Proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries project, 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 millions of barrels of oil into the Gulf over a period of 87 days. 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 an agency in the State of Mississippi, 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 natural resources to make the public whole for injuries and losses that occurred. This process is known as a Natural Resource Damage Assessment (NRDA).

On April 20, 2011, DOI, National Oceanic and Atmospheric Administration (NOAA), 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 subject project is being evaluated by the Trustees as a potential early restoration project. The early restoration project has been proposed in a draft early restoration plan that was released for public comment and review May 20, 2015. If the Trustees select the project after publication of the plan and consideration of public comment and a stipulated agreement is reached with BP, the project will be implemented by the Mississippi Department of Environmental Quality (MDEQ).

The above facts lead us to the conclusion that consultation under Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), is required for the proposed project and we wish to engage in such consultation. The proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries project has multiple project components. We have reviewed each of the project components and the overall project for potential impacts to listed, candidate, and proposed species and designated and proposed critical habitats in accordance with Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). Potential effects, conservation measures and justifications for our determinations are presented for each component of the proposed project in separate Biological Evaluation (BE) forms attached to this letter. The determination for each project component is listed in Table 1 below. Our summary determination for the overall project is may affect, but is not likely to adversely affect piping plover, red knot and West Indian manatee and will have no effect on Alabama red-bellied turtle. We determined the proposed project will not result in destruction or adverse modification to piping plover critical habitat. The attached BE forms will also be used to initiate consultation with National Marine Fisheries Service (five species of sea turtles (loggerhead, green, Kemp's ridley, leatherback, and hawksbill) using in-water habitats, Gulf Sturgeon), and in regards to Marine Mammal Protection Act (MMPA) of 1972, as amended (16 U.S.C. 1461 *et seq.*).

Within the BE forms, 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 and we determined take would be avoided.

Potential effects, conservation measures and justifications for our determinations are presented for each component of the proposed project in a separate BE form to facilitate your review. However, we request your concurrence with the proposed project in totality rather than component by component. To facilitate your response, should you concur with our determinations, we have attached a template response letter. If you have questions or concerns regarding this request for consultation, please contact Ashley Mills, Fish and Wildlife Biologist, at 812-756-2712 or ashley_mills@fws.gov.

Attachments (14)

Endangered Species Act Biological Evaluation Form
Deepwater Horizon Oil Spill Restoration
Fish and Wildlife Service & National Marine Fisheries Service

This form will be used to provide information for the initiation of informal Section 7 consultations under the Endangered Species Act, if required or to document a No Effect determination. In addition, information provided in this form may be used to inform other regulatory compliance processes such as Essential Fish Habitat (EFH), Marine Mammal Protection Act (MMPA), Section 106 of the National Historic Preservation Act (NHPA), Migratory Bird Treaty Act (MBTA), and Bald and Golden Eagle Protection Act (BGEPA). Further information may be required beyond what is captured in this form. Note: if you need additional space for writing, please attach pages as needed.

A. Project Identification

I. *Applicant Agency or Business Name:* Mississippi Department of Environmental Quality
II. *Applicant Contact Person:* Marc Wyatt
III. *Phone and Email:* (601)-961-5637 Marc_Wyatt@deq.state.ms.us
IV. *Project Name and ID# (Official name of project and ID number assigned by action agency):*
Restoring Living Shorelines and Reefs in Mississippi Estuaries - Grand Bay Intertidal Reefs within Gulf Sturgeon Critical Habitat (Unit 8)

V. *Project Type:* Artificial Reef Creation and/or Enhancement
VI. *NMFS Office (Choose appropriate office based on project location):* NMFS Southeast Regional Office
VII. *FWS Office (Choose appropriate office based on project location):* Mississippi Ecological Services Field Office (Jackson)

B. Project Location

I. *Physical Address of Project Site (If applicable*): Grand Bay National Estuarine Research Reserve Facility
6005 Bayou Heron Rd
Moss Point, MS 39562
II. *State & County/Parish of Project Site:* Jackson County, MS
III. *Latitude & Longitude for Project Site (Decimal degrees and datum [e.g., 27.71622°N, 80.25174°W NAD83] [online conversion:http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html]):*
30.360232 N, -88.41681 W
30.386984 N, -88.39635 W

IV. *Township and Range of project area:*
The sites are located in Township 8S, Range 4W and Township 7S, Range 4W

C. Description of Action Area

1. Attach a separate map delineating where the action will occur. 2. Describe ALL areas that may be affected directly or indirectly by the Federal action and not merely the immediate project site involved in the action, or just where species or critical habitat may be present. Provide a description of the existing environmental conditions and characteristics (e.g., topography, vegetation type, soil type, substrate type, water quality, water depth, tidal/riverine/estuarine, hydrology and drainage patterns, current flow and direction), and land uses (e.g., public, residential, commercial, industrial, agricultural). 3. If habitat for species is present in the action area, provide a general description of the current state of the habitat. 4. Identify any management or other activities already occurring in the area. 5. Detailed map of the area of potential effect for ground disturbing activities if it is different from the project area

Maps in Appendix A (Figures 1 and 2)

The Grand Bay Intertidal Reefs within Gulf Sturgeon Critical Habitat is a component of a larger project: The proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries (Figure 1; Appendix A).

The proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries includes the restoration of secondary productivity through the placement of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. The projects would be implemented at proposed locations in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay in Jackson, Harrison, and Hancock Counties, Mississippi (Figure 1; Appendix A). The project builds on recent collaborative projects implemented by the Mississippi Department of Marine Resources (MDMR), National Oceanic and Atmospheric Administration (NOAA), and The Nature Conservancy. When completed at all locations, the project would provide for construction of over four (4) miles of breakwaters, five (5) acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four (4) locations across the Mississippi Gulf Coast. For the Grand Bay and Graveline Bay project locations, intertidal and subtidal reefs would be created in a number of sites. Over time, the breakwaters, intertidal and subtidal restoration areas would develop into living reefs that support benthic secondary productivity, including, but not limited to oysters/bivalve mollusks, annelid worms, shrimp, and crabs. Breakwaters would reduce shoreline erosion as well as marsh loss.

The Grand Bay Intertidal Reefs within Gulf Sturgeon Critical Habitat includes the construction of up to 3 acres of intertidal reef within the Unit 8 boundary for Gulf Sturgeon Critical Habitat (Figure 2 and 3; Appendix A).

The Grand Bay NERR/NWR is a large, pristine, intact estuary which supports a highly diverse floral and faunal community. This site, located in southeastern Jackson County, encompasses 30,000 acres and is one of the largest estuarine systems in Mississippi. The Grand Bay area lies within the gently sloping, lower Gulf coastal plain and was part of the previous deltas of the Escatawpa and Pascagoula rivers. The geomorphic evolution of this area is characterized by a long, complex sequence of events and processes evidenced by extensive marsh headlands and riverine scarring across the landscape (Figure 4; Appendix A). The Escatawpa River became a large tributary of the Pascagoula River through a process of stream piracy after the formation of the delta. As a result, the Grand Bay area is characterized as a retrograding delta with low freshwater inflow and sediment load. Sediments in the area consist of sands, silts and clays of coastal and riverine origin. Sediment substrate of the marshes is rich in organic material and clays but also has a sizeable sand/silt component.

A mosaic of coastal habitat types extend from near Interstate 10 south for 10 miles to the open waters of the Mississippi Sound, and for 10 miles from near the Chevron Refinery in the west to Isle aux Dames, AL, to the east. This broad mosaic of estuarine and non-estuarine wetland habitats forms a largely intact coastal watershed. The open-water estuarine areas support declining oyster reefs and extensive seagrass habitats. The intertidal portion of the site includes a wide variety of marsh types (low, mid-level and high elevation zones across a wide range of salinity). The coastal marshes are also among the most extensive and productive in the state. The non-tidal areas include wet pine savanna, coastal bayhead and cypress swamps, freshwater marshes and maritime forests.

Substrate and depth at project sites: The substrate in the intertidal areas is composed of soft bottom sand and mud in shallow water; depths throughout most of the project area are no greater than 6 ft. below MLLW.

a. *Waterbody (If applicable. Name the body of water, including wetlands (freshwater or estuarine) on which the project is located. If the location is in a river or estuary, please approximate the navigable distance from the project location to the marine environment.):*

The Grand Bay Intertidal Reefs within Gulf Sturgeon Critical Habitat sites are located in the Grand Bay estuary in multiple waterbodies including Bangs Bayou and Bayou Heron.

b. *Existing Structures (If applicable. Describe the current and historical structures found in the project area (e.g., buildings, parking lots, docks, seawalls, groynes, jetties, marina.)). If known, please provide the years of construction.:*

There are no known existing structures in the immediate of area of the intertidal reef sites. A privately owned boat launch with 3 docks and a parking area exists in the northern portion of the study area.

c. *Seagrasses & Other Marine Vegetation (If applicable. Describe seagrasses found in project area. If a benthic survey was done, provide the date it was completed and a copy of the report. Estimate the species area of coverage and density. Attach a separate map showing the location of the seagrasses in the project area.):*

Large seagrass (SAV) beds exist in the Grand Bay estuary and are monitored by the Grand Bay National Estuarine Research Reserve (GNDNERR) at various locations annually. The last mapping effort took place in 2010 (Figure 4; Appendix A) in which a total of 530 acres were documented. The beds are typically patchy with *Halodule wrightii* and *Ruppia maritima* sharing dominance. Macroalgae and epiphytes are documented in the annual transect surveys conducted by GNDNERR staff.

d. *Mangroves (If applicable. Describe the mangroves found in project area. Indicate the species found (red, black, white), the species area of coverage in square footage and linear footage along project shoreline. Attach a separate map showing the location of the mangroves in the project area.):*

Not Applicable

e. *Corals (If applicable. Describe the corals found in project area. If a benthic survey was done, provide the date it was completed and a copy of the report. Estimate the species area of coverage and density. Attach a separate map showing the location of the corals in the project area.):*

Not Applicable

f. *Uplands (If applicable. Describe the current terrestrial habitat in which the project is located (e.g. pasture, forest, meadows, beach and dune habitats, etc.).*

Natural beach and maritime forest

D. Project Description

I. *Construction Schedule (What is the anticipated schedule for major phases of work? Include duration of in-water work.)*

The project is expected to last 4 months, with in-water work conducted from late spring through fall.

II. *Describe the Proposed Action: 1. What is the purpose and need of the proposed action? 2. How do you plan to accomplish it? Describe in detail the construction equipment and methods** needed; permanent vs. temporary impacts; duration of temporary impacts; dust, erosion, and sedimentation controls; restoration areas; if the project is growth-inducing or facilitates growth; whether the project is part of a larger project or plan; and what permits will need to be obtained. 3. Attach a separate map showing project footprint, avoidance areas, construction accesses, staging/ laydown areas. **If construction involves overwater structures, pilings and sheetpiles, boat slips, boat ramps, shoreline armoring, dredging, blasting, or artificial reefs, list the method here, but complete the next section(s) in detail.*

The siting of, intertidal reefs for the Restoring Living Shorelines and Reefs in Mississippi Estuaries project components are conceptual and subject to refinement. For the purposes of impact analysis, the Trustees have conservatively estimated the maximum footprint for permanent and temporary impacts resulting from the deployment of intertidal reef habitat. Additionally, an estimated project area in which the total impacts would occur is also provided. To the extent practicable, submerged aquatic vegetation (SAVs) would be avoided; and, none is expected to be impacted at this time. Intertidal oyster surveys inventories would be completed as part of siting intertidal habitat. Other reasons for refinement in project location include but are not limited to:

- The Trustee would coordinate with Grand Bay NERR Staff and NOAA to ensure project consistency with the Grand Bay NERR Management Plan (GBNERR 2013). Siting of intertidal reefs would avoid monitoring sites at Grand Bay NERR.
- Avoidance of natural or cultural resources (e.g. SAVs or archaeological sites);
- Revised siting based on natural resource inventory;
- Engineering considerations including but not limited to geotechnical, hydrological, navigation, construction materials, construction techniques or bathymetric design constraints;
- Input received during the public comment period.

Construction methods and activities are included in order to assess the impact on the environment from the proposed project. Actual construction methods and activities would be determined after final design and will be comparable to activities described below or consultation will be reinitiated

Intertidal Reef Habitat

The Intertidal reef habitat would be constructed using loose or bagged oyster shells. Oyster shells would be bagged and stockpiled at an existing upland staging area which has water access to the project area. The bagged oyster shells would be loaded by hand onto shallow draft marine vessels. The shallow draft vessels would transport the bagged oyster shells to the project location where they would be unloaded and placed by hand from the boat. The intertidal reef habitat would be constructed along the water's edge between MLLW and Mean Higher High Water (MHHW). Tide surveys would be conducted prior to beginning construction and PVC poles would be pushed in the ground to mark the high and low tide elevations.

Staging Areas

Existing upland staging areas will be used and are not located in habitats used by listed or at-risk species. No new access to staging areas will be necessary.

Impacts

The Grand Bay Intertidal Reefs within Gulf Sturgeon Critical Habitat sites: A total of approximately 3 acres[1] of hard and soft bottom habitat would be impacted and would be replaced with hard structure (Figure 3). SAVs are present at Grand Bay. Intertidal reef habitat would not be installed in any SAV beds to the extent practicable. Data from Grand Bay National Estuarine Research Reserve (GBNERR) SAV surveys has been used in the planning process to site the structures outside of any known SAV beds. Further coordination with the staff of GBNERR for the final location of project components would occur to avoid SAVs. The deployment of intertidal reef habitat at Grand Bay would not require flotation channels.

Approximately 3 acres of intertidal soft bottom habitat and mud flats would be impacted by the placement of loose oyster shells or bagged oyster shells to create intertidal reef habitat. To the extent practicable, intertidal reef would be sited where there is existing adjacent or historic intertidal reef habitat.

Volume of proposed Intertidal Reef Habitat material: Approximately 6 inch thickness for the intertidal reefs. This equates to approx. 2,420 cubic yards for the 3 acres project area.

Bottom Disturbance and Turbidity

Deployment of the reefs would result in short-term impacts to water quality as a result of re-suspension of sediment by vessels (barges, tugs, skiffs, etc.) moving in and out of the area of proposed action. The suspended sediment may be transported into surrounding wetlands, waterways, and the Mississippi Sound. However, the area is currently exposed to elevated turbidity levels as a result of natural re-suspension of sediment during frequent storms, tides and other typical events.

Disturbance of the bottom sediment by placing hardened structure may affect prey availability in the area of proposed action for juvenile and adult fish. The impacts from placing material would be short term, and localized, affecting individuals and not entire populations.

U.S. Army Corps of Engineers Section 10/404 and State Water Quality Certifications would be required; all project activities would be conducted in compliance with permit conditions. Impacts from turbidity would be moderate, short-term and limited in spatial extent.

Figure 4 (Appendix A) shows the project area and the footprint of potential project components.

[1] Note a total of 3 acres of intertidal reef habitat would be sited within the project area. The habitat could be entirely within critical habitat, partially in critical habitat or not at all. This form covers up to 3 acres of intertidal reef habitat deployment within critical habitat only.

III. *Specific In-Water Construction Methods (Provide a detailed account of construction methods. It is important to include step-by-step descriptions of how demolition or removal of structures is conducted and if any debris will be moved and how. Describe how construction will be implemented, what type and size of materials will be used and if machines will be used, manual labor, or both. Indicated if work will be done from upland, barge, or both.)*

a. *Overwater Structures (Place your answers to the following questions in the box below.)*

- i. *Is the proposed use of this structure for a docking facility or an observation platform?*
- ii. *If no, is this a fishing pier? Public or Private? How many people are expected to fish per day? How do you plan to address hook and line captures?*
- iii. *Use of "Dock Construction Guidelines"? http://sero.nmfs.noaa.gov/pr/endangered%20species/Section%207/DockGuidelines.pdf*
- iv. *Type of decking: Grated – 43% open space; Wooden planks or composite planks – proposed spacing?*
- v. *Height above Mean High Water (MHW) elevation?*
- vi. *Directional orientation of main axis of dock?*
- vii. *Overwater area (sqft)?*
- viii. *Use of "Sea Turtle and Smalltooth Sawfish Construction Conditions, March 2006"? http://sero.nmfs.noaa.gov/pr/endangered%20species/Sea%20Turtle%20and%20Smalltooth%20Sawfish%20Construction%20Conditions%20323-06.pdf*

See Intertidal Reefs in project description D.II.

b. *Pilings & Sheetpiles (What type of material is the piling or sheetpiles? What size and how many will be used? Method used to install: impact hammer, vibratory hammer, jetting, etc.?)*

Not Applicable

c. *Boat Slips (Describe the number and size of slips and if the number of new slips changes from what is currently available at the project. Indicate how many are wet slips and how many are dry slips. Estimate the shadow effect of the boats - the area (sqft) beneath the boats that will be shaded.)*

Not Applicable

d. *Boat Ramp (Describe the number and size of boat ramps, the number of vessels that can be moored at the site (e.g., staging area) and if this is a public or private ramp. Indicate the boat trailer parking lot capacity, and if this number changes from what is currently available at the project.)*

Not Applicable

e. *Shoreline Armoring (This includes all manner of shoreline armoring (e.g., riprap, seawalls, jetties, groins, breakwaters, etc.). Provide specific information on material and construction methodology used to install the shoreline armoring materials. Include linear footage and square footage. Attach a separate map showing the location of the shoreline armoring in the project area.)*

Not Applicable

f. *Dredging or digging (Provide details about dredge type (hopper, cutterhead, clamshell, etc.), maximum depth of dredging, area (ft^2) to be dredged, volume of material (yd^3) to be produced, grain size of material, sediment testing for contamination, spoil disposition plans, and hydrodynamic description (average current speed/direction))*

Not Applicable

g. *Blasting (Projects that use blasting might not qualify as "minor projects," and a Biological Assessment (BA) may need to be prepared for the project. Arrange a technical consultation meeting with NMFS Protected Resources Division to determine if a BA is necessary. Please include explosive weights and blasting plan.)*

Not Applicable

h. *Artificial Reefs (Provide a detailed account of the artificial reef site selection and reef establishment decisions (i.e., management and siting considerations, stakeholder considerations, environmental considerations), deployment schedule, materials used, deployment methods, as well as final depth profile and overhead clearance for vessel traffic. For additional information and detailed guidance on artificial reefs, please refer to the artificial reef program websites for the particular state the project would occur in.*

Not Applicable/See Intertidal Reefs in project description D.II.

E. Species & Critical Habitat

1. List all species, critical habitat, proposed species and proposed critical habitat that may be found in the action area.
2. Attach a separate map identifying species/critical habitat locations within the action area.
For information on species and critical habitat under FWS jurisdiction, visit http://www.fws.gov/endangered/species/.
Under NMFS jurisdiction,
visit: http://sero.nmfs.noaa.gov/protected_resources/section_7/threatened_endangered/Documents/gulf_of_mexico.pdf.

SPECIES and/or CRITICAL HABITAT (CH)	Status	CH UNIT
Gulf Sturgeon – estuarine	Threatened	
Loggerhead sea turtle – in water	Threatened	
Green sea turtle – in water	Threatened	
Leatherback sea turtle – in water	Endangered	
Hawksbill sea turtle – in water	Endangered	
Kemp's ridley sea turtle – in water	Endangered	
Piping plover – terrestrial	Threatened	
Red knot – terrestrial	Threatened	
West Indian Manatee – in water	Endangered	
Piping plover CH – terrestrial	Critical Habitat	MS-15; (Figure 3)
Gulf sturgeon CH – estuarine	Critical Habitat	8; (Figure 3)

F. Effects of the Proposed Project

I. *Explain the potential beneficial and adverse effects to each species listed above (Describe what, when, and how the species will be impacted and the likely response to the impact. Be sure to include direct, indirect, interdependent, interrelated, connected actions, and cumulative impacts. Where possible, quantify effects. If species are present (or potentially present) and will not be adversely affected describe your rationale. If species are unlikely to be present in the general area or action area, explain why. This justification provides documentation for your administrative record, avoids the need for additional correspondence regarding the species, and helps expedite review.)*

Five species of sea turtles - The action area does not include nesting habitat for the five sea turtle species therefore there will be no effect to nesting sea turtles. However, in-water project work may coincide with sea turtle presence (i.e. spring/summer). During this time construction crews would be operating mechanized equipment in the water including barges and light watercraft. The noise produced by the machinery, movement of the machinery in the water, and placement of materials could disturb sea turtles. All species are highly mobile and project activities would not impede transitory routes. In the section below we describe conservation measures to protect sea turtles; *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NMFS 2006). The implementation of these measures would minimize any potential risks to sea turtles to an insignificant and discountable effect.

Piping Plover - Piping plover are not known to occur in the action area. Piping plovers do not nest in the action area, but do use it for wintering habitat. Piping plovers could be startled by work crews, vehicles, and machinery and stop foraging or roosting. However, piping plovers would be expected to move away from the disturbance to other suitable habitats outside of the disturbance area. There is an abundance of suitable foraging and roosting habitat within GBNERR and within 2 miles of the action area in which plovers would be expected to move to or within (i.e., within their normal range of movements). The noise produced by the machinery and movement of the machinery may disturb the piping plover present on site, but piping plover could avoid disturbance by moving into adjacent areas of unimpacted habitat. Therefore it is not expected that startling and temporary displacement would interrupt or have long-term consequences to normal behaviors. Foraging habitats are abundant within GBNERR therefore we do not expect indirect effects to piping plover from a loss of prey base. Increased visitor use is not expected as a result of this project. Therefore, an increase of indirect effects from human use is not expected. Based upon the normal movement patterns of piping plover and the conservation measures outlined below (allowing movement of their own volition, and watching for the birds), it is determined the project may affect but is not likely to adversely affect piping plover.

Red Knot - In coastal Mississippi, the red knot is mainly a migratory species that uses coastal beaches and marine intertidal areas as stopover feeding locations or staging areas from March to April during the northward spring migration and September and October during the southward autumn migration (Niles et al. 2007; USFWS 2013). Red knot individuals could be startled by work crews, vehicles, and machinery and stop foraging or roosting. However, they would be expected to move away from the disturbance to other suitable habitats outside of the disturbance area. There is an abundance of suitable foraging and roosting habitat within GBNERR and within 2 miles of the action area in which they would be expected to move to or within (i.e., within their normal range of movements). The noise produced by the machinery and movement of the machinery may disturb the red knot individuals present on site, but red knot individuals could avoid disturbance by moving into adjacent areas of unimpacted habitat. Therefore it is not expected that startling and temporary displacement would interrupt or have long-term consequences to normal behaviors. Foraging habitats are abundant within GBNERR therefore we do not expect indirect effects to red knot from a loss of prey base. Increased visitor use is not expected as a result of this project. Therefore, an increase of indirect effects from human use is not expected. Based upon the normal movement patterns of red knot and the conservation measures outlined below (allowing movement of their own volition, and watching for the birds), it is determined the project may affect but is not likely to adversely affect red knot. Conservation measures will minimize any disturbance to an insignificant and discountable level.

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 summer, when project implementation is expected. Although the West Indian manatee could be present in the project area in warmer months, 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 large beds of *Halodule wrightii* and *Ruppia maritima* throughout the project boundary, but intertidal reefs sites would be selected to completely avoid areas with seagrass. 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. Conservation measures listed below would minimize risk of startle and strike to an insignificant and discountable level. Construction equipment such as a barge would likely cause increased levels of turbidity at the local scale and noise in the water column which may affect the species within a particular distance. Manatees would probably avoid any areas of increased turbidity as they are not known to use turbid habitats and avoid areas with increased noise due to their highly mobile nature. Manatees, if present, would probably avoid the construction areas. *Standard Manatee Conditions (A-D) for In-Water Work* would be implemented during construction (USFWS 2011).

Gulf Sturgeon - 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., 2000; Heise et al. 2004, 2005; Rogillio et al. 2007; Ross et al. 2009; Havrylkoff et al. 2012). Data from Gulf sturgeon that are natal to the Pascagoula 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 (Rogillio et al. 2007). Appendix B is a write up on juvenile Gulf Sturgeon and provides a literature review documenting they are unlikely to occur in the project area. Project work would be completed in the spring and summer months when sturgeon are not expected in marine and estuarine environments. If work continues beyond the May to October window, continued adherence to the Sea turtle and Smalltooth Sawfish Construction Conditions (NMFS, 2006) will minimize the potential for impacting Gulf Sturgeon. No direct or indirect impacts from construction are expected in the riverine ecosystems.

II. *Explain the potential beneficial and adverse effects to [critical habitat for]each species listed above (Describe what, when, and how the species will be impacted and the likely response to the impact. Be sure to include direct, indirect, interdependent, interrelated, connected actions, and cumulative impacts. Where possible, quantify effects. If species are present (or potentially present) and will not be adversely affected describe your rationale. If species are unlikely to be present in the general area or action area, explain why. This justification provides documentation for your administrative record, avoids the need for additional correspondence regarding the species, and helps expedite review.):*

Piping Plover CH - Areas containing habitat components that are essential for primary biological needs of foraging, sheltering, and roosting are considered critical habitat. All project work would be in-water and would not directly impact piping plover Primary Constituent Elements (PCEs). PCEs for piping plover critical habitat include: 1) Intertidal flats with sand or mud flats (or both) with no or sparse emergent vegetation. 2) Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris, detritus, or microtopographic relief (less than 50 cm above substrate surface) offering refuge from high winds and cold weather. 3) Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas. 4) 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.

Areas containing habitat components that are essential for primary biological needs of foraging, sheltering, and roosting are considered critical habitat. During project work, construction crews will be operating mechanized equipment on the water away from the beach and PCEs. No significant change to the structure of existing landscape features (including PCEs) is expected. Further, the project is not anticipated to alter the way any coastal processes (such as washovers and spits). Thus no short or long term effects to piping plover critical habitat are expected to occur.

Gulf Sturgeon CH - The PCEs essential for the conservation of Gulf sturgeon are those habitat components that support feeding, resting and sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support these habitat components. The PCEs of Gulf sturgeon critical habitat are:

1. Abundant food items, such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages; and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages;
2. Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
3. Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during freshwater residency and possibly for osmoregulatory functions;
4. A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging;
5. Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;
6. Sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
7. Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage).

Four PCEs apply to the Grand Bay project area and components: PCEs 1, 5, 6, and 7. Substrate conversion of 3 acres would be composed of bagged oyster shell.

PCE 1: The project footprint for the intertidal components represents a fraction (3 acres) in total area when compared to the overall amount of benthic habitat in the Grand Bay estuary and adjacent waterbodies and in Unit 8 as a whole, therefore we do not expect any effect to abundance of prey items for Gulf sturgeon.

PCE 5: Water quality would be impacted in the short-term due to increased turbidity as a result of construction activities. However, the area is currently exposed to elevated turbidity levels as a result of natural re-suspension of sediment during frequent storms, tides and other typical events.

PCE 6: The project will alter up to 3 acres of soft bottom habitat to hard structure consisting of bagged oyster shell. The project footprint for the intertidal components represents a fraction in total area when compared to the overall amount of sediment necessary for normal behavior, growth and viability in the Grand Bay estuary and adjacent waterbodies and in Unit 8 as a whole, therefore we do not expect any effect to sediment quality.

PCE 7: Since the project footprint is small compared to Grand Bay NERR and Unit 8, it is expected that in the event of Gulf Sturgeon using the area as a migratory pathway, they would be able to easily avoid and maneuver around they proposed intertidal reef habitat. We do not expect any effect to migratory pathways as a result of this project.

Additionally, project locations are located in very shallow environments under 6 feet of depth (MHW). Due to the shallow water depths, that particular project area provides poor foraging and refuge habitat for sturgeon. Gulf sturgeon are suction feeders, using their relatively narrow mouths to funnel water and prey items. Because of their feeding morphology, they are usually found at slightly deeper depths (greater than 6 ft) where there is lower wave energy. (Crabtree 2014).

G. Actions to Reduce Adverse Effects

I. *Explain the actions to reduce adverse effects to each species listed above (For each species for which impacts were identified, describe any conservation measures (e.g. BMPs) that will be implemented to avoid or minimize the impacts. Conservation measures are designed to avoid or minimize effects to listed species and critical habitats or further the recovery of the species under review. Conservation measures are considered part of the proposed action and their implementation is required. Any changes to, modifications of, or failure to implement these conservation measures may result in a need to reinitiate this consultation.):*

General BMPs
Natural cultch materials (i.e. oyster shells) would be used for intertidal cultch placements in the Grand Bay NERR. Material used for construction cannot contain trash, debris, and/or toxic pollutants.

Transiting vessels/barges, and/or mechanical dredge-related activities, will occur at slow transit speed of the towed barges (5 knots or less).

The project would comply with Measures for Reducing Entrapment Risk to Protected Species, revised May 22, 2012.

Minimize the risk of attracting invasive species and predators to the action area
Prior to bringing any equipment (including personal gear, machinery, vehicles or vessels) to the work site, inspect each item for mud or soil, seeds, and vegetation. If present, the equipment, vehicles, or personal gear shall be cleaned until they are free from mud, soil, seeds, and vegetation. This inspection will occur each time equipment, vehicles, and personal gear are being prepared to go to a site or prior to transferring between sites to avoid spreading exotic, nuisance species.

Inspect sites periodically to identify and control new colonies/individuals of an invasive species not previously observed prior to construction.

Remove trash or anything that would attract nuisance wildlife to work areas daily.

Project related trash or debris shall not be allowed to blow into open water or onto beaches.

Sea turtles
Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS 2006)

All project work would be in-water, during daylight hours and no nesting habitat exists in the project area.

All construction personnel would be notified of the potential presence of sea turtles in the water and would be reminded of the need to avoid sea turtles.

If any sea turtles are found to be present in the immediate project area during activities, construction would be halted until species moves away from project area.

All construction personnel would be notified of the criminal and civil penalties associated with harassing, injuring, or killing sea turtles.

Train/instruct all construction personnel of what they are to do in the presence of a sea turtle.

Construction activities would occur during daylight hours and noise would be kept to the minimum feasible.

Shorebirds
All construction personnel would be notified of the potential presence of shorebirds within the project area.

All construction personnel would be instructed and trained in the protection of shorebirds.

Construction personnel would be notified of the criminal and civil penalties associated with harassing, injuring or killing shorebirds.

If piping plovers or red knots are present, work would not occur until the birds have moved, of their own volition, from the area by 150 feet.

Construction noise would be kept to the minimum feasible.

West Indian Manatee
Standard Manatee Conditions (A-D) for In-Water Work (USFWS 2011)

All construction personnel would be notified of the potential presence of West Indian Manatee in the water and reminded of the criminal and civil penalties associated with harassing, injuring, or killing West Indian Manatees.

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) have 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.

All vessels associated with the construction project shall operator 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.

Care would be taken when lowering equipment into the water and the sediment in order to ensure that no harm is caused to West Indian Manatee that may potentially be in the water within the construction area.

Site selection will avoid seagrasses to the maximum extent practicable such that potential feeding areas will not be removed.

Construction noise would be kept to the minimum feasible.

Gulf Sturgeon
In-water construction activities would be limited to late spring/summer months when Gulf sturgeon are unlikely to be within the construction area. In addition, the Sea Turtle and Smalltooth Sawfish Construction Conditions (NMFS, 2006) will be implemented throughout as they are protective of Gulf sturgeon as well.

Project components would not impede any migratory paths during construction. Design or materials used will not create an entanglement or entrapment risk to ESA and MMPA species or block migration. Completed projects would not impede ingress, egress, and migration of species protected under ESA or MMPA (protected species) between shoreline and open water.

Post Construction Monitoring
The following parameters may be monitored after construction is complete.

- Structural integrity of interdial reefs
- Intertidal reef height/elevation and area
- Infauna and epifauna species composition, density, and biomass on intertidal reef

All sites would need to be accessed by small vessels during monitoring events. Structural integrity would be observational from boat or through poling intertidal reef once a year. Area and elevation of interdial reefs may be monitored post-construction to ensure that elevation and area meet design specifications. This may be done by boat using side-scan sonar or other similar instrumentation, at minimum once for as-built verification and once

more during 5-7 year monitoring period. Non-bivalve invertebrate infauna and epifauna surveys would be conducted using trays attached to or laid on intertidal reefs. This method requires deployment from boat or by foot in shallow areas. Trays would be deployed for a 6-week period and then retrieved for at least two post-construction monitoring events. Shoreline profile/slope and marsh edge position may be monitored by foot using GPS, at minimum once post-construction.

Sample size and frequency of sampling will be determined after engineering and design are completed and monitoring contractor costs are established. Minimum number of events are outlined in the monitoring plan. All monitoring data and reporting will go through the quality assurance/ quality control process set up by the Trustees and as outlined in MDEQ's Comprehensive Quality Assurance Plan before being released to the public.

II. *Explain the actions to reduce adverse effects to critical habitat listed above (For critical habitat for which impacts were identified, describe any conservation measures (e.g. BMPs) that will be implemented to avoid or minimize the impacts. Conservation measures are designed to avoid or minimize effects to listed species and critical habitats or further the recovery of the species under review. Conservation measures are considered part of the proposed action and their implementation is required. Any changes to, modifications of, or failure to implement these conservation measures may result in a need to reinitiate this consultation.):*

Piping Plover CH

PCEs for piping plover critical habitat include: 1) Intertidal flats with sand or mud flats (or both) with no or sparse emergent vegetation. 2) Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers. Such sites may have debris, detritus, or microtopographic relief (less than 50 cm above substrate surface) offering refuge from high winds and cold weather. 3) Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas. 4) 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.

The construction activities of the project are not anticipated to have and direct impact to piping plover critical habitat since all of the work will be completed by boat. The reefs could result in less wave action erosion to critical habitat, thus providing some benefit. Some sediment disturbed by placement of materials could wash onto the adjacent shore, but this is anticipated to be insignificant and discountable. To help reduce this risk transiting vessels/barges, and/or mechanical dredge-related activities, will occur at slow transit speed of the towed barges (5 knots or less) to reduce turbidity.

Gulf Sturgeon CH

As described in Section F.I. Four PCEs apply to the Grand Bay project area and components: PCEs 1, 5, 6, and 7: Three acres of substrate would be converted to hard structure by the placement of bagged oyster shell.

PCE 1: The project footprint for the intertidal components represents a fraction (3 acres) in total area when compared to the overall amount of benthic habitat in the Grand Bay estuary and adjacent water bodies and in Unit 8 as a whole, therefore we do not expect any effect to abundance of prey items for Gulf sturgeon.

PCE 5: Water quality would be impacted in the short-term due to increased turbidity as a result of construction activities. However, the area is currently exposed to elevated turbidity levels as a result of natural re-suspension of sediment during frequent storms, tides and other typical events. To help reduce effects to water quality the following BMPs will be followed:

Material used for construction cannot contain trash, debris, and/or toxic pollutants.

Transiting vessels/barges, and/or mechanical dredge-related activities, will occur at slow transit speed of the towed barges (5 knots or less) to reduce turbidity.

PCE 6: The project will alter up to 3 acres of soft bottom habitat to hard structure consisting of bagged oyster shell. The project footprint for the intertidal components represents a fraction in total area when compared to the overall

amount of sediment necessary for normal behavior, growth and viability in the Grand Bay estuary and adjacent waterbodies and in Unit 8 as a whole, therefore we do not expect any effect to sediment quality.

PCE 7: Since the project footprint is small compared to Grand Bay NERR and Unit 8, it is expected that in the event of Gulf Sturgeon using the area as a migratory pathway, they would be able to easily avoid and maneuver around they proposed intertidal reef habitat. We do not expect any effect to migratory pathways as a result of this project. To reduce the risk of impacts to migratory pathways the project would comply with Measures for Reducing Entrapment Risk to Protected Species, revised May 22, 2012, and would site the structures so that Gulf Sturgeon will not be blocked to or from riverine systems.

H. Effect Determination Requested

From the sections above, there should be enough detailed information to provide clear and obvious support for your determination in the section below. If the rationale for the determination is not clear, additional information must be added to one of the sections. Identify if gulf sturgeon are in saltwater, estuarine, or in freshwater in your Species and/or Critical Habitat list to determine which federal agency will perform the analysis (e.g. gulf sturgeon CH - saltwater). Identify if sea turtles are in water or on land in your Species and/or Critical Habitat list to determine which federal agency will perform the analysis (e.g. Loggerhead sea turtle CH - terrestrial).

SPECIES and/or CRITICAL HABITAT	DETERMINATION (see definitions below)
Gulf Sturgeon - estuarine	May Affect, Not Likely to Adversely Affect
Gulf sturgeon CH	no adverse modification or destruction
Loggerhead sea turtle – in-water	May Affect, Not Likely to Adversely Affect
Green sea turtle – in-water	May Affect, Not Likely to Adversely Affect
Leatherback sea turtle – in-water	May Affect, Not Likely to Adversely Affect
Hawksbill sea turtle – in-water	May Affect, Not Likely to Adversely Affect
Kemp's ridley sea turtle – in-water	May Affect, Not Likely to Adversely Affect
Piping plover - terrestrial	May Affect, Not Likely to Adversely Affect
Piping plover CH	no adverse modification or destruction
Red knot - terrestrial	May Affect, Not Likely to Adversely Affect
West Indian Manatee – in water	May Affect, Not Likely to Adversely Affect

NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat.

NLAA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response requested is "Concurrence." This conclusion is appropriate when effects to the species or critical habitat will be beneficial, discountable, or insignificant. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact, while discountable effects are those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. If the Services concur in writing with the Action Agency's determination of "is not likely to adversely affect" listed species or critical habitat, the section 7 consultation process is completed.

LAA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response requested for listed species is "Formal Consultation". Response requested for proposed and candidate species is "Conference." This conclusion is reached if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable or insignificant. In the event the overall effect of the proposed action is beneficial to the listed species or critical habitat, but may also cause some adverse effect on individuals of the listed species or segments of the critical habitat, then the determination should be "is likely to adversely affect." Such a determination requires formal section 7 consultation and will require additional information.

JP = likely to jeopardize proposed species/adversely modify proposed critical habitat. For proposed species and proposed critical habitats, the Service is required to evaluate whether the proposed action is likely to jeopardize the continued existence of the proposed species or adversely modify an area proposed for designation as critical habitat. If you reach this conclusion, a section 7 conference is required.

JC = likely to jeopardize candidate species. For candidate species, the Service is required to evaluate whether the proposed action is likely to jeopardize the continued existence of the candidate species. If this conclusion is reached, intra-Service section 7 conference is required.

I. Bald Eagles

I. Are Bald Eagles present in the action area?: YES

If YES, the following conservation measures should be implemented:

1. If bald eagle breeding or nesting behaviors are observed or a nest is discovered or known, all activities (e.g., walking, camping, clean-up, 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 (e.g., 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 these measures cannot be implemented, then you must contact the Service's Migratory Bird Permit Office.
Texas – (505) 248-7882 or by email: permitsR2MB@fws.gov
Louisiana, Mississippi, Alabama, and Florida – (404) 679-7070 or by email: permitsR4MB@fws.gov

J. Migratory Birds

Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation. You may list similar species on a single line and categorize by type (e.g., Wading birds - great blue heron, snowy egret, reddish egret). Use additional tables on the next page if needed.

SPECIES/SPECIES GROUP	BEHAVIOR	SPECIES/HABITAT IMPACTS
Wading birds (herons, egrets, ibises)	Foraging, feeding, resting, roosting	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.

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 would be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance would 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 would occur during daylight hours only. These birds primarily nest in trees or shrubs (e.g. pines, Baccharis), which occur outside the action area. Therefore, nesting will not be impacted.

Migratory Birds

Continuation page if needed.

Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation. You may list similar species on a single line and categorize by type (e.g., Wading birds - great blue heron, snowy egret, reddish egret). Use additional tables on the next page if needed.

SPECIES/SPECIES GROUP	BEHAVIOR	SPECIES/HABITAT IMPACTS
Shorebirds (plovers, oystercatchers, stilts, sandpipers)	Foraging, feeding, resting, roosting,	Shorebirds forage, feed, rest, and roost in the action 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.

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
Shorebirds (plovers, oystercatchers, stilts, sandpipers)	Care would be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance would 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 would occur during daylight hours only. . These birds primarily nest and roost in the dunes. This project would occur in open water away from potential shorebird nesting areas; therefore it is not anticipated to impact nesting.

Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation. You may list similar species on a single line and categorize by type (e.g., Wading birds - great blue heron, snowy egret, reddish egret). Use additional tables on the next page if needed.

SPECIES/SPECIES GROUP	BEHAVIOR	SPECIES/HABITAT IMPACTS
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Foraging, feeding, resting, roosting,	Seabirds forage, feed, rest, and roost in the action 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.

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
Seabirds (terns, gulls, skimmers, double-crested cormorant, American white pelican, brown pelican)	Care would be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance would 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 would occur during daylight hours only. These birds primarily roost in the dunes. This project would occur in open water away from potential nesting areas; therefore it is not anticipated to impact nesting.

Migratory Birds

Continuation page if needed.

Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation. You may list similar species on a single line and categorize by type (e.g., Wading birds - great blue heron, snowy egret, reddish egret). Use additional tables on the next page if needed.

SPECIES/SPECIES GROUP	BEHAVIOR	SPECIES/HABITAT IMPACTS
Raptors (osprey, hawks, eagles, owls)	Foraging, feeding, resting, roosting,	Raptors forage, feed, and rest in the action 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.

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
Raptors (osprey, hawks, eagles, owls)	No work would occur within 660 feet of any bald eagle nests and all other bald eagle conservation measures (identified under Section I, above) can be implemented. Care would be taken to minimize noise and vibration in their vicinities. Roosting should not be impacted because the project would occur during daylight hours only, and because the areas where these birds nest are not within the action area. A staff biologist would advise the contractor of the nesting status of all identified raptor nests near the action area and approve of work in the vicinity. The areas in the estuary where these birds roost and nest are not within the action area.

Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation. You may list similar species on a single line and categorize by type (e.g., Wading birds - great blue heron, snowy egret, reddish egret). Use additional tables on the next page if needed.

SPECIES/SPECIES GROUP	BEHAVIOR	SPECIES/HABITAT IMPACTS
Goatsuckers	Foraging, feeding, resting, roosting,	Goatsuckers forage, feed, rest, and roost in the project area. However, they are nocturnal/crepuscular and therefore not active during the project work period.

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
Goatsuckers	All work would be done during daylight hours. These birds are nocturnal/crepuscular and as such, should not be foraging or feeding while work occurs. Care would be taken to minimize noise and vibration near habitat where these birds are resting or roosting. They nest in thickets and woodlands, which are present in the action area. This project would occur in open water away from potential nesting areas; therefore it is not anticipated to impact nesting.

Migratory Birds

Continuation page if needed.

Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation. You may list similar species on a single line and categorize by type (e.g., Wading birds - great blue heron, snowy egret, reddish egret). Use additional tables on the next page if needed.

SPECIES/SPECIES GROUP	BEHAVIOR	SPECIES/HABITAT IMPACTS
Waterfowl (geese, swans, ducks, loons, and grebes)	Foraging, feeding, resting, roosting,	Waterfowl forage, feed, rest, and roost in the action 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.

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
Waterfowl (geese, swans, ducks, loons, and grebes)	Care would be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance would 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 would occur during daylight hours only. These birds primarily roost and nest in low vegetation. This project would occur in open water away from potential nesting areas; therefore it is not anticipated to impact nesting.

Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation. You may list similar species on a single line and categorize by type (e.g., Wading birds - great blue heron, snowy egret, reddish egret). Use additional tables on the next page if needed.

SPECIES/SPECIES GROUP	BEHAVIOR	SPECIES/HABITAT IMPACTS
Doves and pigeons	Foraging, feeding, resting, roosting	Doves and pigeons could forage, feed, rest, and roost in the project area. However, they are unlikely to utilize habitat in the estuarine zone/action area.

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
Doves and pigeons	It is unlikely that doves and pigeons would be impacted by this project. In addition, this project would not take near habitats where the species would nest; therefore it is not anticipated to impact nesting.

Migratory Birds

Continuation page if needed.

Identify the species anticipated in the project area and behaviors (breeding, roosting, foraging) anticipated during project implementation. You may list similar species on a single line and categorize by type (e.g., Wading birds - great blue heron, snowy egret, reddish egret). Use additional tables on the next page if needed.

SPECIES/SPECIES GROUP	BEHAVIOR	SPECIES/HABITAT IMPACTS
Rails and coots	Foraging, feeding, resting, roosting	Rails and coots forage, feed, rest, and roost in the action 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 if disturbed by the project. These birds primarily roost and nest in marshes, which are within the action area, and adjacent to project activities which are in-water.

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
Rails and coots	Care would be taken to minimize noise and vibration near areas where foraging or resting birds are encountered. All disturbance would 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 would occur during daylight hours only This project would occur in open water away from potential nesting areas; therefore it is not anticipated to impact nesting.

Pre-existing NEPA Documents: YES

Does this project have any pre-existing, site specific NEPA analysis? If YES, then provide final NEPA analysis, if not final then provide draft. If tiered from a programmatic EIS or EA, then provide the programmatic document or a link below.

Tiered from the DWH Phase III ERP/PEIS; http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/phase-iii/

http://grandbaynerr.org/wp-content/uploads/2010/08/Grand-Bay-NERR-Final-Environmental-Impact-Statement-Reserve-Management-Plan.pdf

NMF S E SA § 7 Consultation

We request that all ESA §7 consultation requests/packages be submitted electronically to: Laurel.Jennings@noaa.gov. Questions about consultation status may be directed to the same email address or by phone, 206-526-4601 or 206-794-4761 (cell).

FWS ESA § 7 Consultation

We request that all consultation requests/packages to FWS be submitted electronically to: Ashley_Mills@fws.gov. You will be notified when we receive your Biological Evaluation. Upon receipt, we will conduct a preliminary review and provide any comments and feedback, including any requests for modifications or additional information. If modifications or additional information is necessary, we will work with you until the Biological Evaluation form is considered complete. Once complete, we will send your Biological Evaluation to the appropriate Field Office to conduct consultation. If you have questions about consultation status, please contact Ashley Mills by phone 812-756-2712 or email Ashley_Mills@fws.gov.

Name of Person Completing this Form: Stephen Parker
Name of Project Lead: Marc Wyatt
Date Form Completed: 7-2-15
Date Form Updated: 8-11-15

Appendix A

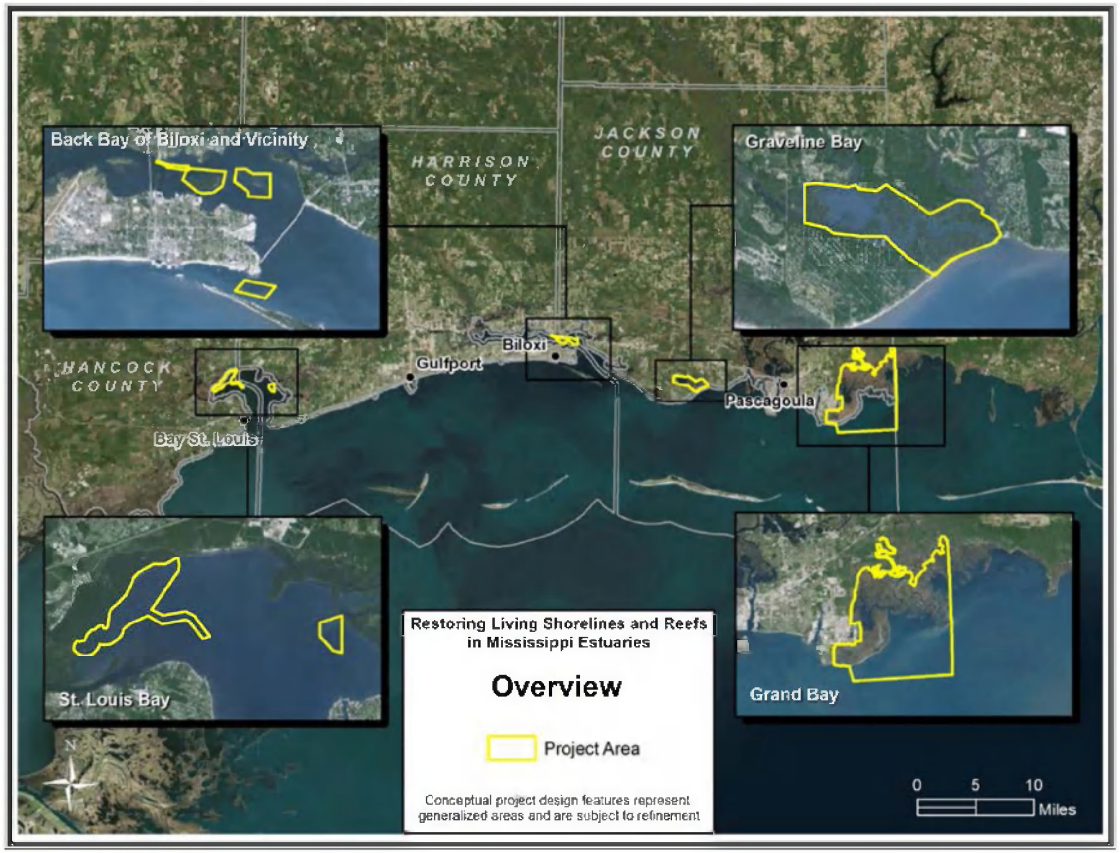


Figure 1: Restoring Living Shorelines and Reefs in Mississippi Estuaries-Vicinity Map Depicting Project Locations and Project Areas[2]

[2] Project areas encompass the project components, the direct restoration measures and potential areas for construction or indirect impacts. Conceptual design features (breakwaters, intertidal reef habitat, subtidal reef habitat, and temporary flotation channels) are subject to refinement and would be sited within respective project areas.

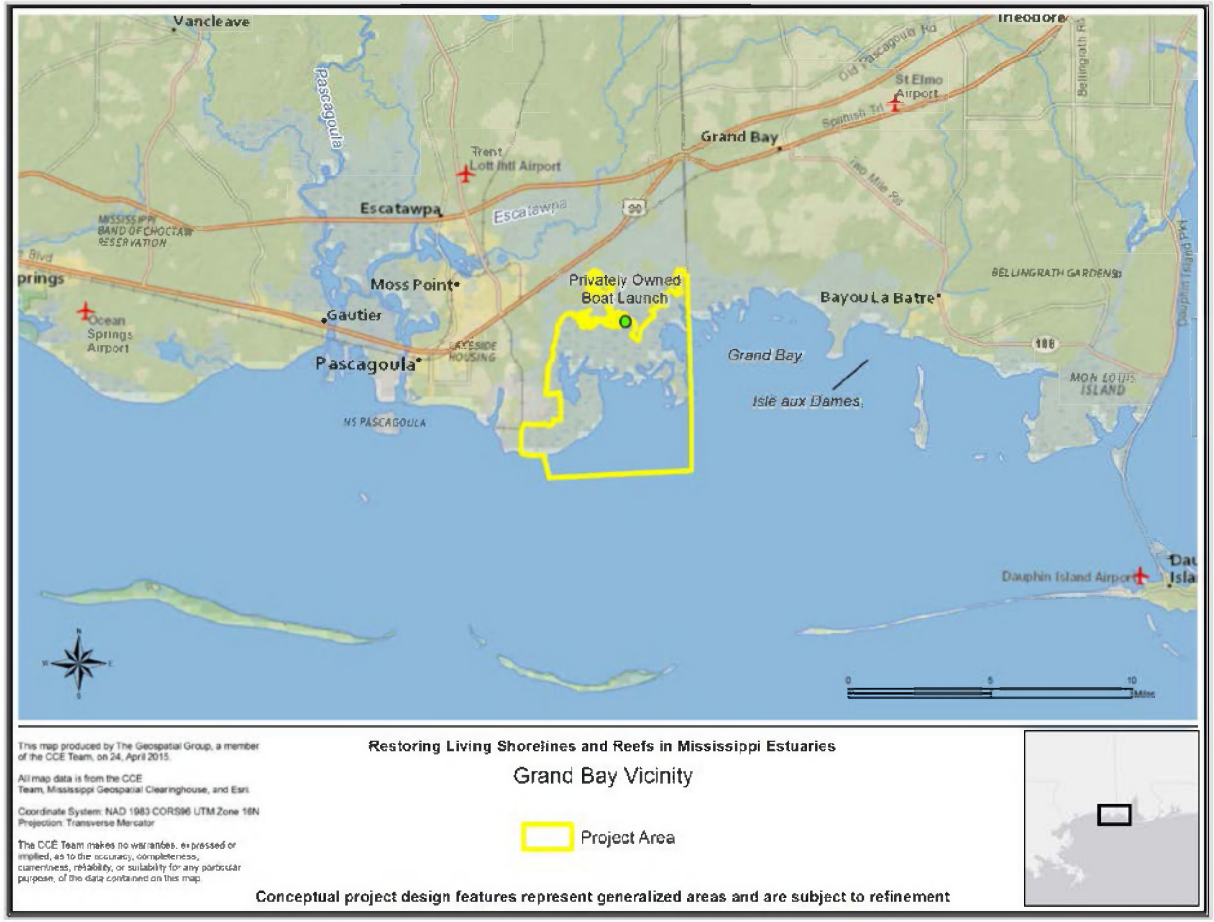


Figure 2. Grand Bay Proposed Intertidal Reefs within Gulf Sturgeon Critical Habitat Vicinity

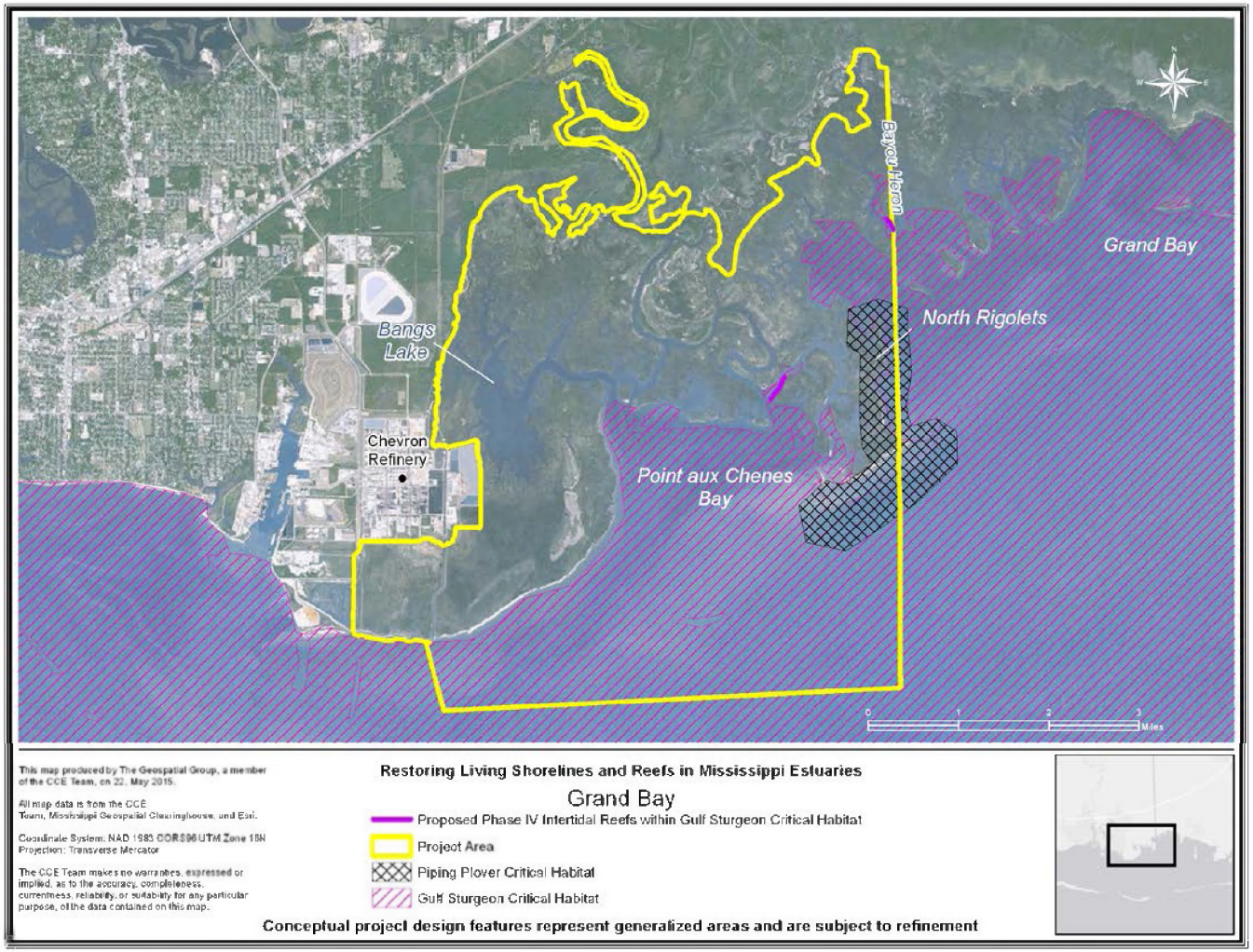


Figure 3. Grand Bay Proposed Intertidal Reefs within Gulf Sturgeon Critical Habitat Sites

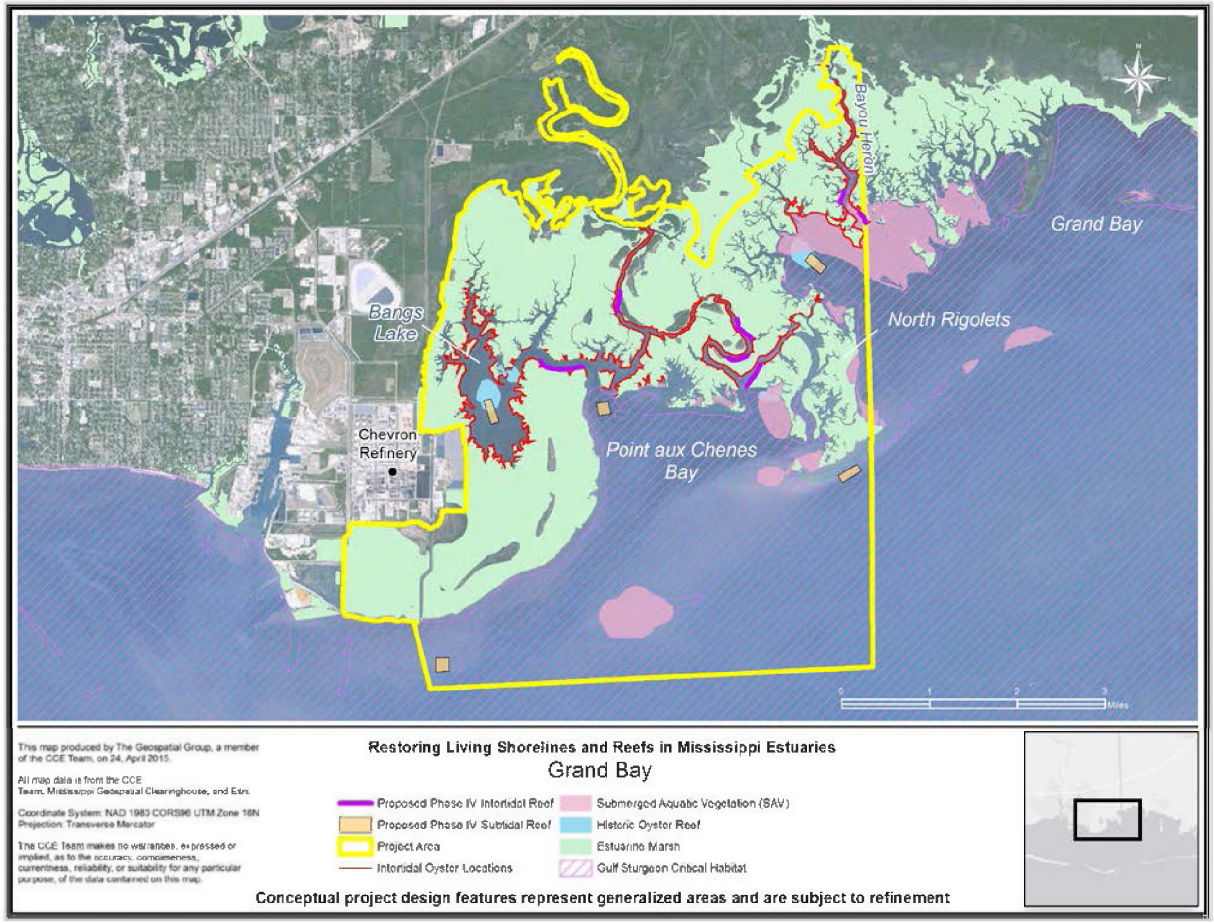


Figure 4. Grand Bay Submerged Aquatic Vegetation, National Wetland Inventory, and Oyster Locations

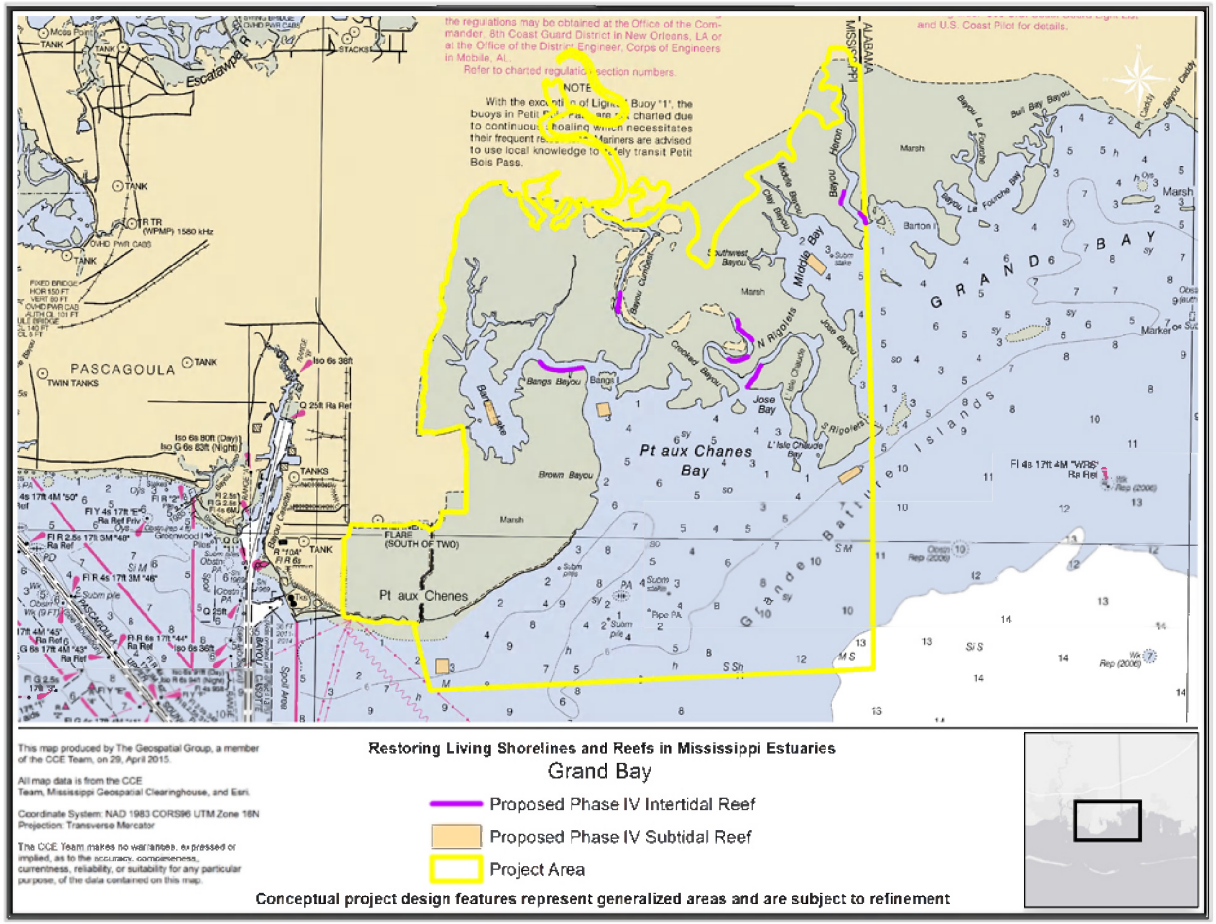


Figure 5. Grand Bay Bathymetry Map

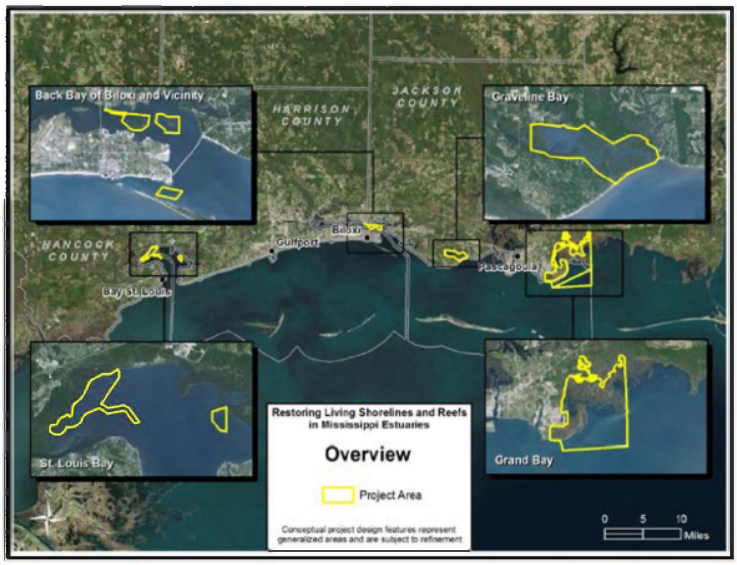
DWH Confidential Settlement Communication - Confidential Attorney Privileged Communication

APPENDIX B: Juvenile Gulf Sturgeon Occurrence in the Restoring Living Shorelines and Reefs in Mississippi Estuaries Project Components within Unit 8 Critical Habitat

Project Summary

The proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries includes the restoration of secondary productivity through the placement of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. Projects are proposed in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay in Jackson, Harrison, and Hancock Counties, Mississippi. When completed at all locations, the project would provide for construction of over four (4) miles of breakwaters, five (5) acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four (4) locations across the Mississippi Gulf Coast (Figure 1). The following is an analysis of the likelihood of juvenile Gulf Sturgeon occurrence and assessment of impact project activities that are within Unit 8 Critical Habitat for Gulf Sturgeon. While the Restoring Living Shorelines and Reefs in Mississippi Estuaries project would occur in 4 locations, only the Grand Bay project location and the Deer Island Subtidal Reef project area to the south of the Back Bay of Biloxi are discussed because those are the only locations within Unit 8 Critical Habitat.

Figure 1. Restoring Living Shorelines and Reefs in Mississippi Estuaries-Vicinity Map Depicting Project Locations and Project Areas[3].



[3] Project areas encompass the project components, the direct restoration measures and potential areas for construction or indirect impacts. Conceptual design features (breakwaters, intertidal reef habitat, subtidal reef habitat, and temporary flotation channels) are subject to refinement and would be sited within respective project areas.

Background and Project Description

The project components[4] are grouped into four project locations: Grand Bay; Graveline Bay; Back Bay of Biloxi and vicinity; and St. Louis Bay. For this project, the living shoreline approach includes constructing multiple breakwaters made of suitable manufactured and/or natural materials that reduce shoreline erosion by dampening wave energy while encouraging reestablishment of habitat that was once present in the region. Breakwaters would develop into reefs that support secondary productivity (living reefs). Subtidal and intertidal reefs would be built using suitable cultch material (e.g. limestone, crushed concrete, oyster shell or a combination thereof). The following proposed early restoration project components are listed in Table 1. Activities in Gulf Sturgeon critical habitat will include intertidal reef habitat restoration and subtidal reef habitat restoration (shown in green in Table 1).

Table 1. Restoring Living Shorelines and Reefs in Mississippi Estuaries-Project Components.

Project Components	Breakwater Structure Length (feet)	Subtidal Reef Habitat (acres)	Intertidal Reef Habitat (acres)
Grand Bay and Graveline Bayou (Jackson County)			
Grand Bay Intertidal and Subtidal Reefs		77	3
Graveline Bay Intertidal and Subtidal Reefs		70	2
Back Bay of Biloxi and Vicinity (Jackson and Harrison County)			
Channel Island Living Shoreline and Subtidal Reefs	2,385	70	-
Big Island Living Shoreline	5,011	-	-
Little Island Living Shoreline	2,316	-	-
Deer Island Subtidal Reef	-	20	-
St. Louis Bay (Harrison and Hancock County)			
Wolf River Living Shoreline and Subtidal Reef	1,388	30	-
St. Louis Bay Living Shoreline	10,812	-	-
TOTAL	21,912 feet 4.1 miles	267 acres	5 acres

Two of the project components are located in Unit 8 Gulf Sturgeon habitat (Figure 2). Those project components are the Grand Bay Intertidal and Subtidal Reefs and the Deer Island Subtidal Reef. The projects are highlighted in green in Table 1.

[4] For the purpose of the Restoring Living Shorelines and Reefs in Mississippi Estuaries Phase IV project components are located in four locations across the Mississippi Gulf Coast and include some combination of the following restoration measures; intertidal reef habitat restoration; subtidal reef habitat restoration and breakwater construction. Grand Bay and Graveline Bay are each considered a project location with numerous intertidal and subtidal reefs sites.

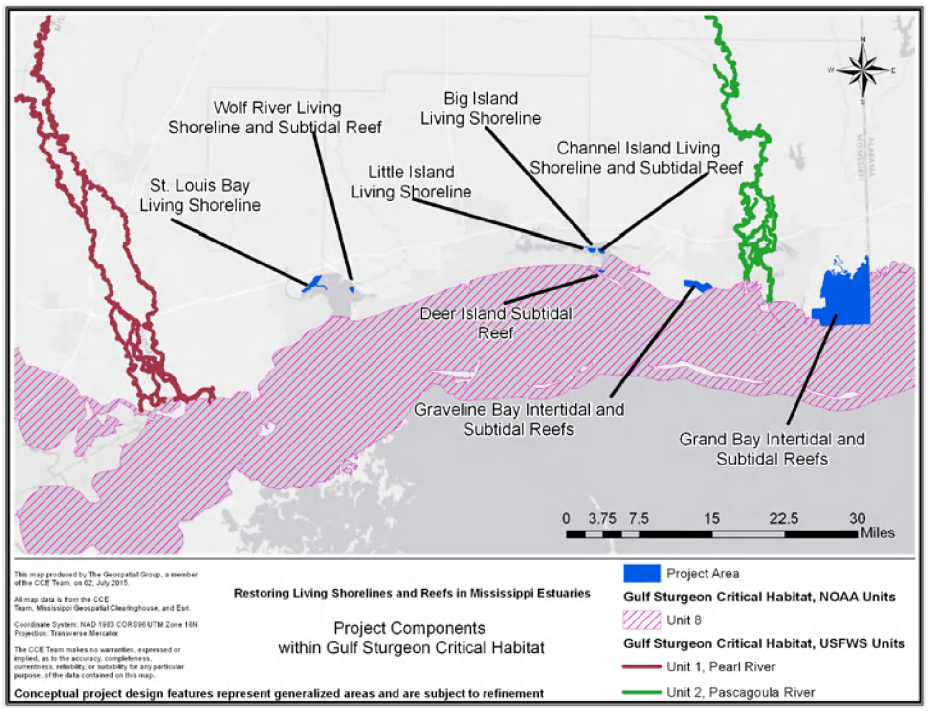


Figure 2: Gulf Sturgeon Critical Habitat-Restoring Living Shorelines and Reefs in Mississippi Estuaries

Gulf Sturgeon Literature Review

A number of studies have documented the summer and winter occurrence of juvenile Gulf Sturgeon in estuarine systems in low salinity environments (oligohaline to mesohaline) near the mouth of rivers where adult sturgeon migrate and spawn (Sultak, et.al., 2009; Duncan et. al., 2011; Parauka et.al., 2011). Juvenile Gulf Sturgeon will move to higher salinity (polyhaline) open Gulf of Mexico environments in response to dramatic drops in air or water temperatures during the winter and offshore excursions may be tolerated several days to weeks at a time, however juvenile GS typically make infrequent use of open polyhaline waters. Research in Choctawhatchee Bay indicates that subadult Gulf sturgeon show a preference for water with a salinity less than 6.3 parts per thousand (50 CFR Part 226).

Project Activities (Intertidal and Subtidal Reef Habitat Restoration)

Project activities in Gulf Sturgeon Critical habitat include intertidal and subtidal reef habitat restoration in Grand Bay and subtidal reef habitat restoration near Deer Island south of the Back Bay of Biloxi. A brief description of project activities is provided here.

Intertidal Reef Habitat: The intertidal reef habitat would be constructed using loose or bagged oyster shells. Oyster shells would be bagged and stockpiled at an existing upland staging area which has water access to the project area. The bagged oyster shells would be loaded by hand onto shallow draft marine vessels. The shallow draft vessels would transport the bagged oyster shells to the project location where they would be unloaded and placed by hand from the boat. The intertidal reef habitat would be constructed along the water's edge between MLLW and Mean Higher High Water (MHHW). Tide surveys would be conducted prior to beginning construction and PVC poles would be pushed in the ground to mark the high and low tide elevations.

Subtidal Reef Habitat: The subtidal reef habitat would be constructed using approved cultch material (limestone, crushed concrete, oyster shells or a combination thereof). The cultch materials would be stockpiled at an existing staging area which has water access to the project area. The cultch materials would be inspected at the existing staging area prior to being loaded onto a barge to ensure the materials are clean and free of all debris, including but not limited to, trash, steel reinforcement, and asphalt. Mechanical equipment would be utilized to load the materials onto shallow draft barges or shallow draft self-powered marine vessels. The material would be deployed using a high pressure water jet or using a clam shell bucket mounted on a crane or a long armed track hoe located on a separate equipment barge. The cultch material would be deployed in water depths ranging from 0 to -10 Mean Lower Low Water (MLLW). The cultch material thickness would be 1 to 12 inches.

Grand Bay Intertidal and Subtidal Reefs: The Grand Bay Intertidal and Subtidal Reef project components would include 77 acres of subtidal reef restoration and 3 acres of intertidal reef habitat restoration in various locations in Grand Bay (Table 1). The activities would occur in Gulf Stugeon Critical Habitat Unit 8. The Pascagoula River (Gulf Sturgeon Critical Habitat Unit 2) is the closest river with known Gulf Sturgeon summer habitat (Figure 2). The mouth of the River is approximately 7.5 miles to the west of the Grand Bay Intertidal and Subtidal Reefs project component area and flows into the Gulf in a southwesterly direction. Intertidal zones (typical tidal range of 0.5 ft.) near the project components are generally composed of mud flats and small areas of natural sand beach. In general, the nearshore subtidal habitat is composed mostly of unconsolidated bottom types including sand, muddy sand, and mud bottom. The average salinity of the Bay near Point Aux Chenes ranges from is 19.1 to 27.9 parts per thousand (GBNERR 2015).

Deer Island Subtidal Reef: The Deer Island Subtidal Reef project component would include 20 acres of subtidal reef restoration (Table 1).The Deer Island project component is located near the Back Bay of Biloxi, which is the mouth of the Biloxi River. The Biloxi River is not known to be used by Gulf Sturgeon primarily due t lack of suitable habitat for breeding and spawning.. Additionally, much of the adjacent shoreline in the Back Bay of Biloxi is developed which includes substantial areas of industrial activity in the western portion of the bay and large navigation channels for barge and large vessel use. The Pascagoula River (Gulf Sturgeon Critical Habitat Unit 2) is the closest river (14 miles to the east) with known Gulf Sturgeon summer habitat (Figure 2). Intertidal zones (typical tidal range of 0.5 ft.) near the project components are generally composed of mud flats and small areas of natural sand beach. In general, the nearshore subtidal habitat is composed mostly of unconsolidated bottom types including sand, muddy sand, and mud bottom. The average salinity of the in the project area is 10.2 parts per thousand (USGS 2015).

Summary

A number of studies have documented the summer and winter occurrence of juvenile Gulf Sturgeon in estuarine systems in low salinity environments (oligohaline to mesohaline) near the mouth of rivers where adult sturgeon migrate and spawn (Sultak, et. al., 2009; Duncan et. al., 2011; Parauka et.al. 2011). The presence of subadult species in either the Grand Bay Intertidal and Subtidal Reefs or Deer Island Subtidal Reef project components during non-migratory season is not likely due high salinity levels near the project components. Research in Choctawhatchee Bay indicates that subadult Gulf sturgeon show a preference water with a salinity less than 6.3 parts per thousand (50 CFR Part 226). Salinity within the Grand Bay Intertidal and Subtidal Reef and Deer Island Subtidal Reefs are 19.1 to 27.9 parts per thousand and 10.2 parts per thousand, respectively. In the unlikely event that an individual would travel into an area of reef habitat creation, it is probable that the noise of the installation would cause the individual to avoid the area. As a result no direct impacts to the individual or the species would occur.

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APPENDIX C: References

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In Reply Refer To:

2015-I-793

August 24, 2015

Memorandum

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

From: Field Supervisor, Mississippi Field Office

Subject: Informal Consultation for the Proposed Restoring Living Shorelines and Reefs in Mississippi Estuaries Project, Mississippi

This memorandum acknowledges our receipt of your memorandum on August 12, 2015. This response is in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA). We have reviewed your proposed project and concur with your August 12, 2015 determinations for endangered and threatened species, their critical habitat, and at-risk species (should they become listed). We based our concurrence on the justification below. Where more than one justification was applicable, multiple boxes are checked and additional comments are added.

☐ Species-specific surveys were conducted and there are no endangered, threatened, or at-risk species or designated critical habitat on site. Comments: _____

☒ Endangered, threatened, and at-risk species are not known from and are not expected to occur within the vicinity of the proposed project. Comments: Alabama red-bellied turtle only

☒ Appropriate avoidance and minimization measures have been included within the project description to ensure that any effects to listed species (or at-risk species should they become listed) are insignificant or discountable. Comments: piping plover, red knot and west Indian manatee

☐ Critical habitat is not present on site and does not occur within the vicinity of the proposed project. Comments: _____

☒ Appropriate avoidance and minimization measures have been included within the project description to ensure PCEs and/or critical habitat will not be adversely modified or destroyed. Comments: Piping plover only

☐ The proposed project is completely beneficial to the listed or at-risk species and/or critical habitat considered. Comments: _____

Unless the project description changes, or new information reveals that the effects of the proposed action may affect listed species in a manner or to an extent not considered, or a new species or critical habitat is designated that may be affected by the proposed action, no further action pursuant to the ESA is necessary.

If you have questions, please contact David Felder at 601-321-1131 or email, david_felder@fws.gov.