

# **Louisiana Trustee Implementation Group Final Restoration Plan #1:**

**Restoration of Wetlands, Coastal, and Nearshore Habitats;  
Habitat Projects on Federally Managed Lands;  
and Birds**

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## EXECUTIVE SUMMARY

On April 20, 2010, the *Deepwater Horizon (DWH)* mobile drilling unit exploded, caught fire, and eventually sank in the Gulf of Mexico, resulting in a massive release of oil and other substances from BP Exploration and Production Inc.'s Macondo well. Initial efforts to cap the well following the explosion were unsuccessful, and for 87 days after the explosion, the well continuously and uncontrollably discharged oil and natural gas into the northern Gulf of Mexico. Approximately 3.19 million barrels (134 million gallons) of oil were released into the ocean (*U.S. v. BP et al.* 2015), by far the largest offshore oil spill in the history of the United States. Oil spread from the deep ocean to the surface and nearshore environment, from Texas to Florida, with most of the oil impacting Louisiana and its precious coastline. The oil came into contact with and injured natural resources in Louisiana, such as fish and shellfish, productive wetland habitats, sandy beaches, birds, endangered sea turtles, and protected marine life. Extensive response actions, including cleanup activities and actions to try to prevent the oil from reaching sensitive resources, were undertaken to try to reduce harm to people and the environment. However, many of these response actions had collateral impacts on the environment. The oil and other substances released from the well in combination with the extensive response actions together make up the *DWH* oil spill.

As an oil pollution incident, the *DWH* oil spill was subject to the provisions of the Oil Pollution Act (OPA) of 1990, which addresses preventing, responding to, and paying for oil pollution incidents in navigable waters, adjoining shorelines, and the exclusive economic zone of the United States. Under the authority of OPA, a council of federal and state "Trustees" was established, on behalf of the public, to assess natural resource injuries resulting from the incident and work to make the environment and public whole for those injuries. As required under OPA, the Trustees conducted a natural resource damage assessment (NRDA) and prepared the Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement (PDARP/PEIS).

A primary goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving an oil discharge (or substantial threat of an oil discharge). Under OPA, the natural resource injuries for which responsible parties are liable include injuries resulting from the oil discharge and those resulting from response actions to the oil discharge or substantial threat of a discharge. OPA specifies that trustees responsible for representing the public's interest (in this case, state and federal agencies) must be designated to act on behalf of the public to assess the injuries and to address those injuries. The *DWH* oil spill Trustees ("the Trustees") for the affected natural resources conducted a NRDA to:

- Assess the impacts of the *DWH* oil spill on natural resources in the Gulf of Mexico and the services those resources provide.
- Determine the type and amount of restoration needed to compensate the public for these impacts.

Following the assessment, the Trustees determined that the injuries caused by the *DWH* oil spill could not be fully described at the level of a single species, a single habitat type, or a single region. Rather, the injuries affected such a wide array of linked resources over such an enormous area that the effects of the *DWH* oil spill must be described as constituting an ecosystem-level injury. Consequently, the

Trustees' preferred alternative for restoration planning employs a comprehensive, integrated ecosystem approach to best address these ecosystem-level injuries.

Given the broad ecological scope of the injuries, restoration planning requires a broad ecosystem perspective to restore the vast array of resources and services injured by the *DWH* oil spill. Thus, the Trustees proposed a comprehensive, integrated ecosystem restoration plan with a portfolio of Restoration Types that addresses the diverse suite of injuries that occurred at both regional and local scales. The Trustees identified the need for a comprehensive restoration plan at a programmatic level to guide and direct the massive restoration effort, based on the following five overarching goals:

- Restore and conserve habitat
- Restore water quality
- Replenish and protect living coastal and marine resources
- Provide and enhance recreational opportunities
- Provide for monitoring, adaptive management, and administrative oversight to support restoration implementation

These five goals work both independently and together to restore injured resources and services.

### **Final Restoration Plan**

This document, the "Louisiana Trustee Implementation Group Final Restoration Plan #1: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; and Birds" (Final RP), was prepared by the Louisiana Trustee Implementation Group (Louisiana TIG) pursuant to OPA and is consistent with the Trustees' findings in the PDARP/PEIS. The Louisiana TIG includes five Louisiana state trustee agencies and four federal trustee agencies: the Louisiana Coastal Protection and Restoration Authority (CPRA); the Louisiana Department of Natural Resources (LDNR); the Louisiana Department of Environmental Quality (LDEQ); the Louisiana Oil Spill Coordinator's Office (LOSCO); the Louisiana Department of Wildlife and Fisheries (LDWF); the United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); the United States Department of the Interior (DOI), represented by the United States Fish and Wildlife Service (USFWS) and National Park Service (NPS); the United States Department of Agriculture (USDA); and the Environmental Protection Agency (EPA).

The Louisiana TIG prepared this Final RP to inform the public about *DWH* NRDA restoration planning efforts and to select six restoration alternatives for engineering and design (E&D).

In selecting projects for this Final RP, the Louisiana TIG considered the OPA screening criteria, the Restoration Goals and other criteria identified by the Trustees in the PDARP/PEIS, the contents of Louisiana's 2012 Comprehensive Master Plan for a Sustainable Coast (Coastal Master Plan), the need to provide restoration benefits across the many Louisiana basins impacted by the *DWH* oil spill, input from the public, and the current and future availability of funds under the *DWH* oil spill NRDA settlement payment schedule.

Following Hurricanes Katrina and Rita in 2005, CPRA was charged with developing a Coastal Master Plan to guide the State of Louisiana's work toward a sustainable coast. The Coastal Master Plan uses the best

available science to achieve long-term sustainability of Louisiana’s coast, and the restoration strategies and specific projects identified in the Louisiana Master Plan are the result of extensive public input, review, and vetting.

In furtherance of Louisiana’s strategy for coastal restoration, Louisiana Governor John Bel Edwards issued Executive Order JBE 2016-09, which requires all State of Louisiana departments and agencies to “administer their regulatory practices, programs, projects, contracts, grants, and all other functions vested in them in a manner consistent with the Coastal Master Plan and public interest to the maximum extent possible.” As such, projects selected in this Final RP were evaluated for consistency with the goals and objectives of the Coastal Master Plan.

The Coastal Master Plan is the State of Louisiana’s publicly vetted and scientifically approved approach to coastal restoration. Because the Coastal Master Plan presents Louisiana’s comprehensive strategy for protecting and restoring coastal resources, the Louisiana TIG considered projects that would further the implementation of the Coastal Master Plan, particularly under the “Wetlands, Coastal, and Nearshore Habitats” Restoration Type. In developing a list of project alternatives suitable for addressing the injuries caused by the *DWH* oil spill, the Louisiana TIG evaluated Coastal Master Plan projects based on geographic location, immediacy, and sustainability of project benefits provided to the resources injured by the *DWH* oil spill, and other relevant considerations. Through this analysis, the Louisiana TIG narrowed the universe of Coastal Master Plan projects down to a suite of projects that were consistent with the Restoration Goals identified in the PDARP/PEIS and would provide the most immediate benefits to the basins and resources greatest affected by the spill.

Under the Consent Decree discussed in Section 1.1 of this Final RP, the vast majority of NRDA funds that will be made available to the Louisiana TIG—over \$4 billion—are to be utilized for the restoration and conservation of wetland, coastal, and nearshore habitats impacted by the *DWH* oil spill. Because of the significant injury to Louisiana’s coastal marshes caused by the *DWH* oil spill, the Louisiana TIG chose to prioritize restoration projects under the “Restore and Conserve Habitat” Restoration Goal in this Final RP. In particular, the Final RP focuses on implementation of large-scale marsh creation projects because these projects have been determined by the Coastal Master Plan to provide the most immediate benefit to the same Louisiana coastal habitats that were impacted by the *DWH* oil spill. For this Final RP, the Louisiana TIG is moving forward with E&D on the following marsh creation projects within the “Wetlands, Coastal, and Nearshore Habitats” Restoration Type:

- Terrebonne Basin Ridge and Marsh Creation Project—Bayou Terrebonne Increment
- Barataria Basin Ridge and Marsh Creation Project— Spanish Pass Increment
- Lake Borgne Marsh Creation Project—Increment One

To restore for injuries to submerged aquatic vegetation on federally managed lands resulting from *DWH* oil spill response activities, the Louisiana TIG is moving forward with E&D on the following project under the “Restore and Conserve Habitat” Restoration Goal and the “Habitat Projects on Federally Managed Lands” Restoration Type:

- Shoreline Protection at Jean Lafitte National Historical Park and Preserve

The *DWH* oil spill also caused unprecedented injury to birds in Louisiana. Therefore, the Louisiana TIG is moving forward with E&D on the following two bird island restoration projects under the “Replenish and Protect Living Coastal and Marine Resources” Restoration Goal and the “Birds” Restoration Type:

- Queen Bess Island Restoration Project
- Rabbit Island Restoration Project

The six selected projects and proposed funding requested in this Final RP are set forth in Table 1 below. The geographic locations of the six selected projects are depicted below in Figure 1. More information about each of these projects, as well as other projects evaluated by the Louisiana TIG, can be found in Section 2 of this Final RP.

**Table 1. Projects Selected for E&D in the Final RP**

<b>Project</b>	<b>PDARP/PEIS Restoration Goal and Restoration Type</b>	<b>Proposed Funding for E&amp;D</b>
<b>Terrebonne Basin Ridge and Marsh Creation Project: Bayou Terrebonne Increment</b>	Restore and Conserve Habitat: Wetlands, Coastal, and Nearshore Habitats	\$3,000,000
<b>Barataria Basin Ridge and Marsh Creation Project: Spanish Pass Increment</b>	Restore and Conserve Habitat: Wetlands, Coastal, and Nearshore Habitats	\$4,500,000
<b>Lake Borgne Marsh Creation Project: Increment One</b>	Restore and Conserve Habitat: Wetlands, Coastal, and Nearshore Habitats	\$7,000,000
<b>Shoreline Protection at Jean Lafitte National Historical Park and Preserve</b>	Restore and Conserve Habitat: Habitat Projects on Federally Managed Lands	\$2,300,000
<b>Queen Bess Island Restoration Project</b>	Replenish and Protect Living Coastal and Marine Resources: Birds	\$2,500,000
<b>Rabbit Island Restoration Project</b>	Replenish and Protect Living Coastal and Marine Resources: Birds	\$3,000,000

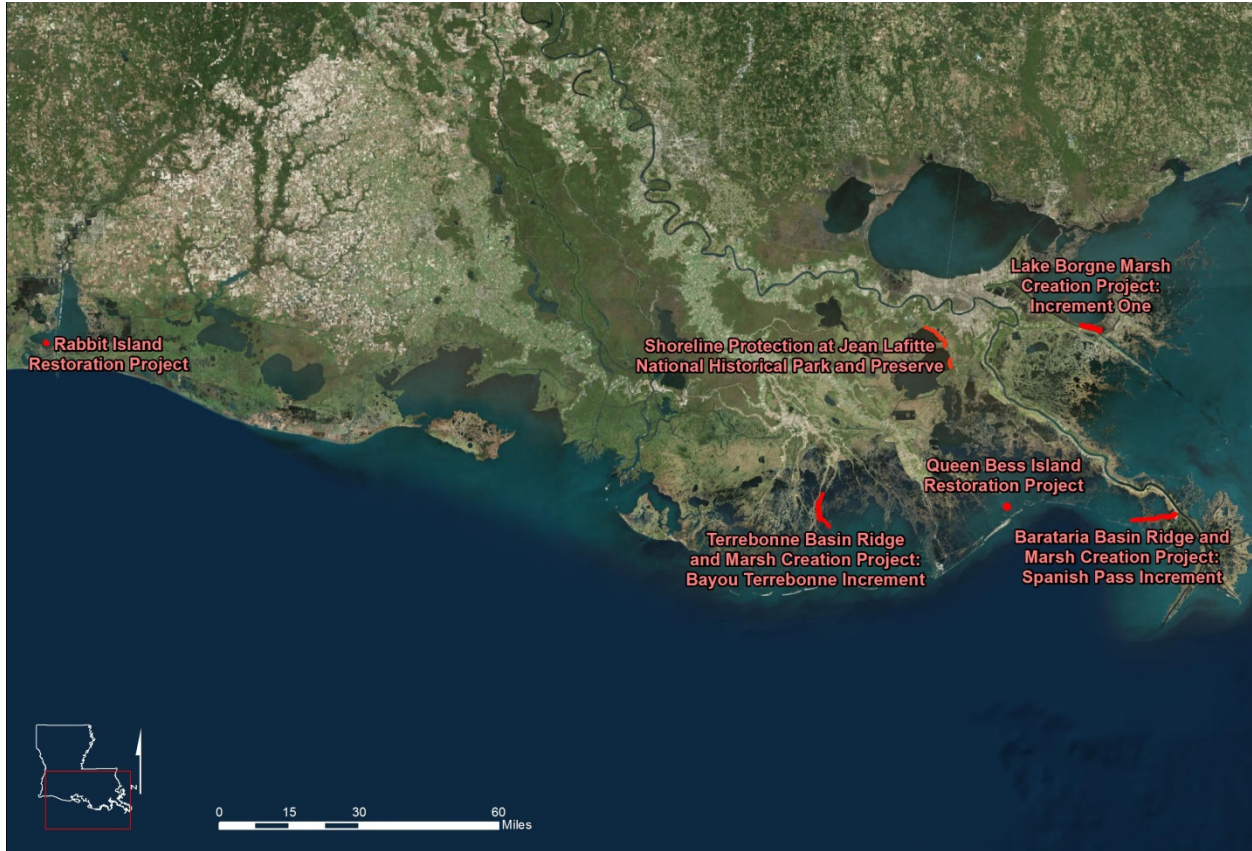


Figure 1. Projects Selected for E&D in this Final RP

At this time, the Louisiana TIG is moving forward with a phased restoration approach for the six restoration projects selected in this Final RP. Consistent with the PDARP/PEIS, this Final RP requests funding only for the E&D phase of each of the six restoration projects selected in this Final RP. An evaluation of environmental consequences related to E&D activities is discussed in the PDARP/PEIS and incorporated by reference into this Final RP. When sufficient information is obtained from E&D activities, the Louisiana TIG will proceed with the next phase of this approach, which will include a proposal for implementation of preferred restoration projects resulting from the E&D phase and a discussion of the impacts from the proposed construction/implementation. The next phase of this analysis will be included in a future phased restoration plan that will be published for public review and comment.

Additionally, although all of the projects evaluated in this Final RP would provide considerable benefits to the affected environments, due to the limited *DWH* NRDA funds currently available, we are only able to select for E&D a limited number of projects at this time. However, as more funds and resources become available, we anticipate revisiting, and potentially proposing for *DWH* NRDA restoration, the other projects considered but not selected as restoration alternatives in this Final RP.



## 1.0 Introduction

This “Louisiana Trustee Implementation Group Final Restoration Plan #1: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects On Federally Managed Lands; and Birds” (Final RP) was prepared by the federal and state natural resource trustees for the Louisiana Trustee Implementation Group (Louisiana TIG), which is responsible for restoring the natural resources and services within the Louisiana Restoration Area that were injured by the April 20, 2010 *Deepwater Horizon* oil spill and associated spill response efforts (*DWH* oil spill). The purpose of restoration, as discussed in this document and detailed more fully in the Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement (PDARP/PEIS), is to make the environment and the public whole for injuries resulting from the incident by implementing restoration actions that return injured natural resources and services to baseline conditions and compensate for interim losses, in accordance with the Oil Pollution Act of 1990 (OPA) and associated Natural Resource Damage Assessment (NRDA) regulations.

The Louisiana TIG includes five Louisiana state trustee agencies and four federal trustee agencies: the Louisiana Coastal Protection and Restoration Authority (CPRA); the Louisiana Department of Natural Resources (LDNR); the Louisiana Department of Environmental Quality (LDEQ); the Louisiana Oil Spill Coordinator’s Office (LOSCO); the Louisiana Department of Wildlife and Fisheries (LDWF); the United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); the United States Department of the Interior (DOI), represented by the United States Fish and Wildlife Service (USFWS) and National Park Service (NPS); the United States Department of Agriculture (USDA); and the Environmental Protection Agency (EPA) (collectively the Louisiana TIG).

The Louisiana TIG has prepared this Final RP to inform the public about *DWH* NRDA restoration planning efforts and to select six restoration alternatives for engineering and design (E&D).

### 1.1 Background and Summary of Settlement

On April 4, 2016, the United States District Court for the Eastern District of Louisiana entered a Consent Decree resolving civil claims by the *DWH* oil spill trustees (Trustees) against BP Exploration and Production Inc. (BP) arising from the *DWH* oil spill. This historic settlement resolves the Trustees’ claims against BP for natural resources damages under OPA.

Under the Consent Decree, BP agreed to pay over a 15-year period a total of \$8.1 billion in natural resource damages (which includes \$1 billion that BP previously committed to pay for early restoration projects), and up to an additional \$700 million (some of which is in the form of accrued interest) for adaptive management or to address injuries to natural resources that are presently unknown but may come to light in the future.

The *DWH* NRDA settlement payment schedule for the Louisiana TIG is set forth in Table 2 below.

**Table 2. Louisiana TIG NRDA Settlement Payment Schedule**

<b>Year</b>	<b>Louisiana TIG NRDA Payments</b>
2016	\$3,000,000
2017	\$319,211,220
2018	\$159,605,610
2019	\$319,211,220
2020	\$319,211,220
2021	\$319,211,220
2022	\$319,211,220
2023	\$319,211,220
2024	\$319,211,220
2025	\$319,211,220
2026	\$319,211,220
2027	\$319,211,220
2028	\$319,211,220
2029	\$319,211,220
2030	\$319,211,220
2031	\$319,211,230
<b>TOTAL</b>	<b>\$4,631,562,700</b>

More details on the background of the *DWH* oil spill, the impact of the spill on the Gulf of Mexico ecosystem, and additional context for the settlement and allocation of funds can be found in Chapter 2 of the PDARP/PEIS.

### 1.2 *DWH* Oil Spill Trustees

The *DWH* Trustees are the government entities authorized under OPA to act as trustees on behalf of the public to assess the natural resource injuries resulting from the *DWH* oil spill and develop and implement a restoration plan to compensate for those injuries. The following federal and state agencies are the designated Trustees under OPA for the *DWH* oil spill:

- NOAA;
- DOI;
- EPA;
- USDA;
- The State of Alabama’s Department of Conservation and Natural Resources (ADCNR) and Geological Survey of Alabama (GSA);
- The State of Florida’s Department of Environmental Protection (FDEP) and Fish and Wildlife Conservation Commission (FWC);
- The State of Louisiana’s CPRA, LOSCO, LDEQ, LDWF, and LDNR;
- The State of Mississippi’s Department of Environmental Quality (MDEQ); and
- The State of Texas’ Parks and Wildlife Department (TPWD), General Land Office (TGLO), and Commission on Environmental Quality (TCEQ).

## 1.3 Authorities and Regulations

### 1.3.1 OPA and NEPA Compliance

As an oil pollution incident, the *DWH* oil spill is subject to the provisions of OPA, 33 U.S.C. § 2701 *et seq.* A primary goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving an oil discharge or substantial threat of an oil discharge. Under OPA, each party responsible for a vessel or facility from which oil is discharged, or which poses the substantial threat of a discharge, is liable for, among other things, removal costs and damages for injury to, destruction of, loss, or loss of use of natural resources, including the reasonable cost of assessing the damage.

This process of injury assessment and restoration planning is referred to as NRDA. Under the authority of OPA, a council of federal and state trustees was established to assess natural resource injuries resulting from the incident and to work to make the environment and public whole for those injuries. NRDA is described under Section 1006 of OPA (33 U.S.C. § 2706) and the Louisiana Oil Spill Prevention and Response Act (“LOSPRA”) (La. R.S. 30:2451 *et seq.*). Under the OPA and LOSPRA NRDA regulations (15 C.F.R. Part 990 and La. Admin. Code 43:XXIX.101 *et seq.*), the NRDA process consists of three phases: 1) Preassessment; 2) Assessment and Restoration Planning; and 3) Restoration Implementation. The *DWH* Trustees are currently in the Restoration Implementation phase of the NRDA. As part of the initiation of restoration implementation this Final RP identifies a reasonable range of restoration alternatives, evaluates those alternatives under various criteria, and selects a suite of alternatives for further E&D. A subsequent restoration plan will evaluate the outcome of E&D and select restoration alternatives for construction.

Restoration activities under OPA are intended to return injured natural resources and services to their baseline condition (primary restoration) and to compensate the public for interim losses from the time of the incident until the time resources and services recover to baseline conditions (compensatory restoration). To meet these goals, the restoration activities need to produce benefits that are related to or have a nexus (connection) to natural resource injuries and service losses resulting from the spill.

Under the OPA regulations, federal trustees must comply with National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, and its implementing regulations when planning restoration projects. NEPA requires federal agencies to consider the potential environmental impacts of planned actions. NEPA provides a mandate and framework for federal agencies to determine if their proposed actions have significant environmental effects and related social and economic effects, consider these effects when choosing between alternative approaches, and inform and involve the public in the environmental analysis and decision-making process.

More information about OPA and NEPA, as well as their application to *DWH* oil spill restoration planning, can be found in Chapters 5 and 6 of the PDARP/PEIS.

### 1.3.2 PDARP/PEIS Record of Decision

On February 19, 2016, the *DWH* Trustee Council, made up of the four federal trustee agencies and trustees from all five Gulf States, issued a Final PDARP/PEIS detailing a specific proposed plan to fund and implement restoration projects across the Gulf of Mexico region. Based on the Trustees’ thorough assessment of impacts to the Gulf’s natural resources, a comprehensive, integrated ecosystem

restoration approach for restoration implementation was proposed. This approach is outlined in the PDARP/PEIS, which will allocate funds from the settlement for restoration over the next 15 years.

On March 29, 2016, in accordance with OPA and NEPA, the Trustees published a Notice of Availability of a Record of Decision (ROD) for the PDARP/PEIS in the Federal Register (81 Fed. Reg. 17438).<sup>1</sup> Based on the Trustees' injury determination established in the PDARP/PEIS, the ROD set forth the basis for the Trustees' decision to select Alternative A: Comprehensive Integrated Ecosystem Alternative. The Trustees' selection of Alternative A includes the funding allocations established in the PDARP/PEIS.

More information about Alternative A can be found in Sections 5.5 and 5.10 of the PDARP/PEIS.

### 1.3.3 Relationship of the Final RP to the PDARP/PEIS

Given the potential magnitude and breadth of restoration for injuries resulting from the *DWH* oil spill, the Trustees prepared a PDARP/PEIS under OPA and NEPA to analyze alternative approaches to implementing restoration and to consistently guide restoration decisions.

As a programmatic restoration plan, the PDARP provides direction and guidance for identifying, evaluating, and selecting future restoration projects to be carried out by the TIGs (PDARP/PEIS Section 5.10.4 and Chapter 7). The Trustees elected to prepare a PEIS to support analysis of the environmental consequences of the Trustees' selected restoration types, to consider the multiple related actions that may occur as a result of restoration planning efforts, and to allow for a better analysis of cumulative impacts of potential actions. The programmatic approach was taken to assist the Trustees in their development and evaluation and to assist the public in its review of future restoration projects.

Consistent with the PDARP/PEIS, TIGs may propose to phase restoration projects across multiple restoration plans. For example, a TIG may propose funding a planning phase (e.g., initial E&D and compliance) in one plan for a conceptual project. This would allow the TIG to develop projects to the extent needed to fully consider a subsequent implementation phase of that project in a future restoration plan. For the E&D phase, discussed in more detail in Section 3.3 of this Final RP, the Implementing Trustee(s) will develop projects to the extent possible given the funding allocated to that project for that phase. Examples of activities that may be performed during the E&D phase include landowner and land rights investigation, identification of existing infrastructure, cultural resources investigation, delineation of borrow sources, identification of construction access and pipeline corridors, survey and geotechnical data acquisition/geotechnical engineering, delineation of earthen containment dikes, identification of construction marsh fill elevation, submission of permits, development of operations and maintenance plans, and development of bidding documents, among other activities. TIGs will ensure that initial cost/budget estimates for the E&D phase will lead to sufficient information to evaluate a more detailed reasonable range of alternatives in a subsequent restoration plan. This Final RP serves as the E&D phase restoration plan for the six selected projects. Subsequent restoration plans may include projects that are phased as well as projects that are not.

This Final RP is consistent with the PDARP/PEIS/ROD and incorporates by reference the PEIS NEPA analysis for the E&D phase of each project alternative considered. The Trustees considered the extent to

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<sup>1</sup> Available at [http://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/PDARP\\_ROD\\_Final-with-All-Signatures508.pdf](http://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/PDARP_ROD_Final-with-All-Signatures508.pdf).

which additional NEPA analysis may be necessary, including whether the analysis of relevant conditions and environmental effects described in the PEIS are still valid or whether project impacts have already been fully analyzed in the PEIS or a separate NEPA analysis. The Trustees determined the actions used to support the proposed E&D phase of these selected projects fall within the scope of the analysis in the PEIS. Section 3.3 provides more details.

The projects selected in this Final RP are consistent with the PDARP/PEIS programmatic analysis. Although information gathered may inform future projects, the outcome of the preliminary phases does not commit the Trustees to future actions.

For the PDARP/PEIS, the Trustees developed a set of restoration types for inclusion in programmatic alternatives, consistent with the desire to seek a diverse set of projects providing benefits to a broad array of potentially injured resources and services they provide. Ultimately, this process resulted in the inclusion of 13 restoration types in the programmatic alternatives evaluated for restoration, including:

1. Wetlands, Coastal, and Nearshore Habitats
2. Habitat Projects on Federally Managed Lands
3. Nutrient Reduction (Nonpoint Source)
4. Water Quality (e.g., Stormwater Treatments, Hydrologic Restoration, Reduction of Sedimentation, etc.)
5. Fish and Water Column Invertebrates
6. Sturgeon
7. Submerged Aquatic Vegetation
8. Oysters
9. Sea Turtles
10. Marine Mammals
11. Birds
12. Mesophotic and Deep Benthic Communities
13. Provide and Enhance Recreational Opportunities

For this Final RP, the Louisiana TIG considered and evaluated projects within the following restoration types: 1) Wetlands, Coastal, and Nearshore Habitats; 2) Habitat Projects on Federally Managed Lands; and 3) Birds. All projects included in Section 2 of this Final RP are consistent with the Trustee's selected programmatic alternative in the PDARP/PEIS, the Consent Decree and OPA.

#### 1.3.4 Louisiana's Comprehensive Master Plan for a Sustainable Coast

In an effort to combat Louisiana's coastal land loss crisis, following Hurricanes Katrina and Rita in 2005, the Louisiana Legislature created CPRA and tasked it with coordinating the local, state, and federal efforts to achieve comprehensive coastal protection and restoration. To accomplish these goals, CPRA was charged with developing a Master Plan to guide the State of Louisiana's work toward these efforts. Louisiana's Comprehensive Master Plan for a Sustainable Coast (Coastal Master Plan) uses the best available science to achieve long-term sustainability of Louisiana's coast. The restoration strategies and specific projects identified in the Coastal Master Plan are the result of extensive public input, review, and vetting.

CPRA completed its first iteration of the Coastal Master Plan in 2007. After 2007, state and federal investments in the protection and restoration of Louisiana’s coast increased dramatically, allowing for the implementation of improvements to Louisiana coastal communities’ hurricane protection systems, as well as shoreline protection, marsh creation, barrier island repairs, and other projects that have taught the engineers and planners involved in this effort many lessons and allowed them to begin to plan for and evaluate landscape scale efforts.

The second edition of the Coastal Master Plan was adopted by the Louisiana State Legislature in 2012, two years after the *DWH* oil spill. This plan looks 50 years into Louisiana’s future and, relying on world class science and engineering, presents large-scale actions that best match the needs of the coast with the resources available. The 2012 Coastal Master Plan was approved unanimously by the Louisiana Legislature.

CPRA is currently drafting the 2017 Coastal Master Plan, which will be presented to the legislature for approval in the 2017 legislative session. The 2017 Coastal Master Plan will carry previous planning efforts forward by improving the science and analysis, incorporating new ideas and information, expanding stakeholder engagement, and focusing more on communities and comprehensive flood risk resilience. More information about these updates and the 2017 Coastal Master Plan development process can be found at <http://coastal.la.gov/a-common-vision/2017-master-plan-update/>.

In furtherance of Louisiana’s strategy for coastal restoration, Louisiana Governor John Bel Edwards issued Executive Order JBE 2016-09, which requires all State of Louisiana departments and agencies to “administer their regulatory practices, programs, projects, contracts, grants, and all other functions vested in them in a manner consistent with the Coastal Master Plan and public interest to the maximum extent possible.”<sup>2</sup> As such, projects identified in this Final RP are evaluated for consistency with the goals and objectives of the Coastal Master Plan.

### **Coastal Master Plan Project Evaluation**

The 2012 Coastal Master Plan sought to identify coastal protection and restoration projects that would improve the lives of coastal residents by creating a more resilient south Louisiana. Achieving this goal required new tools that helped CPRA better understand Louisiana’s coast and how projects could provide benefits. The Louisiana coast is a complex system. CPRA needed to better understand how the coast is currently changing and the kinds of changes that could be expected in the future. CPRA also had hundreds of project ideas and different views about how to move forward and needed a way to sort through the many options and find those that would work best.

To meet these needs, CPRA used a systems approach to coastal planning and a science-based decision making process that resulted in a plan that was both funding- and resource-constrained (e.g., limited availability of sediment sources, contractors, and other resources necessary to implement restoration projects). These tools helped CPRA understand the practical implications of different project options and how gains in one area might create losses in another. Based on the preferences CPRA wanted to explore, those tools helped identify strategies for investing in coastal protection and restoration projects. This analysis improved CPRA’s understanding of how projects were affected by budgetary constraints and the river water and sediment that Louisiana has to work with. CPRA also used tools to

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<sup>2</sup> Available at <http://gov.louisiana.gov/assets/ExecutiveOrders/JBE16-09.pdf>.

consider possible future coastal conditions that could affect the way CPRA's projects operate, along with other factors such as construction time.

### **Predictive Models**

The 2012 Coastal Master Plan analyzed both protection and restoration measures, which influenced the models CPRA selected and how they work. To estimate risk reduction outcomes, CPRA used models that evaluated storm surge and the risk of expected annual damages. To estimate restoration outcomes, the models looked at how land changes throughout the coast—where land is building and where it is disappearing. These models examined how water moves through the coastal system as well as how salt and fresh water affect vegetation and habitats for key species and ecosystem services.

The integrated suite of Predictive Models developed for the Coastal Master Plan assessed how Louisiana's coastal landscape may change and how much damage communities may face from storm flooding over the next 50 years if no further action is taken. For comparison, CPRA then assessed how the coastal ecosystem and the level of risk could change if certain risk reduction and restoration projects are constructed.

The Predictive Models used in the Coastal Master Plan were organized into seven linked groups, involving the work of over 60 scientists and engineers. Each group worked on a different aspect of how the coastal system changes over time. This effort was based on existing models where appropriate. New models were developed for vegetation, nitrogen uptake, barrier shorelines, flood risk, and to reflect potential for nature based tourism, fresh water availability, and support for agriculture/aquaculture.

The models were designed to work together, following the precedent set by earlier State planning efforts. CPRA also found new ways to link the expanded set of models to more fully capture how the coast works as a system. The level of modeling in the 2012 Coastal Master Plan was a significant technical achievement in the systems approach, the linked nature of the models, and in the breadth of subjects evaluated.

### **Future Environmental Scenarios**

Many factors that will have a profound effect on the future of Louisiana's coast cannot be easily predicted or controlled. These include factors such as subsidence and the levels of nutrients in the river, as well as the effects of climate change, such as sea level rise, changes in rainfall patterns, and storm frequency and intensity. Climate change was central to CPRA's analysis, given coastal Louisiana's vulnerability to increased flooding and the sensitivity of its habitats.

To account for these factors when developing the Coastal Master Plan, CPRA worked with experts to develop two different sets of assumptions or scenarios. These scenarios reflect different ways future coastal conditions could affect the State's ability to achieve protection and build land:

- Moderate scenario—assumed limited changes in the considered factors over the next 50 years.
- Less optimistic scenario—assumed more dramatic changes in these factors over the next 50 years.

CPRA found that restoration projects selected under the less optimistic scenario tended to be in the upper end of the estuaries and closer to existing land rather than near the Gulf of Mexico. As a result, the 2012 Coastal Master Plan is largely comprised of projects selected under the less optimistic scenario.

## The Planning Tool

The Planning Tool, in concert with the modeling effort, offered a way to examine these projects. The model results, represented by terabytes of data, are the building blocks of the 2012 Coastal Master Plan. CPRA needed a user friendly way to sort and view these results to identify groups of projects that could be examined in greater detail. The Planning Tool is a decision support system that helps the State choose smart investments for the coast. The tool integrates information from the models with other information such as funding constraints, compares how different coastal restoration and risk reduction projects could be grouped, and allows CPRA to systematically consider many variables (e.g., project costs, funding, landscape conditions, and stakeholder preferences). These science-based tools help CPRA understand the practical implications of different project options. Based on the outcomes, these tools suggested a strategy for investing in coastal flood risk reduction and restoration projects. As part of this strategy, the tools considered constraints, such as the limited funding, water, and sediment that Louisiana has to work with. The tools also considered possible future conditions that will affect the way projects operate, along with other important factors such as construction time and how combinations of projects will work together. These results were packaged in the Master Plan such that citizens and State leaders could use the plan as a tool to understand and convey the projects' real world effects.

CPRA used predictive models and the Planning Tool to help select high-performing projects that could deliver measurable benefits to Louisiana communities and coastal ecosystem over the coming decades. The Planning Tool was designed to translate the models' scientific output and show the practical implications of different options. Decision making for the plan followed directly from this analysis.

The 2017 Coastal Master Plan, currently in development, will continue to use the best, most up to date science, in its process. Therefore, the 2017 Coastal Master Plan will include some improvements and refinement in analysis and screening of restoration projects. More information about the Coastal Master Plan, including the restoration strategies vetted by the public and approved by the Louisiana legislature, can be found at <http://coastal.la.gov/a-common-vision/master-plan/>.

Because the Coastal Master Plan is the State of Louisiana's publicly vetted and scientifically approved approach to coastal restoration, whenever possible, the Louisiana TIG will consider using available NRDA funds to implement projects from the Coastal Master Plan to restore for damages to the Louisiana Restoration Area caused by the *DWH* oil spill. In developing a list of project alternatives suitable for addressing the injuries caused by the *DWH* oil spill, the Louisiana TIG evaluated Coastal Master Plan projects based on geographic location, immediacy and sustainability of project benefits provided to the resources injured by the *DWH* oil spill, and other relevant considerations. Through this analysis, the Louisiana TIG narrowed the universe of Coastal Master Plan projects down to a suite of projects that were consistent with the Restoration Goals identified in the PDARP/PEIS and would provide the most immediate benefits to the basins and resources greatest affected by the spill. These projects are discussed in more detail in Section 2 of this Final RP. Any projects evaluated but not selected as an alternative to undergo E&D in this Final RP may continue to be considered for implementation in future restoration plans.

### 1.4 Louisiana TIG Final RP

The Louisiana TIG prepared this Final RP in accordance with the PDARP/PEIS, the ROD, and OPA. This Final RP describes the *DWH* NRDA restoration planning process, identifies a reasonable range of



restoration alternatives to address a portion of the injuries to resources and habitats caused by the *DWH* oil spill, and selects from those alternatives a suite of restoration alternatives on which the Louisiana TIG will conduct E&D. In accordance with 40 C.F.R. § 1508.12, the Louisiana TIG designated DOI as the lead federal agency responsible for NEPA compliance for this RP.

For the projects selected as restoration alternatives to undergo E&D in this Final RP, the Louisiana TIG may, after completion of the E&D process discussed in this plan, propose some or all of those projects, or potentially a modified version of any of the projects, for implementation using *DWH* NRDA funds. Those proposed projects would then be fully evaluated under NEPA and OPA in a future restoration plan, which would be provided to the public for review and comment in accordance with the appropriate Louisiana and federal laws.

### 1.5 Context and Ecosystem Setting

Louisiana is in the midst of a coastal land loss crisis that has claimed approximately 1,900 square miles of land since the 1930s, about 25 percent of the 1932 land area (Couvillion *et al.* 2011). During the past 25 years, wetland loss has occurred at a rate of 16.57 square miles a year, equal to the loss of a football field of coastal wetland loss every hour (Couvillion *et al.* 2011). In a future without action, Louisiana could lose another 1,750 square miles of land by 2060 (CPRA 2012). The primary causes of land loss in Louisiana have been sediment starvation due to levees and dams, dredging canals for oil and gas exploration and pipelines, sea level rise, subsidence, and natural disasters, including tropical storms and hurricanes (PDARP/PEIS Section 3.3.1). When these causes are combined with the impacts of the *DWH* oil spill, environmental degradation in and around southeast Louisiana continues to deteriorate the barrier island and coastal wetland systems that shield the vulnerable communities and provide ecological services to the entire region. One study found that the Mississippi River Delta ecosystems provide \$12-47 billion in benefits to people every year; however, land loss puts this vital resource at risk (Batker *et al.* 2010). Given the importance of so many of south Louisiana's assets—waterways, wetlands, natural resources, and unique culture—the effects of additional land loss and the increased risk of flooding will be catastrophic. Barrier islands, marshes, and swamps throughout the coast reduce incoming storm surge, helping to reduce flooding impacts. If these habitats continue to erode, the vulnerability of communities and infrastructure will increase substantially.

As discussed in more detail above in Section 1.3.4, following Hurricanes Katrina and Rita in 2005, CPRA was charged with developing a Coastal Master Plan to guide the State of Louisiana's work toward a sustainable coast. The Coastal Master Plan uses the best available science to achieve long-term sustainability of Louisiana's coast, and the restoration strategies and specific projects identified in the Louisiana Master Plan are the result of extensive public input, review, and vetting.

Because the Coastal Master Plan presents Louisiana's comprehensive strategy for protecting and restoring coastal resources, the Louisiana TIG intends to consider projects that further the implementation of the Coastal Master Plan whenever possible, particularly under the "Wetlands, Coastal, and Nearshore Habitats" Restoration Type. Under the Consent Decree, the vast majority of NRDA funds that will be made available to the Louisiana TIG—over \$4 billion—are to be utilized for the restoration and conservation of wetland, coastal, and nearshore habitats impacted by the *DWH* oil spill. Therefore, to address impacts to these habitats, one of the strategies the Louisiana TIG envisions implementing are multiple large-scale marsh creation projects from the Coastal Master Plan within the various impacted basins along Louisiana's coast, including the Barataria, Terrebonne, and Pontchartrain

basins, which are prioritized in this first Final RP. The Final RP focuses on implementation of large-scale marsh creation projects because these projects have been determined by the Coastal Master Plan to provide the most immediate benefit to the same Louisiana coastal habitats that were impacted by the *DWH* oil spill.

Another strategy that the Louisiana TIG envisions evaluating for future use is large-scale sediment diversions. The Coastal Master Plan recognizes that large-scale sediment diversions are an essential strategy to sustain coastal Louisiana. Without diversions, long-term, sustainable restoration of Louisiana's coast is likely not possible. At the same time, sediment diversions present a significant opportunity to restore damages to coastal habitats caused by the *DWH* oil spill. In the PDARP/PEIS the Trustees noted that "diversions will help restore injured wetlands and resources by reducing widespread loss of existing wetlands through 1) reintroducing nutrients and freshwater into salt-stressed, nutrient-starved ecosystems, and 2) increasing sediment deposition to partially offset relative sea level rise and help build new habitats" (PDARP/PEIS Section 5.5.2.2 (citations omitted)). Additionally, targeted marsh creation projects and sediment diversions can be complementary, as implementing diversions can help maintain marsh restoration projects and increase their sustainability, while also increasing the sustainability of existing marshes. Therefore, the Louisiana TIG may consider proposing implementation of sediment diversions with *DWH* NRDA funds in future restoration plans.

As previously discussed in meetings with the public, including CPRA Board meetings, the Louisiana TIG anticipates that the following projects, most of which are taken directly from or are consistent with the Coastal Master Plan's goals and objectives, may be proposed for implementation using *DWH* NRDA funding from the Wetlands, Coastal, and Nearshore Habitats Restoration Type over the next 15 years:

- New Orleans East Land Bridge Marsh Creation
- Lake Borgne Marsh Creation
- Barataria Basin Ridge and Marsh Creation
- Terrebonne Basin Ridge and Marsh Creation
- Mid-Barataria Sediment Diversion
- Raccoon Island
- Wine Island
- Freshwater Bayou Shoreline Protection

Because the Coastal Master Plan does not address potential restoration options for other resources injured by the *DWH* oil spill, the Louisiana TIG will identify projects from other sources that are also consistent with the goals and objectives of the Coastal Master Plan. For those other Restoration Types, the Louisiana TIG anticipates that the following projects, which are not included within the Coastal Master Plan but which are consistent with the goals and objectives of that plan, may be proposed for implementation using *DWH* NRDA funding over the next 15 years:

- Pass-a-Loutre Restoration
- New Harbor Island
- Queen Bess Island
- Cat Island/Mangrove islands
- Rabbit Island
- Shoreline Protection at Jean Lafitte National Historical Park and Preserve

All projects considered for *DWH* NRDA funding will first be evaluated under the pertinent OPA criteria before determining which projects should be formally proposed for E&D and subsequent implementation. The Louisiana TIG intends to work with relevant Trustee agencies to develop appropriate restoration projects to address damages to impacted resources. However, as required of State of Louisiana departments and agencies by Executive Order JBE 2016-09 by Louisiana Governor John Bel Edwards,<sup>3</sup> the Louisiana TIG, to the maximum extent practical, will support state goals that all projects be consistent with the Coastal Master Plan.<sup>4</sup>

## 1.6 Purpose and Need

To meet the purpose of restoring those natural resources and services injured as a result of the *DWH* oil spill, the Louisiana TIG will implement this Final RP. This Final RP is consistent with the Final PDARP/PEIS (2016), which identifies extensive and complex injuries to natural resources and services across the Gulf of Mexico, as well as a need and plan for comprehensive restoration consistent with OPA. Studies and data collection are needed to allow the TIG to develop projects to the extent necessary to fully consider a subsequent implementation phase of the selected alternatives identified in this RP. Funding and performing the E&D for these projects would provide sufficient information to evaluate a more detailed reasonable range of alternatives in a subsequent restoration plan.

### *Meeting the Goals of DWH Restoration*

As described in Section 5.3 of the PDARP/PEIS, the five programmatic goals for restoration work independently and together to benefit injured resources and services. The programmatic goals that would be addressed by the selected projects selected for E&D in this Final RP are 1) Restore and Conserve Habitat, and 2) Replenish and Protect Living Coastal and Marine Resources.

Consistent with the programmatic goals, the Trustees also developed goals for each Restoration Type (PDARP/PEIS Sections 5.5.2 through 5.5.14). These specific goals help to guide restoration planning and project selection for each Restoration Type.

To help meet these goals, in this Final RP the Louisiana TIG addresses three Restoration Types: Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; and Birds.<sup>5</sup>

Additional information about the Purpose and Need for *DWH* NRDA restoration can be found in Section 5.3.2 of the PDARP/PEIS at page 5-11.

## 1.7 Final Action: Louisiana TIG Final RP

This Final RP addresses the *DWH* restoration goals discussed above by selecting six projects as restoration alternatives to undergo E&D. These projects are intended to contribute to primary and compensatory restoration of habitats, species, and services in Louisiana using funds made available in

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<sup>3</sup> Available at <http://gov.louisiana.gov/assets/ExecutiveOrders/JBE16-09.pdf>.

<sup>4</sup> For more information on determining when a project is consistent with the Coastal Master Plan, see “Consistency with the 2012 Coastal Master Plan: Guidelines for Restoration Projects Receiving State Funding,” available at <http://coastal.la.gov/wp-content/uploads/2013/12/MPCConsistencyGuidelines112013.pdf>.

<sup>5</sup> PDARP/PEIS Section 5.5.2.1 describes the programmatic goals for Restoration Type Wetlands, Coastal and Nearshore Habitats, Section 5.5.3.1 describes the goals for Restoration Type Habitat Projects on Federally Managed Lands, and Section 5.5.12.1 presents goals for the Restoration Type Birds.

the *DWH* Consent Decree. Projects selected as restoration alternatives to undergo E&D in this Final RP are listed below in Table 3, while Figure 2 shows the locations of the six selected restoration projects.

**Table 3. Projects Selected for E&D in this Final RP**

<b>Project</b>	<b>PDARP/PEIS Restoration Goal and Restoration Type</b>	<b>Geographic Area Identified in Notice of Initiation of Restoration Planning</b>	<b>Proposed Funding for E&amp;D</b>
<b>Terrebonne Basin Ridge and Marsh Creation Project: Bayou Terrebonne Increment</b>	Restore and Conserve Habitat: Wetlands, Coastal, and Nearshore Habitats	Terrebonne Basin	\$3,000,000
<b>Barataria Basin Ridge and Marsh Creation Project: Spanish Pass Increment</b>	Restore and Conserve Habitat: Wetlands, Coastal, and Nearshore Habitats	Barataria Basin	\$4,500,000
<b>Lake Borgne Marsh Creation Project: Increment One</b>	Restore and Conserve Habitat: Wetlands, Coastal, and Nearshore Habitats	Pontchartrain Basin	\$7,000,000
<b>Shoreline Protection at Jean Lafitte National Historical Park and Preserve</b>	Restore and Conserve Habitat: Habitat Projects on Federally Managed Lands	Jean Lafitte National Historical Park and Preserve	\$2,300,000
<b>Queen Bess Island Restoration Project</b>	Replenish and Protect Living Coastal and Marine Resources: Birds	N/A (no specific geographic area identified for bird restoration in NOI)	\$2,500,000
<b>Rabbit Island Restoration Project</b>	Replenish and Protect Living Coastal and Marine Resources: Birds	N/A (no specific geographic area identified for bird restoration in NOI)	\$3,000,000

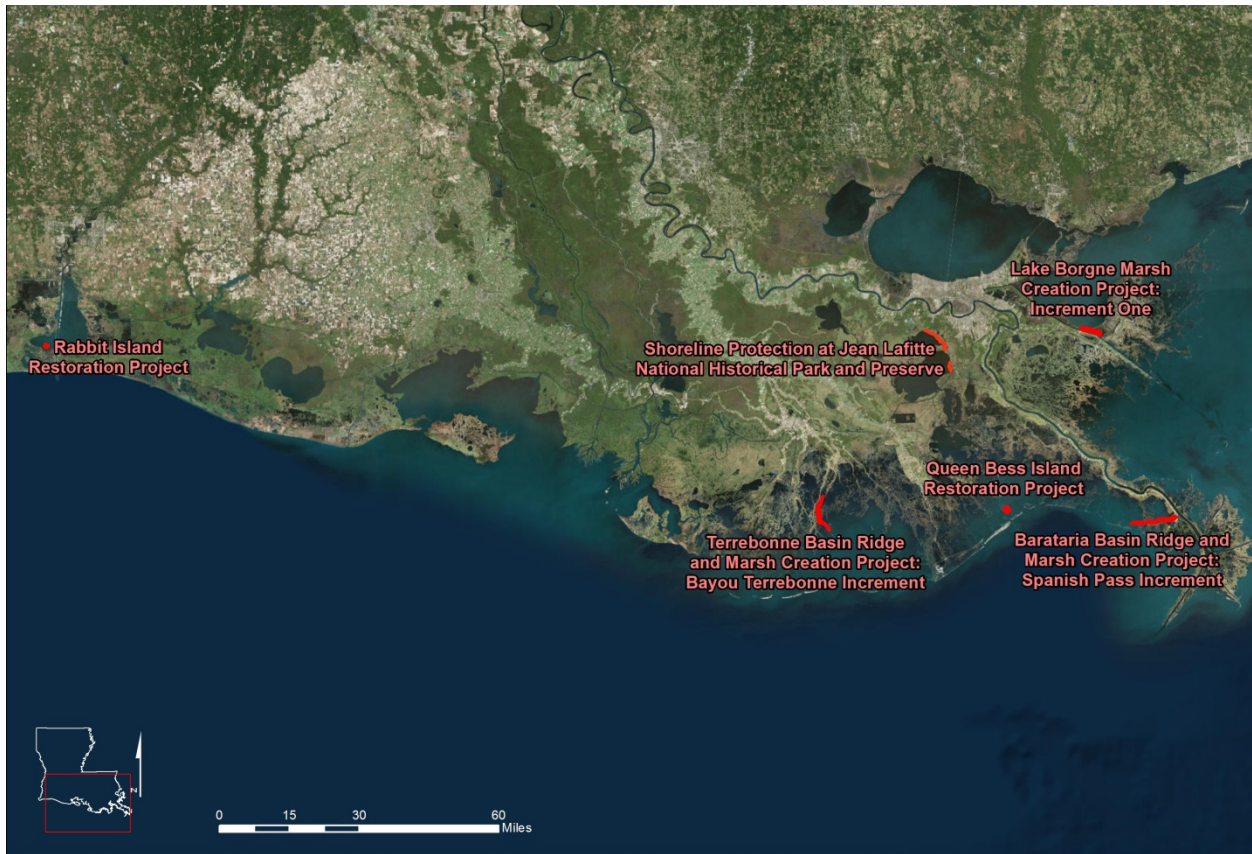


Figure 2. Projects Selected for E&D in this Final RP

As discussed further in Sections 2.2.2 and 3 of this Final RP, the restoration projects presented in this Final RP were prioritized through a variety of screening criteria and practical considerations to help evaluate projects. These include the goals of each restoration type described in Chapter 5 of the PDARP, OPA, NEPA, resource availability, and the nexus between *DWH* oil spill injury and projects identified in the 2012 Louisiana Coastal Master Plan.

Further detail on each of these projects, as well as all projects considered in this Final RP, can be found in Section 2.2.2 below.

The Louisiana TIG will propose evaluating and implementing additional projects in Louisiana, potentially including the restoration alternatives that are evaluated in this Final RP but not selected to undergo E&D at this time, in subsequent restoration plans.

### 1.8 Public Involvement

Public input is an integral part of NEPA, OPA, and the *DWH* oil spill restoration planning effort. The purpose of public review is to facilitate public discussion regarding the restoration project alternatives, allow the Trustees to solicit and consider public comment, and ensure that final plans consider relevant issues. The Trustees conducted an extensive public outreach process as part of the PDARP/PEIS; that process is described more fully in Chapter 8 of the PDARP/PEIS. More discussion on public outreach and involvement can also be found in previous phases of *DWH* NRDA restoration can be found in the Early Restoration Plans available at <http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration>.

### 1.8.1 Public Involvement in the Development of the Draft RP

On July 12, 2016, the Louisiana TIG published a Notice of Initiation of Restoration Planning in response to the *DWH* oil spill. The purpose of this notice was to inform the public that restoration planning has begun and to solicit restoration project ideas from the public. The notice included restoration types and geographic locations that would be addressed in this Final RP. Restoration types and geographic areas prioritized for this plan include:

- (1) Restore and Conserve Habitat—Wetlands, Coastal, and Nearshore Habitats, in Barataria Basin;
- (2) Restore and Conserve Habitat—Wetlands, Coastal, and Nearshore Habitats, in Terrebonne Basin;
- (3) Restore and Conserve Habitat—Wetlands, Coastal, and Nearshore Habitats, in Pontchartrain Basin;
- (4) Restore and Conserve Habitat—Habitat projects on Federally Managed Lands, Jean Lafitte National Historical Park and Preserve; and
- (5) Replenish and Protect Living Coastal and Marine Resources—Birds.

The Louisiana TIG received several comments in response to the July 12, 2016 notice. All comments were supportive of Louisiana TIG restoration planning efforts and the proposed restoration types and geographical locations. Some comments included project proposals, which were reviewed as they were received. Notably, a version of one of the projects selected for E&D in this plan, the Rabbit Island Restoration Project, was also proposed via public comment in response to the Notice of Initiation of Restoration Planning.

On August 17, 2016, the Louisiana TIG published a Notice of Intent to Begin Drafting a Restoration Plan.<sup>6</sup>

### 1.8.2 Public Involvement in the Development of the Final RP

The public comment period for the Draft RP opened on October 20, 2016, and was scheduled to end on November 28, 2016. The comment period was reopened and closed on December 9, 2016, to accommodate a request for a public meeting.

On November 30, 2016, the Louisiana TIG held a public meeting in Baton Rouge, Louisiana, at the CPRA Board's monthly meeting. At the public meeting, the Louisiana TIG presented on the Draft RP and accepted verbal comments. In addition, the Louisiana TIG hosted a web-based comment submission site and provided a P.O. Box and email address for the public to provide comments. As a result, the Louisiana TIG received comments provided via public meetings, web-based submissions, emailed submissions, and mailed-in submissions.

Section 5 of this document provides further detail on the public comment process and includes a summary of all relevant public comments received on the Draft RP and Louisiana TIG responses. This Final RP reflects revisions to the Draft RP arising from public comments, continuing Trustee project development, and consideration of other potentially relevant information.

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<sup>6</sup> Available at <http://www.gulfspillrestoration.noaa.gov/2016/08/louisiana-trustee-implementation-group-begins-drafting-first-restoration-plan>.

### 1.8.3 Administrative Record

Pursuant to 15 C.F.R. § 990.45, the Trustees opened a publicly available Administrative Record for the *DWH* oil spill NRDA, including restoration planning activities, concurrently with the publication of the 2010 Notice of Intent to Conduct Restoration Planning (75 Fed. Reg. 60800).<sup>7</sup> DOI is the lead federal Trustee for maintaining the Administrative Record, which can be found at <http://www.doi.gov/deepwaterhorizon/adminrecord>. The State of Louisiana also maintains a Louisiana *DWH* Administrative Record, which can be found at <http://la-dwh.com/AdminRecord.aspx>. Information about Louisiana TIG restoration project implementation is being provided to the public through the Administrative Records and other outreach efforts, including <http://www.gulfspillrestoration.noaa.gov>.

### 1.9 Severability of Projects

In this Final RP, the Louisiana TIG selects six individual restoration project alternatives for E&D, with a total proposed funding of \$22.3 million. The restoration projects selected in this Final RP are independent of each other and have been selected independently for E&D funding. A decision to substantially modify or not fund one or more of the projects for E&D funding should not affect the Louisiana TIG's E&D funding for the remaining restoration projects selected in this Final RP.

### 1.10 Decisions to be Made

This Final RP is intended to provide the public and decision-makers with information and analysis on the Louisiana TIG's decision to proceed with E&D on six restoration projects. The public, government agencies, and other entities have identified and continue to identify potential restoration projects for consideration during the restoration planning process. Projects not identified for inclusion in the Final RP may continue to be considered for inclusion in future restoration plans.

For the projects in this Final RP selected for further E&D, no additional NEPA analysis is necessary at this time, as a programmatic NEPA evaluation of environmental consequences related to the types of E&D activities anticipated to occur was performed in the PDARP/PEIS. Upon review (Section 3.3), the NEPA analysis in the PDARP/PEIS is considered sufficient at this time for E&D activities for the six selected projects. When sufficient information is developed for the projects selected to undergo E&D, project-specific NEPA analysis of the environmental consequences of a reasonable range of design alternatives for those projects will be performed in a subsequent restoration plan.

### 1.11 Document Organization

This Final RP is divided into the following sections:

- **Section 1 (Introduction):** Introductory information and context for this document;
- **Section 2 (Restoration Planning Process):** Background on the NRDA restoration planning process, summary of injuries to resources resulting from the *DWH* oil spill that the Louisiana TIG intends to address in this Final RP, and screening of a suite of restoration projects to address those injuries;

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<sup>7</sup> Available at <https://federalregister.gov/a/2010-24706>.

- **Section 3 (OPA Evaluation of Alternatives and NEPA Discussion):** Evaluation of projects proposed for NRDA restoration, selection of a suite of restoration alternatives to proceed with E&D, and discussion of NEPA compliance;
- **Section 4 (Monitoring and Adaptive Management):** Discussion of monitoring and adaptive management requirements for *DWH* oil spill NRDA restoration projects;
- **Section 5 (Public Comment on the Draft RP and Responses):** Summary of all relevant public comments received on the Draft RP and Louisiana TIG responses;
- **Section 6 (List of Preparers and Reviewers):** Identification of individuals who substantively contributed to the development of this document;
- **Section 7 (List of Repositories):** A list of facilities that will receive copies of the Final RP for review by the public; and
- **Section 8 (Literature Cited).**



## 2.0 Restoration Planning Process

### 2.1 Restoration Planning Context

#### 2.1.1 Summary of Injuries Addressed in the Final RP

Immediately following the *DWH* oil spill, the Trustees initiated an injury assessment pursuant to OPA, which established the nature, degree, and extent of injuries from the *DWH* incident to both natural resources and the services they provide. The Trustees then used the results of the injury assessment to inform restoration planning so that restoration can address the nature, degree, and extent of the injuries caused by the *DWH* oil spill.

This Final RP focuses on the injuries to coastal habitat and nearshore marine ecosystem, injuries to habitat on federally managed lands, and injuries to birds in the Louisiana Restoration Area. This section will highlight some of the primary considerations from the PDARP/PEIS injury assessment that led the Louisiana TIG to choose to begin restoration planning on these particular resources. For further information, see Chapter 4 of the PDARP/PEIS, where each of these injury categories is discussed in great detail.

##### 2.1.1.1 Nearshore Marine Ecosystem

The *DWH* oil spill caused significant injuries to the nearshore marine ecosystem in Louisiana, which experienced the majority of oiled shoreline and the vast majority of oiled wetland shorelines (PDARP/PEIS 4-289). Oiling caused multiple injuries to these habitats, including increased erosion of oiled shorelines, reductions in aboveground biomass and total plant cover in mainland herbaceous salt marshes, reductions in periwinkle snail abundance, reductions in shrimp and flounder growth rates, reduced reproductive success in forage fish, reduced amphipod survival, impacts to submerged aquatic vegetation (SAV) habitats, and reduced nearshore oyster cover. *Id.* In addition to extensive injuries to these habitats and their dependent resources, Louisiana suffered extensive injuries to birds and their corresponding habitats (PDARP/PEIS Chapter 4.7). Additionally, some response actions resulted in unintended injury to resources, such as a reduction in diversity and percent cover of SAV (PDARP/PEIS 4-289).

As discussed in the PDARP/PEIS, “[o]iling has been documented to adversely affect coastal wetland vegetation and associated fauna. Oil can wash up at the marsh edge, oiling soil and coating vegetation. It can also penetrate the marsh through tidal creeks and wash-over events, and become stranded in the marsh interior where it can coat plant stems and soil” (PDARP/PEIS 4-326 (internal citations omitted)).

Shoreline oiling results in the loss of marsh vegetation, which “initiate[s] a cascade of trophic-level impacts to bacteria, invertebrates, plankton, and higher-level organisms” (PDARP/PEIS 4-435). Further, “[m]arsh plants also play an important role in shoreline stabilization, holding and stabilizing soil and sediment, and helping to retain and accumulate soil in the marsh. The marsh serves a role in coastal flood protection by attenuating storm and wave energy” (PDARP/PEIS 4-435 (internal citations omitted)).

The Trustees concluded that some of these losses are permanent, and some injuries, such as marsh edge erosion, can only be addressed through the creation of new marsh land (PDARP/PEIS 4-289). Therefore, the injuries caused by the *DWH* oil spill have significantly contributed to the ongoing coastal

crisis in Louisiana. For these reasons, the Louisiana TIG has chosen to prioritize restoration of wetland, coastal, and nearshore habitats in this Final RP.

For more detail on the injuries caused to wetland, coastal, and nearshore habitats and the Trustees' extensive efforts to assess the impact of the *DWH* oil spill on these resources, see Chapter 4.6 of the PDARP/PEIS, "Nearshore Marine Ecosystem."

#### 2.1.1.2 Habitat Projects on Federally Managed Lands/Submerged Aquatic Vegetation

The Trustees documented injuries to SAV across the northern Gulf of Mexico as a result of the *DWH* oil spill. As noted in the PDARP/PEIS, SAV injury occurred to seagrass beds in Florida from physical response activities, in the Chandeleur Islands due to direct oil exposure, and to SAV in Lake Cataouatche on the Jean Lafitte National Historic Park and Preserve due to river water releases as part of response actions (PDARP/PEIS 4-420).

Broadly, "SAV resources are a vital component of coastal aquatic ecosystems in the northern Gulf of Mexico, which has at least 26 species of SAV growing in fresh, brackish, and saline coastal environments. SAV that grows in saline environments is called seagrass. SAV is among the most productive primary producers in the biosphere. In the northern Gulf of Mexico coastal ecosystems, SAV provides a wide range of ecological services rivaling or, in some instances, exceeding the functions of tropical rain forests and coral reefs. SAV and its epiphytic communities produce large quantities of organic matter that form the structural habitat and biochemical basis of a diverse food web leading to high secondary production rates of ecologically important and commercially valuable fish, shellfish, and wildlife communities. SAV primary production also maintains good water quality by recycling and temporarily storing nutrients, filtering the water column, dissipating wave and current energy, and stabilizing sediments" (PDARP/PEIS 4-420 (internal citations omitted)).

More pertinent to this Final RP, the PDARP noted that "between May and August 2010, the sustained increased flows from the Davis Pond structure resulted in reduced salinity into Lake Cataouatche and Jean Lafitte National Historical Park and Preserve. These studies also showed an increase in freshwater flows and turbidity along the Lake Cataouatche shoreline. Focusing on the sampling stations along this shoreline, changes in habitat conditions coincided with changes in SAV community structure within the Park, including reductions in SAV diversity. From fall 2010 to fall 2012, SAV diversity on the lake shoreline decreased from an average 4.6 ( $\pm$  0.55) species per station to 1.3 ( $\pm$  0.86) species per station. After the river water releases, SAV percent cover also dramatically decreased along the Park's Lake Cataouatche shoreline from an average 10.34 ( $\pm$  2.92) percent cover per station to an average 1.76 ( $\pm$  2.56) percent cover per station. Conservatively, 60 acres (24 hectares) of SAV along the shoreline experienced 83 percent decline in percent cover from baseline, which was calculated using 2006 survey data and aerial imagery from 2008. Earlier research indicated that SAV beds remained stable or increased after normal flow from Davis Pond structure became more regular beginning in 2002; however, SAV beds were apparently unable to withstand the increased flow rate and turbidity associated with the 2010 releases" (PDARP/PEIS 4-425 (internal citations omitted)). While Lake Cataouatche and Lake Salvador are distinct lakes separated by the land mass of Couba Island, their waters intermingle through their connections via Bayou Bardeaux to the east of Couba Island and Couba Bayou to the west.

Given the consistency between this SAV injury and the precarious condition of Louisiana’s wetland and nearshore resources, the Louisiana TIG also decided to prioritize projects to restore SAV in Jean Lafitte National Historical Park and Preserve in this Final RP. Restoration for SAV in this case is categorized under the PDARP/PEIS category of Restoring Habitat on Federally Managed Lands.

For more detail on the Trustees’ assessment efforts as they relate to SAV, see Chapter 4.6.8 of the PDARP/PEIS, “Submerged Aquatic Vegetation Assessment.” For a summary of documented injury to Federally Managed Lands, see Chapter 5.5.3.

#### 2.1.1.3 Birds

The Trustees documented large-scale and pervasive bird injuries in the northern Gulf of Mexico as a result of the *DWH* oil spill. As noted in the PDARP/PEIS, “the *DWH* oil spill exposed dozens of species of birds to oil in a variety of northern Gulf of Mexico habitats, including open water, island waterbird colonies, barrier islands, beaches, bays, and marshes. Birds were exposed to oil in several ways, including physical contact with oil in the environment; ingestion of external oil during preening; and ingestion of oil while foraging and consuming contaminated prey, water, or sediment” (PDARP/PEIS 4-461).

Importantly, “[n]earshore habitats (waters, beaches, and marsh edges) of the northern Gulf of Mexico support a diversity of resident and migratory birds, including the federally endangered piping plover and the federally threatened red knot. Birds use multiple nearshore habitats (including shallow waters, beaches, and marsh edge) for nesting, feeding, and loafing. Nearshore areas are important migration and wintering habitat for significant numbers of the continental waterfowl populations that use the Atlantic, Mississippi, and Central flyways. The Southeastern United States Regional Waterbird Conservation Plan identified nearshore habitats as among the most important for colonial birds, especially herons, ibises, pelicans, cormorants, skimmers, terns and gulls, and non-colonial birds such as rails. It is also important for gannets, loons, shorebirds, and grebes. Oil from the *DWH* oil spill affected all nearshore habitats. The nearshore marsh edge provides habitat for marsh-associated shorebirds, wading birds, gulls, terns, and other bird species. Marsh edge habitat also includes periodically exposed mudflats and tidal flats on the leading edge of marshes, which provide critical foraging areas. Sandy beach habitats (primarily beaches, dunes, sand bars, and sandy inlet shorelines) provide services to numerous resident and migratory birds. They provide nesting areas for several solitary nesting shorebirds (e.g., American oystercatcher, snowy plover, and Wilson’s plover), as well as colonial black skimmers, laughing gulls, and several species of terns” (PDARP/PEIS 4-467 (internal citations omitted)).

Given the extensive injuries to birds and their various habitats in Louisiana, the Louisiana TIG also decided to prioritize in this Final RP projects that would restore for birds injured by the *DWH* oil spill. Restoration for bird injury is categorized under the PDARP/PEIS category of Replenish and Protect Living Coastal and Marine Resources.

For more detail on the Trustees’ assessment efforts as they relate to avian injuries, see Chapter 4.7 of the PDARP/PEIS, “Birds.”

#### 2.1.2 Summary of *DWH* NRDA Early Restoration Addressing the Injuries

During *DWH* NRDA Early Restoration, the Trustees selected one project for implementation in Louisiana within the “Wetlands, Coastal, and Nearshore Habitats” Restoration Type, as well as one project that

received funding from both the “Wetlands, Coastal, and Nearshore Habitats” and “Birds” Restoration Types. In Phase I of Early Restoration, the Trustees selected the Lake Hermitage Marsh Creation Project for implementation. The Lake Hermitage Marsh Creation Project received \$13,200,000 in funding from the “Wetlands, Coastal, and Nearshore Habitats” Restoration Type. This project is fully constructed and is currently in the monitoring phase. More details on this project can be found in the Phase I Early Restoration Plan.<sup>8</sup>

In Phase III, the Trustees selected the Louisiana Outer Coast Restoration Project for implementation. The Louisiana Outer Coast Restoration Project received \$246,425,700 in funding from the “Wetlands, Coastal, and Nearshore Habitats” Restoration Type, as well as \$71,937,300 from the “Birds” Restoration Type. Three of the four components of the Louisiana Outer Coast Restoration Project (Shell Island Barrier Island Restoration, Caillou Lake Headlands Barrier Island Restoration, and Chenier Ronquille Barrier Island Restoration) are in the construction phase. The fourth component, Breton Island Barrier Island Restoration, is in the E&D phase. More details on this project can be found in the Phase III Early Restoration Plan.<sup>9</sup>

To date, there has been no *DWH* NRDA restoration to address the SAV injury at Jean Lafitte National Historical Park and Preserve.

More information on the status of all *DWH* NRDA Early Restoration projects and a summary of funds obligated to each project can be found on NOAA’s Gulf Spill Restoration Early Restoration Project Atlas.<sup>10</sup>

### 2.1.3 Coordination with Other Gulf Restoration Programs

As discussed in the PDARP/PEIS at Chapter 1.5.6, the Trustees are committed to coordination with other Gulf of Mexico restoration programs to maximize the overall ecosystem impact of *DWH* NRDA restoration efforts. This coordination will ensure that funds are allocated for critical restoration projects across the affected regions of the Gulf of Mexico and within appropriate Louisiana basins.

During the course of the restoration planning process, the Louisiana TIG has coordinated, and will continue to coordinate, with other *DWH* oil spill and Gulf of Mexico restoration programs, including the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act); National Fish and Wildlife Foundation (NFWF); and Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) programs. In so doing, the Louisiana TIG has been reviewing the implementation of projects in other coastal restoration programs and is attempting to create synergies with those programs to ensure the most effective use of available funds for the maximum coastal benefit.

For example, the Louisiana TIG has coordinated with USDA’s Natural Resources Conservation Service (NRCS) regarding marsh creation projects in Terrebonne Basin and with EPA on marsh creation projects in the Pontchartrain Basin to ensure that complementary projects are being evaluated and implemented

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<sup>8</sup> Available at <http://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Final-ERP-EA-041812.pdf>.

<sup>9</sup> Available at <http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/phase-iii>.

<sup>10</sup> Available at <http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/early-restoration-projects-atlas>.

across funding streams. Through coordination with NRCS, it became apparent that NRCS was using RESTORE Act funds for one of the increments of the Terrebonne Basin Marsh Creation Project. It was decided that NRCS would proceed with E&D on that marsh creation increment using RESTORE funds, while the Louisiana TIG would implement a complementary marsh creation increment in that same basin. This coordination will allow multiple large-scale marsh creation projects to proceed simultaneously in Terrebonne Basin, greatly accelerating restoration to resources in the basin that were injured by the *DWH* oil spill.

The Louisiana TIG also coordinated with EPA on a proposed CWPPRA marsh creation project in Pontchartrain Basin. Through this coordination, it was determined that funding for this project would be obtained by the Louisiana TIG under the NRDA program, potentially resulting in cost savings, efficiencies, and increased restoration benefits in coastal Louisiana by allowing the CWPPRA funding to be used for other complementary projects.

The Louisiana TIG will continue to engage in coordination with these and similar restoration programs during the life of the *DWH* NRDA restoration program to maximize cost savings and restoration benefits to the resources in coastal Louisiana that were injured by the *DWH* oil spill.

## 2.2 Screening for Potential Alternatives

Trustee Council SOP Section 9.4.1.4 provides that “[t]he TIGs and individual Trustees within the TIG will develop project ideas and will consider relevant project ideas submitted by the public. The TIGs will screen initial project ideas to hone in on potential projects and alternatives that will continue to be developed for consideration. Screening will adhere to project selection criteria consistent with OPA regulations (15 C.F.R. § 990.54), the PDARP/PEIS, and any additional evaluation criteria established by a TIG and identified in a restoration plan or public notice.”<sup>11</sup>

In this Final RP, the Louisiana TIG evaluates and documents whether each considered project is consistent with the OPA screening criteria, the PDARP Restoration Type goals, and other screening criteria identified below that are determined by the Louisiana TIG to be relevant.

### 2.2.1 Screening Process

#### 2.2.1.1 OPA Screening Criteria

Each project identified in this Final RP was evaluated according to the OPA screening criteria (15 C.F.R. § 990.54(a)), which include:

- The cost to carry out the alternative;
- The extent to which each alternative is expected to meet the goals and objectives of returning the injured natural resources and services to baseline and/or compensating for interim losses;
- The likelihood of success of each alternative;

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<sup>11</sup> Available at <https://pub-dwhdatadiver.orr.noaa.gov/dwh-ar-documents/1184/DWH-AR0308710.pdf>.

- The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative;
- The extent to which each alternative benefits more than one natural resource and/or service; and
- The effect of each alternative on public health and safety.

#### 2.2.1.2 PDARP Programmatic and Restoration Type Goals and Objectives

The OPA regulations allow trustees to establish additional incident specific evaluation and selection criteria for alternatives and restoration projects (15 C.F.R. § 990.54). For this incident, the Trustees have determined that the action alternatives and subsequent restoration plans and projects must also be consistent with the goals outlined in Section 5.3.1, Programmatic Trustee Goals, and with the restoration types described in Section 5.5, Alternative A: Comprehensive Integrated Ecosystem Restoration (Preferred Alternative).

Chapter 5 of the PDARP/PEIS provides the criteria that a project must meet to be consistent with the PDARP. To be consistent with the PDARP/PEIS, the Louisiana TIG will document whether a project is:

1. Consistent with one or more of the programmatic goals identified by the Trustees:
  - Restore and Conserve Habitat
  - Restore Water Quality
  - Replenish and Protect Living Coastal and Marine Resources
  - Provide and Enhance Recreational Opportunities
  - Provide for Monitoring, Adaptive Management, and Administrative Oversight to Support Restoration Implementation.
2. Consistent with the Restoration Type strategy to achieve goals described in the PDARP.
3. Guided by an informed decision-making process, consistent with the Adaptive Management process described in the PDARP.

#### 2.2.1.3 Additional Screening Criteria

In addition to the screening criteria outlined above, in screening potential projects for this Final RP, the Louisiana TIG also considered Executive Order JBE 2016-09 by Louisiana Governor John Bel Edwards. Accordingly, the Louisiana TIG considered many projects that have already been publicly vetted and approved in the most recent iteration of the Coastal Master Plan, as well as projects that are not necessarily evaluated in, but are still consistent with, the Coastal Master Plan. See Section 1.3.4 of this Final RP for further discussion of Executive Order JBE 2016-09 and the Coastal Master Plan development process.

During the screening process, the Louisiana TIG also considered the availability of funds over time and the need to allocate those funds across the many regions of the state of Louisiana that were impacted by the *DWH* oil spill. Therefore, priority was placed on projects that could make the most significant impact over the greatest geographical area in light of the available funding.

### 2.2.2 Reasonable Range of Restoration Alternatives Considered

In developing a reasonable range of restoration alternatives to be evaluated in this Final RP, the Louisiana TIG took note of the PDARP/PEIS's statement that:

This investment of funds particularly focuses on restoring Louisiana coastal marshes as an essential element of the preferred alternative. Given both the extensive impacts to Louisiana marsh habitats and species and the critical role that these habitats play across the Gulf of Mexico for many injured resources and for the overall productivity of the Gulf, coastal and nearshore habitat restoration is the most appropriate and practicable mechanism for restoring the ecosystem-level linkages disrupted by this spill.

(PDARP/PEIS 5-4 (internal citation omitted)). To address the significant injury to Louisiana's coastal marshes, the Louisiana TIG identified a number of projects under the "Restore and Conserve Habitat" Restoration Goal for evaluation in this Final RP. The Louisiana TIG relied upon the publicly vetted projects in the Coastal Master Plan, which is the scientifically and legislatively approved gold standard for coastal restoration in Louisiana. In evaluating potential Coastal Master Plan projects for consideration in this Final RP, the Louisiana TIG focused on geographic location, immediacy and sustainability of project benefits provided to the resources injured by the *DWH* oil spill, and other relevant considerations. The large-scale marsh creation projects and sediment diversion project discussed in Section 2.2.2.1 below satisfy these initial considerations.

Additionally, under the "Restore and Conserve Habitat" Restoration Goal, the Louisiana TIG has chosen to address injury to habitats on federally managed lands in this Final RP – specifically the injury to SAV which occurred from the sustained increased flows from the Davis Pond structure and which resulted in reduced salinity and increased turbidity in Lake Cataouatche within the Jean Lafitte National Historical Park and Preserve (PDARP/PEIS 4-425). SAV is one of the best natural buffers of wave action and its attendant shoreline erosion. The loss of SAV following *DWH* response efforts has the potential to significantly accelerate shoreline erosion within the Park.

The PDARP/PEIS also recognized that "[t]he magnitude of the injury and the number of [bird] species affected makes the *DWH* oil spill an unprecedented human-caused injury to birds" (PDARP/PEIS 5-23). Given the extensive bird injuries in Louisiana, the Louisiana TIG also identified several bird restoration projects based on input from the Coastal Master Plan, public comments, and LDWF's consideration of priority factors, including constructability, restoration success, protection against future loss, and geographic location. Restoration for bird injury is categorized under the PDARP/PEIS category of Replenish and Protect Living Coastal and Marine Resources.

In developing a reasonable range of project alternatives, the Louisiana TIG identified a range of projects within the basins that were most impacted by the *DWH* oil spill, including projects submitted by the public as requested by the Louisiana TIG in the July 12, 2016 Notice of Initiation of Restoration Planning. The Louisiana TIG believes that allocating *DWH* NRDA funds across multiple impacted basins is the most appropriate approach for this first tier of projects. If the Louisiana TIG instead focused efforts on a single basin at a time, there is a risk that conditions in the other basins could deteriorate as a result of unaddressed injuries from the *DWH* oil spill in the interim, resulting in potentially greater cost and lower effectiveness of future restoration efforts in those basins. With regard to potential marsh creation projects, it also makes practical sense to spread initial restoration efforts among several basins, rather

than focus on one basin at a time, because sediment availability within each of those basins may not allow simultaneous implementation of multiple projects in a single basin.

A brief description of each project considered in this Final RP is included below, along with the Louisiana TIG's evaluation of the relevant OPA screening criteria.

### 2.2.2.1 Restoration Type: Wetlands, Coastal, and Nearshore Habitats

#### 2.2.2.1.1 Terrebonne Basin Ridge and Marsh Creation Project

The Terrebonne Basin supports about 155,000 acres of swamp and almost 574,000 acres of marsh, grading from fresh marsh inland to brackish and saline marsh near the bays and the Gulf of Mexico. This project represents a large-scale restoration strategy for the Terrebonne Basin that would rebuild ridge and intertidal marsh habitat that has degraded due, in part, to the *DWH* oil spill. The project would restore approximately 5,000 acres of marsh and ridge habitat and would be implemented in four increments through multiple design and construction phases (Figure 3). The increments include three ridge restoration and marsh creation projects north of Terrebonne Bay, including the Bayou Dularge Ridge, the Bayou Terrebonne Ridge, and the Point au Chien Ridge, and a large-scale marsh creation component to be located in southern Lafourche Parish, just west of Bayou Lafourche and Port Fourchon. Additional information about this project can be found in Louisiana's 2012 Coastal Master Plan.



Figure 3. Terrebonne Basin Ridge and Marsh Creation Project



This project is consistent with the Restore and Conserve Habitat programmatic goal and the Wetlands, Coastal, and Nearshore Habitat restoration type. In addition, it would meet the evaluation criteria established by OPA because:

- the project has likely benefits to more than one resource;
- large-scale marsh creation projects result in immediate benefits to habitat and therefore would likely prevent ongoing and future injuries to the same types of habitats affected by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;
- there is a high likelihood of success because this project is technically feasible and utilizes proven and established restoration methods used by other projects in the region;
- cost estimates are based on similar past projects, and similar projects have been constructed at a reasonable cost; and
- there would be a positive effect on public health and safety by providing natural protection against storm surge and flooding.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.

#### 2.2.2.1.1.1 Bayou Terrebonne Increment

The Bayou Terrebonne Increment of the Terrebonne Basin Ridge and Marsh Creation Project is a ridge restoration and marsh creation project located in western Terrebonne Parish (Figure 4). The ridge restoration feature of this project will restore 126 acres of earthen ridge. The marsh creation feature of this project will dredge sediment from offshore to create 1,370 acres of marsh. The total estimated cost of this project is \$123,000,000. The anticipated E&D cost is \$3,000,000.

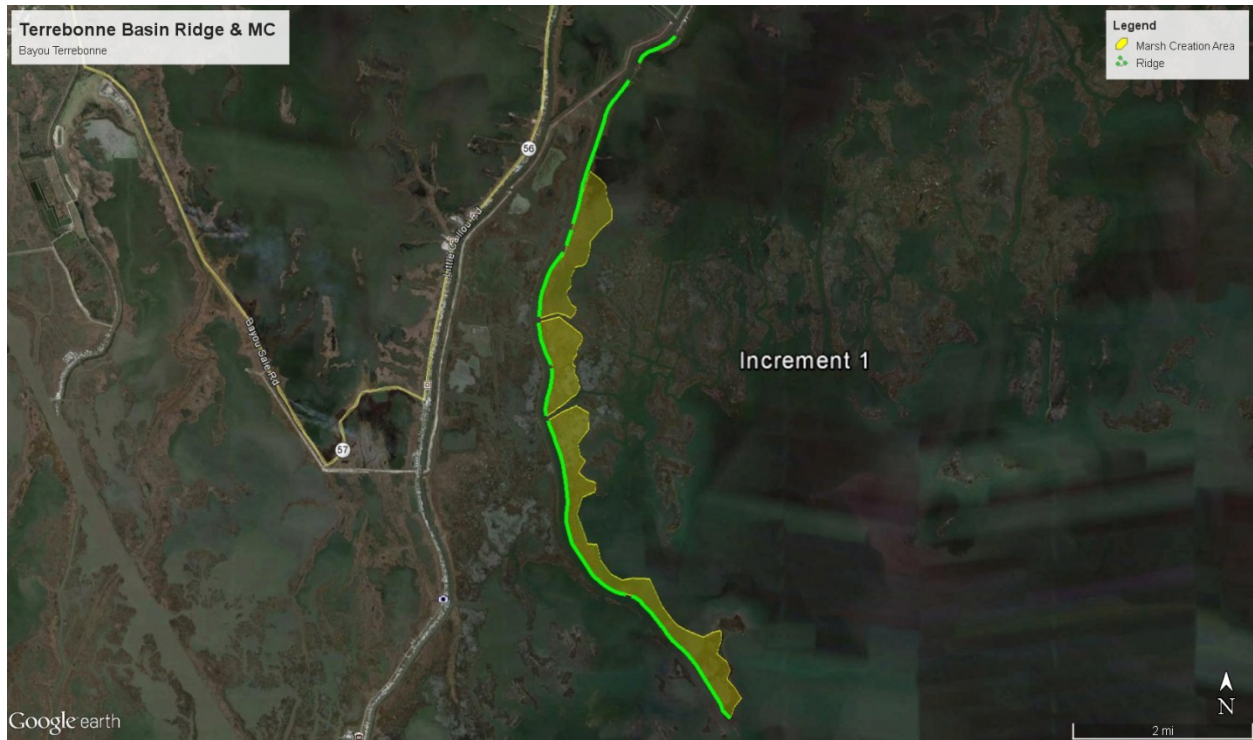


Figure 4. Bayou Terrebonne Increment of Terrebonne Basin Ridge and Marsh Creation Project

#### 2.2.2.1.1.2 Bayou Dularge Increment

The Bayou Dularge Increment of the Terrebonne Basin Ridge and Marsh Creation Project is a ridge restoration and marsh creation project located in central Terrebonne Parish (Figure 5). The ridge restoration feature of this project will restore 243 acres of earthen ridge. The marsh creation feature of this project will dredge sediment from Lake Barre to create 1,604 acres of marsh. The total estimated cost of the project is \$171,000,000. The anticipated E&D cost is \$6,000,000.

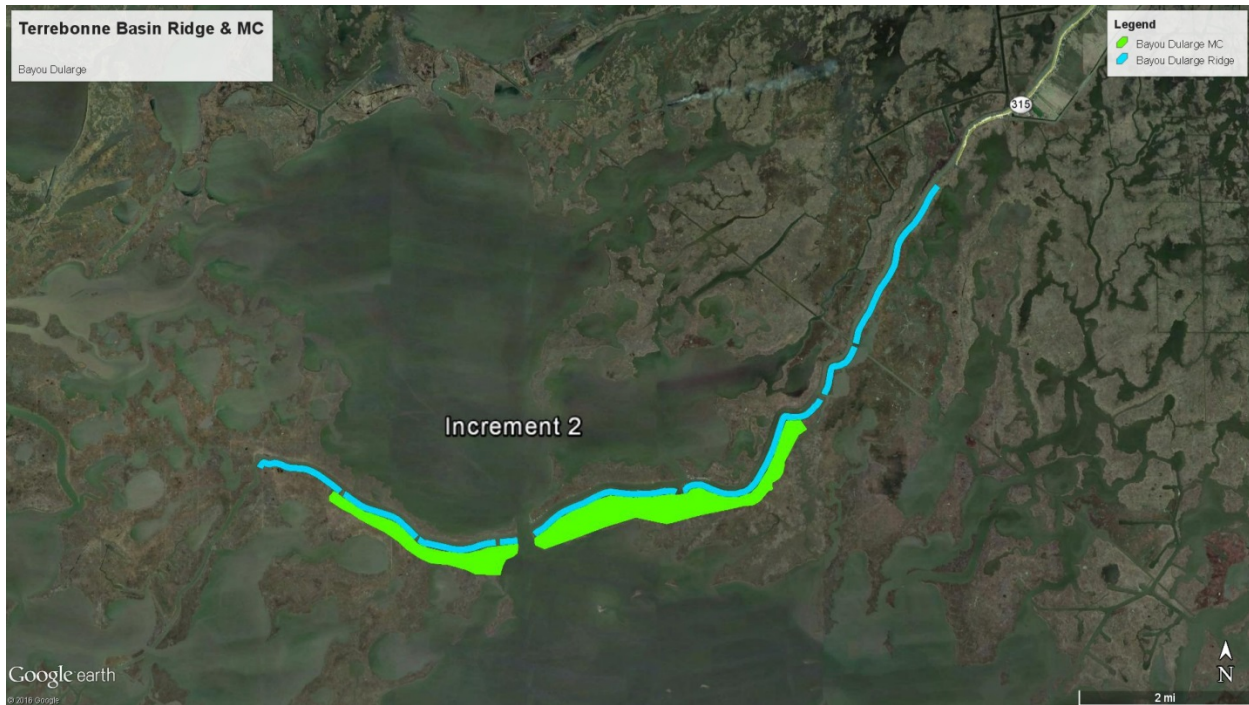


Figure 5. Bayou Dularge Increment of Terrebonne Basin Ridge and Marsh Creation Project

#### 2.2.2.1.1.3 Point Au Chien Increment

The Point Au Chien Increment of the Terrebonne Basin Ridge and Marsh Creation Project is a ridge restoration and marsh creation project located in eastern Terrebonne Parish (Figure 6). The ridge restoration feature of this project will restore 130 acres of earthen ridge. The marsh creation feature of this project will dredge sediment from Lake Barre to create 1,463 acres of marsh. The total estimated cost of this project is \$138,000,000. The anticipated E&D cost is \$3,000,000.

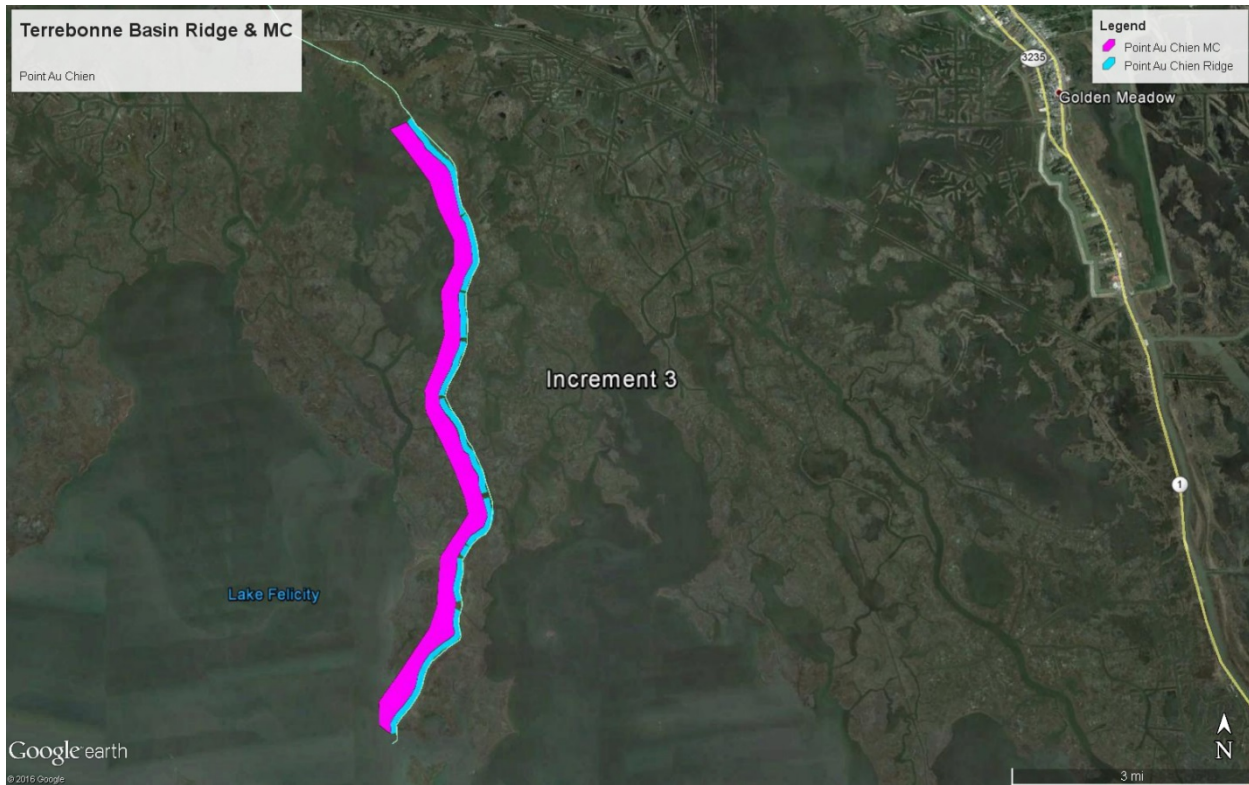


Figure 6. Point Au Chien Increment of Terrebonne Basin Ridge and Marsh Creation Project

#### 2.2.2.1.1.4 Fourchon Increment

The Fourchon Increment of the Terrebonne Basin Ridge and Marsh Creation Project is a marsh creation project located in Lafourche Parish (Figure 7). This project will dredge sediment from Lake Raccourci/Timbalier Bay to create 1,678 acres of marsh. The total estimated cost of this project is \$123,000,000. The anticipated E&D cost is \$3,000,000.



Figure 7. Fourchon Increment of Terrebonne Basin Ridge and Marsh Creation Project

#### 2.2.2.1.2 Barataria Basin Ridge and Marsh Creation Project

The Barataria Basin Ridge and Marsh Creation Project (Figure 8) is a large-scale restoration strategy for the Barataria Basin that would re-establish degraded marsh and ridge habitat by mechanically and hydraulically dredging local sediment sources. The project would create approximately 6,500 acres of marsh through five large-scale marsh creation increments in central and lower Barataria Basin that would be implemented in multiple design and construction phases. Additional information about this project can be found in the 2012 Coastal Master Plan.



Figure 8. Barataria Basin Ridge and Marsh Creation Project

This project is consistent with the Restore and Conserve Habitat programmatic goal, Wetlands, Coastal, and Nearshore Habitat restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- the project has likely benefits to more than one resource;
- large-scale marsh creation projects result in immediate benefits to habitat and therefore would likely prevent ongoing and future injuries to the same types of habitats affected by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;
- there is a high likelihood of success because this project is technically feasible and utilizes proven and established restoration methods used by other projects in the region;
- cost estimates are based on similar past projects, and similar projects have been constructed at a reasonable cost; and
- there would be a positive effect on public health and safety by providing natural protection against storm surge and flooding.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.

### 2.2.2.1.2.1 Spanish Pass Increment

The Spanish Pass Increment of the Barataria Basin Ridge and Marsh Creation Project is a marsh creation and ridge restoration project located in Plaquemines Parish (Figure 9). Spanish Pass is a natural historic tributary of the Mississippi River located west of Venice, Louisiana. The natural channel banks and adjacent marsh have degraded due to natural and manmade causes. The ridge restoration feature of this project will restore 120 acres of earthen ridge. The marsh creation feature of this project will dredge sediment from the Mississippi River, near Venice, LA, to create approximately 1,134 acres of marsh. The total estimated cost of this project is \$124,500,000. The anticipated E&D cost is \$4,500,000.

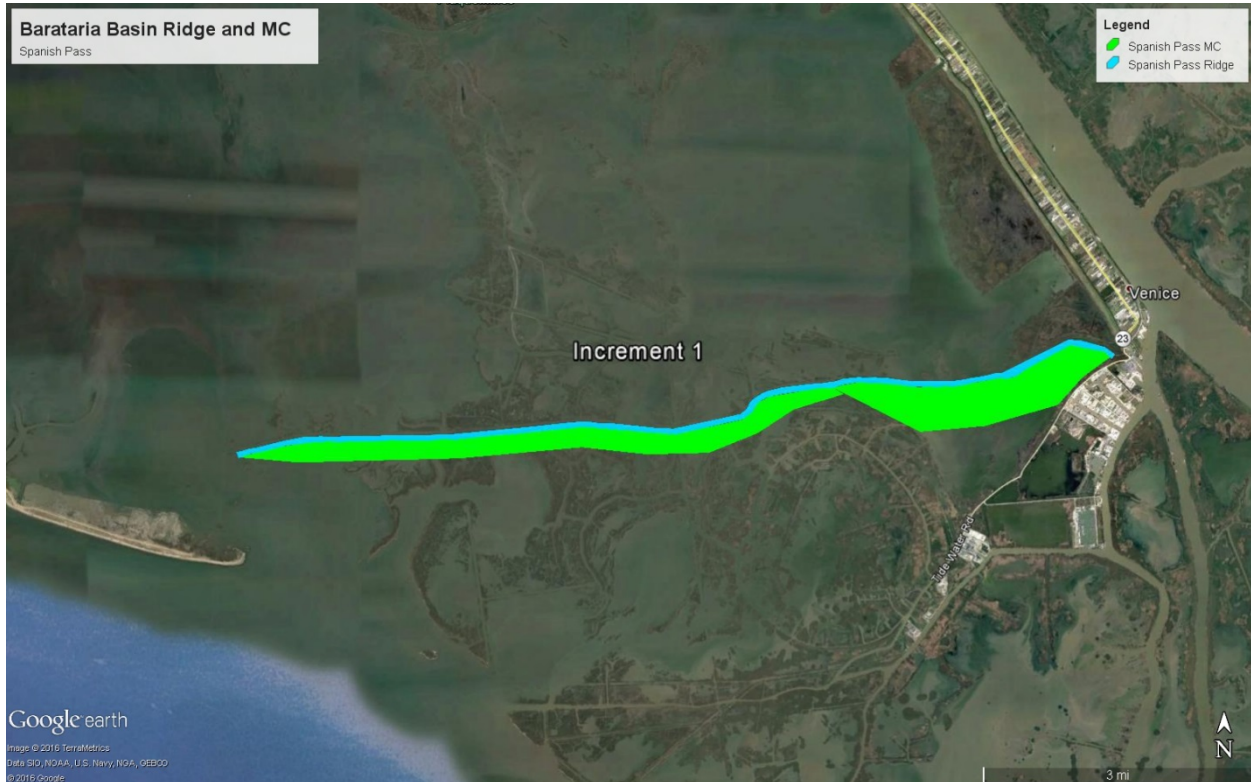


Figure 9. Spanish Pass Increment of Barataria Basin Ridge and Marsh Creation Project

### 2.2.2.1.2.2 Bayou Dupont IV Increment

The Bayou Dupont IV Increment of the Barataria Basin Ridge and Marsh Creation Project is a marsh creation project located in Jefferson Parish (Figure 10). This project will dredge sediment from Wills Point/Alliance to create approximately 1,213 acres of marsh. The total estimated cost of this project is \$139,500,000. The anticipated E&D cost is \$4,500,000.

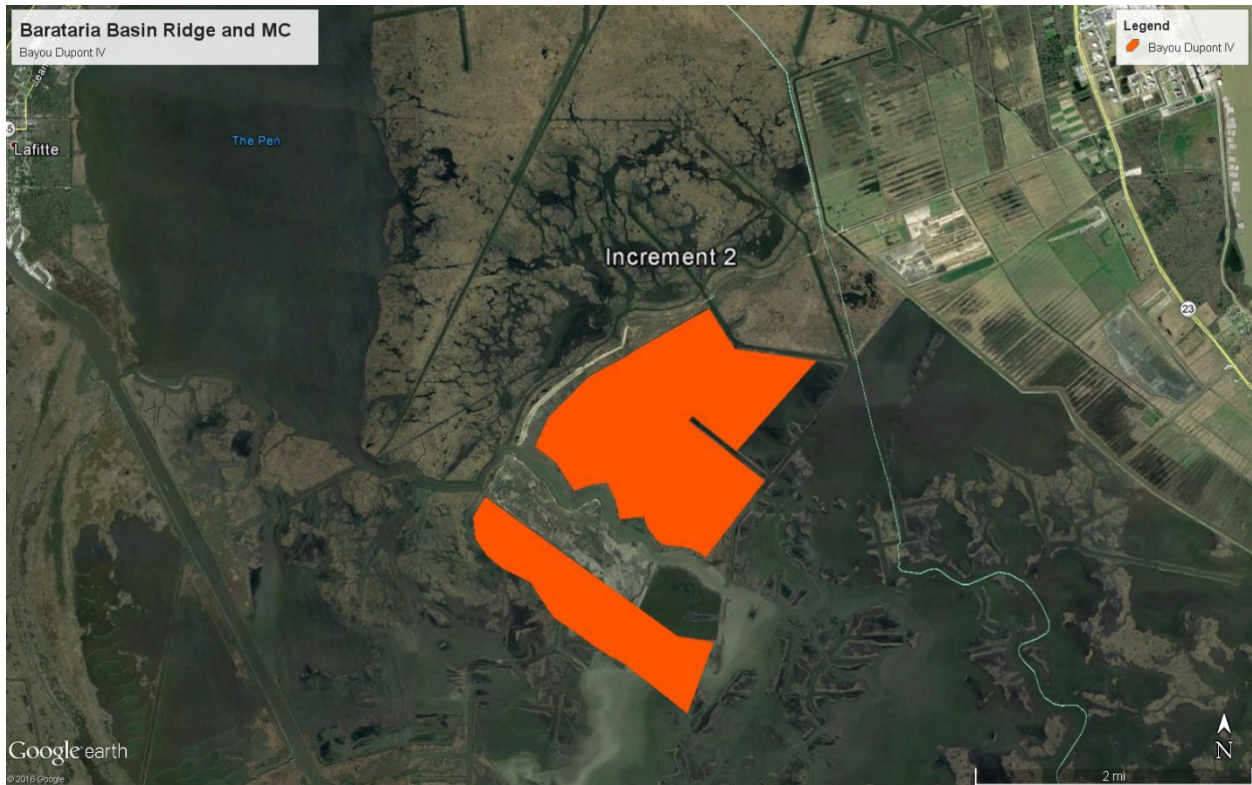


Figure 10. Bayou Dupont IV Increment of Barataria Basin Ridge and Marsh Creation Project

#### 2.2.2.1.2.3 Wilkinson Canal Increment

The Wilkinson Canal Increment of the Barataria Basin Ridge and Marsh Creation Project is a marsh creation project located in Plaquemines Parish (Figure 11). This project will dredge sediment from Davant/Myrtle Grove to create approximately 1,434 acres of marsh. The total estimated cost of this project is \$138,000,000. The anticipated E&D cost is \$3,000,000.



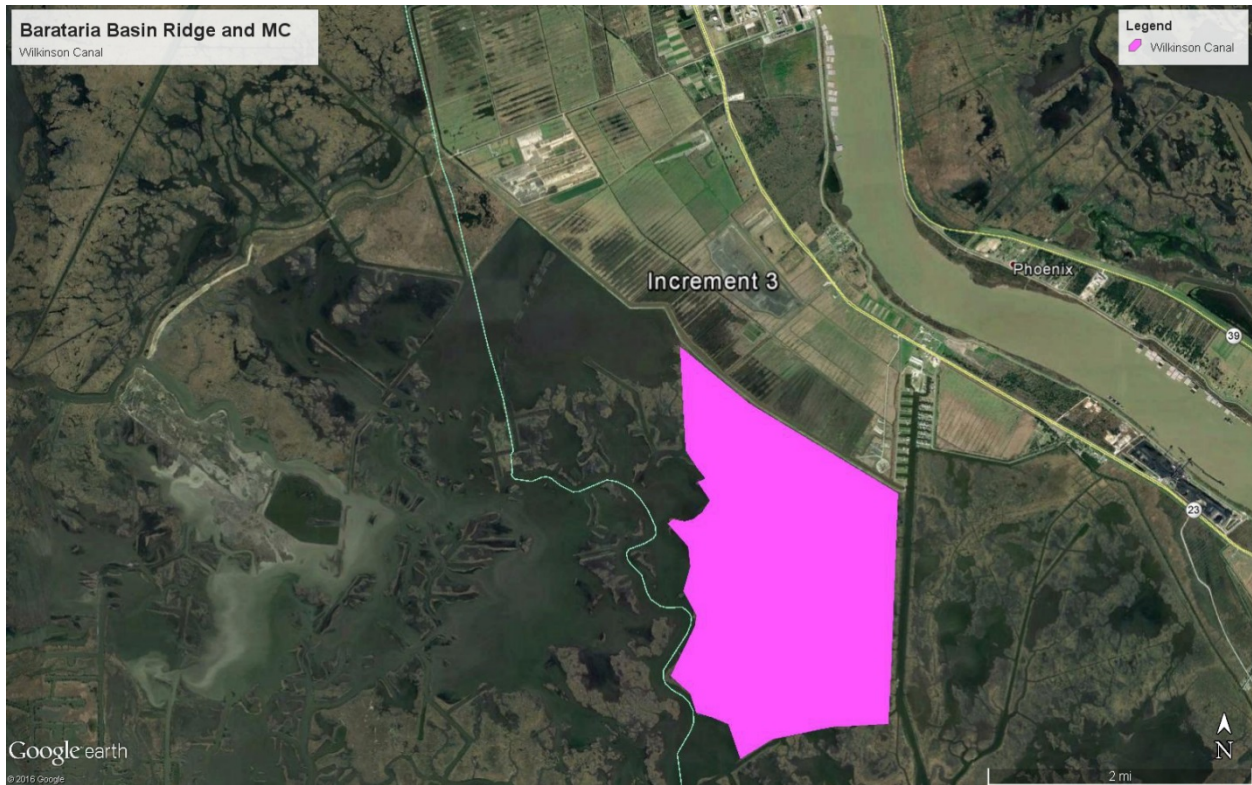


Figure 11. Wilkinson Canal Increment of Barataria Basin Ridge and Marsh Creation Project

#### 2.2.2.1.2.4 Bayou Dupont V Increment

The Bayou Dupont V Increment of the Barataria Basin Ridge and Marsh Creation Project is a marsh creation project located in Jefferson Parish (Figure 12). This project will dredge sediment from Wills Point/Alliance to create approximately 1,058 acres of marsh. The total estimated cost of this project is \$138,000,000. The anticipated E&D cost is \$3,000,000.



Figure 12. Bayou Dupont V Increment of Barataria Basin Ridge and Marsh Creation Project

#### 2.2.2.1.2.5 Bayou Dupont VI Increment

The Bayou Dupont VI Increment of the Barataria Basin Ridge and Marsh Creation Project is a marsh creation project located in Jefferson Parish (Figure 13). This project will dredge sediment from Wills Point/Alliance to create approximately 1,635 acres of marsh. The total estimated cost of this project is \$200,000,000. The anticipated E&D cost is \$4,500,000.

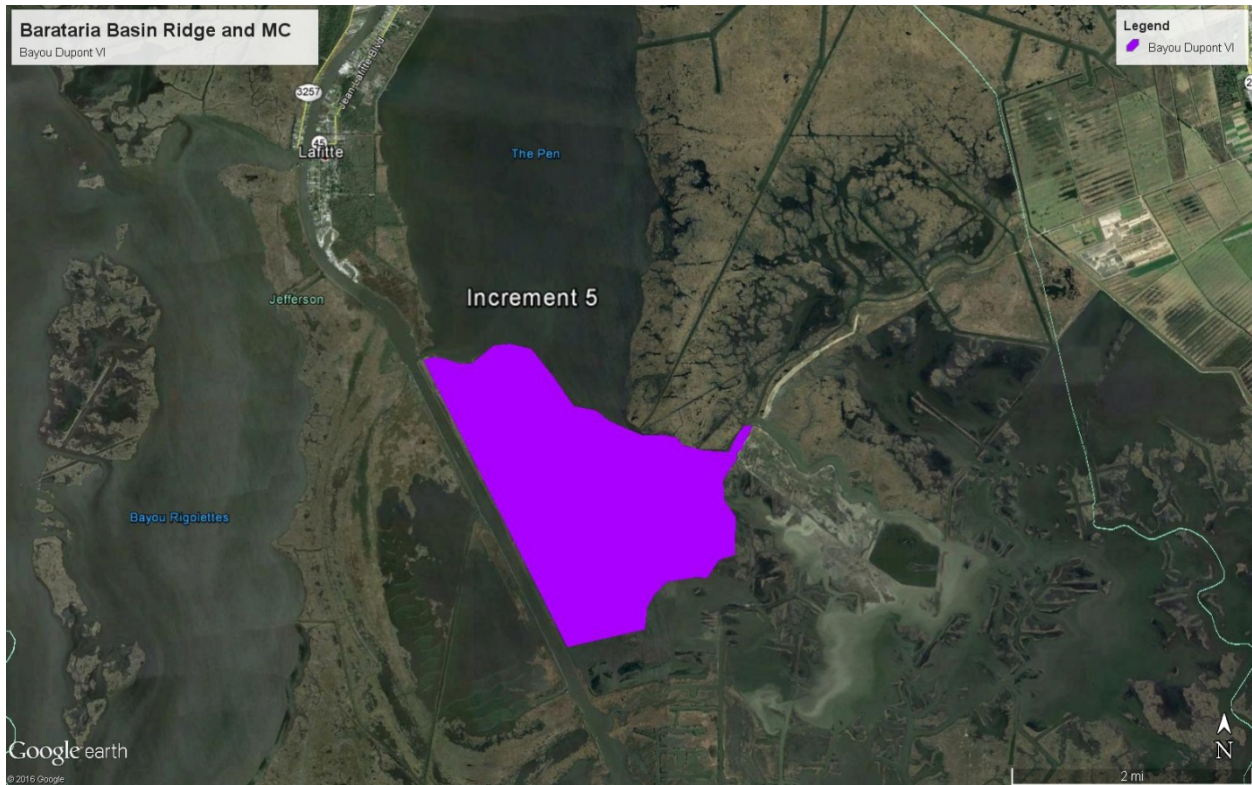


Figure 13. Bayou Dupont VI Increment of Barataria Basin Ridge and Marsh Creation Project

#### 2.2.2.1.3 Lake Borgne Marsh Creation Project

The Lake Borgne Marsh Creation Project (Figure 14) is a large-scale restoration strategy for the southwestern shoreline of Lake Borgne that would re-establish the bay rim and intertidal marsh habitat that has degraded. The comprehensive project would restore approximately 4,100 acres of marsh habitat and be implemented in three increments, though multiple design and construction phases. Additional information about this project can be found in Louisiana’s Coastal Master Plan.



Figure 14. Lake Borgne Marsh Creation Project

This project is consistent with the Restore and Conserve Habitat programmatic goal, Wetlands, Coastal, and Nearshore Habitat restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- the project has likely benefits to more than one resource;
- large-scale marsh creation projects result in immediate benefits to habitat and therefore would likely prevent ongoing and future injuries to the same types of habitats affected by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;
- there is a high likelihood of success because this project is technically feasible and utilizes proven and established restoration methods used by other projects in the region;
- cost estimates are based on similar past projects, and similar projects have been constructed at a reasonable cost; and
- there would be a positive effect on public health and safety by providing natural protection against storm surge and flooding.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.

### 2.2.2.1.3.1 Increment One

Increment One of the Lake Borgne Marsh Creation Project is a marsh creation project located in St. Bernard Parish (Figure 15). The project limits would extend approximately four miles from Shell Beach on the southern rim of Lake Borgne to Lena Lagoon on the east. This project will dredge sediment from Lake Borgne to create approximately 1,548 acres of marsh. The total estimated cost of the project is \$127,000,000. The anticipated E&D cost is \$7,000,000.



Figure 15. Increment One of Lake Borgne Marsh Creation Project

### 2.2.2.1.3.2 Increment Two

Increment 2 of the Lake Borgne Marsh Creation Project is a marsh creation project located in St. Bernard Parish (Figure 16). The project begins at the northern edge of Increment 1 near Shell Beach and extends northwest for approximately four miles along the edge of Lake Borgne. This project will dredge sediment from Lake Borgne to create approximately 1,490 acres of marsh. The total estimated cost of this project is \$126,000,000. The anticipated E&D cost is \$6,000,000.



Figure 16. Increment Two of Lake Borgne Marsh Creation Project

#### 2.2.2.1.3.3 Increment Three

Increment 3 of the Lake Borgne Marsh Creation Project is a marsh creation project located in St. Bernard Parish (Figure 17). The project begins at the northern edge of Increment 2 and extends northwest for approximately 8 miles along the edge of Lake Borgne. This project will dredge sediment from the Mississippi River to create approximately 1,078 acres of marsh. The total estimated cost of this project is \$126,000,000. The anticipated E&D cost is \$6,000,000.



Figure 17. Increment Three of Lake Borgne Marsh Creation Project

#### 2.2.2.1.4 New Orleans East Land Bridge Project

The New Orleans East Land Bridge Project (Figure 18) is a large-scale restoration strategy for the northwestern shoreline of Lake Borgne that would re-establish the bay rim and intertidal marsh habitat that has degraded. The comprehensive project would restore approximately 4,700 acres of marsh habitat and be implemented in three increments, though multiple design and construction phases. Additional information about this project can be found in Louisiana’s Coastal Master Plan.



Figure 18. New Orleans East Land Bridge Project

This project is consistent with the Restore and Conserve Habitat programmatic goal, Wetlands, Coastal, and Nearshore Habitat restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- the project has likely benefits to more than one resource;
- large-scale marsh creation projects result in immediate benefits to habitat and therefore would likely prevent ongoing and future injuries to the same types of habitats affected by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;
- there is a high likelihood of success because this project is technically feasible and utilizes proven and established restoration methods used by other projects in the region;
- cost estimates are based on similar past projects, and similar projects have been constructed at a reasonable cost; and
- there would be a positive effect on public health and safety by providing natural storm protection for the Lake, as well as New Orleans and surrounding communities.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.



#### 2.2.2.1.4.1 Increment One

Increment One of the New Orleans East Land Bridge Project 1 is a marsh creation project located in Orleans Parish (Figure 19). This project will dredge sediment from Lake Borgne to create approximately 1,885 acres of marsh. The total estimated cost of this project is \$141,000,000. The anticipated E&D cost is \$4,500,000.



Figure 19. Increment One of New Orleans East Land Bridge Project

#### 2.2.2.1.4.2 Increment Two

Increment 2 of the New Orleans East Land Bridge Project is a marsh creation project located in Orleans Parish (Figure 20). This project will dredge sediment from Lake Borgne to create approximately 1,788 acres of marsh. The total estimated cost of this project is \$140,000,000. The anticipated E&D cost is \$5,000,000.



Figure 20. Increment Two of New Orleans East Land Bridge Project

#### 2.2.2.1.4.3 Increment Three

Increment 3 of the New Orleans East Land Bridge Project is a marsh creation project located in Orleans Parish (Figure 21). This project will dredge sediment from Lake Borgne to create approximately 1,046 acres of marsh. The total estimated cost of this project is \$78,000,000. The anticipated E&D cost is \$3,000,000.



Figure 21. Increment Three of New Orleans East Land Bridge Project

#### 2.2.2.1.5 Mid-Barataria Sediment Diversion (MBSD)

The area of influence for this project, the Mid-Barataria Basin (Basin), is suffering from land loss due to hydrologic alteration, sediment deprivation, subsidence, sea level rise, and saltwater intrusion. The primary purpose of the MBSD project (Figure 22) is to reintroduce freshwater and sediment from the Mississippi River to the Basin to re-establish deltaic processes in order to build, sustain, and maintain land. The MBSD would be expected to build and nourish tens of thousands of acres of critical coastal wetlands over a 50 year period. Additionally, the MBSD will work synergistically with the Barataria Basin Ridge and Marsh Creation Project, discussed in Section 2.2.2.1.1. The mechanically placed wetlands cells will help retain sediment from the MBSD, while sediment and nutrients from MBSD will sustain and prolong the design life of the mechanically placed marsh. Secondary long-term goals include restoring and preserving critical coastal ecosystems. The current estimated construction cost for this project is approximately \$1.3 billion. The anticipated E&D cost is approximately \$100 million.



Figure 22. Mid-Barataria Sediment Diversion

The PDARP/PEIS establishes the Mississippi River Diversions as a preferred restoration alternative. Specifically, “Diversions are a long-term strategy to address regional land loss, and, as a restoration approach, diversions also provide potential benefits that are intended to complement the benefits of other wetland restoration approaches” (PDARP/PEIS Section 5.5.2.2). Additionally, “Diversions of Mississippi River water into adjacent wetlands have a high probability of providing these types of large-scale benefits for the long-term sustainability of deltaic wetlands. Controlled river diversions are gated structures that allow for release of river water and associated nutrients and sediments into adjacent deltaic wetland areas at prescribed times and rates [] ... If correctly designed, sited, and operated, diversions will help restore injured wetlands and resources by reducing widespread loss of existing wetlands through 1) reintroducing nutrients and freshwater into salt-stressed, nutrient-starved ecosystems, and 2) increasing sediment deposition to partially offset relative sea level rise and help build new habitats” (PDARP/PEIS Section 5.5.2.2 (internal citations omitted)).

This project is consistent with the Restore and Conserve Habitat programmatic goal, Wetlands, Coastal, and Nearshore Habitat restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- the project has likely benefits to more than one resource;
- large-scale diversion projects create long-term benefits to coastal and marsh habitat and therefore would likely prevent ongoing and future injuries to the same types of habitats affected by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;

- there is a high likelihood of success because the project is technically feasible and utilizes state-of-the-art modeling and techniques with established methods and documented results;
- despite the high cost of implementation, sediment diversions are anticipated to be more cost effective than other methods of marsh creation; and
- there would be a positive effect on public health and safety by providing natural storm protection for surrounding communities.

This project is consistent with the Coastal Master Plan, and is in fact recognized by the Coastal Master Plan as an essential restoration strategy for the long-term survival of Louisiana’s coast. The nexus between the injury and programmatic restoration goal is clear.

### 2.2.2.2 Restoration Type: Habitat Projects on Federally Managed Lands

#### 2.2.2.2.1 Shoreline Protection at Jean Lafitte National Historical Park and Preserve

The National Park Service proposes to restore SAV habitat by constructing breakwaters along the shorelines of Lake Cataouatche, Lake Salvador, and Bayou Bardeaux, and to add material where needed to raise the elevation of the existing features to match the elevation of the new construction. Further, it may be possible to integrate marsh creation features and/or SAV planting activities into the project. This request would fund E&D (including planning, compliance, permitting, surveys, drawings, and other design documents), to fully develop the scope of the project.

The PDARP/PEIS establishes protection and enhancement of SAV through wave attenuation as a preferred restoration alternative. “Segmented living shorelines or permeable barriers that dissipate wave energy and enable SAV to naturally regenerate behind them have been previously used in the coastal areas of Louisiana and elsewhere on the Gulf Coast” (PDARP/PEIS Chapter 5, Appendix D.1.6, 5-237 (internal citations omitted)).

In 2004, Corps of Engineers Mississippi Valley New Orleans District (CEMVN), pursuant to NEPA, prepared an environmental assessment (EA) of shoreline protection activities within the Park in Lake Salvador, taking into account previous technique evaluations. Based on that EA, the rock dike method was recommended to the NPS Development Advisory Board and approved. Due to the success of that Lake Salvador project, the currently proposed project would be similar in nature and method, but could extend shoreline protection beyond the already constructed portions on Lake Salvador to adjacent Bayou Bardeaux and Lake Cataouatche (Figure 23).

Environmental compliance and permits were completed for the 2004 Lake Salvador project (project features have been constructed as recently as 2012), and will be reviewed and consultations re-initiated if necessary for this project. Environmental compliance and permits for the Lake Cataouatche and Bayou Bardeaux sections of the project will be initiated during design. Completing compliance/permitting and design/engineering is likely to take approximately 18 months. The current estimated cost to implement this project is \$41,423,600. The anticipated E&D cost is \$2,300,000.



Figure 23. Shoreline Protection at Jean Lafitte Historic Park and Preserve Project

This project is consistent with the Restore and Conserve Habitat programmatic goal, Habitat Projects on Federally Managed Lands restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- The project benefits more than one resource (restore injured habitats on federally managed lands, restore water quality through reduction in suspended sediment and excess nutrients in the water column as waves are attenuated, replenishes and protects living coastal and marine resources, including SAV and a variety of fish and wildlife through habitat improvement);
- The project would prevent future injury to the area by reducing wave action on the shorelines;

- There is a high likelihood of success because similar projects in nearby, similar locations have proven technically feasible, and will utilize state of the art modeling and techniques with established methods and documented results; and
- There would be a positive effect on public health and safety by providing natural storm protection for surrounding communities.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.

### 2.2.2.3 Restoration Type: Birds

#### 2.2.2.3.1 Queen Bess Island Restoration Project

Barataria Bay is home to a limited number of bird rookeries. Queen Bess Island, located in Jefferson Parish, is one of the largest and most productive rookeries for a number of colonial nesting bird species, including brown pelicans. However, natural and manmade forces, including the *DWH* oil spill, have contributed to the deterioration of this rookery. The existing island footprint is approximately 36 acres, but suitable habitat for nesting birds is only approximately 5 acres. From previous restoration efforts, the island has been encompassed by a rock dike which has helped slow erosional processes, but over time subsidence and overwash have reduced viable bird habitat.

This project is designed to restore suitable colonial waterbird nesting and brood rearing habitat on the island from its current size of less than 5 acres to approximately 36 acres (Figures 24 and 25). This will be accomplished by hydraulically dredging sediment from a nearby suitable offshore sand source and disposing of it within existing rock ring that outlines the island. The island shall be pumped to a post-construction settled elevation of +5.5' NAVD 88. Small limestone will be deposited on most of the perimeter of the island to create a low maintenance beach-like feature for nesting terns and skimmers. Following construction the island will be planted with suitable vegetation to provide optimal nesting substrate such as oyster grass, wire grass, marsh elder, and black mangrove.

The anticipated habitat breakdown for this island is 9.2 acres of suitable habitat for nesting terns and skimmers and 26.8 acres for other colonial nesting water birds. The bird habitat will be constructed on the west and north side of the island and will be approximately 985' long x 240' deep and will be planted with grasses suitable for colonial nesting water birds. The tern nesting habitat will occupy the remaining perimeter of the island from the edge of the rock ring interior for approximately 110'. Small limestone will be deposited at this location to enhance the attractiveness of the site to terns and skimmers. Interior of the habitat will be the pelican and wading bird habitat. It will be planted with black mangrove and marsh elder to create the woody nest substrate that is ideal for these guilds of birds.

The total estimated cost of this project would be \$17,500,000. The anticipated E&D cost is \$2,500,000.

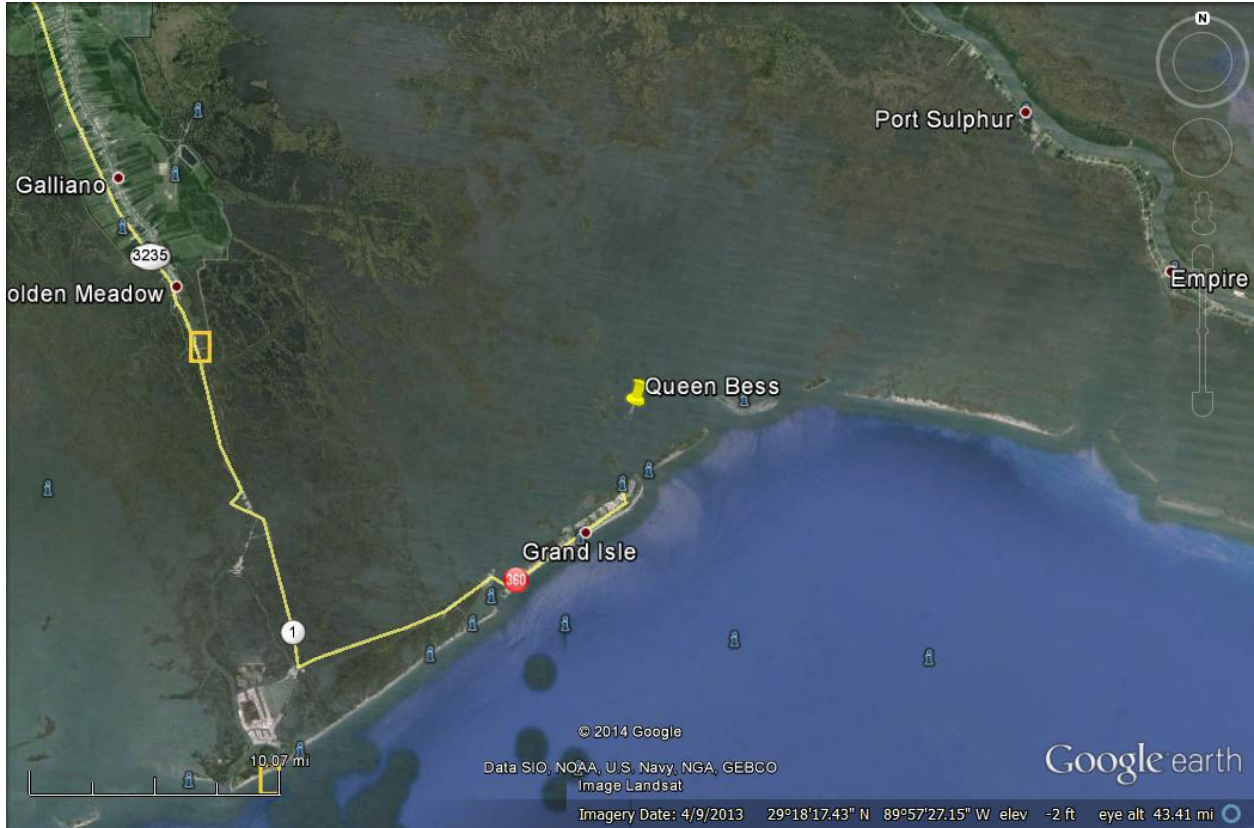


Figure 24. Queen Bess Island Restoration Project

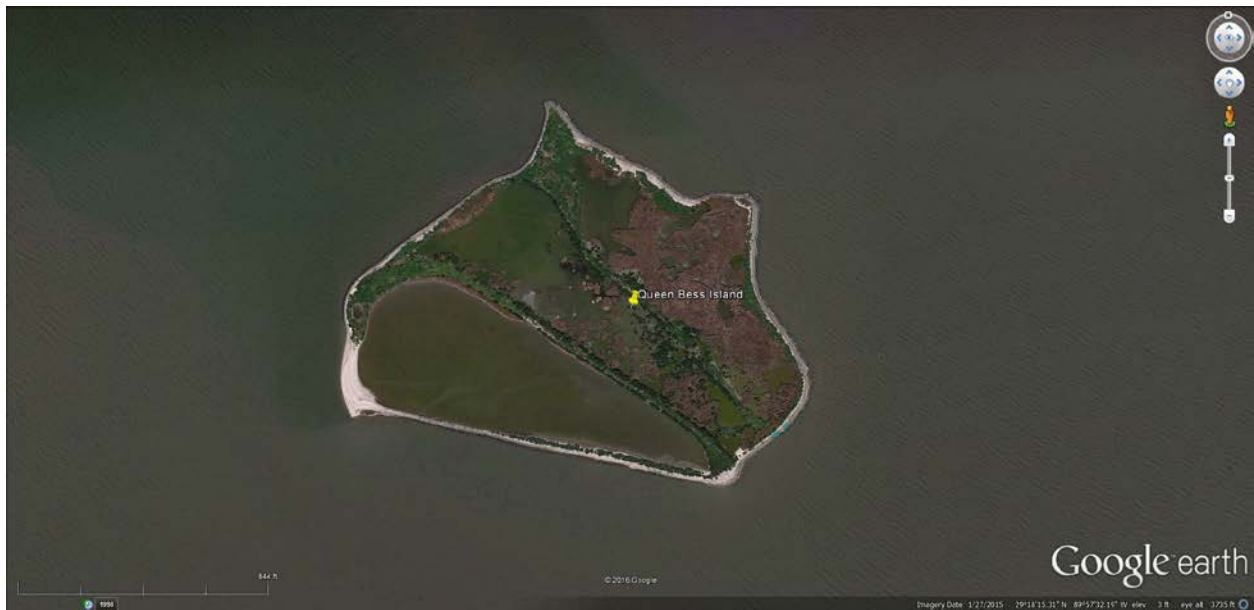


Figure 25. Queen Bess Island Restoration Project



This project is consistent with the Replenish and Protect Living Coastal and Marine Resources programmatic goal, Birds restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- the project likely benefits more than one resource (restore and enhance nesting habitat for multiple bird species);
- the project would prevent future injury to the area by elevating the island and reinforcing the surrounding protective rock dike to restore bird habitat injured by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;
- there is a high likelihood of success because the project is technically feasible and utilizes proven and established restoration methods used by other projects in the region;
- cost estimates are based on similar past projects, and similar projects have been constructed at a reasonable cost; and
- there would be no effect on public health and safety.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.

#### 2.2.2.3.2 Rabbit Island Restoration Project

The marshes of Cameron Parish are home to a limited number of bird rookeries. Rabbit Island is important to a number of colonial nesting bird species, including brown pelicans and reddish egrets. Rabbit Island is the westernmost nesting ground for brown pelicans in Louisiana. The island is centrally located along the Chenier Plain, about one mile from the southwestern shore of Calcasieu Lake and two miles west of the Calcasieu ship channel. Wind-generated waves in the shallow estuary, coupled with periodic high tides that are amplified by the ship channel, have slowly eroded Rabbit Island. Since 1955, the island has lost 89 acres of landmass, or 35% of its area. Today, Rabbit Island's total area is 200 acres, with much of that being open water, and the majority of the land at or below sea level.

This project proposes to utilize dredged sediment from the Calcasieu Ship Channel or other suitable source to restore the elevation of the island on its current footprint of approximately 200 acres (Figures 26 and 27). The restored island's increased elevation will increase the abundance and quality of nesting habitat for a number of colonial nesting waterbirds including brown pelicans, wading birds, terns, and other colonial nesting water birds.

The total estimated cost for the Rabbit Island Restoration project is \$27,000,000. The anticipated E&D cost is \$3,000,000.

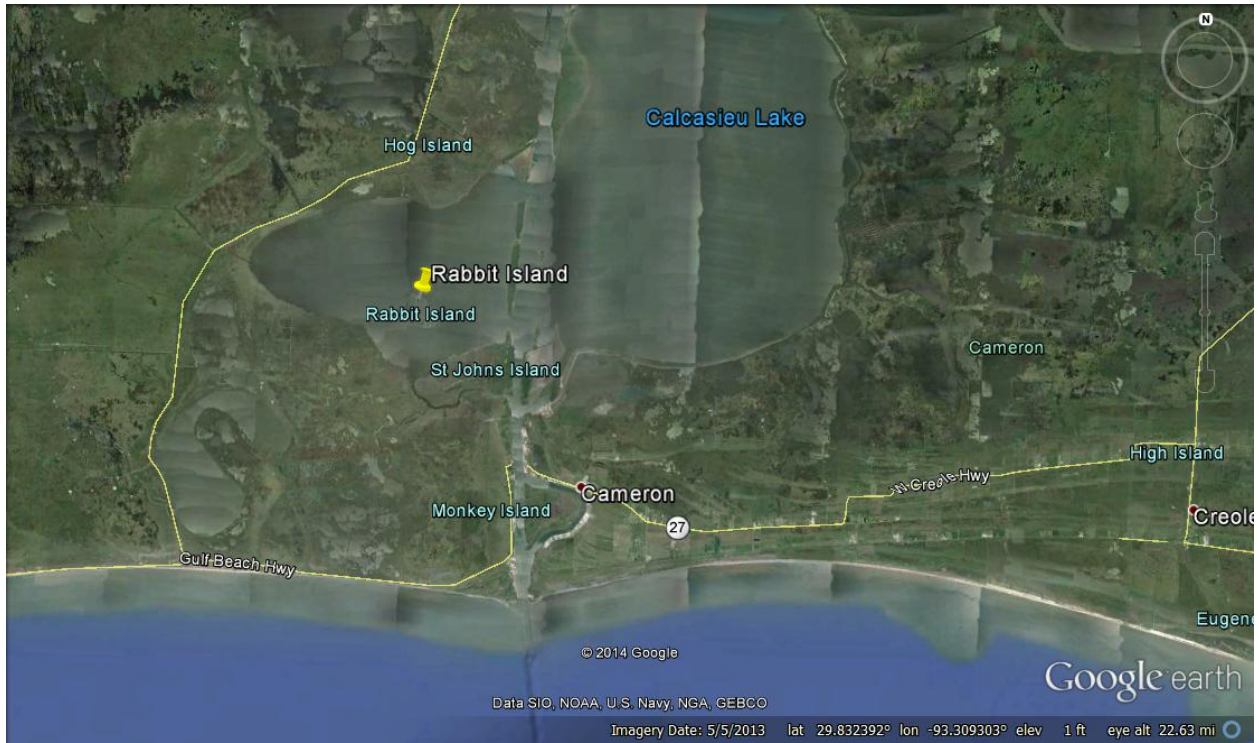


Figure 26. Rabbit Island Restoration Project



Figure 27. Rabbit Island Restoration Project

This project is consistent with the Replenish and Protect Living Coastal and Marine Resources programmatic goal, Birds restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- the project likely benefits more than one resource (restore and enhance nesting habitat for multiple bird species);
- the project would prevent future injury to the area by elevating the island and reinforcing the surrounding protective rock dike to restore bird habitat injured by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;
- there is a high likelihood of success because this project is technically feasible and utilizes proven and established restoration methods used by other projects in the region;
- cost estimates are based on similar past projects, and similar projects have been constructed at a reasonable cost; and
- there would be no effect on public health and safety.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.

#### 2.2.2.3.3 Raccoon Island Restoration Project

Raccoon Island supports a variety of nesting avian species, including brown pelicans, terns, gulls, and wading birds. It is considered the most diverse nesting colony on the Louisiana coast and historically supported well over 60,000 nests during peak breeding seasons. Raccoon Island is one of the three largest brown pelican colonies in Louisiana (thousands of nesting pair per year, with a historic high of nearly 6,000) and is extremely valuable for the longevity of the species. As a result of various erosional processes (particularly hurricane activity over the past 10 years), the western end of Raccoon Island has degraded to roughly 20 acres and is at risk of being a subaqueous sand shoal in the near future. This portion of the island no longer serves as breeding bird habitat due to lack of elevation and rapid shoreline loss.

The goal of this project would be to restore, provide protection, and enhance habitat conditions on the western area (i.e., shoal) of Raccoon Island, by rebuilding approximately 230 acres of barrier island habitat to support nesting brown pelicans, terns, skimmers, egrets, and herons (Figures 28 and 29). Offshore dredge material (and/or mined Atchafalaya River sand if feasible) would be placed to reconnect the eastern and western portions of the original island and augment the western portion. Vegetative plantings, both herbaceous and woody, will follow the construction of the dune/beach platform to support breeding bird habitat and to stabilize the island. The project would also include the construction of 16 offshore segmented rock breakwaters extending from existing breakwater #15 westward to the newly created area. It would also include a terminal groin on the western tip of Raccoon Island. Consistent with the demonstrated successful use of this design on the eastern portion, the breakwaters would lessen shoreline erosion and help sustain the island by potentially trapping sediment traveling west with long shore currents.

The total estimated cost of this project is \$94,500,000. The anticipated E&D cost is \$7,000,000.

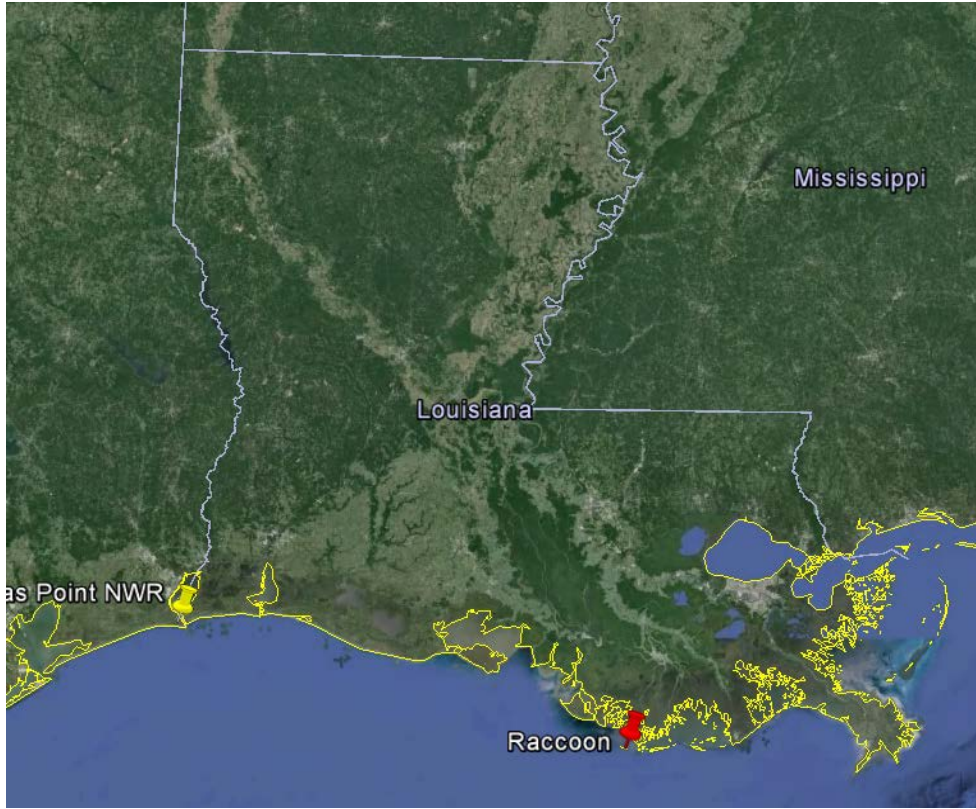


Figure 28. Raccoon Island Restoration Project



Figure 29. Raccoon Island Restoration Project

This project is consistent with the Replenish and Protect Living Coastal and Marine Resources programmatic goal, Birds restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- the project likely benefits more than one resource (restore and enhance nesting habitat for multiple bird species);
- the project would prevent future injury to the area by restoring bird habitat injured by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;
- there is a high likelihood of success because project is technically feasible and utilizes proven and established restoration methods used by other projects in the region;
- cost estimates are based on similar past projects, and similar projects have been constructed at a reasonable cost; and
- there would be no effect on public health and safety.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.

#### 2.2.2.3.4 Wine Island Restoration Project

Wine Island, located in Terrebonne Parish, is part of the Isle Dernieres barrier island chain, which provides critical breeding grounds for colonial waterbirds. Wine Island once supported a variety of nesting avian species including brown pelicans, terns, gulls, and wading birds. During peak years of nest success, over 15,000 nests were documented at Wine Island.

In the early 1990s, Water Resource Development Act funds were used to recreate Wine Island of the Isle Dernieres chain after it had eroded to a sand shoal. Material from the Houma Navigation Canal was used to rebuild the island during channel maintenance events in 1991 and 1993-94. The island was approximately 34 acres after completion. During the years of peak habitat conditions, Wine Island supported a variety of nesting avian species including brown pelicans, terns, gulls, and wading birds. During peak years of nest success, over 25,000 nests were documented at Wine Island. Natural and manmade forces have contributed to the significant erosion of this rookery.

Because of erosion (including hurricane activity over the past 10 years), Wine Island has degraded again to pre-1990s conditions to the point where the island no longer serves as breeding bird habitat due to lack of elevation and rapid shoreline loss. At present, the island is less than five acres and is a slightly emergent sand spit.

This project proposes to utilize dredged sediment to restore Wine Island and expand its footprint to include a shallow sand shoal southwest of the island (Figure 30). Vegetative plantings, both herbaceous and woody, will follow the construction of the dune/beach platform to support breeding bird habitat and to stabilize the island. Suitable vegetation would include smooth cordgrass, marsh hay cordgrass, bitter panicum, marsh elder, and black mangrove. The project would also include the construction of 16 offshore segmented rock breakwaters and two terminal groins on the eastern and western tips of the island. This technique is consistent with the demonstrated successful design used at Raccoon Island. The breakwaters would lessen shoreline erosion and help sustain the island by potentially trapping sediment traveling west with long shore currents.

The project would rebuild approximately 230 acres of habitat to support nesting pelicans, terns, skimmers, and wading birds, at a total estimated cost of \$81,000,000. The anticipated E&D cost is \$6,000,000.



Figure 30. Wine Island Restoration Project

This project is consistent with the Replenish and Protect Living Coastal and Marine Resources programmatic goal, Birds restoration type, and adaptive management criteria in the PDARP/PEIS. In addition, it would meet the evaluation criteria established by OPA because:

- the project likely benefits more than one resource (restore and enhance nesting habitat for multiple bird species);
- the project would prevent future injury to the area by restoring bird habitat injured by the *DWH* oil spill;
- collateral injury will be avoided by addressing the potential for collateral impacts in project design and employing best management practices in project implementation;
- there is a high likelihood of success because project is technically feasible and utilizes proven and established restoration methods used by other projects in the region;
- cost estimates are based on similar past projects, and similar projects have been constructed at a reasonable cost; and
- there would be no effect on public health and safety.

This project is consistent with the Coastal Master Plan. The nexus between the injury and programmatic restoration goal is clear.

### 2.3 Alternatives Selected for Further Evaluation in this Final RP

As discussed above and detailed in Table 4 below, the Louisiana TIG screened each of the projects discussed above for this Final RP by taking into account the pertinent OPA criteria as well as the additional screening criteria identified by the Louisiana TIG. The Louisiana TIG determined that all of the projects screened in this Final RP would restore for damages caused by the *DWH* oil spill. Therefore, all projects identified above are evaluated further in the next section to determine which projects should move forward for additional E&D at this time.

Table 4. Restoration Project Screening Criteria

Project/Increment	Approximate Benefit Acres	Habitat	PDARP/PEIS			OPA Screening						Consistent with Coastal Master Plan?
			Programmatic Goals	Restoration Type	Adaptive Management	Cost	Meet goals/objectives of OPA	Likelihood of Success	Prevention of Future Injury	Beneficial to more than one resource	Effect on public health and safety	
Terrebonne Basin Ridge and Marsh Creation			Restore and Conserve Habitat	Wetlands, Coastal, and Nearshore Habitat	Yes		Yes	High	Yes	Yes	Beneficial, natural protection against storm surge and flooding	Yes
Bayou Dularge	1850 acres	Ridge and marsh				\$171 million						
Bayou Terrebonne	1500 acres	Ridge and marsh				\$123 million						
Point Au Chien	1600 acres	Ridge and marsh				\$138 million						
Fourchon	1680 acres	Ridge and marsh				\$123 million						
Barataria Basin Ridge and Marsh Creation			Restore and Conserve Habitat	Wetlands, Coastal, and Nearshore Habitat	Yes		Yes	High	Yes	Yes	Beneficial, natural protection against storm surge and flooding	Yes
Spanish Pass	1250 acres	Ridge and marsh				\$124.5 million						
Bayou Dupont IV	1210 acres	Ridge and marsh				\$139.5 million						
Wilkinson Canal	1430 acres	Ridge and marsh				\$138 million						
Bayou Dupont V	1060 acres	Ridge and marsh				\$138 million						
Bayou Dupont VI	1630 acres	Ridge and marsh				\$200 million						
Lake Borgne Marsh Creation			Restore and Conserve Habitat	Wetlands, Coastal, and Nearshore Habitat	Yes		Yes	High	Yes	Yes	Beneficial, natural protection against storm surge and flooding	Yes
Increment 1	1550 acres	Marsh				\$127 million						
Increment 2	1490 acres	Marsh				\$126 million						
Increment 3	1080 acres	Marsh				\$126 million						
New Orleans East Land Bridge			Restore and Conserve Habitat	Wetlands, Coastal, and Nearshore Habitat	Yes		Yes	High	Yes	Yes	Beneficial, natural protection against storm surge and flooding	Yes
Increment 1	1890 acres	Marsh				\$141 million						
Increment 2	1790 acres	Marsh				\$140 million						
Increment 3	1046 acres	Marsh				\$78 million						
Mid-Barataria Sediment Diversion	Tens of thousands of acres	Marsh	Restore and Conserve Habitat	Wetlands, Coastal, and Nearshore Habitat	Yes	\$1.3 billion	Yes	High	Yes	Yes	Beneficial, natural protection against storm surge and flooding	Yes



Project/Increment	Approximate Benefit Acres	Habitat	PDARP/PEIS			OPA Screening						Consistent with Coastal Master Plan?
			Programmatic Goals	Restoration Type	Adaptive Management	Cost	Meet goals/objectives of OPA	Likelihood of Success	Prevention of Future Injury	Beneficial to more than one resource	Effect on public health and safety	
Shoreline Protection at Jean Lafitte National Historical Park and Preserve	83 acres	SAV	Restore and Conserve Habitat	Habitat Projects on Federally Managed Lands	Yes	\$40 million	Yes	High	Yes	Yes	Beneficial, natural protection against storm surge and flooding	Yes
Queen Bess Island	36 acres	Barrier Island	Replenish and Protect Living Coastal and Marine Resources	Birds	Yes	\$17.5 million	Yes	High	Yes	Yes	Neutral	Yes
Rabbit Island	200 acres	Barrier Island	Replenish and Protect Living Coastal and Marine Resources	Birds	Yes	\$27 million	Yes	High	Yes	Yes	Neutral	Yes
Raccoon Island	230 acres	Barrier Island	Replenish and Protect Living Coastal and Marine Resources	Birds	Yes	\$94.5 million	Yes	High	Yes	Yes	Beneficial, natural protection against storm surge and flooding	Yes
Wine Island	230 acres	Barrier Island	Replenish and Protect Living Coastal and Marine Resources	Birds	Yes	\$81 million	Yes	High	Yes	Yes	Beneficial, natural protection against storm surge and flooding	Yes

## 3.0 OPA Evaluation of Alternatives and NEPA Discussion

### 3.1 Introduction

As detailed in Chapter 2 of this Final RP, the Louisiana TIG developed a reasonable range of restoration alternatives and screened those alternatives using the OPA criteria and additional screening criteria identified by the Louisiana TIG as relevant and critical to restoration efforts in the State of Louisiana. The Louisiana TIG determined that all projects considered in the reasonable range of restoration alternatives would be appropriate restoration projects under the relevant criteria.

This Chapter further evaluates those project alternatives in accordance with the OPA criteria and identifies six projects as restoration alternatives that the Louisiana TIG selects for further E&D evaluation.

Consistent with the PDARP/PEIS, in this Final RP the Louisiana TIG selects a preliminary phase of restoration planning to perform E&D evaluation for each selected restoration alternative to develop information needed to fully consider the implementation phase which will be proposed in a subsequent restoration plan. Although information gathered may inform future projects, the outcome of the preliminary phases does not commit the Louisiana TIG to future actions.

This Final RP incorporates by reference Section 6.4.14 of the PDARP/PEIS, which provides NEPA analysis of the environmental consequences of activities that are associated with planning, feasibility studies, design engineering, and permitting for preferred alternatives.

DOI, as the lead agency responsible for NEPA compliance for this Final RP, and in coordination with the other Trustee members of the Louisiana TIG, reviewed the analysis of the E&D activities in the PDARP/PEIS and determined that for this preliminary phase of restoration planning the environmental consequences of the proposed E&D activities for the selected projects, as described more fully in Section 3.3 of the Final RP, fall within the range of impacts evaluated in Section 6.4.14 of the PDARP/PEIS. Therefore no additional NEPA analysis is necessary at this time. Environmental impacts of the projects proposed for evaluation in implementation phases will be analyzed in subsequent restoration plans with appropriate levels of NEPA analyses. See Section 3.3 for more details.

### 3.2 OPA Evaluation of Screened Projects

In Section 2 of this Final RP, the Louisiana TIG screened each project in the reasonable range of restoration alternatives under the appropriate screening criteria (see Section 2.2.1.2). Section 3 identifies the key criteria that distinguish the projects and form the basis for the Louisiana TIG's decision to move forward with E&D evaluation on particular projects as restoration alternatives.

Although all of the projects identified as reasonable restoration alternatives in this Final RP would provide considerable benefits to the affected environments, due to the limited *DWH* NRDA funds currently available, we are only able to prioritize a limited number of projects at this time. However, as more funds and resources become available, we anticipate revisiting, and potentially proposing for *DWH* NRDA restoration, the other projects considered but not selected at this time to undergo E&D in this Final RP.

The OPA evaluation of the reasonable range of alternatives is separated by Restoration Type to more appropriately compare similar projects against one another and ensure that the Louisiana TIG's goal of spreading resources across geographic regions and Restoration Types is fully realized.

### 3.2.1 Restoration Type: Wetlands, Coastal, and Nearshore Habitats

As discussed previously, the PDARP/PEIS places significant emphasis on restoration of Louisiana coastal marshes to restore for damages caused by the *DWH* oil spill. Therefore, all increments of the Terrebonne Basin Ridge and Marsh Creation project, the Barataria Basin Ridge and Marsh Creation project, the Lake Borgne Marsh Creation project, and the New Orleans East Landbridge project are appropriate restoration projects under OPA and the PDARP/PEIS. Further, part or all of these projects have been developed under Louisiana's Coastal Master Plan, so selection of any or all of these projects would be compliant with Governor Edward's Executive Order requiring projects implemented by Louisiana state agencies to be consistent with the Coastal Master Plan.

#### 3.2.1.1 Terrebonne Basin Ridge and Marsh Creation Project: Bayou Terrebonne Increment

The Louisiana TIG selects the Bayou Terrebonne Increment of the Terrebonne Basin Ridge and Marsh Creation project to undergo E&D evaluation. In arriving at this decision, the Louisiana TIG evaluated cost related considerations of each alternative, its expected benefits of restoring for marsh injured by the oil spill, and its likelihood of success and ability to prevent future injury in coastal Louisiana as evaluated in the Coastal Master Plan. Additionally, at an estimated cost of \$123 million, this increment is the least expensive of the four increments, allowing the Louisiana TIG to best utilize the early limited NRDA funds available to implement projects in multiple affected basins. Also, as discussed above in Section 2.1.3, USDA's NRCS will be performing E&D evaluation of the Bayou Dularge Increment of this project using RESTORE Act funds. Collaboration on these increments with USDA may potentially free up NRDA funds that would have been dedicated to design and implementation of the Bayou Dularge Increment to be used instead for implementation of additional restoration projects in the future, allowing for the realization of greater benefits than if the Louisiana TIG implemented the entire Terrebonne Basin Ridge and Marsh Creation Project through NRDA alone. Environmental logistical considerations, including sediment availability and the availability of resources and services, were also considered.

#### 3.2.1.2 Barataria Basin Ridge and Marsh Creation Project: Spanish Pass Increment

The Louisiana TIG also selects the Spanish Pass Increment of the Barataria Basin Ridge and Marsh Creation project to move forward with E&D for feasibility reasons. The results of ongoing modeling of the Mid-Barataria Sediment Diversion project may require changes to the design and implementation of other increments of the Barataria Basin Ridge and Marsh Creation project. The Spanish Pass Increment is farther away from the outfall of the Mid-Barataria Diversion, and therefore will be less impacted by the construction and operation of the diversion. Moreover, the Spanish Pass Increment is selected to undergo E&D evaluation based on its expected benefits of restoring for marsh injured by the oil spill and its likelihood of success and ability to prevent future injury in coastal Louisiana as evaluated in the Coastal Master Plan. Environmental logistical considerations, including sediment availability and the availability of resources and services were also considered.

### 3.2.1.3 Lake Borgne Marsh Creation Project: Increment One

The Louisiana TIG will also move forward with E&D on Increment One of the Lake Borgne Marsh Creation because it allows Louisiana to build the most acreage with the funds available in the first Final RP. Environmental logistical considerations, including sediment availability and the availability of resources and services were also considered.

### 3.2.1.4 Projects Not Currently Being Considered for Wetlands, Coastal, and Nearshore Habitats

With regard to the increments of the three marsh creation projects (Terrebonne Basin Ridge and Marsh Creation, Barataria Basin Ridge and Marsh Creation, and Lake Borgne Marsh Creation) that are not currently being considered for E&D, limited finances, sediment availability, and manpower resources do not allow us to implement all phases of those projects at the same time while also dividing restoration efforts among multiple basins. Further, through coordination efforts with RESTORE, we understand that E&D on the Bayou Dularge Increment of the Terrebonne Basin Ridge and Marsh Creation Project is projected to be conducted by USDA under the RESTORE Act. Therefore, the Louisiana TIG has made the decision to allocate funding to other increments of this project, thereby accelerating the timeline for restoration in those basins. The Louisiana TIG fully intends to consider the additional increments of these three marsh creation projects for NRDA funding in future restoration plans, as all increments of these projects are important to both the Restoration Goals identified by the Trustees in the PDARP/PEIS and to the state of Louisiana's long-term restoration goals identified in the Coastal Master Plan.

Because of resource considerations (including the State of Louisiana's preference to utilize Mississippi River sediment sources as a renewable resource), planning considerations, geographic proximity to other proposed NRDA restoration projects, and the limited funding available in the early stages of the *DWH* NRDA program as a result of the settlement payment schedule, the Louisiana TIG has decided not to select any increments of the New Orleans East Landbridge project in the Final RP at this time. However, we believe that all increments of this project are appropriate restoration projects under OPA and the PDARP/PEIS, and we intend to consider these increments individually and collectively for implementation in future restoration plans.

Finally, with regard to the Mid-Barataria Sediment Diversion project, the Louisiana TIG has chosen not to select this project in this Final RP for two primary reasons. First, the costs to implement the project are high, which creates a challenge in light of the limited funding that will be available for NRDA projects, especially in the first few years of implementation of the Settlement. While it is anticipated that this project would have significant benefits to the resources injured by the *DWH* oil spill, the cost of the Mid-Barataria Sediment Diversion is much higher than the other projects evaluated in this Final RP.

Second, Louisiana is currently working with NOAA to more closely evaluate the potential environmental impacts, both negative and positive, of the project. In particular, there may be options in the design, engineering and operational aspects of the project that allow for significant marsh creation while minimizing potential impacts on ecological resources (including fish, shellfish, and marine mammals) in Barataria Bay. Louisiana is currently evaluating options for proceeding with environmental review and E&D for this project through other available funding sources.

For these reasons, while the Louisiana TIG continues to believe that the sediment diversion projects are an appropriate (and crucial) component of NRDA restoration, the Louisiana TIG also believes that it is

prudent to advance diversion projects in a future restoration plan. Such an approach will allow the Louisiana TIG additional time to plan for the high project costs by reserving portions of funds from annual BP payments to build a capital reserve to fund the project in the event the project is selected. That additional time will also allow the Trustees to work together to develop a better understanding of the resources that might be impacted by the diversion, and to develop design, engineering and operational approaches that will help minimize adverse impacts to those resources.

For this reason, the Louisiana TIG does not select the Mid-Barataria Sediment Diversion project at this time, as the state of Louisiana and its partners continue to evaluate the project, including ongoing environmental analysis and modeling, and will continue to determine how best to utilize all of the various funding sources available for the project. However, the Louisiana TIG fully intends to revisit and further evaluate the sediment diversions as NRDA restoration planning for the Louisiana Restoration Area continues.

### 3.2.2 Restoration Type: Habitat Projects on Federally Managed Lands/SAV

#### 3.2.2.1 Shoreline Protection at Jean Lafitte National Historical Park and Preserve

SAV in the federally managed Jean Lafitte National Historical Park and Preserve was injured as a result of freshwater releases during spill response. Increased amounts of fresh water from the Davis Pond Diversion release reduced salinity, resulting in reductions in SAV species diversity and percent cover. Along the Lake Cataouatche shoreline of the Park, the Trustees documented an 83 percent loss of SAV cover on 60 hectares between March 2010 and November 2012.

SAV communities provide ecosystem services that include wave attenuation, and marsh shorelines at the Park are fragile and rapidly eroding. Breakwaters have been constructed along portions of the Lake Salvador shoreline that have provided protection that reduces the rate of shoreline retrograde by an order of magnitude. DOI/NPS proposes to construct similar features along the shorelines of Lake Cataouatche, Lake Salvador, and Bayou Bardeaux to facilitate natural regeneration of SAV. We also propose to add material where needed to raise the elevation of the existing features to match the elevation of the new construction. Further, it may also be possible to integrate marsh creation features, and/or SAV replanting, into the project design.

This request would fund planning, compliance/permitting, and design work to fully develop the scope of the project. The objectives of the request would be to develop environmental compliance documentation, secure permits, complete surveys, and to develop detailed cost estimates, drawings, and other design documents for construction.

#### 3.2.2.2 Projects Not Currently Being Considered for Habitat Restoration on Federally Managed Lands

There were no projects submitted to the Louisiana TIG that focused on restoration of habitat on federally managed lands. Only one project submitted to the Louisiana TIG, Bayou Villars Shoreline Stabilization (Project ID# 11167), was similar in its goals and nature to the Shoreline Protection at Jean Lafitte National Historical Park and Preserve Project. That project proposed the installation of approximately 31,000 tons of rock along 5,500 linear feet of shoreline from the existing pipeline crossing

north of Bayou Villars to the north bank of the mouth of Bayou Villars, and to install approximately 44,000 tons of rock along 8,000 linear feet of shoreline from the existing pipeline crossing south of Bayou Villars to the south bank of the mouth of Bayou Villars. A portion of the project would take place on the edge of Jean Lafitte National Historical Park and Preserve, but would not address injury to Lake Cataouatche. While the Bayou Villars project was designed to protect shorelines, and while the PDARP identified wave attenuation as a preferred restoration alternative for SAV (PDARP/PEIS Chapter 5, Appendix D.1.6, 5-237), the Bayou Villars project was not designed to directly benefit federally managed lands that were injured and would not meet the purpose of addressing the Restoring Habitat on Federally Managed Lands Restoration Type. Therefore, the Louisiana TIG screened the project out of consideration as a project to restore the Federally Managed Land Habitat injury that occurred at the Park. The Louisiana TIG may consider the project in a future restoration plan addressing an appropriate Restoration Type.

The Louisiana TIG believes that the Shoreline Protection at Jean Lafitte National Historic Park and Preserve Project is an important project for the long-term health of federally managed lands in Louisiana. As described above in Section 2.2.2.2.1, the NPS, the CEMVN have evaluated shoreline protection treatments in the vicinity of the SAV injured in the Park by the *DWH* oil spill, and the method selected for this project has consistently delivered the best results.

### 3.2.3 Restoration Type: Birds

#### 3.2.3.1 Queen Bess Island Restoration Project

Queen Bess Island is a significant, but highly deteriorated, Louisiana bird rookery. It is also one of the island colonies most impacted by the spill. Restoration of this island would contribute to restoration of bird injuries caused by the *DWH* oil spill. We will move forward with E&D of the Queen Bess Island Restoration Project because, at a cost of \$17,500,000, it is one of the two least expensive viable bird restoration projects evaluated in this Final RP. These cost considerations will enable the Louisiana TIG to move forward with multiple avian restoration projects in various locations within Louisiana, resulting in a robust approach to avian injury restoration in the first Final RP. In addition to cost, Queen Bess Island was evaluated based on its expected benefits of restoring for avian injury in Louisiana caused by the oil spill and its likelihood of success and ability to prevent future injury in coastal Louisiana. Queen Bess Island is also a priority project because of significant land loss that has occurred. Failure to restore the island at this time could result in further erosion, making it infeasible and not cost effective to restore the island at a future time, and potentially resulting in the permanent loss of this important rookery.

#### 3.2.3.2 Rabbit Island Restoration Project

Rabbit Island is the only significant brown pelican habitat in western Louisiana, and this project would significantly accelerate restoration of damages to that species caused by the *DWH* oil spill. For similar reasons as Queen Bess Island, the Louisiana TIG will move forward with E&D of the Rabbit Island Restoration Project because, at a total cost of \$27,000,000, it is one of the two least expensive viable bird restoration projects within the reasonable range of restoration alternatives considered in this Final RP. These considerations enable the Louisiana TIG to implement multiple avian restoration projects in various locations within Louisiana, resulting in a robust approach to avian injury restoration in the first Final RP. Rabbit Island was also selected based on its expected benefits of restoring for avian injury in Louisiana caused by the oil spill and its likelihood of success and ability to prevent future injury in coastal

Louisiana. Further, Rabbit Island is a significant priority project due to erosion of the island. If this island is not restored soon, continued land loss over time may result in it being neither feasible nor cost effective to restore at a later date, potentially resulting in the permanent loss of the only significant brown pelican rookery in western Louisiana.

### 3.2.3.3 Projects Not Currently Being Considered for Bird Restoration

The Louisiana TIG believes that Raccoon Island and Wine Island are important projects for the long-term health of Louisiana's coast and will continue to consider implementing these projects in future restoration plans. The decision not to select any of those projects for implementation at this time is based in part on the cost of those projects as compared to the two avian projects selected to undergo E&D evaluation. Because of the limited funds available for the first RP, the two selected restoration projects offer an opportunity to quickly and effectively begin restoring for avian injuries in two locations along Louisiana's coast. Additionally, Rabbit Island and Queen Bess Island are high priorities for Louisiana at this time due to the significant erosion occurring at those two sites. Any further delays in restoring these islands would likely lead to greater loss of land, making it infeasible and less cost effective or even impractical to implement those projects at a later date, potentially resulting in the permanent loss of these important bird rookeries.

## 3.3 NEPA Discussion

As discussed in Section 3.1, at this time the Louisiana TIG will move forward only with an E&D evaluation on the six restoration projects selected in this Final RP. An evaluation of environmental consequences related to E&D activities is discussed in Section 6.4.14 of the PDARP/PEIS, summarized in this section and incorporated by reference into this Final RP. For any projects selected for E&D that are later proposed for full implementation, NEPA analysis of the impacts from construction/implementation will be included in the associated restoration plan.

Preliminary planning phases can increase the effectiveness and efficiency of habitat restoration. This preliminary phase of project planning may include activities such as landowner and land rights investigation, identification of existing infrastructure, cultural resources investigation, delineation of borrow sources, identification of construction access and pipeline corridors, survey and geotechnical data acquisition/geotechnical engineering, delineation of earthen containment dikes, identification of construction marsh fill elevation, submission of permits, development of operations and maintenance plans, and development of bidding documents. Such activities may also include researching historical conditions, modeling hydrologic response to the project, and creating maps and scale drawings of the project site. This may also include minimally intrusive field activities such as drilling into the soil or sediment with a soil auger, vibra-core, or hand probe to remove core samples for grain size or chemical analysis; determining existing and predicted ground water levels and elevations; and performing geotechnical evaluation. E&D activities may also include archaeological studies at and around the project site, which often involve digging test pits, and collecting and documenting historic features. Some data collection may also require permits, for example when collecting data related to threatened and endangered species.

Some preliminary phases of project planning would cause direct, short-term, minor impacts through associated fieldwork (e.g., including drilling into soil or sediment with an auger, drill rig, or other tools to remove surface, subsurface, or core samples). These impacts would be very minor and localized to the

project site given how small such areas are in relation to an overall project area. Temporary impacts to the biological and physical environment also could include short-term, temporary disturbance of habitats and species; minor emissions from vehicles; and minor disturbance to terrestrial, estuarine, and marine environments. Permits for E&D activities will be secured when necessary. In cases where the appropriate permit or other environmental review has been secured (e.g., for photographing, handling, or disturbing listed species) or determined to be unnecessary (e.g., certain minor, temporary disturbance of marine mammals that does not constitute harassment), minor impacts to certain protected and managed resources also could occur and be considered minor.

Project-planning actions for the six projects selected in this Final RP fall within the scope of the analysis in the PDARP/PEIS. The use of airboats, marsh buggies, augers and other equipment for bathymetric surveys, gathering elevation data, soil strength and compaction data would cause short-term, temporary impacts similar to those described above. Adherence to permit conditions and other requirements would minimize adverse impacts.

### 3.4 Compliance with Other Laws and Regulations

Additional federal and state laws may apply to the projects selected in this Final RP. Legal authorities applicable to restoration project development were fully described in the context of the *DWH* restoration planning in the PDARP/PEIS, Section 6.9 Compliance with Other Applicable Authorities and Appendix 6.D, Other Laws and Executive Orders. That material is incorporated by reference here.

The Louisiana TIG will ensure compliance with all applicable state and local laws and other applicable federal laws and regulations relevant to the area within which projects selected as restoration alternatives to undergo E&D are to be located. The Louisiana TIG will request technical assistance from appropriate regulatory agencies during E&D evaluation to identify any compliance issues early. Once E&D is complete (or nearly complete) and sufficient information is available for a project, compliance processes can be initiated and a compliance status update provided in the next Louisiana TIG restoration plan.

#### 3.4.1 Additional Federal Laws

Additional federal laws and regulations that may be applicable include, but are not limited to:

- Endangered Species Act
- Magnuson-Stevens Fishery Conservation and Management Act
- Marine Mammal Protection Act
- Coastal Zone Management Act
- National Historic Preservation Act
- Coastal Barrier Resources Act
- Migratory Bird Treaty Act
- Bald and Golden Eagle Protection Act
- Clean Air Act
- Clean Water Act, Rivers and Harbors Act, and Marine Protection, Research and Sanctuaries Act
- Estuary Protection Act
- Archaeological Resource Protection Act
- National Marine Sanctuaries Act
- Farmland Protection Policy Act



- Additional Executive Orders
  - EO 11988: Floodplain Management
  - EO 11990: Protection of Wetlands
  - EO 12898: Environmental Justice
  - EO 12962: Recreational Fisheries
  - EO 13112: Invasive Species
  - EO 13175: Consultation and Coordination with Indian Tribal Governments
  - EO 13186: Responsibilities of Federal Agencies to Protect Migratory Birds
  - EO 13653: Preparing the United States for the Impacts of Climate Change
  - EO 13693: Planning for Federal Sustainability in the Next Decade

### 3.4.2 Additional State Laws

Potentially applicable state laws include:

- Archeological Finds on State Lands (La. Rev. Stat. 41:1605)
- Coastal Wetlands Conservation and Restoration Authority (La. Rev. Stat. 49:213.1)
- Coastal Wetlands Conservation and Restoration Plan (La. Rev. Stat. 49:213.6)
- Louisiana State and Local Coastal Resources Management Act (La. Rev. Stat. 49:214.21 – 214.42)
- Louisiana Oil Spill Prevention and Response Act (La. Rev. Stat. 30:2451 *et seq.*)
- Management of State Lands (La. Rev. Stat. 41:1701.1 *et seq.*)
- Louisiana Coastal Resources Program (La. Admin. Code 43:700 *et seq.*)
- Louisiana Surface Water Quality Standards (La. Admin. Code 33.IX, Chapter 11)
- Management of Archaeological and Historic Sites (La. Rev. Stat. 41:1605)
- Oyster Lease Relocation Program (La. Admin. Code 43:I, 850-859, Subchapter B)

## 4.0 Monitoring and Adaptive Management

As discussed in Section 5.5.15 of the PDARP/PEIS and Section 10 of the Trustee Council SOPs, the Louisiana TIG will prepare monitoring and adaptive management (MAM) plans and conduct appropriate MAM activities for any projects selected for implementation with *DWH* NRDA funds. Because the Louisiana TIG has selected restoration projects in this Final RP for E&D evaluation only, no MAM plan is required at this time. Draft MAM plans will be developed for any project alternatives selected for full implementation in a subsequent RP. All such plans will be developed consistent with the requirements and guidelines set forth in the PDARP/PEIS, the Trustee Council SOPs, and the MAM Manual that will be developed by the cross-TIG MAM work group in accordance with Section 10 of the Trustee Council SOPs.

## 5.0 Public Comment on the Draft RP and Responses

### 5.1 Introduction

The public comment period for the Draft RP opened on October 20, 2016, and was scheduled to end on November 28, 2016. The comment period was reopened and closed on December 9, 2016, to accommodate a request for a public meeting.

On November 30, 2016, the Louisiana TIG held a public meeting in Baton Rouge, Louisiana, at the CPRA Board's monthly meeting. At the public meeting, the Louisiana TIG presented on the Draft RP and accepted verbal comments. In addition, the Louisiana TIG hosted a web-based comment submission site and provided a P.O. Box and email address for the public to provide comments. As a result, the Louisiana TIG received comments provided via public meetings, web-based submissions, emailed submissions, and mailed-in submissions.

During the public comment period, the Louisiana TIG received 255 submissions from private citizens, governmental entities, non-governmental organizations, and others. Similar or related comments contained in the submissions were then grouped and summarized for purposes of response. All comments submitted during the public comment period were reviewed and considered by the Louisiana TIG before preparing the Final RP. All comments submitted are represented in the summary comment descriptions listed in this chapter, and all public comments will be included in the Administrative Record.

### 5.2 The Comment Analysis Process

Comment analysis is a process used to compile similar public comments into a format that can be addressed by the Louisiana TIG.

Comments were sorted into logical groups by topics and issues, consistent with the range of topics applicable to the Draft RP. The process was designed to capture and condense all comments received. The comment analysis process allows the Louisiana TIG to provide an organized and comprehensive response to public comments, consistent with OPA and NEPA regulations.

DOI's Planning, Environment and Public Comment (PEPC) database was used to manage public comments. The database stores the full text of all submissions and allows each comment to be grouped by topic and issue.

All comments were read and analyzed, including those of a technical nature; those that contained opinions, feelings, and preferences for one element over another; and comments of a personal or philosophical nature.

### 5.3 Comments

1. Comment: Multiple commenters expressed support for the Draft RP and proposed projects.

Response: The Louisiana TIG acknowledges and appreciates this support.

2. Comment: Commenter requested a public meeting on the Draft RP.

Response: The Louisiana TIG held a public meeting on November 30, 2016.

3. Comment: Commenters expressed appreciation for the opportunity for public input on the Draft RP and requested that the Louisiana TIG continue to provide opportunities for public input throughout the *DWH* NRDA restoration planning process.

Response: The Louisiana TIG is committed to providing regular opportunities for public input consistent with the *DWH* TC SOPs and applicable state and federal laws and regulations throughout the restoration planning process.

4. Comment: Commenter requested that the Louisiana TIG provide more information regarding long-term *DWH* NRDA restoration planning efforts in Louisiana.

Response: Section 1.5 of the Final RP provides an overview of the projects that the Louisiana TIG may consider proposing throughout the *DWH* NRDA restoration planning process. With the understanding that this vision may be revised and updated as a result of changes to the Coastal Master Plan, availability of other funding sources for coastal restoration, and other relevant circumstances, the Louisiana TIG will continue to provide updates in future restoration plans on the long-term vision for *DWH* NRDA restoration.

5. Comment: Commenter requested that the Louisiana TIG provide more technical detail and specificity regarding the proposed projects.

Response: The Louisiana TIG believes that the Final RP provides the necessary information to demonstrate that the proposed projects are appropriate under the relevant OPA criteria, in addition to the other criteria identified as relevant by the Louisiana TIG, in order to move forward with E&D on the proposed projects. Further detail on the projects will be developed during the E&D process and would be discussed in a future Louisiana TIG restoration plan seeking funds for construction of the proposed projects. That restoration plan would also contain information regarding project monitoring and adaptive management, including criteria for evaluating project success.

6. Comment: Commenter requested that the Louisiana TIG provide more explanation regarding how screening criteria were used to prioritize projects in the Draft RP.

Response: Section 2.2.1 of the Final RP outlines the screening process used by the Louisiana TIG in this phase of restoration planning. The Louisiana TIG applied the OPA screening criteria and the criteria outlined by the Trustees in the PDARP/PEIS in accordance with relevant federal laws and regulations regarding NRDA restoration planning. Projects were also screened using additional criteria identified by the Louisiana TIG, including consistency with the goals and objectives of the Coastal Master Plan and considerations related to resource and funding availability, to ensure that any projects proposed for implementation would be appropriate in light of Louisiana's coastal crisis.

7. Comment: Commenter requested that the Louisiana TIG address injuries to recreational use by implementing recreational enhancement projects in subsequent restoration plans.

Response: The Louisiana TIG recognizes the vast scope of injuries to natural resources and the services they provide, including lost recreational use. The Louisiana TIG would prefer to be able to restore for all injuries caused by the *DWH* oil spill in the first restoration plan. However, because *DWH* NRDA funds will be made available in annual installments over the next 15 years, the Louisiana

TIG is unable to simultaneously prioritize restoration for every type of damage caused by the *DWH* oil spill. Due to the limited available funding at this time, the Louisiana TIG made the decision in the first restoration plan to prioritize the implementation of projects that it determined would restore some of the most significantly injured resources and habitats in coastal Louisiana.

However, on November 23, 2016, the Louisiana TIG issued a notice that it is planning activities to restore for lost recreational opportunities caused by the oil spill (available at [http://la-dwh.com/2016\\_2017Restoration.aspx](http://la-dwh.com/2016_2017Restoration.aspx)). Therefore, the Louisiana TIG does intend to develop and implement projects to restore for lost recreational use in the foreseeable future.

8. Comment: Multiple commenters expressed strong support for sediment diversion projects.

Response: The Louisiana TIG acknowledges and appreciates this support.

9. Comment: Commenter requested that the Draft RP provide a stronger commitment of the intent of the Louisiana TIG to implement sediment diversions. Additionally, multiple commenters requested that the Louisiana TIG provide detailed information and updates in subsequent restoration plans regarding restoration planning efforts related to the implementation of sediment diversions.

Response: As discussed in the Final RP, the Louisiana TIG is committed to revisiting and further evaluating the planning, E&D, and implementation of the Mid-Barataria Sediment Diversion in future restoration plans. Further, the Louisiana TIG is engaged in ongoing collaboration and coordination with the necessary state and federal agencies responsible for permitting and approving the use of *DWH* NRDA funds and other funding sources for Louisiana sediment diversion projects.

10. Comment: Commenter requested that the effect of Wine Island and Raccoon Island barrier island projects on public health and safety be revised to reflect the beneficial impact of those projects against storm surge and flooding.

Response: Table 4 in the Final RP has been revised from “neutral” to “beneficial” to reflect that these two projects would have a beneficial impact on public health and safety due to effects on storm surge and flooding.

11. Comment: Multiple commenters requested that projects considered in the Draft RP but not identified as preferred restoration projects at this time be selected for implementation.

Response: Any projects considered by the Louisiana TIG in the Draft RP but not selected for implementation at this time will continue to be considered for implementation in future restoration plans.

12. Comment: Commenters provided various project proposals for the Louisiana TIG to consider throughout *DWH* NRDA restoration planning efforts.

Response: The Louisiana TIG appreciates the continued public interest in restoration planning, including recommendations for new restoration projects. The Louisiana TIG will continue to evaluate these ideas as potential *DWH* NRDA restoration projects. Project ideas can continue to be submitted at [www.la-dwh.com](http://www.la-dwh.com) and <http://www.gulfspillrestoration.noaa.gov/restoration/give-us-your-ideas/suggest-a-restoration-project>.

13. Comment: Commenter requested that the Louisiana TIG consider opportunities for matching funds to support Parish-level planning and restoration activities.

Response: The Louisiana TIG acknowledges and appreciates this recommendation and will continue to consider any available opportunities to maximize funding for restoration planning and implementation in Louisiana and to supplement available *DWH* NRDA restoration funds.

14. Comment: Commenter expressed appreciation for the Louisiana TIG's coordination with other restoration programs and requested that such coordination be expanded to other restoration efforts.

Response: The Louisiana TIG recognizes the importance of coordination among the multiple restoration efforts in Louisiana and throughout the Gulf Coast and will continue to explore opportunities to coordinate with those efforts to ensure efficiency, avoid duplicative work, and maximize restoration benefits.

15. Comment: Commenter requested additional information on projects proposed in the Draft RP to provide a clearer understanding of how each project will be evaluated to meet the Restoration Goals identified in the PDARP/PEIS.

Response: The Louisiana TIG believes that the Draft RP provides the necessary information to demonstrate that the proposed projects are appropriate under the relevant OPA criteria, in addition to the other criteria identified as relevant by the Louisiana TIG, in order to move forward with E&D on the proposed projects. Further detail on the projects will be developed during the E&D process and would be discussed in a future Louisiana TIG restoration plan seeking funds for construction of the proposed projects. That restoration plan would also contain information regarding project monitoring and adaptive management, including criteria for evaluating project success.

16. Comment: Commenter suggested that the location of the Bayou Terrebonne Increment of the Terrebonne Basin Ridge and Marsh Creation Project could be revised to provide more ecological benefits.

Response: The Louisiana TIG has revised the maps of the Bayou Terrebonne Increment in Figures 3 and 4 of the Final RP to address the comment and place the project in a potentially more beneficial location. However, the E&D phase will provide the information necessary for the Louisiana TIG to ultimately determine the most beneficial location for the selected projects.

17. Comment: Commenters requested that funding be budgeted to control and manage non-native nest predators on Queen Bess Island and Rabbit Island.

Response: The Louisiana TIG will consider the proposal in this comment and recognizes that predator reduction programs have been shown to significantly increase nesting success in many studies. However, the Louisiana TIG believes that investing as much funding into habitat restoration will create more benefits for nesting birds than reducing the size of the habitat restoration project for a short term predator reduction program.

18. Comment: Commenter is generally supportive of the proposed shoreline protection project in Jean Lafitte National Historical Park and Preserve, but believes the plan would be stronger with the

addition of more project information. Commenter suggests some clarification regarding how the project addresses the goals of Habitat Projects on Federally Managed Lands.

Response: The LA TIG appreciates support for the proposed shoreline protection project in Jean Lafitte National Historical Park and Preserve. The project would address the three goals of Habitat Projects on Federally Managed Lands as described in Section 5.5.3.1 of the PDARP/PEIS in the following ways:

Goal: "Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats." This project would restore and enhance SAV species that were injured by freshwater releases through the Davis Pond Diversion.

Goal: "Restore for injuries to federally managed lands by targeting restoration on federal lands where the injuries occurred, while considering approaches that provide resiliency and sustainability."

Goal: "Ensure consistency with land management plans for each designated federal land and its purpose by identifying actions that account for the ecological needs of these habitats." This project is consistent with the enabling legislation that established the Preserve (Public Law 95-625), which calls for the protection and preservation of vegetative cover and the integrity of ecological and biological systems. Park-wide management objectives for natural resources, as outlined in the General Management Plan (1995) include the protection of representative natural communities. This project will complement a canal-backfilling project in the interior marsh, funded through the RESTORE Act, which will help restore the hydrological and ecological integrity of the unique marshes of the Barataria Preserve.

19. Comment: Commenter believes that further explanation of how the Jean Lafitte shoreline protection project meets the Restoration Goals identified in the PDARP/PEIS and why it provides the most immediate benefits to the basins and resources greatest affected by the spill will be useful in the public's understanding of the rigor undertaken in the evaluation conducted.

Response: The project would meet the Restore and Conserve Habitat goal by constructing a breakwater on federal lands that produces the restoration benefits described above.

20. Comment: Commenter supports the inclusion of the Shoreline Protection at Jean Lafitte National Historical Park and Preserve project but expressed disappointment that the entire Bayou Villars Shoreline Stabilization (project ID#11167) was not included in the plan. Commenter urges the Louisiana TIG to consider project ID#11167 in a future restoration plan to protect both sides of the lake shoreline at Bayou Villars.

Response: The Louisiana TIG acknowledges and appreciates support for this project. Additionally, although project ID#11167 does not fit within the Habitat on Federal Lands Restoration Type based on its location, the Louisiana TIG may consider this project under a different Restoration Type in a future plan.

21. Comment: Commenter suggests adding information about how the Jean Lafitte shoreline protection project will work in conjunction with other restoration actions, as part of "an integrated portfolio of restoration approaches across a variety of habitats."

Response: Integration of marsh creation features into the breakwaters and possible SAV planting activities will be evaluated during the design phase of this project. The project would also complement a canal-backfilling project in the interior marsh, funded through the RESTORE Act, which will help restore the hydrological and ecological integrity of the unique marshes of the Barataria Preserve, as well as previously constructed marsh creation, shoreline protection, and canal backfilling projects.

22. Comment: Commenter recognizes cost estimates to implement and construct projects may change as the engineering and design process progresses but recommends providing additional information on how the current estimated project cost of \$41,423,600 for the proposed shoreline protection project in Jean Lafitte National Historical Park and Preserve was derived and what this equals in terms of cost per linear foot of shoreline protection constructed.

Response: The project cost estimate of \$41,423,600 was based on costs required to construct a similar project. As noted in the comment, one of the tasks in the proposed project will be to create a detailed cost estimate to accompany the design. That estimate will take into account actual site conditions and appropriate construction details. As proposed, we anticipate that 11 miles of shoreline would be protected; however, that number could change based on the engineering and design process. Although shoreline protection is a significant benefit of this project, the primary benefit is the restoration of SAV.



## 6.0 List of Preparers and Reviewers

AGENCY/FIRM	NAME	POSITION
<b>STATE OF LOUISIANA</b>		
Louisiana Coastal Protection and Restoration Authority	Karim Belhadjali	Coastal Resources Assistant Administrator
Louisiana Coastal Protection and Restoration Authority	Roy Bergeron, Jr.	Attorney
Louisiana Coastal Protection and Restoration Authority	Maury Chatellier	Division Administrator of Project Management
Louisiana Coastal Protection and Restoration Authority	Tye Fitzgerald	Supervisor, Engineering Division
Louisiana Coastal Protection and Restoration Authority	Alyson Graugnard	Attorney
Louisiana Coastal Protection and Restoration Authority	Anne Howard	Coastal Resources Scientist Supervisor
Louisiana Coastal Protection and Restoration Authority	Russ Joffrion	Manager, Engineering Division
Louisiana Coastal Protection and Restoration Authority	Matt Mumfrey	Attorney
Louisiana Coastal Protection and Restoration Authority	Kelly Patrick	Attorney
Louisiana Coastal Protection and Restoration Authority	Richard Raynie	Coastal Resources Administrator
Louisiana Coastal Protection and Restoration Authority	Rudy Simoneaux	Manager, Engineering Division
Louisiana Coastal Protection and Restoration Authority	Jennifer Solak	Attorney
Louisiana Coastal Protection and Restoration Authority	Liz Williams	Coastal Resource Program Specialist
Louisiana Department of Environmental Quality	Amanda Vincent	Environmental Scientist Manager
Louisiana Department of Natural Resources	Nicholas LaCroix	Coastal Resources Scientist, DCL-A
Louisiana Department of Natural Resources	Keith Lovell	Assistant Secretary
Louisiana Department of Wildlife and Fisheries	Todd Baker	Biologist Director
Louisiana Department of Wildlife and Fisheries	Glenn Thomas	Fisheries Biologist
Louisiana Department of Wildlife and Fisheries	Jon Wiebe	Biologist Program Manager
Louisiana Oil Spill Coordinator's Office	Kelli Braud	Attorney
Louisiana Oil Spill Coordinator's Office	Karolien Debusschere	Geomorphologist, Deputy Oil Spill Coordinator
Plauché & Carr	Billy Plauché	Attorney
<b>NATIONAL OCEANIC AND ATMOSPHERIC ASSOCIATION</b>		
NOAA National Marine Fisheries Service	Christina Fellas	Marine Habitat Resource Specialist
NOAA Restoration Center	Mel Landry	Marine Habitat Resource Specialist
Earth Resources Technology/NOAA Restoration Center	Ramona Schreiber	Marine Habitat Restoration Specialist
NOAA Office of General Counsel	Robert Taylor	Senior Counselor for Restoration
<b>U.S. DEPARTMENT OF AGRICULTURE</b>		
U.S. Department of Agriculture	Ronald Howard	Program Specialist
U.S. Department of Agriculture	Michele Laur	USDA Senior Advisor Gulf Coast Ecosystem Restoration
<b>U.S. ENVIRONMENTAL PROTECTION AGENCY</b>		
U.S. Environmental Protection Agency, Region 6	Brad Crawford, P.E.	Environmental Engineer
U.S. Environmental Protection Agency	Timothy Landers	Environmental Protection Specialist
<b>U.S. DEPARTMENT OF THE INTERIOR</b>		
National Park Service	James Haas, Ph.D.	Chief, Resource Protection Branch
National Park Service	Amy Mathis, Ph.D.	Natural Resource Specialist
National Park Service	Haigler Pate	Natural Resource Program Manager, Jean Lafitte National Historical Park and Preserve
U.S. Department of the Interior	Colette Charbonneau	DWH Restoration Program Manager
U.S. Department of the Interior	Robin Renn	DWH NEPA Coordinator

## 7.0 List of Repositories

<b>LIBRARY</b>	<b>ADDRESS</b>	<b>CITY</b>	<b>ZIP</b>
St. Tammany Parish Library	310 W. 21st Avenue	Covington	70433
Terrebonne Parish Library	151 Library Drive	Houma	70360
New Orleans Public Library, Louisiana Division	219 Loyola Avenue	New Orleans	70112
East Baton Rouge Parish Library	7711 Goodwood Boulevard	Baton Rouge	70806
Jefferson Parish Library, East Bank Regional Library	4747 W. Napoleon Avenue	Metairie	70001
Jefferson Parish Library, West Bank Regional Library	2751 Manhattan Boulevard	Harvey	70058
Plaquemines Parish Library	8442 Highway 23	Belle Chasse	70037
St. Bernard Parish Library	1125 E. St. Bernard Highway	Chalmette	70043
St. Martin Parish Library	201 Porter Street	St. Martinville	70582
Alex P. Allain Library	206 Iberia Street	Franklin	70538
Vermillion Parish Library	405 E. St. Victor Street	Abbeville	70510
Martha Sowell Utley Memorial Library	314 St. Mary Street	Thibodaux	70301
South Lafourche Public Library	16241 E. Main Street	Cut Off	70345
Calcasieu Parish Public Library Central Branch	301 W. Claude Street	Lake Charles	70605
Iberia Parish Library	445 E. Main Street	New Iberia	70560
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## 8.0 Literature Cited

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