

Executive Summary

The Louisiana Trustee Implementation Group (LA TIG) is responsible for restoring the natural resources and services within the Louisiana Restoration Area that were injured by the *Deepwater Horizon* oil spill (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 DWH oil spill by implementing restoration actions intended to 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.¹ The LA TIG has prepared this “Louisiana Trustee Implementation Group Draft Strategic Restoration Plan and Environmental Assessment #3: Restoration of Wetlands, Coastal, and Nearshore Habitats in the Barataria Basin, Louisiana” (SRP/EA) in order to identify a restoration strategy that will help prioritize future decisions regarding project selection and funding. This integrated SRP/EA will also ensure compliance with the National Environmental Policy Act (NEPA) by incorporating information included in the PDARP/PEIS, where appropriate, to evaluate and compare environmental impacts of considered alternatives.

In this Phase I SRP/EA, rather than selecting specific projects for construction, the Trustees evaluate a suite of restoration techniques and approaches, for example large-scale diversions or marsh creation, to determine how to best support restoring ecosystem-level injuries in the Gulf of Mexico through restoration in the Barataria Basin. This strategic approach to restoration will allow the Trustees to prioritize projects for further evaluation by the LA TIG. Thus, the Trustees are proposing two decisions in this draft SRP/EA. First, after evaluating a reasonable range of alternatives, the Trustees have proposed a preferred alternative that relies on a suite of restoration approaches and techniques in the Barataria Basin, including large-scale sediment diversions to restore deltaic processes, marsh creation, and ridge restoration. This preferred alternative recognizes that a large-scale sediment diversion in the Barataria Basin likely would provide benefits to the ecosystem that cannot be realized by any other technique or suite of techniques – for example, one that relies on large-scale marsh creation without a diversion. Second, the Trustees propose to select to advance several projects forward for further evaluation and planning: the Mid-Barataria Sediment Diversion and two marsh creation increments within Large Scale Marsh Creation - Component E in northern Barataria Basin. In this Plan, the Trustees also confirm that their 2017 decision to move the Spanish Pass Increment of the Barataria Basin Ridge and Marsh Creation project forward for further evaluation and planning (Louisiana TIG, 2017) is consistent with the preferred alternative proposed here. The Trustees are not proposing these projects for construction funding at this time. Rather, the Trustees propose selecting these

¹ The Final PDARP/PEIS and Record of Decision (ROD) can be found at <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulfplan/>.

projects for further development and evaluation under both OPA and NEPA in subsequent project specific Restoration Plans.

The PDARP/PEIS selected alternative identified a goal for the Wetlands, Coastal, and Nearshore Habitat restoration type as restoration in all five Gulf states that would provide benefits across the interconnected northern Gulf of Mexico ecosystem, placing particular emphasis on coastal and nearshore habitat restoration in the historic Mississippi River delta plain in Louisiana. The Trustees recognized that Louisiana's diverse combination of habitats supports a vast array of resources injured by the spill, and thus presents an opportunity for restoration to benefit a large variety of injured species and ecological functions. As described in the PDARP/PEIS, the coastal wetlands within the Barataria Basin provide the foundational habitat for the Barataria Basin ecosystem, support resources within the Barataria Basin and throughout the Gulf of Mexico, and were among the most heavily oiled parts of the Gulf Coast shoreline. The extensive oiling of wetlands in the Barataria Basin not only directly impacted many of the species of flora and fauna that rely on those shorelines, but the oiling and associated response activities also significantly exacerbated the loss of these wetlands (e.g., Silliman et al., 2012; Zengel et al., 2015; Turner et al., 2016; Silliman et al., 2016; Ragoonwala et al., 2016; PDARP/PEIS, Ch. 4). These wetlands are also experiencing extremely high rates of land loss as a result of declines in sediment supply from the Mississippi River, combined with subsidence and eustatic sea level rise. The significant impact from the spill combined with the sustained loss of wetlands, makes the Barataria Basin an important region to focus restoration by the LA TIG. The Trustees believe restoration in the Barataria Basin has the potential to provide significant benefits to the Gulf of Mexico ecosystem.

Purpose of Strategic Restoration Planning

The PDARP/PEIS explains that Trustees may use strategic restoration plans "to focus and sequence priorities within a Restoration Area" and to "consider resources at the ecosystem level, while implementing restoration at the local level" (PDARP Section 7.3.1). This SRP/EA aids the Trustees' consideration of resources at the ecosystem level and provides context for prioritization, sequencing, evaluating, and selecting specific projects within subsequent project-specific restoration plans. The purpose of this SRP/EA is to help restore for ecosystem-level injuries in the Gulf of Mexico through restoration of critical wetlands, coastal, and nearshore habitat resources and services in the Barataria Basin. The LA TIG selected the Barataria Basin as the geographic scope for this SRP/EA because, in addition to the high rates of erosion in the Barataria Basin, wetlands in the Barataria Basin experienced some of the heaviest and most persistent oiling and associated response activities from the DWH oil spill (Michel et al. 2013; Zengel and Michel 2011). Critically, the wetlands in this estuary support very high primary and secondary production that contribute to the overall function of the northern Gulf of Mexico ecosystem. Multiple projects in the Barataria Basin have been suggested by the public to the Trustees, including large-scale sediment diversions and large-scale marsh creation. The PDARP identified both of these restoration techniques as key to restoring Wetlands, Coastal and Nearshore Habitat. Planning and evaluating substantial projects, such as sediment diversions and large-scale marsh creation, can require significant investments of time and cost. The Trustees believe preparing this strategic restoration plan to prioritize approaches and techniques will allow for the most efficient use of restoration funds.

The process of identifying proposed alternatives considered in this SRP/EA included requests for public input and notification of TIG process in accordance with the Trustee Council Standard Operating Procedures (Trustee Council SOP). In March 2017, the LA TIG published a Notice of Solicitation (NOS) of Project Ideas requesting the public's input regarding natural resource restoration opportunities in Louisiana, focusing on projects that restore and conserve wetland, coastal, and nearshore habitats in the Barataria Basin.² On April 28, 2017, a Notice of Intent (NOI) was published in the Federal Register (FR) by the LA TIG announcing its intention to prepare a Strategic Restoration Plan for the Barataria Basin, Louisiana, that would consider identifying habitat restoration components of the Louisiana Draft 2017 Coastal Master Plan (draft 2017 CMP), among other feasible alternatives, to serve as an OPA Strategic Restoration Plan for restoring wetland, coastal, and nearshore habitat in the Barataria Basin, Louisiana, consistent with OPA and the Trustees' PDARP/PEIS.

Range of Alternatives

The LA TIG prepared this SRP/EA in accordance with the PDARP/PEIS, the March 2016 Record of Decision (ROD) selecting a Comprehensive Integrated Ecosystem Alternative, the OPA and NEPA statutes, and relevant Natural Resource Damage Assessment (NRDA) and National Environmental Policy Act (NEPA) regulations. To restore for the ecosystem injuries identified in the PDARP/PEIS, the LA TIG focused on two approaches: creating, restoring and enhancing coastal wetlands; and restoring and preserving Mississippi-Atchafalaya River processes. These approaches provide the most direct link to restoring, creating, and maintaining coastal wetland habitat in the Barataria Basin. To develop alternatives, the Trustees followed this approach:

- **Step one:** The LA TIG identified which restoration approaches and techniques are most compatible with restoring wetlands, coastal, and nearshore habitat in the Barataria Basin.
- **Step two:** The LA TIG compiled a list of potential projects submitted in response to the March 2017 NOS to the federal and state project portals. The LA TIG also did an initial pre-screening of projects from the Final 2017 Louisiana CMP (see <http://coastal.la.gov/our-plan/2017-coastal-master-plan/planning-process/projects/>) to identify CMP projects of potential geographic and ecological relevance to this SRP/EA (e.g., screening out non-structural risk reduction projects). The combined list of projects submitted in response to the NOS plus projects pre-screened from the CMP were then carried forward to step three.
- **Step three:** The LA TIG screened the list of projects from step two using a set of screening criteria focused on applicability to this SRP/EA.

² Specifically, restoration approaches identified in the PDARP/PEIS that can sustainably create, restore, and enhance coastal wetlands and restore and/or preserve Mississippi River processes). See: <http://www.gulfspillrestoration.noaa.gov/2017/03/request-restoration-project-ideas-louisiana> and http://la-dwh.com/2016_2017Restoration.aspx.

- **Step four:** The LA TIG developed appropriate strategic restoration alternatives that logically combine restoration approaches and techniques exemplified by the projects that passed through the screening of step three.

The goal was to identify a reasonable range of options for compensating the public for injuries to Louisiana's wetlands, coastal, and nearshore habitat in the Barataria Basin and to the injured resources that benefit from these habitats. Identification and evaluation of feasible alternatives meets the requirements of both OPA and NEPA and their implementing regulations.

The LA TIG identified four strategic alternatives that, with the exception of natural recovery, meet the SRP/EA's purpose and need "to restore ecosystem-level injuries in the Gulf of Mexico through restoration of critical wetland, coastal, and nearshore habitat resources and services in the Barataria Basin." The four alternatives are as follows:

Alternative 1: Marsh creation and ridge restoration plus large-scale sediment diversion

Alternative 2: Marsh creation and ridge restoration plus shoreline protection

Alternative 3: Marsh creation and ridge restoration

Alternative 4: Natural recovery/No-action

For each alternative, the LA TIG evaluated each OPA criterion independently, and determined how well the alternative met each criterion. In addition to evaluating these approaches under OPA, additional considerations under NEPA were included in the analysis. This SRP/EA serves as a tiered EA from the PDARP/PEIS (40 C.F.R. 1502.20; 1502.21). In this SRP/EA, the Trustees evaluate whether the approaches and techniques included in this SRP/EA fall within the scope of the impacts analysis conducted in Chapter 6 of the PDARP/PEIS for those restoration approaches, and have not identified any new significant impacts.

The Preferred Alternative

The Trustees have proposed Alternative 1 as the preferred alternative. Under this alternative, the Trustees would support a suite of restoration projects in the Barataria Basin, including projects that would create marsh and restore ridges together with the implementation of large-scale sediment diversions to restore deltaic processes. The analysis under both OPA and NEPA demonstrates that Alternative 1 would provide the greatest level of benefits to injured Wetlands, Coastal, and Nearshore habitats and to the large suite of injured resources that depend in their lifecycle on productive and sustainable wetland habitats in the Barataria Basin. This alternative best meets the goals for this restoration type described in the PDARP/PEIS, has a high likelihood of success, and would reduce some sources of future injury (particularly erosion). The Trustees acknowledge that there may be collateral injury and impacts to public health and safety, physical, biological, and socioeconomic resources in the Barataria Basin. These impacts were evaluated as part of the PDARP/PEIS and will be further analyzed as part of any Phase II restoration plan. Despite the potential for a range of possible adverse impacts, the LA TIG has determined that the preferred alternative will provide long-term ecosystem-level benefits and restoration of injured resources and have an overall positive impact on public health and safety and the environment affected by the spill.

Diversions of Mississippi River water and sediment into adjacent wetlands have a high probability of providing large-scale benefits for the long-term sustainability of deltaic wetlands and the Gulf of Mexico ecosystem. Large-scale sediment diversions are designed for significant wetland/marsh-building through the transportation of large quantities of mineral sediments via high discharge volumes from the Mississippi River. If correctly designed, sited, and operated, large-scale sediment diversions will help restore injured wetlands and resources by reducing widespread loss of existing sediment deposition to partially offset relative sea level rise and help build and maintain wetlands (Andrus, 2007; Day et al., 2012; DeLaune et al., 2003; DeLaune et al., 2013; Kemp et al., 2014). Further, large scale sediment diversions will reestablish the full suite of deltaic processes including enhancement of trophic dynamics and nutrient cycling. Despite the high cost of construction, large-scale sediment diversions are anticipated to be more cost-effective long-term than other methods of marsh creation and are the only technique capable of producing the full suite of ecological benefits to the Gulf of Mexico ecosystem provided by the reestablishment of deltaic processes.

Marsh creation projects directly restore wetland habitat; these projects are typically located in areas that have historically supported marsh habitat, but the marsh has been lost to natural and human-induced processes. Marsh creation projects through the placement of dredged materials can be implemented quickly, targeted to specific locations with currently degraded habitat, and have a track record of success within Louisiana. Ridge restoration projects are designed to complement marsh creation projects by protecting the marshes from further losses due to storm surge and wave action. These projects re-establish historical ridge features within the marsh complex that are important to the complex habitats and hydrology of the Barataria Basin.

Modeling demonstrates that marsh creation projects, when built along with a large-scale sediment diversion projects such as the Mid-Barataria Sediment Diversion, yield more net habitat gain than developing either alternative in isolation (CPRA, 2017; see pp. 133-134). Marsh creation projects can build habitat relatively quickly, and once built can help retain the sediment being introduced into the basin by the diversion. At the same time, the influx of sediment from the diversion will help make the marsh creation projects more sustainable over the long term, by providing a continuous source of sediment, freshwater, and nutrients to maintain marsh growth. Large-scale sediment diversions also have the potential to reduce impacts from relative sea level rise in the Barataria Basin, by providing a sustainable source of sediment to replenish land as it is inundated, thus contributing to long-term resiliency. Thus, the Trustees have concluded that other restoration techniques, such as large marsh creation projects or multiple small-scale sediment diversions, cannot by themselves deliver the same benefits or perform the same functions as an alternative that includes a large-scale sediment diversion.

Based on this analysis, the preferred alternative would restore a variety of interspersed and ecologically connected coastal habitats, because the combination of marsh creation, ridge restoration, and large-scale sediment diversion techniques would build/maintain marsh and ridge habitat across a large area of the Barataria Basin. This alternative would restore for injuries in the Barataria Basin, where the greatest oiling injuries in Louisiana occurred. By creating sustainable wetland habitats in the Barataria Basin, this alternative would address injuries in the Gulf of Mexico ecosystem that depend on these productive wetlands. This alternative also provides resiliency and sustainability for restoring wetlands, coastal and nearshore habitat

because large-scale sediment diversions and marsh creation and ridge restoration together yield a greater net gain than any of these techniques individually.

Projects Advanced for Further Evaluation

During the screening process, the Trustees identified the following projects that meet the criteria set out by the LA TIG (Table 4):

- Two Large-Scale Diversions: Mid-Barataria Sediment Diversion, Ama Sediment Diversion
- Marsh Creation: Large-Scale Marsh Creation – Component E, Lower Barataria Marsh Creation – Component A
- Ridge Restoration: Grand Bayou Ridge Restoration, Bayou Eau Noire Ridge Restoration, Adams Bay Ridge Restoration, Red Pass Ridge Restoration
- Combined ridge restoration and marsh creation: Spanish Pass Increment of the Barataria Basin Ridge and Marsh Creation
- Shoreline Protection: Lake Hermitage Shoreline Protection, East Snail Bay Shoreline Protection, West Snail Bay Shoreline Protection, Bayou Perot Shoreline Protection

The LA TIG proposes selecting the Mid-Barataria Sediment Diversion and two marsh creation increments within Large Scale Marsh Creation - Component E in northern Barataria Bay for advancement and further evaluation under both OPA and NEPA in Phase II restoration plans and NEPA. The Trustees also confirm their 2017 decision to move the Spanish Pass Increment of the Barataria Basin Ridge and Marsh Creation project forward for further evaluation and planning.

The Large-Scale Barataria Marsh Creation – Component E project as a whole would create approximately 12,900 acres of marsh at the time of construction in Plaquemines and Jefferson parishes, Louisiana, in the Barataria Basin, south of The Pen to the Barataria Landbridge, to create new wetland habitat and restore degraded marsh. The 2017 CMP project cost estimate includes \$48,700,000 for planning/engineering and design, \$608,600,000 for Construction, \$17,200,000 for Operation + Maintenance (O+M) for a total cost of \$674,500,000.

The Mid-Barataria Sediment Diversion (MBSD) is located near Ironton in Plaquemines Parish, Louisiana. Based on the model outputs, the MBSD is expected to build or maintain 8,041 acres of land in the near-term (Year 20) and 29,686 acres of land in the long-term (Year 50). The 2017 CMP project cost estimate includes \$39,400,000 for planning/engineering and design (already funded through National Fish and Wildlife Foundation [NFWF]), \$821,400,000 for construction, \$138,000,000 for O+M, for a total cost of \$998,800,000, of which \$959,400,000 is not yet funded.

The Spanish Pass Increment of the Barataria Basin Ridge and Marsh Creation was previously selected to move forward with Engineering and Design in Louisiana’s First Restoration Plan (Louisiana Trustee Implementation Group, 2017). That selection is consistent with the preferred alternative identified in this SRP/EA and is therefore affirmed by, and incorporated into, this Plan.

The LA TIG is proposing to advance these specific projects for further analysis for several reasons. First, the location of these projects places them in close proximity to some of the most heavily oiled portions of the Louisiana coastline. Second, Large Scale Marsh Creation – Component E

proposes to use a nearby Mississippi River borrow source that will be depleted if the MBSD is constructed. Thus, the project needs to be evaluated in time to be sequenced prior to any potential diversion in that location. The proximity of the MBSD and the Large-Scale Marsh Creation- Component E to each other will maximize the synergistic benefits of the two projects. In contrast, the Ama Sediment Diversion is located in the upper portion of the Barataria Basin and is not shown to synergistically benefit the marsh creation projects considered in this Plan. As noted in the LA TIG's Restoration Plan #1, the design of the Spanish Pass Increment of the Barataria Basin Ridge and Marsh Creation project will not be affected by the MBSD project, and thus this project will not be delayed by the design, construction, or operation of the diversion. These projects have a high likelihood of success based on the information that already has been developed using modeling and related analysis. For example, the MBSD project has been studied in different iterations of the 2012 and 2017 CMP, and multiple other studies including in the Louisiana Coastal Area Hydrodynamic and Delta Management Study. It also has undergone initial project-specific engineering and design at CPRA. Lastly, while many of these projects may be considered in future plans, limited availability of funds limits how many can be prioritized at this time.

Relationship of SRP/EA to Mid-Barataria Sediment Diversion Permit Process

In light of the need to address the severe sustained land loss in the Barataria Basin as soon as possible, the CPRA has submitted a permit application to the U.S. Army Corps of Engineers (USACE) for the MBSD, anticipating that the permitting process could take time. The permit application was not a proposal by the Trustees to pursue Mid-Barataria Sediment Diversion as a restoration project. However, after the permit process began, the Trustees took steps to participate in that process. This was due in part to the Trustees' prior recognition in the PDARP/PEIS that large-scale sediment diversions are an important restoration technique that would be considered as the Trustees began to implement the restoration called for in the PDARP/PEIS. The particular large-scale sediment diversions applied for by the State – the Mid-Barataria Sediment Diversion – has been the subject of long discussion prior to the PDARP/PEIS among experts as one of the most promising potential diversions, in terms of its potential to create and help sustain marsh/wetlands complexes on an ecosystem scale. Given this background and the potential importance of a MBSD to any ultimate restoration strategy, the Federal Trustees stated their intention to participate as cooperating agencies under NEPA in the USACE's development of an Environmental Impacts Statement (EIS) for that project and have worked to do so by funding their participation with TIG monies and by developing a Memorandum of Understanding (MOU) with the USACE describing the Trustees' role in EIS development.

Before investing too much time and energy in the EIS development for the MBSD project in the context of the USACE's permitting process, the TIG believes it would be best to determine an overall wetland/marsh restoration strategy for the Barataria Basin. The TIG believes that doing so now is important, for at least two reasons. First, the TIG needs to decide whether large-scale sediment diversions are part of its overall restoration strategy for the Barataria Basin before it can decide whether substantial TIG funding should be expended on any particular sediment diversion. Thus far, only modest amounts of funding have been expended on TIG participation in the USACE's permitting process. The potential "funding curve" for any large-scale river diversion makes it especially appropriate for the TIG to decide now on a wetlands/marsh restoration

strategy for the Barataria Basin. For example, if the TIG were to decide that an overall restoration strategy should not include large-scale sediment diversions, making that decision now would allow the TIG to focus expenditures on restoration techniques other than diversions, and the TIG likely would minimize its involvement in the USACE's permitting process for the MBSD. Second, if the TIG decides to include one or more large-scale sediment diversions in its restoration strategy (as is proposed in this document), making that decision now will allow the TIG to better coordinate needed environmental analysis of a MBSD with the EIS being developed as part of the USACE's permitting process. In particular, this SRP/EA will focus the TIG's future restoration efforts as they relate to the MBSD, including using the EIS under development in the USACE's permitting process in a way that avoids duplication of effort in future restoration planning done by the TIG.

Following selection of a preferred strategic alternative that includes a large-scale sediment diversion, the Trustees propose that the MBSD project be advanced for further evaluation under both OPA and NEPA. The Trustees are soliciting and will consider public comment on that proposal before any final determination is made. In addition, it is important to understand that, if the preferred alternative is selected as final, the MBSD will not be selected for construction until it has been subject to further OPA and NEPA evaluation, including a detailed analysis of impacts from different operational designs. Further OPA and NEPA evaluation would be part of a subsequent restoration decision by the Trustees. If the preferred alternatives in this plan, after review and consideration of public comment, are selected as final, the Trustees anticipate that they would, as cooperating agencies with the USACE's MBSD EIS, work to ensure that any future Phase II restoration plan OPA/NEPA analysis could take advantage of the environmental analysis conducted in the USACE's EIS. As noted above, one of the reasons for proposing this SRP/EA now is to ensure that the Trustees can make cost-efficient decisions regarding restoration planning, and reducing duplicative efforts is precisely the kind of efficiency that can be gained by development of the SRP/EA.

Public Comment

The public is encouraged to review and comment on this Draft SRP/EA. The Draft SRP/EA will be made available for public review and comment for 45 days following the release of the Draft SRP/EA, as specified in the public notice published in the Federal and Louisiana Registers. The public notice will also specify the date, time, and location of a public meeting. Comments on the Draft SRP/EA can be submitted during the comment period by one of following methods:

- Via the internet: <http://www.gulfspillrestoration.noaa.gov/restoration-areas/louisiana>.
- Via hard copy, write: Louisiana Coastal Protection & Restoration Authority, ATTN: Liz Williams, P.O. Box 44027, Baton Rouge, LA 70804; or
- U.S. Fish & Wildlife Service, P.O. Box 49567, Atlanta, GA 30345.

Submissions must be postmarked no later than 45 days after the release date of the Draft SRP/EA.

The Louisiana TIG will also take written and verbal comments at the CPRA Board Meeting on January 17, 2018; 9:30 a.m.; Louisiana State Capitol, House Committee Room 5, 900 Third Street, Baton Rouge, LA 70802.

After the close of the public comment period, the LA TIG will consider the comments received and revise the Draft SRP/EA as needed. A summary of comments received and the LA TIG's responses (where applicable) will be included in the Final SRP/EA. Additional logistics for the public meeting, including the timing of the public comment opportunity following the CPRA Board agenda, will be posted to the Louisiana and DWH Websites. See: <http://la-dwh.com> and <http://www.gulfspillrestoration.noaa.gov/restoration-areas/louisiana>.

A second public meeting, to be held in the evening, is being planned and the location and time of this meeting, when confirmed, will be posted to the Louisiana and DWH websites. See: <http://la-dwh.com/>and <http://www.gulfspillrestoration.noaa.gov/restoration-areas/louisiana>.