

LOUISIANA RESTORATION AREA TRUSTEE IMPLEMENTATION GROUP
of the
DEEPWATER HORIZON TRUSTEE COUNCIL

Civil Action Nos. 10-4536; 10-04182; 10-03059; 13-4677; 13-158; 13-00123 (ED. La.)
MDL No. 2179

Resolution # LA-2025-007

**Resolution to Allocate and Approve Trustee Labor to Develop a Barataria Basin
Conceptual Ecological Model and Support Ecosystem Modeling**

1. In accordance with the Oil Pollution Act of 1990 (OPA), the National Environmental Policy Act (NEPA), the *Deepwater Horizon* (DWH) Oil Spill: *Final Programmatic Damage Assessment Restoration Plan and Final Programmatic Environmental Impact Statement* (PDARP/PEIS), and the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* (DWH) Oil Spill (TC SOPs), the undersigned representatives of the Louisiana Trustee Implementation Group (LA TIG) hereby approve the restoration activities set forth below to continue the restoration of natural resources and services injured or lost as a result of the DWH oil spill, which occurred on or about April 20, 2010 in the Gulf of America¹.
2. The restoration activities to be funded through this Resolution support restoration planning to carry out the restoration goals identified in the Final PDARP/PEIS and the Record of Decision that provides and explains the Trustees' selection of the Preferred Alternative (Alternative A) for the Programmatic Restoration Plan in the Final PDARP/PEIS. The tasks are also consistent with the Consent Decree resolving the civil actions referenced above.
3. Funds transferred from the Department of the Interior (DOI) Restoration Fund to DOI may only be used for the restoration activities authorized by this Resolution. Any other use of funds disbursed pursuant to this Resolution is prohibited. Any non-authorized use of disbursed funds must be reported to the full TIG immediately upon discovery of unauthorized use.
4. It is resolved that, after due deliberation and review of the tasks, level of effort, and costs, through this Resolution and associated DWH Trustee Withdrawal Form, the LA TIG requests disbursement of Wetlands, Coastal, and Nearshore Habitats (WCNH) from the DOI Restoration Fund to prepare a Barataria Basin Conceptual Ecological Model and support Ecosystem Modeling:

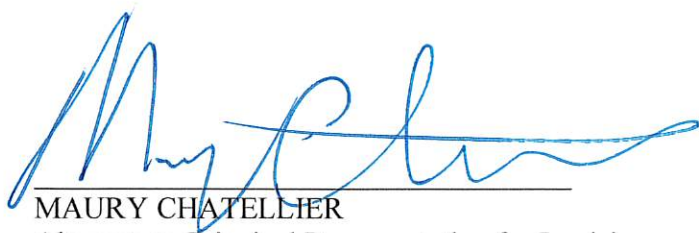
¹ Per Executive Order 14172, "Restoring Names That Honor American Greatness," the area formerly known as the Gulf of Mexico has been officially renamed the Gulf of America.

- A. DOI in the amount of \$101,609, which will be used by DOI to develop a Barataria Basin Conceptual Ecological Model and support its integration into ecosystem models developed for the basin
- B. Wherever activities in this project are determined to overlap with a previously approved project, the budget of the previously approved project will be reduced.

Resolution	Project Name	Project ID	Trustee	Restoration Type	Withdrawal From Restoration Fund	Total Project Budget
LA-2025-007	Barataria Basin Conceptual Ecological Model and Ecosystem Modeling Support	TBD	DOI	WCNH	\$101,609	\$101,609

- 5. This funding allocation is to support restoration planning activities beginning May of 2025.
- 6. It is resolved that having reviewed these restoration planning activities, the duly authorized officials for the Louisiana TIG authorize the commitment and release of these funds. This Resolution may be authorized in counterparts.

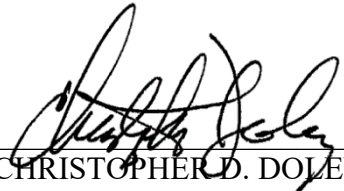
RESTORATION IN LOUISIANA TRUSTEE IMPLEMENTATION GROUP

A handwritten signature in blue ink, appearing to read 'Maury Chatellier', is written over a horizontal line.

MAURY CHATELLIER

Alternate to Principal Representative for Louisiana

RESTORATION IN LOUISIANA TRUSTEE IMPLEMENTATION GROUP



CHRISTOPHER D. DOLEY

Principal Representative, National Oceanic and Atmospheric Administration



MARY JOSIE BLANCHARD

Principal Representative, Department of the Interior



DORIS G. WASHINGTON

Alternate to Principal Representative, U.S. Department of Agriculture



MARY KAY LYNCH

Alternate to Principal Representative, U.S. Environmental Protection Agency

EFFECTIVE DATE: June 23, 2025

Planning Activity Implementation Plan: Barataria Basin Conceptual Ecological Modeling and Ecosystem Modeling Support

Introduction

The *Deepwater Horizon* (DWH) oil spill settlement in 2016 provides the Natural Resource Damage Assessment (NRDA) Trustees (Trustees) up to \$8.8 billion, distributed over 15 years, to restore natural resources and services injured by the spill. As described in the DWH oil spill *Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement* (PDARP/PEIS; DWH NRDA Trustees, 2016), the Trustees selected a comprehensive, integrated ecosystem approach to restoration. The PDARP/PEIS considers programmatic alternatives, composed of Restoration Types, to restore natural resources, ecological services, and recreational use services injured or lost as a result of the DWH oil spill incident. As shown in the PDARP/PEIS, the injuries caused by the DWH oil spill affected such a wide array of linked resources over such an enormous area that the effects must be described as constituting an ecosystem-level injury. The PDARP/PEIS and information on the settlement with BP Exploration & Production, Inc. (termed the “Consent Decree”) are available at www.gulfspillrestoration.noaa.gov.

Given the unprecedented temporal, spatial, and funding scales associated with the DWH oil spill restoration effort, the Trustees recognized the need for robust Monitoring and Adaptive Management (MAM) to support restoration planning and implementation. As such, the following proposed Conceptual Ecological Model (CEM) will provide essential information to develop and evaluate the programmatic goals established in the PDARP/PEIS to “Provide for Monitoring, Adaptive Management, and Administrative Oversight to Support Restoration Implementation” to ensure that the portfolio of restoration projects provides long-term benefits to natural resources and services injured by the DWH oil spill (Appendix 5.E of the PDARP/PEIS). The CEM produced as a part of the proposed effort will allow the Trustees to evaluate ecosystem-wide impacts of restoration in Barataria Basin, address potential uncertainties related to restoration planning and implementation, and provide feedback to inform future restoration decisions. The integrated restoration portfolio emphasizes the broad ecosystem benefits that can be realized through coastal habitat restoration in combination with resource-specific restoration in the ecologically interconnected northern Gulf of America ecosystem (DWH NRDA Trustees, 2016).

Purpose of this Document

This implementation plan describes a planning activity to produce a CEM that identifies how biogeochemical processes and water quality influence primary production, trophic transfer, and production of lower trophic level organisms based on peer-reviewed research and ongoing data collection efforts. This document provides information about the activities to be implemented; describes their applicability to the PDARP/PDEIS and describes their consistency with the programmatic alternatives selected by the DWH Trustees in the PDARP/PEIS. The CEM will be integrated into ecosystem models for the Barataria Basin.

MAM Activity Overview

Activity Description

This implementation plan describes a planning activity to produce a CEM that identifies how biogeochemical processes and water quality influence primary production, trophic transfer, and production of lower trophic level organisms based on peer-reviewed research and ongoing data collection efforts.

Background

This project will enable Trustees to integrate data from ongoing projects into ecosystem models built for Barataria Basin. Barataria Basin was the most heavily oiled shoreline during the *Deepwater Horizon* Oil Spill and has been the focus of unprecedented investment in restoration during the years following the spill. Given the scope and scale of restoration, the Trustees hope to characterize the ecosystem level benefits of restoration in Barataria Basin. Ecosystem models can be used to understand the relationships between food web structure and ecosystem structure. Because these models can estimate how habitat creation and changes to hydrology affect food webs and ecosystem structure, they can serve as particularly useful tools for the adaptive management of large-scale restoration efforts.

The Trustees recently funded large-scale data collection efforts to characterize lower trophic levels (DWH NRDA Trustees, 2023) and nekton (DWH NRDA Trustees, 2022) in Barataria Basin. These data collection efforts provide an opportunity to update and improve ecosystem models planned for the Basin; however, integration of those data will require structural changes to ecosystem models and refinements to our understanding of how the ecological system operates. Thus, this planning activity proposes to produce a CEM that identifies how biogeochemical processes and water quality influence primary production, trophic transfer, and production of lower trophic level organisms based on peer-reviewed research and ongoing data collection efforts. The developers of the CEM will also participate in the ecosystem modeling team so they can ensure the CEM and recently collected data are integrated into ecosystem models.

Objectives

The objective of this planning activity is to ensure recently collected nekton and lower trophic level data are integrated into ecosystem models and those models are grounded in a CEM that reflects an up-to-date understanding of how the Barataria Basin ecosystem functions.

Tasks

Task 1: Conceptual Ecological Model Development

DOI will lead the development of a conceptual ecological model (CEM) of Barataria Basin. CEMs are useful tools because they present qualitative and simplified schematics of estuarine ecosystems. They tend to include state variables (e.g., phytoplankton) as the main ecological parameters, environmental drivers (e.g., suspended sediments), and arrows that connect them to describe the likely ecological process or response (e.g., primary productivity) (de Vries et al., 1996). They can be used to demonstrate the current ecological understanding and future changes including how coastal restoration efforts are likely to influence the ecosystem (Rudnick et al., 2005). Lastly, CEMs are valuable to communicate the state of the estuarine ecosystem to diverse stakeholders.

The CEM of Barataria Basin will include dominant lower trophic levels (represented as state variables) and use arrows to describe how environmental drivers (e.g., turbidity, salinity, inorganic nutrients) that are common water quality parameters influence ecological processes in the estuarine water column and sediments, including primary productivity (e.g., by phytoplankton and microphytobenthos) and trophic transfer to primary consumers (e.g., zooplankton, benthic infauna). Previous CEMs of Barataria Basin will be searched in the peer-reviewed literature and project reports to build upon previous efforts. In addition, existing data from the [Lower Trophic Level Inventory activity for the Barataria Basin \(Project ID #269\)](#) will be used to inform the CEM.

Development of the CEM will be coordinated with NOAA and ecosystem modelers to ensure the information provided in the CEM can be readily integrated into ecosystem models of Barataria Basin. Two meetings will be planned with the following objectives: 1) review the draft CEM based on initial literature review and gain feedback from partners about applicability to informing ecosystem models, and 2) review the revised CEM for final comments. A report will be written that describes the methodology and results of the CEM development.

Task 2: Support Ecosystem Modeling Planning and Implementation

DOI will support the ecosystem modeling team by assisting with the integration of the CEM into ecosystem models and helping review and interpret ecosystem modeling results. DOI will assist NOAA with the development of an Ecosystem Modeling Implementation Plan for Barataria Basin. DOI will work to ensure the Implementation Plan integrates the findings of the CEM. The ecosystem models selected for use in the Implementation Plan could require substantial modifications to incorporate newly collected data in Barataria Basin and the CEM. DOI will help keep ecosystem modelers abreast of any important publications so that models can incorporate those independent findings and will provide assistance with the integration of data collected as a part of the LTL MAM Activity. Finally, DOI will attend working sessions, provide input on model updates, assess model output, and review the ecosystem modeling report following model production runs.

Project Outputs/Deliverables

- The CEM will be included in a report with supporting literature
- A peer-reviewed publication
- Review of Barataria Basin Ecosystem Modeling Implementation Plan
- Support Integration of CEM into ecosystem models

Budget

The following budget describes DOI's supporting role of ecosystem modeling in Barataria Basin.

Cost Items	Organization	Cost Estimate
Task 1	DOI	\$48,966
Task 2	DOI	\$52,643.00
Total Estimated Cost		\$101,609

Schedule

The following schedule describes DOI's supporting role of ecosystem modeling in Barataria Basin. The work will occur over a period of four years, likely to begin in July 2025 and end in June 2029.

Task	Description	2025	2026	2027-2029
1	Conceptual Ecological Model Development	X	X	
2	Support Ecosystem Modeling Planning and Implementation		X	X

Implementation Roles

DOI will be the Implementing Trustee responsible for implementing this planning activity. DOI will be responsible for coordinating with the LA TIG and providing overall direction and oversight for this planning activity, including completing compliance requirements, financial tracking, annual reporting, and DIVER data management.

Data Management and Reporting

The DWH Trustees, as stewards of public resources under the Oil Pollution Act (OPA), will inform the public on the planning activity's progress and performance. Therefore, DOI will report the status of the proposed activity via the Data Integration, Visualization, Exploration, and Reporting (DIVER) Restoration Portal annually, as outlined in Chapter 7 of the PDARP/PEIS (DWH NRDA Trustees 2016). All reports and documentation created or compiled as part of this planning activity, including the CEM and associated documentation will also be stored on the DIVER Restoration Portal. Data storage and accessibility will be consistent with the guidelines in Section 3.1.3 of the MAM Manual (DWH NRDA Trustees 2021).

Consistency with the DWH Programmatic Restoration Plan

This planning activity is consistent with the DWH Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement (PDARP/PEIS) (DWH NRDA Trustees 2016). For injuries to coastal habitats in the northern Gulf of America and resources that use these habitats (e.g., fish, invertebrates, and birds), the PDARP/PEIS states this goal (PDARP/PEIS 5.5.2.1):

Restore a variety of interspersed and ecologically connected coastal habitats in each of the five Gulf states to maintain ecosystem diversity, with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities (PDARP/PEIS 5.5.2.1, Goals of the Restoration Type).

The PDARP/PEIS emphasizes the complex and interconnected food webs of nearshore habitats, stating, "Coastal and nearshore habitats integrate and form a continuum within the nearshore ecosystem and contribute to an integrated, connected food web." This complexity is a result of the interactions that occur among the different subsystems (e.g., salt marsh, oyster reef, and their associated communities) and a series of food webs that form connections among them.

Recognizing this complexity, the PDARP/PEIS emphasizes the potential for multiple restoration approaches to be implemented in combination to increase overall habitat benefits to other injured resources, such as fish and shallow benthic communities. For example, a goal of the Wetlands, Coastal, and Nearshore Habitats restoration type is to restore a variety of interspersed and ecologically connected coastal habitats[...] to maintain ecosystem diversity, with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities (PDARP/PEIS 5.5.2.1). As such, this planning activity is consistent with the PDARP/PEIS.

In summary, this proposed planning activity will support restoration planning and evaluation of restoration actions and associated benefits to fish, estuarine habitats, and increased ecosystem services in Barataria Basin by improving our understanding of the estuarine food web.

Compliance Considerations

NEPA Review and Conclusion

The Trustees' approach to compliance with NEPA summarized in this section is consistent with, and tiers where applicable from the PDARP/PEIS Section 6.4.14. Resources considered and impact definitions (minor, moderate, major) align with the PDARP/PEIS. Relevant analyses from the PDARP/PEIS are incorporated by reference. Such incorporation by reference of information from existing plans, studies or other material is used in this analysis to streamline the NEPA process and to present a concise document that briefly provides sufficient evidence and analysis to address the LA TIG's compliance with NEPA. All source documents relied upon are available to the public and links are provided in the discussion where applicable.

As discussed in Chapter 6 of the PDARP/PEIS, a TIG may propose funding a planning phase (e.g., initial engineering, design, and compliance) in one plan for a conceptual project, or for studies needed to maximize restoration planning efforts. This would allow the TIG to develop information needed leading to sufficient project information to develop a more detailed analysis in a subsequent restoration plan, or for use in the restoration planning process. Where these conditions apply and activities are consistent with those described in the PDARP/PEIS, NEPA evaluation is complete, and no additional evaluation of individual activities is necessary at this time.

NEPA Review of Planning Activity

The activities and tasks described here consist exclusively of desktop analysis of existing literature, existing data resources, report development, and engagement of subject matter experts. This activity would include data collation and synthesis with no field data collection. Consequently, there will be no impact to resources as defined within the PDARP/PEIS.

NEPA Conclusion

After review of the proposed activities against those actions previously evaluated in the PDARP/PEIS, the LA TIG determined that the environmental consequences resulting from this planning activity falls within the range of impacts described in Section 6.4.14 of the PDARP/PEIS, thus no additional NEPA evaluation is necessary at this time.

Compliance with Other Environmental Laws and Regulations

There will be no fieldwork as part of this planning activity, thus further compliance reviews are not necessary because there will be no effects to protected species, their habitats, or to cultural resources. No consultations, permits or authorizations are needed to complete this modeling activity. See the table below for the compliance status by statute at the time of this PAIP.

Federal environmental compliance responsibilities and procedures follow the Trustee Council Standard Operating Procedures (SOP), which are laid out in Section 9.4.6 of that document. Following the SOP, the Implementing Trustees for each activity will ensure that the status of environmental compliance (e.g., completed vs. in progress) is tracked through the Restoration Portal.

Documentation of regulatory compliance will be available in the Administrative Record that can be found at the DOI's Online Administrative Record repository for the DWH NRDA (<https://www.doi.gov/deepwaterhorizon/adminrecord>). The current status of environmental compliance can be viewed at any time on the Trustee Council's website: <http://www.gulfspillrestoration.noaa.gov/environmental-compliance/>.

Status of federal regulatory compliance reviews and approvals.

Federal Statute	Compliance Status
Bald and Golden Eagle Protection Act (USFWS)	N/A
Coastal Barrier Resources Act (USFWS)	N/A
Coastal Zone Management Act	N/A
Endangered Species Act (NMFS)	N/A
Endangered Species Act (USFWS)	N/A
Essential Fish Habitat (NMFS)	N/A
Marine Mammal Protection Act (NMFS)	N/A
Marine Mammal Protection Act (USFWS)	N/A
Migratory Bird Treaty Act (USFWS)	N/A
National Historic Preservation Act	In process
Rivers and Harbors Act/Clean Water Act	N/A
National Environmental Policy Act	Complete, based on Section 6.4.14 of the Final PDARP/PEIS and above in the Summary NEPA Review section

References

DWH NRDA Trustees. (2016). *Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement*. Available: [Http://www.gulfspillrestoration.noaa.gov/restorationplanning/gulf-plan](http://www.gulfspillrestoration.noaa.gov/restorationplanning/gulf-plan).

https://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/Front-Matter-and-Chapter-1_Introduction-and-Executive-Summary_508.pdf

DWH NRDA Trustees. (2022). *Monitoring the Effects of Coastal Wetland Restoration on Fish and Invertebrates Monitoring and Adaptive Management Activity Implementation Plan*. Available: <https://pub-data.diver.orr.noaa.gov/restoration/Monitoring%20the%20Effects%20of%20Wetland%20Restoration%20on%20Fish%20and%20Invertebrates%20MAM%20Implementation%20Plan>

DWH NRDA Trustees. (2023). *MAM Activity Implementation Plan: Lower Trophic Level Monitoring for Barataria Basin*. Available: <https://pub-data.diver.orr.noaa.gov/restoration/Lower%20Trophic%20Level%20Monitoring%20for%20Barataria%20Basin%20MAIP%20%28Phase%20II%29>

Rudnick, D. T., P. B. Ortner, J. A. Browder, and S. M. Davis. 2005. A conceptual ecological model of Florida Bay. *Wetlands* 25: 870–883.

de Vries, I., A. C. Smaal, P. H. Nienhuis, and J. C. A. Joordens. 1996. Estuarine management strategies and the predictability of ecosystem changes. *Journal of Coastal Conservation*: 139–148.