*Deepwater Horizon*

Open Ocean Trustee Implementation Group

# MONITORING AND ADAPTIVE MANAGEMENT ACTIVITY IMPLEMENTATION PLAN:

## ANALYSIS OF OPEN OCEAN HABITAT USE, THREATS, AND ANIMAL MOVEMENT

February 2023

# 1.0 Introduction and Purpose

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 Final 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 British Petroleum Exploration and Production Inc. (called the Consent Decree) are available at the Gulf Spill Restoration website.

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, one of the programmatic goals established in the PDARP/PEIS is 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 spill (Appendix 5.E of the PDARP/PEIS). This framework allows the Trustees to evaluate restoration effectiveness, address potential uncertainties related to restoration planning and implementation, and provide feedback to inform future restoration decisions.

The Trustees also established a governance structure that assigned a Trustee Implementation Group (TIG) to each of the eight designated Restoration Areas, including the Open Ocean Restoration Area. Each TIG makes restoration decisions for the funding allocated to its Restoration Area and is also responsible for identifying MAM priorities for its respective TIG. The Open Ocean TIG includes the four federal Trustee agencies: U.S. Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); U.S. Department of the Interior (DOI); U.S. Department of Agriculture (USDA); and U.S. Environmental Protection Agency (EPA). It is responsible for restoring the natural resources and services within the Open Ocean Restoration Area that were injured by the DWH oil spill and associated spill response efforts.

The DWH Trustees opened a publicly available Administrative Record for the NRDA of the DWH oil spill, including restoration planning activities, concurrently with publication of the 2010 Notice of Intent (pursuant to 15 CFR § 990.45). DOI is the lead federal Trustee for maintaining the Administrative Record, which can be found at http://www.doi.gov/deepwaterhorizon/adminrecord. This administrative record is used by the Open Ocean TIG to provide the public with information about DWH restoration planning, including MAM activities. Additional information is also provided at http://www.gulfspillrestoration.noaa.gov. Information about restoration projects and MAM activities, including any data and/or analyses produced and annual reports, are made publicly available via the Data Integration Visualization Exploration and Reporting portal (DIVER), https://www.diver.orr.noaa.gov/web/guest/deepwater-horizon-nrda-data.

To articulate its approach to MAM, the Open Ocean TIG released its MAM strategy in April 2019 and revised it in June 2020 (OO TIG 2020). The strategy describes the TIG's responsibilities, goals, and

priorities for the use of the Open Ocean Restoration Area MAM allocation. Three goals were identified for the use of Open Ocean MAM funds: the evaluation of outcomes of the Open Ocean restoration effort across the portfolio of Open Ocean projects, the identification and filling of data gaps that affect the Open Ocean TIG's ability to meet and/or evaluate progress toward restoration goals for Open Ocean resources, and the identification of benefits and outcomes from Open Ocean restoration activities to resource, cross-resource, and ecosystem restoration across the northern Gulf of Mexico. The strategy also identifies three priorities for Open Ocean MAM: evaluation of restoration progress, identification of threats, and assessment of focal species and important habitats. In addition to MAM goals and priorities, the strategy also describes the TIG's process to develop and release MAM Activities. MAM activities are projects or other MAM efforts (e.g., monitoring, modeling, data collection, research) developed to address identified MAM priorities.

This MAM Activity Implementation Plan (MAIP) describes the MAM activity, "Analysis of Open Ocean Habitat Use, Threats, and Animal Movement" which addresses MAM priorities identified by the Open Ocean TIG for the restoration types under its purview (fish and water column invertebrates, marine mammals, sea turtles, mesophotic and deep benthic communities, birds, and sturgeon). This MAM activity is intended to support evaluation of restoration outcomes within the Open Ocean Restoration Area, perform data synthesis and analysis, and resolve critical information gaps and uncertainties for restoration planning and informing restoration decision-making. This document provides details on how the MAM activity will be implemented and the data gaps and uncertainties it will address. This MAIP also describes the activity's applicability to the Open Ocean MAM Strategy and consistency with the programmatic alternative selected by the Trustees in the PDARP/PEIS (DWH NRDA Trustees 2016).

The activity described in this document will synthesize available information on movement and habitat usage of Open Ocean resources and threats affecting these resources. Examining the overlap between threats and resources will help identify locations where threat reduction projects may have greater impact, and serve as a baseline against which the TIG's threat reduction work may be evaluated. Additionally, this activity will identify gaps in threat, animal movement, and habitat usage data and make recommendations for data collection.

# 2.0 MAM Activity Description

## 2.1 Background

Many of the DWH PDARP/PEIS restoration approaches and existing Open Ocean restoration projects focus on the reduction of threats (DWH NRDA Trustees 2016, OO TIG 2019). In order for restoration work to have the biggest impact, it is helpful to reduce threats (i.e., threats) and their interactions, or reduce their overlap with animals and their habitats in areas where they have the largest impact and/or affect multiple resources. This activity will conduct a geospatial analysis to identify areas of overlap among threats (including overlap of threats themselves), animal migration corridors, and important habitats. The analysis may guide selection of locations for future threat reduction projects, and serve as a baseline for evaluation of the collective outcomes of the TIG's threat reduction projects. In addition to the analysis, this activity will identify and prioritize gaps in threat, animal movement, and habitat usage data based on those data that would be most useful for restoration planning and evaluation.

In its MAM strategy (OO TIG 2020), the Open Ocean TIG identified several direct threats (fisheries interactions, marine debris, vessel traffic, underwater noise, and mineral extraction activities) that affect multiple Open Ocean resources. Additionally, the PDARP/PEIS (DWH NRDA Trustees 2016), Fish and

Water Column Invertebrates Strategic Plan (OO TIG 2022), and existing projects (OO TIG 2019) have identified other threats of interest including invasive species, harmful algal blooms, and boat anchoring. These direct threats would be the primary focus of this project, as the TIG is likely to pursue restoration projects associated with PDARP restoration techniques and/or approaches focused on reduction of these threats.

Information on spatial distribution and habitat use by focal species, including their migration corridors within and into and out of the Gulf of Mexico, may be used to identify locations for restoration projects and to assess the effectiveness of restoration of habitats and species. If several focal species representing different restoration types use the same area (i.e., an ecological hotspot), restoration in that area would have a greater cumulative impact than in locations used by a single species. Even if no common sites are found, the information provided will still aid in the prioritization of restoration locations for individual resources.

Threat, animal movement, and habitat usage data may be used together to site threat reduction projects in areas where animals and threats co-occur. For some restoration types, information on animal movement and habitat use could be used to assess the effectiveness of restoration by demonstrating an increase in the number and diversity of animals using a particular area, increased productivity, or expanding species distributions. The information obtained through this activity could also inform a conceptual model or structured decision-making process (addressed by separate MAM activities) that will support ecosystem restoration and monitoring and evaluation efforts of the Open Ocean TIG.

Where appropriate, this activity will use results from the recently completed Gulf of Mexico Marine Assessment Program for Protected Species (GOMMAPPS) (NOAA et al. 2021), which provides geospatial data and maps on the distribution and abundance of seabirds, marine mammals, and sea turtles to inform seasonally- and spatially-explicit density and abundance estimates for these taxa. The inventoried data from GOMMAPPS and other sources will be analyzed in a geospatial context, looking for spatiotemporal overlap between threats and focal resources to identify potential restoration locations.

The duration of this activity is expected to be 2 years, with work overseen by a coordinating committee consisting of project co-leads and representatives for each restoration type. The coordinating committee will engage data providers as necessary to complete this activity.

This MAM activity was selected by the Open Ocean TIG because the resulting analysis will help the TIG plan and evaluate threat reduction restoration projects for all restoration types under their purview by identifying areas of overlap between high levels of threats and focal resources. The work directly addresses the Open Ocean MAM Strategy goals of evaluating the outcomes of the Open Ocean restoration effort across the portfolio of Open Ocean projects, identifying gaps that affect the Open Ocean TIG's ability to meet and/or evaluate progress toward restoration goals for Open Ocean resources, and identifying the benefits and outcomes from Open Ocean restoration activities to resource, cross-resource, and ecosystem restoration across the northern Gulf of Mexico (OO TIG 2020).

The results of the activity will help address the three MAM priorities identified in the MAM strategy: evaluation of restoration progress, identification of threats, and assessment of focal resources and important habitats. Furthermore, this work will support the assessment of progress toward the TIG's draft ecosystem level goals of improving habitat (feeding, breeding, and refuge habitats, migration corridors, biological hotspots, mobile and transient habitats including water column habitats) in areas

important to multiple restoration types, increasing production of injured open ocean species through increasing important habitat quality and quantity, and reducing sub-lethal effects and mortality across Open Ocean living resources through reduction of important threats (OO TIG 2020).

## 2.2 Task Descriptions

**Task 1: Identification of focal species or species groups, life history stages, habitats, and data needs**

This task will identify the focal species or species groups whose habitat usage and movement patterns will be examined. It will also identify the relevant movement and habitat data needs to be addressed in order to inform restoration planning and evaluation, including spatiotemporal considerations. Habitat will be broadly construed to include static and dynamic habitats, and will include transient habitats such as water masses. The data needs identified during this task will inform the spatiotemporal scale and appropriate data sets to be considered in Tasks 2 and 3.

Restoration type teams and other trustee representatives as necessary will identify focal species, habitats, and habitat data needs. Teams will reach out to subject matters experts as needed. Project managers will collate the information received into a single document. This task is a desktop exercise and will not involve any fieldwork or laboratory work.

Product: List of focal taxa and relevant data needs

Duration: 2 months

**Task 2. Inventory and gathering of existing Gulf of Mexico focal species' habitat usage and movement data**

This task will inventory and gather existing data for movement and habitat usage for the focal taxa identified in Task 1. The inventory may include published literature, tagging data, acoustic data, eDNA data, capture-based data, and data from existing Open Ocean restoration projects. Relevant Open Ocean projects include those tagging sturgeon and other fish, surveying marine mammals and seabirds, and compiling threat and animal location data for sea turtles and marine mammals. Data may be gathered from telemetry networks and data aggregators, species and habitat distributions from NOAA climate vulnerability assessments, and other applicable sources of information. Programs collecting new data will also be identified. Where possible, data will be obtained in or converted to a GIS format for use in the analysis described in Task 4. Only data with spatial and temporal information will be considered. The coordinating committee will meet as needed with data providers to facilitate data transfer to the platform used for this project. This task is a desktop exercise and will not involve any fieldwork or laboratory work.

Product: Inventory of available habitat usage and animal movement data and associated metadata, and programs collecting the data; spatiotemporal display of available data using GIS

Duration: 7 months

**Task 3. Inventory and gathering of existing threat data**

This task will inventory and gather existing threat data and identify programs collecting such data, including existing Open Ocean TIG projects. The task will focus on those threats mentioned above. Example data sets include automatic vessel tracking systems that use transceivers on ships to track vessel movement and fishing effort data sets from various NOAA systems (e.g. observer data, vessel monitoring systems, and cellular electronic logbooks). Where possible, data will be obtained in or converted to a GIS format for use in the analysis in Task 4. Only data with spatial and temporal information will be considered. This task is a desktop exercise and will not involve any fieldwork or laboratory work.

Product: Inventory of available threat datasets and associated metadata; spatiotemporal display of available data using GIS

Duration: 7 months

**Task 4. Combined analysis of animal movement, habitat usage, and threat data**

This task will use GIS to identify spatiotemporal overlap among threats, animal movement, and habitat usage data identified in Tasks 2 and 3. Similar analyses have been performed by Love et al. (2013), Brenner et al. (2016), and Hart et al. (2018). This work will use datasets updated since these analyses and be targeted toward the focal species and habitats identified in Task 1, and the threats identified above.

Based on the overlap analysis, spatiotemporal data gaps will be identified. For example, there may be a high concentration of focal resources in a particular area during particular times of year, but threat data may be lacking for that area at those times. Conversely, we may have threat data for a particular area, but data on focal resource use of that area may be lacking. Data gaps will be prioritized based on the utility of the missing information for restoration planning and/or evaluation. A rubric for evaluation of the data gaps will be developed and applied; evaluation criteria may include the data's relevance to the habitat needs identified in Task 1, ability to contribute to the specification of restoration timing and location, overlap with existing threat, habitat, and movement data, spatiotemporal coverage, potential to contribute to restoration indicators, and the opportunity to form partnerships with existing programs. The Council Monitoring and Assessment Program developed a framework for using a data inventory to conduct gap assessments (NOAA and USGS, 2020), and this activity may use that framework or portions thereof as appropriate. Evaluation will involve coordination across multiple restoration type teams, as well as with ongoing DWH projects with similar data needs. For example, current projects are examining the distribution of threats and animals for sea turtles and marine mammals, and will analyze these data temporally and geospatially. Coordination with these projects will ensure that effort identifying, formatting, and importing datasets is not duplicated, and that the same data platforms are used where appropriate. Pertinent datasets obtained by these other projects will be incorporated into this project. This exercise will be designed to allow for repeated analysis as necessary. This task is a desktop exercise and will not involve any fieldwork or laboratory work.

Products: A GIS geodatabase with the threats, animal movement, and habitat layers; a report including areas of overlap between threats and animal and habitat locations, a list of priority data collection needs for animal movement, habitat, and threat data, including locations, timing, and techniques.

Duration: 8 months

**Timeline**

The project is anticipated to take 24 months total, with tasks performed consecutively.

| Task Number | Task Description | Approximate Duration (months) |
|---|---|---|
| 1 | Identification of focal species or species groups, life history stages, habitats, and habitat questions | 2 |
| 2 | Inventory and gathering of existing Gulf of Mexico focal species' habitat usage and movement data | 7 |
| 3 | Inventory and gathering of existing threat data | 7 |
| 4 | Combined analysis of animal movement, habitat usage, and threat data | 8 |

**Budget**

The total budget requested for this MAM activity is $901,802.

| Item | NOAA | DOI | Total |
|---|---|---|---|
| Coordinating Committee | $5,100 | $5,100 | $10,200 |
| Task 1: Species and Data Needs | $18,870 | $7,650 | $26,520 |
| Task 2: Movement and Habitat Usage Data Gathering and Inventory | $110,900 | $46,000 | $156,900 |
| Task 3: Threat Data Gathering and Inventory | $110,900 | $46,000 | $156,900 |
| Task 4: Analysis | $123,300 | $51,000 | $174,300 |
| MAM Activity Management, Oversight, and Reporting | $165,000 | $130,000 | $295,000 |
| Total Cost Without Contingency | $534,070 | $285,750 | $819,820 |
| Contingency | $53,407 | $28,575 | $81,982 |
| Total with Contingency | $587,477 | $314,325 | $901,802 |

## 3.0 Roles and Responsibilities

NOAA and DOI are implementing trustees and will co-lead this activity, with one project manager from each agency. Both Trustees will be responsible for coordinating with the OO TIG and providing overall

direction and oversight for this MAM activity, completing compliance requirements, financial tracking, annual reporting, and DIVER data management. The project managers will jointly oversee the coordinating committee.

Each implementing trustee will be responsible for assisting with obtaining, formatting, and incorporating relevant data sets under its purview. The coordinating committee will seek out expertise in analysis of overlap between threats, habitats, and animals.

# 4.0 Data Management and Reporting

All new derived datasets created as part of this activity will be stored on the Data Integration, Visualization, Exploration, and Reporting (DIVER) Restoration Portal or other data platforms as appropriate for the data type. Data management, including data documentation standards, quality assurance and quality control procedures, and long-term maintenance and data archiving policies, will conform to the guidance provided in the Monitoring and Adaptive Management Procedures and Guidelines Manual (DWH NRDA Trustees 2021a) and the Trustee Council Standard Operating Procedures (DWH NRDA Trustees 2021b).

MAM activities will be reported in the DIVER Restoration Portal and updated annually to reflect the status of the MAM activities. Interim monitoring reports will be released annually, and a final project report will be released within one year of project activities being concluded.

# 5.0 Consistency with the DWH Programmatic Restoration Plan

This activity supports planning and evaluation of restoration for all resources covered by the Open Ocean TIG. By identifying areas with important habitats for multiple species overlap with threats, this work will facilitate the ecosystem approach to restoration identified in the PDARP/PEIS (DWH NRDA Trustees 2016, Chapter 3). The specific threats identified in the Open Ocean MAM Strategy, and addressed by this activity, are also identified in the PDARP/PEIS as providing opportunities for restoration (fisheries interactions, sections 3.7.3, 5.5.6.1, 5.5.10.1, 5.5.11.1, 5.5.12.2; marine debris, section 5.5.13.2; vessel traffic, sections 5.D.4.7, 5.D.5.7; underwater noise, section 5.5.11.1; mineral extraction activities, section 5.5.13.2). Similarly, the threats identified in the Fish and Water Column Invertebrate Restoration Strategy and the Mesophotic and Deep Benthic Communities Active Management and Protection and also addressed here are also identified in the PDARP as providing opportunities for restoration (invasive species, section 5.5.13.2; harmful algal blooms, sections 5.5.4.1, 5.5.5.1, 5.5.11.2; boat anchoring, section 5.5.13.3). Given that this activity supports an ecosystem approach to restoration by addressing threats identified in the PDARP/PEIS, it is consistent with that document.

# 6.0 Compliance Considerations

## 6.1 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 OO TIG's compliance with NEPA (40 CFR 1506.3, 40 CFR § 1508.9). 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 MAM 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 OO TIG determined that the environmental consequences resulting from this MAM 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.

## 6.2 Compliance with Other Environmental Laws and Regulations

There will be no fieldwork as part of this MAM 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 MAM activity. See the table below for the compliance status by statute at the time of this MAIP.

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 for the proposed project.**

| 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 | Complete |
| Rivers and Harbors Act/Clean Water Act | N/A |
| National Environmental Policy Act | Complete, see analysis above. |

# 7.0 References


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