*Deepwater Horizon*

Open Ocean Trustee Implementation Group

# MONITORING AND ADAPTIVE MANAGEMENT ACTIVITY IMPLEMENTATION PLAN:

## EVALUATION FRAMEWORK FOR MARINE MAMMAL AND SEA TURTLE RESTORATION

June 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 BP 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 stressors, 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, studies) developed to address identified MAM priorities.

This MAM Activity Implementation Plan (MAIP) describes the MAM activity, "Evaluation Framework for Marine Mammal and Sea Turtle Restoration" which addresses MAM priorities identified by the Open Ocean TIG for the Marine Mammal and Sea Turtle Restoration Types under its purview. This MAM activity would develop a feasible and cost-effective framework to evaluate the cumulative outcomes of restoration projects for marine mammals and sea turtles in the Open Ocean Restoration Area.

# 2.0 MAM Activity Description

## 2.1 Background

To date, $20M and $23M in restoration funding have been approved by the Open Ocean TIG for the Sea Turtle and Marine Mammal Restoration Types, respectively. It is challenging to measure the impact of these restoration actions at the resource-level and this MAM activity is designed to bridge the gap between evaluating project outputs and the resulting benefits to the resource. This MAM activity would identify performance measures related to restoration actions, stressors, and other influences on the resources to tease out the benefits of Open Ocean TIG restoration. The performance measures will be developed from the existing draft Open Ocean TIG indicators. The activity will develop a repeatable restoration evaluation framework for the Sea Turtle and Marine Mammal Restoration Types, as well as the results of initial application of the framework to assess the outcomes of restoration projects implemented to date. By identifying performance measures relevant to our goals under NRDA (cost efficiency, restoration impact, etc.) and evaluating Open Ocean marine mammal and sea turtle restoration actions against them, the project will contribute to our existing decision-making framework for adaptively managing the Sea Turtle and Marine Mammal Restoration Type portfolios and selecting new projects.

This project would benefit all species and life stages of sea turtles found in the GOM, and will benefit the Open Ocean marine mammal species that were injured and are addressed by Open Ocean TIG restoration activities. For both resources, this will be done by the application of Structured Decision Making (SDM), with expert elicitation techniques embedded in the process to quantify the benefits of OO restoration actions. Martin, et al. (2023) defines SDM or decision analysis, as a formal way of analyzing a problem by breaking the problem into key components: management objectives, management actions, models to project consequences of the management actions, and a monitoring program to evaluate changes. The traditional use of SDM is centered around future or ongoing decision-

making, where the process is used to evaluate alternative scenarios to determine the best course of action. This MAM activity is expected to look a little different from a traditional SDM, and could be considered a modified SDM. The difference is mainly because we are not actively deciding between two or three future paths, rather we are evaluating the effects of various completed and ongoing actions (individually and cumulatively) on our resources. Expert elicitation is the synthesis of opinions from individuals with expertise in a specific subject and is especially useful when there is insufficient empirical data (Slottje et al. 2008; Sutherland and Burgman 2015; Runge et al. 2011; Martin et al. 2017). For sea turtles and marine mammals, we have insufficient data to fully model or analyze the effects of our restoration actions, therefore, this MAM activity will develop a framework for evaluation using SDM techniques and will employ expert elicitation for the parts of the analysis where data is insufficient for modeling or other data analyses. The estimates based on expert elicitation will account for and document uncertainty (Runge et al. 2011; Martin et al. 2017).

This MAM activity will allow us to better report benefits to the public and will contribute to our existing Oil Pollution Act (OPA) Natural Resource Damage Assessment (NRDA) decision-making framework for adaptively managing existing projects and selecting new projects.

This MAM activity was selected by the Open Ocean TIG because the work directly addresses its MAM Strategy goals of evaluating the outcomes of its restoration efforts across the portfolio of projects, identifying gaps that affect the TIG's ability to meet and/or evaluate progress toward restoration goals for Open Ocean resources, and identifying the benefits and outcomes from the TIG's restoration activities at the resource level across the northern Gulf of Mexico (OO TIG 2020). Understanding the impact of existing restoration activities will help inform decisions regarding future restoration activities. The analysis will also inform the prioritization of MAM data collection and monitoring necessary to evaluate the impact of future restoration actions.

The activity also addresses the three MAM priorities identified in the MAM strategy: evaluation of restoration progress, identification of stressors, and assessment of focal resources and important habitats. Furthermore, while the project is evaluating restoration at the resource level, the result of this project will be a restoration evaluation framework, which could be used to inform the Open Ocean ecosystem evaluation process.

## 2.2 Task Descriptions

**Task 1: Development of the Evaluation Framework**

The first task would compile existing data from marine mammal and sea turtle Open Ocean restoration projects, as well as population assessments, trends and abundance information, threat/stressor data, and environmental driver data. A team would be convened to implement a modified SDM process and develop an evaluation framework. This would involve review and discussion of existing Open Ocean TIG Restoration Type objectives, available project level outputs, and appropriate performance measures (criteria used to quantify or assess progress toward each objective). Collectively, this information will be used to develop an "objective hierarchy" (Figure 1) and a set of tables and other tools (Table 1 and Table 2).

Task 1 will be completed concurrently for sea turtles and marine mammals by a small working group, including the USGS SDM team and NOAA/DOI management team. These individuals will represent marine mammal and sea turtle management and technical expertise, from both NOAA and DOI. The DOI

representatives will be specific to the sea turtle restoration type. Sea turtles and marine mammals would be discussed at the same time to create efficiencies in discussing and creating the objective hierarchies, but would likely break out into specific resource groups for portions of this task. We envision that this small working group would be convened for a series of virtual meetings and one in-person workshop where the initial evaluation framework would be developed, including gathering and assembling the necessary components for evaluation.

The initial evaluation framework will likely consist of a set of diagrams, work flows, figures, and spreadsheets outlining the restoration projects and MAM activities that will be included in the evaluation. The intent of this work is to develop a framework that can serve as a blueprint for the initial and future evaluations. The team will summarize and consolidate available project level outputs, and identify ways to represent restoration theme-level outcomes and appropriate resource-level outcomes (Table 1). For example, one restoration theme would include all the sea turtle projects that are working to reduce bycatch across commercial and recreational fisheries. The resource-level outcome would seek to evaluate sea turtle benefits across all theme areas. The purpose of this exercise is to examine the available data that is collectively available from the Open Ocean projects and outside sources, and determine how the available data can be used to evaluate restoration benefits.

This team will identify where data are lacking and where expert elicitation will be most helpful to fill in data gaps. To help illustrate this process, Figure 1, Table 1, and Table 2 provide high-level examples of a set of products that may be developed and refined as part of Task 1. We will rely on the SDM facilitator to guide us through the creation of the most appropriate products. While there may be more than 3 resulting components, we will use the three examples below to walk through the evaluation vision.

**Step 1.**

Table 1 summarizes information about restoration activities, project level outcomes, approach level outcomes, and resource-level outcomes for the sea turtle stranding network enhancement restoration theme for sea turtles. The green column in Table 1 lists activities that have been funded within restoration projects. The blue section characterizes the major project-level data that were produced (all numbers are fictionalized for the sake of illustration), pink shows a potential rating structure for approach-level outcomes, and orange are potential categories and a rating structure for resource-level outcomes. The model represented in Table 1 would be repeated for all sea turtle and marine mammal themes/approaches. Compiling this data across all marine mammal and sea turtle activities will help us with the development of an objective hierarchy described in Step 2. This objective hierarchy will be used to determine performance measures (or criteria) to evaluate the restoration activities.

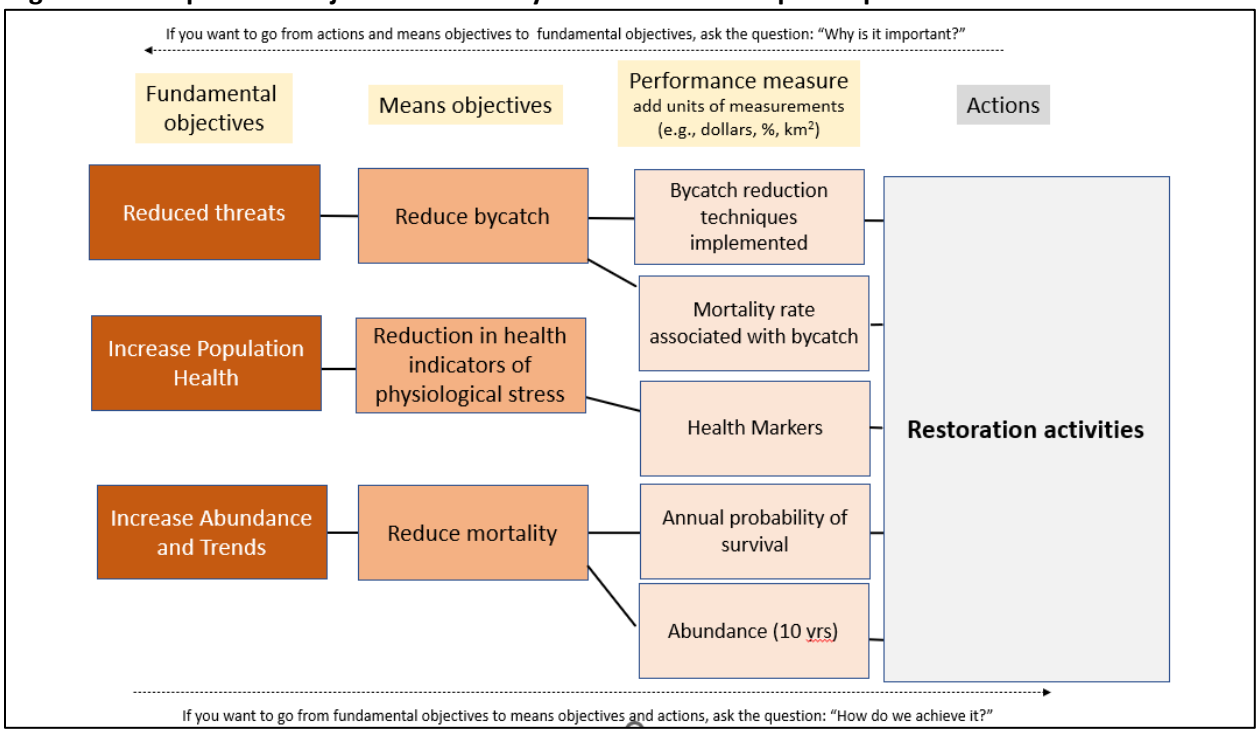
**Table 1 – Example of an output that could be developed as part of the initial framework development.**

| Sea Turtle Stranding Network Enhancements Theme<br><br>Restoration Activities | Project-Level Outputs | | | | | | | | Approach-Level Outcomes | | Resource-Level Outcomes | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of strandings documented | Number of necropsies conducted | Number of staff hired | Miles of beach surveyed | Publications Produced | Live animals transported to rehab | Responder training events | Public Outreach Events | Increased STSSN ability to respond to new strandings (H, M, L) | Improved outcomes for live stranded sea turtles (H, M, L) | Reduced Threats (H,M,L, none) | Increased Abundance (H,M,L, none) | Improved Health population level (H,M,L, none) | Relative Cost (H,M,L, none) | Improved Public Perception of the Value of Sea Turtles (H,M,L, none) | Increased understanding of threats (H,M,L, none) |
| **NO ACTION** | 100 | 50 | 0 | 0 | 0 | 8 | 2 | 2 | L | L | none | none | none | none | none | none |
| Stranding Coordinator Positions - LA, MS, AL | 100 | 50 | 1 | 200 | 0 | 10 | 8 | 2 | H | H | H | H | H | M | M | M |
| Assistant Stranding Coordinator Positions - TX and FL | 100 | 50 | 2 | 200 | 0 | 10 | 8 | 4 | H | H | H | H | H | M | M | L |
| Outreach at TX Inlets | n/a | n/a | n/a | n/a | 0 | n/a | n/a | 5 | H | H | H | H | H | L | L | M |
| STSSN Database Enhancements | n/a | n/a | 1 | n/a | 0 | n/a | 10 | n/a | M | M | M | M | M | H | H | H |
| Analysis of 5-year GOM Stranding Trends | n/a | n/a | n/a | n/a | 1 | n/a | n/a | n/a | L | L | L | L | L | L | L | H |
| Sediment Analysis work | n/a | n/a | n/a | n/a | 1 | n/a | n/a | n/a | M | M | M | M | M | M | M | H |
| Purchase of response equipment | n/a | n/a | n/a | n/a | 0 | n/a | n/a | n/a | H | H | H | H | H | M | M | L |
| Enhanced Mortality Investigation (position and necropsies) | n/a | 100 | n/a | n/a | 5 | n/a | n/a | n/a | L | L | L | L | L | M | M | H |
| Vehicles for stranding response (trucks/ATV/UTV) | n/a | n/a | n/a | n/a | 0 | n/a | n/a | n/a | H | H | H | H | H | L | L | L |

**Step 2.**

Figure 1 provides a basic visualization of the intended process to develop the objective hierarchy. This is a hypothetical objective hierarchy which we have developed as an illustration and that would be used in a traditional SDM process. It may be helpful to envision starting at the right of the hierarchy and moving left, whereas a traditional SDM may start at the left and move right. We know the restoration activities that have been selected for implementation by the OO TIG, so those would be our starting point. We also know what data has been collected from individual projects. By starting with those two data sets, we will lay out the appropriate, consistent, and useful performance measures, which are measurable criteria that will be used to evaluate the restoration activities to assess progress toward restoration objectives. During this process we will determine how the performance measures relate to means objectives and fundamental objectives in consultation with the Open Ocean TIG. The fundamental objectives represent what the decision makers want to achieve ultimately through the restoration activities. The "fundamental objectives" are defined as "the primary or long-term desired outcomes to achieve" (Hemming et al. 2022). The "means objectives" are intermediate objectives which are used as proxies which are more easily measurable than fundamental objectives. For example, in Figure 1, "increase population health" is a fundamental objective that decision makers may care about but is not easily measurable, therefore a "means objective" is used: "health markers linked to physiological stress". The goal will be to determine a method to quantitatively and qualitatively summarize the resource-level benefits from the activities.

**Figure 1. Example of an objectives hierarchy that will be developed as part of the initial framework.**




**Step 3.**

Table 2 provides an example of a summary table that would be developed based on Table 1 and the objective hierarchy (Fig. 1), and would apply across all restoration theme areas. This step would include narrowing in on the performance measures that represent the most important fundamental objectives. In this example, we are looking at potential performance measures for the sea turtle restoration type, including reduction in threats, increased abundance, and improved health, and implementation or maintenance cost of restoration activities. Each restoration theme would be evaluated using common performance measures. Within this step, the management and technical resource participants could assign weights to the various performance measures, allowing for more emphasis to be placed on one metric over another. For example, our restoration team may determine that a measure for reducing threats is more important and therefore would be weighted higher than the cost of a project or public perception.

**Table 2. Example of a final output framework. The basic structure would be laid out and tested during Task 1. The full evaluation and final table, with values would be produced during Task 2.**

| Restoration Actions | Resource-Level Performance Metrics | | | | | | |
|---|---|---|---|---|---|---|---|
| | weight 1 | weight 2 | weight 3 | weight 4 | weight 5 | weight 6 | Cumulative Value for each Restoration Action |
| | Reduced Threats (measurement is TBD) | Increased Abundance | Improved Health population level | Cost | Improved Public Perception of the Value of Sea Turtles | Increased understanding of threats | |
| Status Quo/No Action | | | | | | | |
| Stranding Network | | | | | | | |
| Commercial Bycatch Reduction | | | | | | | |
| Recreational Bycatch Reduction | | | | | | | |
| Vessel Strikes | | | | | | | |
| Total | | | | | | | |

Outputs: Evaluation Framework (i.e. a set of tables, figures, spreadsheets). The initial evaluation framework will include the development of the objective hierarchy (fundamental objectives, means objectives and performance measures) in consultation with the Open Ocean TIG. The framework developed during Task 1 would have placeholder values (or blank space), to be refined and filled in during Task 2. One of the end products will be a R Shiny app that will allow the end user to vary the weights for each objective and observe the effect of these weights on the final evaluation. At the end of Task 1, we anticipate having a prototype of the R Shiny app, which will then be updated, finalized and operationalized during Task 2 and Task 3.

**Task 2. Expert Elicitation and Formal Evaluation**

In Task 2, two working groups (one for marine mammals, one for sea turtles) will work through the evaluation framework developed in Task 1. This will require the use of project data and other data sources, such as species abundance information and fishing effort, to complete a full evaluation of current OO TIG projects. Task 2 will be completed separately for sea turtles and marine mammals, as this portion of the project will focus on resource-specific information and expertise. Each working group will consist of the resource-specific participants in Task 1, plus 4-8 additional technical experts. The working groups will be led by the SDM facilitator.

The SDM facilitator and technical team will work through each portion of the framework one by one, using appropriate tools. This step may involve the use of formal mathematical modeling and data quantification, where data are available. Expert elicitation will be employed, when data are not sufficient for analysis and quantification. The technical experts that participate in Task 2 will be chosen based on their expertise of the resource and/or specific restoration activities, and will serve as the experts for the elicitation process. The SDM facilitator will identify the questions that require expert elicitation, and will determine the best use of this tool.

The purpose and end result of the Task 2 efforts will be an initial evaluation of the benefits of Open Ocean TIG restoration. Future evaluation efforts will build from the Task 2 final evaluation, by adding additional projects and data as they become available.

Outputs: Final Evaluation Framework, including mathematical models and evaluation methods and results of the first evaluation – The evaluation framework would be a user-friendly product developed in Microsoft Excel. The Microsoft Excel spreadsheet will be set up so that the user will be able to add restoration activities and performance measures and vary the weights. This tool will be designed so that it can be maintained and re-used in the future. A more advanced version would be implemented in programming language R to address more complex analyses that explicitly account for uncertainty and risk tolerance of restoration experts. We will also update the R Shiny prototype developed in Task 1 during Task 2.

Report: Task 2 would result in a report to the Open Ocean TIG detailing the SDM and expert elicitation process, and a summary of findings and results.

**Task 3. Analysis of critical uncertainties**

Failing to account for uncertainty can lead to misinformed planning decisions. Therefore, the approach in Task 2 will account for uncertainty, and in Task 3 an analysis of critical uncertainties will be conducted to help restoration staff improve monitoring for the purpose of more informed planning. While the focus of this project is on evaluation of current marine mammal and sea turtle restoration projects and activities, the outputs will help reduce uncertainties for future monitoring efforts, further benefiting the program's monitoring and adaptive management efforts.

This task will identify the key uncertainties in the mathematical models used in the evaluation framework and evaluate whether reducing these uncertainties will affect recommendations for future restoration actions. This task will be completed utilizing a Value of Information (VOI) analysis (either quantitative or qualitative; Runge et al. 2011). Hemming et al. (2022) states a VOI analysis evaluates how much a reduction of uncertainty, prior to making a decision, could improve the expected outcome of the decision. A VOI analysis uses "decision trees and expected value calculations to produce an estimate of the expected benefits (as a probability-weighted average) from improved information" (Gregory et al. 2012). The VOI analysis will allow us to determine whether spending time and resources to reduce a particular source of uncertainty (i.e., data gathering projects) will influence a future decision. This may inform prioritization of MAM data collection and monitoring needed to improve our understanding of the benefits of our restoration actions.

Outputs: VOI analysis and associated documentation on monitoring objectives, strategies, weights and predictions. We will also provide R programming code to implement the VOI analysis. During Task 3, we will update, finalize and operationalize the products developed in Task 1 and 2. This will include the Microsoft Excel spreadsheet being set up so that the user will be able to add restoration activities and performance measures and vary the weights. This tool will be designed so that it can be maintained and re-used in the future. It will also include the R Shiny app.

Final Report: Task 3 will involve a final project report to the Open Ocean TIG.

**Timeline**

The project is anticipated to take 33 months total, with tasks performed consecutively.

| Task Number | Task Description | Approximate Duration (months) |
|---|---|---|
| 1 | Initial Framework Development | 12 |
| 2 | Expert Elicitation and Formal Evaluation | 12 |
| 3 | Analysis of Critical Uncertainties | 9 |

**Budget**

| Open Ocean TIG Evaluation Framework for Marine Mammal and Sea Turtle Restoration | | | |
|---|---|---|---|
| **Category** | **NOAA** | **DOI** | **Total Cost Estimate** |
| Project Management Team | $359,760 | $48,870 | $408,630 |
| Implementation | | | |
| - SDM Facilitation and analysis | $0 | $1,056,503 | $1,056,503 |
| - MM and ST Technical Expertise (Task 1) | $22,500 | $15,000 | $37,500 |
| - MM and ST Technical Expertise (Task 2) | $148,500 | $89,833 | $238,333 |
| Trustee Oversight | $140,400 | $20,000 | $160,400 |
| **Total Cost Without Contingency** | **$671,160** | **$1,230,206** | **$1,901,366** |
| *Contingency (10%)* | *$95,068* | *$95,068* | *$190,136* |
| **TOTAL ESTIMATED COST** | $766,228 | $1,325,274 | **$2,091,502** |

## 3.0 Roles and Responsibilities

NOAA and DOI will collaborate on this project. Both Trustees will be responsible for coordinating with the OO TIG and providing overall direction and oversight for this MAM activity, including administration of any contracts or cooperative agreements, completing compliance requirements, financial tracking, annual reporting, and DIVER data management. For each Restoration Type, we have outlined the general participants required.

- The sea turtle project/component will be managed by a joint NOAA and DOI management team, along with the DOI SDM team (including a facilitator and decision analyst), and will require input from a team of 6-10 technical sea turtle experts.
- The marine mammal project/component will be managed by a NOAA management team, along with the DOI SDM team (including a facilitator and decision analyst), and will require input from a team of 6-10 technical marine mammal experts.

# 4.0 Data Management and Reporting

The DWH Trustees, as stewards of public resources under OPA, will inform the public on the MAM activity's progress and performance. Therefore, NOAA and 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 MAM activity, including the evaluation framework and associated tables, 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).

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 submitted annually, and a final project report will be released within six months 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 that overlap with stressors, this work will facilitate the ecosystem approach to restoration identified in the PDARP/PEIS (DWH NRDA Trustees 2016, Chapter 3). The specific stressors 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 stressors 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/PEIS 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 stressors 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 Open Ocean 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 Open Ocean 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 | In Progress |
| Rivers and Harbors Act/Clean Water Act | N/A |
| National Environmental Policy Act | Complete, see analysis above. |

# 7.0 References

Brenner, J., C. Voight, and D. Mehlman. 2016. Migratory Species in the Gulf of Mexico Large Marine Ecosystem: Pathways, Threats and Conservation. The Nature Conservancy, Arlington, 93 pp.

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