Open Ocean Trustee Implementation Group

Monitoring and Adaptive Management Strategy

April 2019

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Acronyms

DIVER	Data Integration, Visualization, Exploration, and Reporting
DWH	*Deepwater Horizon*
MAM	Monitoring and Adaptive Management
MAM Manual	Monitoring and Adaptive Management Procedures and Guidelines Manual
NEPA	National Environmental Policy Act
NRDA	Natural Resource Damage Assessment
PDARP	Programmatic Damage Assessment and Restoration Plan
PEIS	Programmatic Environmental Impact Statement
RESTORE	Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States
SOP	Standard Operating Procedure
TIG	Trustee Implementation Group

Key Terms and Definitions

This document describes Monitoring and Adaptive Management (MAM)-related processes, procedures, and guidelines that are relevant to the Open Ocean *Deepwater Horizon* (DWH) oil spill Natural Resource Damage Assessment (NRDA) restoration effort. To provide clarity and avoid confusion, definitions are provided below for key terms that are used throughout the document. Where possible, these definitions were drawn from the DWH NRDA Trustees' MAM Procedures and Guidelines Manual (MAM Manual; DWH NRDA Trustees, 2017) and/or the Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS; DWH NRDA Trustees, 2016a).

Cross-TIG MAM work group – The Cross-Trustee Implementation Group (TIG) MAM work group was established by the Trustee Council to serve as a forum for the TIGs to collectively address MAM topics relevant to multiple TIGs. The Cross-TIG MAM work group has no independent authority to act except when directed by the Trustee Council. See the Trustee Council's Standard Operating Procedures for more information (DWH NRDA Trustees, 2016b).

Implementing Trustee – The Implementing Trustee is the Trustee Agency designated by the TIG that is responsible for carrying out a specific restoration project or MAM activity.

MAM activities – MAM activities are actions taken (e.g., monitoring, modeling, data collection, targeted investigations) to reduce uncertainty or otherwise fulfill MAM needs and priorities. MAM activities may be funded using either Restoration Type or MAM allocation, as appropriate. The Open Ocean TIG may allocate MAM funds for MAM-related operational activities of the TIG.

MAM Activities Implementation Plan – A MAM Activities Implementation Plan is a document that details the actions to be taken to obtain information identified as MAM priorities.

MAM framework – The MAM framework is the iterative process the Trustees outlined in Chapter 5 of the PDARP/PEIS (DWH NRDA Trustees, 2016a) to measure the effectiveness of restoration and support restoration decision-making. The steps of this iterative process are described in Section 2.1 of this document.

MAM Manual – The MAM Manual is a document developed by the Cross-TIG MAM work group that presents details on MAM procedures and guidelines applicable to all TIGs.

MAM needs – MAM needs are knowledge gaps or information needs that, if addressed, may help the Trustees successfully plan, implement, and evaluate Gulf restoration. MAM needs may be identified at any scale or at any time, including at a project concept or restoration-technique level, a single Restoration Area or multiple Restoration Areas, a single Restoration Type or multiple Restoration Types ("cross-resource"), and/or at the ecosystem level.

MAM priorities – MAM priorities are the subset of knowledge gaps or information needs identified by the Open Ocean TIG for near-term action. MAM priorities may be identified at any scale or at any time, including at a project concept or restoration-technique level, a single Restoration Area or multiple Restoration Areas, a single Restoration Type or multiple Restoration Types ("cross-resource"), and/or at the ecosystem level.

Open Ocean Restoration Area – The Open Ocean Restoration Area includes all geographic areas where restoration projects may be implemented to restore Open Ocean resources, including restoring these species throughout their life stages and geographic ranges.

Open Ocean Trustee Implementation Group – The Open Ocean TIG is comprised of four federal Trustees that are responsible for planning, implementing, and evaluating restoration for Open Ocean Restoration Types. These federal Trustees include the National Oceanic and Atmospheric Administration, the U.S. Department of the Interior, the U.S. Department of Agriculture, and the U.S. Environmental Protection Agency.

Project MAM Plan – A Project MAM Plan is a project-specific plan developed by the Implementing Trustee(s) that outlines MAM for a specific restoration project. Project MAM Plans are designed to evaluate the effectiveness of the proposed restoration projects in meeting the restoration objectives and to assist, where feasible, in determining the need for adaptive management, including corrective actions.

Restoration Areas – Restoration Areas are geographic areas identified in the Consent Decree[1] for the 2016 DWH oil spill settlement to which the NRDA funding is allocated. There are seven Restoration Areas, including each of the five Gulf States, Region-wide, and Open Ocean (Sections 5.10.2 and 7.2 of PDARP/PEIS; DWH NRDA Trustees, 2016a). An eighth Restoration Area focused on Unknown Conditions and Adaptive Management will be established by the Trustees 10–15 years following the 2016 settlement (Sections 5.10.2 and 7.2 of PDARP/PEIS; DWH NRDA Trustees, 2016a).

Restoration Types – Restoration Types are the broad restoration categories the Trustees identified pertaining to the programmatic goals described in the PDARP/PEIS (DWH NRDA Trustees, 2016a). Within the Open Ocean Restoration Area, the Trustees identified six Restoration Types, including Fish and Water Column Invertebrates, Sturgeon, Sea Turtles, Marine Mammals, Birds, and Mesophotic and Deep Benthic Communities (Chapter 5 of PDARP/PEIS; DWH NRDA Trustees, 2016a).

Trustee Implementation Groups – TIGs are the decision-making bodies the Trustees established for the purposes of planning, administering, implementing, and evaluating restoration within their Restoration Area. There are currently seven active TIGs, one for each Restoration Area, as follows: Alabama, Florida, Louisiana, Mississippi, Texas, Region-wide, and Open Ocean. An eighth TIG, the Unknown Conditions and Adaptive Management TIG, will be established by the Trustees 10–15 years following the 2016 settlement.

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1. On April 4, 2016, a federal court in New Orleans entered a Consent Decree in matters related to the DWH oil spill*: United States v. BPXP et al., Civ. No. 10-4536, centralized in MDL 2179, In re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010 (E.D. La.)*. This Consent Decree resolved civil claims against BP arising from the April 20, 2010 Macondo well blowout and oil spill in the Gulf of Mexico. For more information, see: https://www.justice.gov/enrd/deepwater-horizon.

1 Introduction

1.1 Background

The *Deepwater Horizon* (DWH) oil spill settlement in 2016 provides the Natural Resource Damage Assessment (NRDA) Trustees (the Trustees) up to $8.8 billion to restore natural resources and services injured by the spill. The funds will be distributed over 15 years. 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, 2016a), the Trustees selected a comprehensive, integrated ecosystem approach to restoration.

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. Therefore, the Trustees committed to conduct monitoring and scientific support activities within an adaptive management framework (Appendix 5.E of the PDARP/PEIS; DWH NRDA Trustees, 2016a). This framework will allow the Trustees to evaluate restoration effectiveness, address potential uncertainties related to restoration planning and implementation, and provide feedback to inform future restoration decisions.

The Trustee's Standard Operating Procedures (SOP) and MAM Procedures and Guidelines Manual (the MAM Manual) provides guidance to the Trustees regarding the implementation of MAM for the DWH oil spill restoration effort (DWH NRDA Trustees, 2016b, 2017). Version 1.0 of the MAM Manual is focused on MAM at the project level, and subsequent versions will include more information on MAM at the Restoration Type and programmatic levels. Building off of the MAM Manual, this document focuses on the development of a strategy for implementing MAM specifically for the Open Ocean Trustee Implementation Group (TIG; the "Open Ocean TIG MAM Strategy"). Consistent with the PDARP/PEIS and SOP, the TIG is responsible for identifying MAM needs and priorities for its Restoration Area (Section 7.5.1.2 of the PDARP/PEIS, DWH NRDA Trustees, 2016a; Section 10.4.1.2(a) of SOP, DWH NRDA Trustees, 2016b).

1.2 Open Ocean TIG

The Consent Decree[2] for the 2016 DWH oil spill settlement allocated funds for NRDA restoration by Restoration Type and Restoration Area. The Trustees also established a governance structure

2. On April 4, 2016, a federal court in New Orleans entered a Consent Decree in matters related to the DWH oil spill: *United States v. BPXP et al., Civ. No. 10-4536, centralized in MDL 2179, In re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010 (E.D. La.)*. This Consent Decree resolved civil claims against BP arising from the April 20, 2010 Macondo well blowout and oil spill in the Gulf of Mexico. For more information, see: https://www.justice.gov/enrd/deepwater-horizon.

that assigned a 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 (DWH NRDA Trustees, 2016a) and is also responsible for identifying MAM priorities for its respective TIG (DWH NRDA Trustees, 2016b).

The Open Ocean Restoration Area has restoration funds allocated to six Restoration Types: Fish and Water Column Invertebrates, Sturgeon, Sea Turtles, Marine Mammals, Birds, and Mesophotic and Deep Benthic Communities (Figure 1). Additional funds were also allocated for MAM, Administrative Oversight and Comprehensive Planning, and Early Restoration Recreational Opportunities on Federal Lands (Figure 1). The Open Ocean TIG will address restoration for the species throughout their life history stages and geographic ranges, potentially undertaking restoration activity in offshore, coastal, and inland areas; and in some cases outside of the Gulf of Mexico (if/as restoration needs require). The Trustees for the Open Ocean Restoration Area are the National Oceanic and Atmospheric Administration, the U.S. Department of the Interior, the U.S. Department of Agriculture, and the U.S. Environmental Protection Agency.

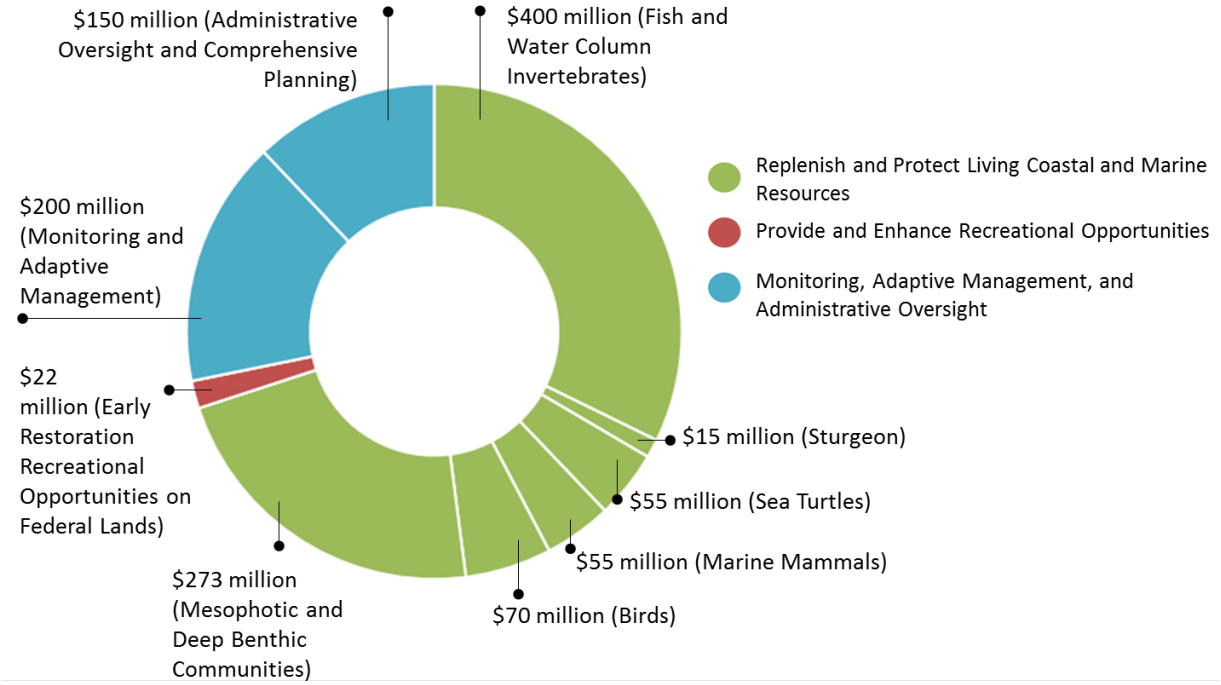

Figure 1. The allocation of Open Ocean restoration funds by programmatic goal and Restoration Type.

1.3 Purpose of the Open Ocean TIG MAM Strategy

The purpose of this document is to articulate an agile and responsive approach to MAM for the Open Ocean TIG to promote effective and efficient restoration of Open Ocean resources. Specific objectives for this document include (1) developing processes for the Open Ocean TIG to implement MAM, including the identification and prioritization of MAM needs and the development, selection, and approval of MAM activities; (2) facilitating collaboration and

coordination among TIGs and with science and other restoration programs; and (3) providing information to support public participation in Open Ocean restoration planning. These processes apply to implementing MAM under the MAM allocation (Figure 1). However, there may be circumstances when these processes will apply to implementing MAM using the Restoration Type allocations consistent with the PDARP/PEIS (DWH NRDA Trustees, 2016a).

The Open Ocean TIG anticipates releasing the Open Ocean TIG MAM Strategy in stages. This document is focused on describing the Open Ocean TIG's MAM-related planning processes, including those that identify MAM priorities and related MAM activities. Future updates to the MAM Strategy will identify the Open Ocean TIG's MAM priorities that emerge from the implementation of processes described in this document. The Open Ocean TIG MAM Strategy will be a living document and updated over time as the TIG evaluates its MAM priorities through adaptive management.

1.4 Contents

This Open Ocean TIG MAM Strategy includes information on the Open Ocean TIG's approach to MAM. The document is organized as follows:

- Section 1, this section, provides an introduction to the document and describes its purpose
- Section 2 provides an overview of MAM for the DWH oil spill NRDA, including the MAM framework and roles and responsibilities
- Section 3 articulates the goals for the DWH oil spill NRDA Open Ocean restoration effort and Open Ocean MAM more specifically
- Section 4 describes the process that will be used to identify and prioritize Open Ocean MAM needs at the Restoration Type, cross-resource, and ecosystem levels
- Section 5 describes the process through which specific MAM activities will be developed and released to address MAM priorities
- Section 6 describes Open Ocean TIG's MAM coordination with other TIGs, as well as science programs and other restoration programs
- Section 7 describes key next steps in the revision of this document.

2 DWH NRDA MAM Overview

2.1 MAM Overview

As noted by the Trustees in the PDARP/PEIS, the unprecedented temporal, spatial, and funding scales associated with the DWH oil spill NRDA restoration effort warrant a robust MAM framework to support restoration decisions (DWH NRDA Trustees, 2016a). To increase the likelihood of successful restoration, the Trustees committed to monitor and evaluate restoration outcomes, which can provide feedback to inform decision-making for current projects and refine the

Adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al., 1997; Williams, 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC, 2004).

selection, design, and implementation of future restoration actions (DWH NRDA Trustees, 2016a).

The Trustees presented a general MAM framework in the PDARP/PEIS to guide restoration efforts, as illustrated in Figure 2. The steps of this iterative process include restoration planning (including the development of MAM plans for restoration projects), implementation of the initial restoration plan, monitoring of restoration actions, evaluation of restoration effectiveness, feedback of information to restoration planning and implementation, refinements to restoration implementation, and reporting on progress toward meeting restoration goals and objectives. This MAM framework may be more robust for some elements of the restoration effort with higher degrees of uncertainty, or where large amounts of restoration are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees, 2016a). Importantly, this adaptive management feedback loop provides the Trustees with the opportunity to adjust restoration actions, as needed, based on monitoring and evaluation of restoration outcomes (Williams et al., 2009; Williams, 2011). Once a project is completed, data obtained can be used to inform the next set of restoration project decisions.

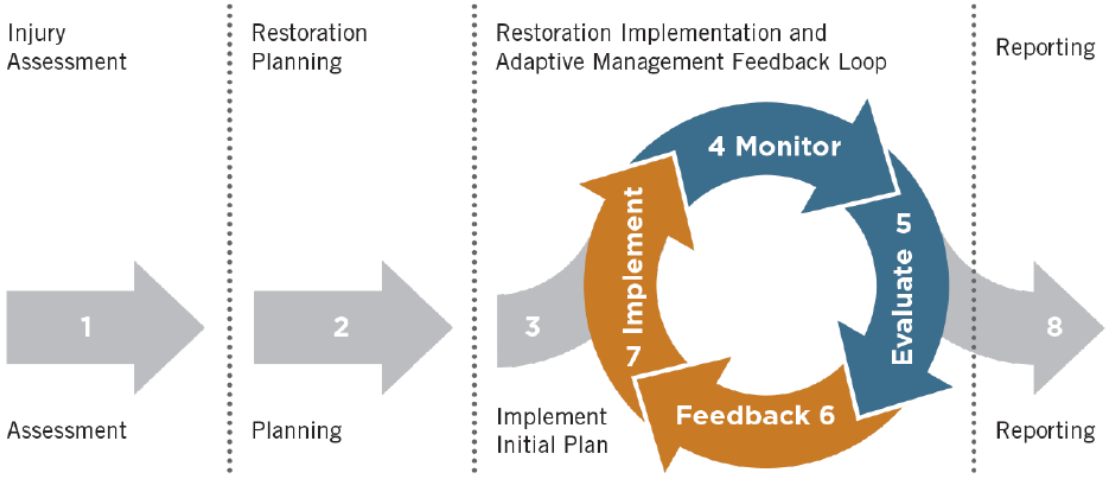

Figure 2. The MAM framework presented by the Trustees in the PDARP/PEIS.

MAM may be applied at multiple scales, including project, Restoration Type, and programmatic levels (Appendix 5.E.3 of PDARP/PEIS; DWH NRDA Trustees, 2016a). Project-level MAM includes the monitoring and scientific support needed for planning, implementing, and evaluating individual restoration projects. Restoration Type MAM includes the monitoring and scientific support needed to inform planning and implementation at the resource level and to evaluate the collective benefits provided to a resource across projects. Programmatic MAM includes any monitoring and scientific support more broadly needed to support restoration and evaluate benefits for multiple injured resources.

2.2 TIG Responsibilities for MAM

As outlined in the Trustee Council's SOP for the implementation of natural resource restoration for the DWH oil spill, TIGs are responsible for addressing MAM objectives that pertain to their

restoration activities and for communicating information to the Trustee Council or Cross-TIG MAM work group (Section 10.3.2 of SOP; DWH NRDA Trustees, 2016b). Each TIG will address the following MAM responsibilities, as appropriate to its restoration activities:

- Review and approve Project MAM Plans for compatibility with the Trustee Council's SOP and MAM Manual for compliance with regulatory requirements, and determine the MAM Plans' readiness for inclusion in restoration plans (Sections 2.3.4 and 10.3.2 of SOP; DWH NRDA Trustees, 2016b)
- Identify MAM priorities for the TIG's Restoration Area and communicate priorities to the Cross-TIG MAM work group (Sections 2.3.4 and 10.3.2 of SOP; DWH NRDA Trustees, 2016b)
- Ensure project monitoring data, monitoring reports, and other monitoring information are compatible with the MAM Manual and are submitted to the Restoration Portal (Sections 2.3.4 and 10.3.2 of SOP; DWH NRDA Trustees, 2016b)
- Provide TIG-related aggregated and quality-controlled MAM data, information, and evaluations to the Trustee Council and Implementing Trustee(s) (Sections 2.3.4 and 10.3.2 of SOP; DWH NRDA Trustees, 2016b)
- Provide the Trustee Council an annual status update of project monitoring information and data (Section 10.3.2 of SOP; DWH NRDA Trustees, 2016b).

2.3 Uses of Open Ocean MAM Allocation

The Open Ocean TIG has been allocated $200 million for the purposes of conducting MAM activities in support of restoration of Open Ocean resources. Consistent with the Trustee Council's SOP (Section 10.5.1(b) of SOP; DWH NRDA Trustees, 2016b), MAM activities that may be funded by the Open Ocean MAM allocation include, but are not limited to, the following:

1. Performing cross-resource science and monitoring activities
2. Evaluating regional restoration outcomes (beyond individual project footprints) within the Open Ocean TIG's Restoration Area
3. Performing programmatic or operational MAM activities such as data aggregation, summary, and synthesis; report development; and data management activities
4. Resolving critical information gaps/uncertainties for restoration planning and informing restoration decision-making
5. Supplementing Restoration Type monitoring activities, where needed
6. Responsively re-examining Open Ocean TIG MAM priorities following a disturbance (e.g., a hurricane, oil spill)
7. Performing monitoring to inform the design and implementation of future restoration projects, including better characterization of ecological function.

The Open Ocean TIG will emphasize activities 1–3 above as these most directly contribute to the evaluation of the Open Ocean restoration effort, but will maintain the flexibility to conduct any of the above activities. The Trustee Council SOP also authorizes the use of Restoration Type funds for some of these activities (Section 10.5.2(b)(4) of SOP; DWH NRDA Trustees, 2016b).

3 Open Ocean TIG MAM

3.1 Restoration of Open Ocean Resources

As part of the DWH NRDA, the Open Ocean TIG is addressing restoration for fish and water column invertebrates, sea turtles, marine mammals, birds, sturgeon, and mesophotic and deep benthic communities. This effort includes addressing species throughout their life stages and geographic ranges, including inland, coastal, and offshore areas. Because many of these species spend part of their lives in the Gulf of Mexico but also migrate to other places – as far away as Mexico and the Mediterranean Sea – some funds may be used for restoration outside of the Gulf of Mexico. Open Ocean restoration, in conjunction with the restoration efforts of the other TIGs, is intended to accomplish the Trustee's goal of comprehensive integrated ecosystem restoration.

3.2 Goals of Open Ocean MAM

In the PDARP/PEIS, the Trustees committed to conduct monitoring and scientific support in an adaptive management framework to evaluate restoration effectiveness, address uncertainties related to the planning and implementation of projects and portfolios of projects, and provide feedback to inform future restoration decisions (DWH NRDA Trustees, 2016a). Aligned with the MAM framework, the Open Ocean TIG has the following goals for MAM:

- Evaluate the outcomes of the Open Ocean restoration effort across the portfolio of Open Ocean projects, including evaluating benefits to Restoration Types as well as across Restoration Types (i.e., cross-resource).
- Identify and fill data gaps that affect the Open Ocean TIG's ability to meet and/or evaluate progress toward restoration goals for Open Ocean resources. The Open Ocean TIG would coordinate efforts to meet this goal with the other TIGs and the Cross-TIG MAM work group to achieve effective and efficient use of MAM resources.
- Identify the benefits and outcomes from Open Ocean restoration activities to resource, cross-resource, and ecosystem restoration across the northern Gulf of Mexico.

4 Process for Identification and Prioritization of MAM Needs

The Trustee Council SOP recommends that TIGs identify MAM priorities for the use of their designated MAM funds (Section 10.4.1.2 of SOP; DWH NRDA Trustees, 2016b). MAM priorities refer to key knowledge gaps or information needs relevant to planning, implementing, and/or evaluating restoration that would help the Trustees achieve the restoration goals established in the PDARP/PEIS (DWH NRDA Trustees, 2017). MAM priorities can represent information gaps that are relevant to different spatial and temporal scales. For example, MAM priorities may apply to project concepts or restoration techniques, an individual Restoration Area or multiple Restoration Areas, an individual Restoration Type or multiple Restoration Types, and/or at the ecosystem level. These knowledge gaps or information needs can change over time, and will be evaluated periodically.

Below, information is presented on how the Open Ocean TIG will (1) identify MAM needs, (2) prioritize MAM needs (becoming MAM priorities), and (3) share MAM priorities with the public.

4.1 Identification of MAM Needs

Consistent with the Trustee Council SOP, the Open Ocean TIG will develop MAM priorities for its Restoration Area. To accomplish this, the Open Ocean TIG will first identify MAM needs for each of its Restoration Types, as well as consider MAM needs across multiple Restoration Types (cross-resource) and at the ecosystem level. While the Restoration Type MAM needs will likely address information needed to support successful planning, implementation, and evaluation of DWH restoration, MAM needs at the cross-resource and ecosystem levels will be focused on information needed to evaluate progress toward meeting the programmatic goals and achieving comprehensive integrated ecosystem restoration.

To support the development of MAM needs, the Open Ocean TIG may do one or more of the following:

- Consult with subject matter experts and/or stakeholders
- Conduct targeted outreach and engagement with other restoration or science programs
- Hold workshops or webinars to gain input from resource experts, stakeholders, and/or the public
- Review existing management plans and science gap analyses
- Review existing or TIG-developed conceptual models, such as influence diagrams and logic models.

The Open Ocean TIG will review the MAM needs identified at the Restoration Type, cross-resource, and ecosystem levels to identify potential efficiencies in addressing multiple MAM needs together and avoid duplication of effort.

4.2 Prioritization of MAM Needs

Once identified, the Open Ocean TIG will prioritize MAM needs. The overarching consideration for prioritizing MAM needs will be their importance to achieving the restoration goals established in the PDARP/PEIS, including evaluation of restoration success. Therefore, the Open Ocean TIG will prioritize MAM needs based on the following criteria (in no particular order):

- Relevance to Open Ocean resources and the Open Ocean ecosystem
- Importance for restoration planning and implementation
- Importance for programmatic evaluation
- Importance for multiple Restoration Types
- Importance at the ecosystem level
- Feasibility of obtaining data of sufficient quality and timeliness to meet objectives
- Urgency of the MAM need
- Likelihood of success in meeting the MAM need.

Following prioritization, the Open Ocean TIG will finalize its list of MAM priorities. These MAM priorities will be evaluated and updated periodically as needed.

5 Process for Development and Release of MAM Activities to Address MAM Priorities

5.1 Development of MAM Activities

The Open Ocean TIG will identify and develop MAM activities to address MAM priorities, and evaluate the extent to which potential activities would address these priorities. MAM activities may include, but are not limited to, monitoring, modeling, data collection, and/or targeted investigations (DWH NRDA Trustees, 2017). While MAM activities can be funded to address MAM priorities through the TIGs, it is also possible that activities addressing MAM priorities may be supported by other programs or funding mechanisms (e.g., projects funded by other science or restoration programs).

To support the development of the MAM activities, the Open Ocean TIG may do one or more of the following:

- Hold workshops or webinars to gain additional expert, stakeholder, and/or public input on MAM activities
- Refine ideas and/or develop new activities, as needed, to specifically address MAM priorities
- Review activity ideas submitted to the DWH NRDA project portal (https://www.gulfspillrestoration.noaa.gov/restoration/give-us-your-ideas/view-submitted-projects) and, as needed, request additional ideas to be submitted to the project portal for specific Open Ocean TIG MAM priorities.

Factors the Open Ocean TIG may consider when evaluating MAM activities include, but are not limited to, whether the activities:

- Address one or more Open Ocean MAM priorities
- Involve one or more Open Ocean Restoration Types
- Address MAM priorities at the ecosystem level
- Inform multiple restoration decisions or evaluations of restoration progress
- Address MAM priorities across life stages and geographic ranges
- Provide data in a timely manner to make restoration planning or evaluation decisions
- Take advantage of existing monitoring or evaluation efforts from other TIGs, or Gulf restoration or monitoring programs
- Do not duplicate existing efforts
- Are technically sound
- Are cost-effective.

Based on this evaluation, the Open Ocean TIG will approve MAM activities for funding. This approval process will be based on the timing and urgency of MAM needs. This will allow the Open Ocean TIG to maintain agility in obtaining MAM information when needed.

5.2 Methods for Releasing MAM Activities

Once the Open Ocean TIG has selected MAM activities, information on the approved activities will be released to the public. The types of information to be provided will include, as appropriate, a description of the MAM activity (e.g., objectives, tasks, methods, anticipated information to be acquired, timeline, and summary budget information), an overview of the approach to data management and reporting, any environmental compliance considerations, and other relevant information. This information may be released to the public through a variety of mechanisms, such as:

1. A MAM Activities Implementation Plan
2. A draft restoration plan.

In determining which mechanism is more appropriate, the Open Ocean TIG may consider a number of factors including, but not limited to, whether the MAM activities:

- Are consistent with Restoration Type goals described in the PDARP/PEIS
- Address monitoring and information gaps identified in the PDARP/PEIS and/or priorities identified in future versions of the Open Ocean TIG MAM Strategy
- Are related to specific project(s) included in a restoration plan
- Are covered under existing National Environmental Policy Act (NEPA) analysis
- Require new/additional NEPA analysis.

As appropriate, the Open Ocean TIG may release draft documents with MAM-related information (e.g., a component of a draft restoration plan) and consider public comments when developing the final TIG document.

5.3 Informing the Public about MAM Activity Progress

The Open Ocean TIG will inform the public about MAM activities being implemented. Potential methods of communication include, but are not limited to:

- Providing updates at the Trustee Council annual meeting
- Providing updates during the Open Ocean TIG annual meeting
- Providing project information in the Data Integration, Visualization, Exploration, and Reporting (DIVER) platform
- Providing updates in the Trustee Council annual report
- Highlighting accomplishments in a webstory and/or e-mail blast (e.g., when a MAM activity is approved)
- Posting MAM-related documents (e.g., MAM Activities Implementation Plan, restoration plans) to the Gulf Spill Restoration website (https://www.gulfspillrestoration.noaa.gov/) and Administrative Record (https://www.doi.gov/deepwaterhorizon/adminrecord).

6 Coordination on MAM Needs with Other Restoration Programs

6.1 Coordination with Other TIGs

Many Open Ocean Restoration Types are shared with other TIGs. In addition, MAM efforts are being coordinated by each TIG as well as across TIGs by the Trustees and through the Cross-TIG MAM work group. Thus, the Open Ocean TIG will coordinate with the other TIGs and the Cross-TIG MAM work group on MAM needs and activities as applicable. This may include coordinating on:

- Monitoring efforts for Open Ocean Restoration Types that cross TIG boundaries
- Opportunities to fill data gaps for shared Restoration Types that would improve the Trustees' collective efforts to prioritize restoration and evaluate progress toward restoration goals
- Monitoring and other activities to support the identification of outcomes from Open Ocean TIG restoration projects that contribute to resource, cross-resource, and ecosystem benefits across Restoration Areas
- Monitoring and other activities to support the identification of outcomes of other TIG projects that affect Open Ocean resources.

6.2 Coordination with Science Programs and Other Restoration Programs

As the Trustees noted in the PDARP/PEIS, the DWH NRDA restoration effort is being conducted within a matrix of other restoration and science efforts and programs across the Gulf of Mexico, both originating from and unrelated to the DWH incident (Appendix 5.E of PDARP/PEIS; DWH NRDA Trustees, 2016a). In addition, many relevant science and other technical datasets, research results, models, and decision support tools are available to support restoration planning, implementation, and/or evaluation. Recognizing this, the Trustees committed to leverage existing work, when possible, to address priority uncertainties and conduct monitoring and scientific support activities efficiently (Appendix 5.E of PDARP/PEIS; DWH NRDA Trustees, 2016a). The Trustees are also committed to maintain coordination with the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States (RESTORE) Council and other appropriate programs and/or partners in the Gulf of Mexico (e.g., National Oceanic and Atmospheric Administration's RESTORE Science Program, RESTORE Centers of Excellence, National Academies of Sciences' Gulf Research Program) throughout the restoration process in order to identify synergies across programs and ensure efficiencies are realized (Appendix 5.E of PDARP/PEIS; DWH NRDA Trustees, 2016a).

Consistent with the PDARP/PEIS, the Open Ocean TIG will coordinate with other restoration and science efforts and programs that could include, but are not limited to:

- Communicating Open Ocean MAM priorities and identified critical information gaps to applicable science programs
- Engaging with other restoration programs participating in research, restoration, and/or management of Open Ocean resources to determine whether they are collecting or plan to conduct activities that may meet Open Ocean MAM needs or priorities

- Exploring opportunities to coordinate or partner with existing programs to obtain data needed to support restoration of Open Ocean resources and/or evaluation of Open Ocean restoration.

The Open Ocean TIG also recognizes that the best available science for planning restoration activities will evolve as the amount of information from the DWH NRDA restoration effort, as well as other science, monitoring, and restoration programs in the Gulf of Mexico, continues to grow. Thus, the Open Ocean TIG will seek to leverage newly available science in the identification of MAM priorities and activities. The Open Ocean TIG may engage with subject matter experts for specific Restoration Types, as well as for cross-resource and ecosystem level issues as appropriate, to obtain relevant information regarding MAM priorities or activities. This could include coordinating with subject matter experts to:

- Help identify MAM needs and provide input on Open Ocean MAM priorities
- Provide technical input on potential MAM activities
- Provide input on the best approaches for collecting data to address MAM priorities.

7 Next Steps

The Open Ocean TIG will develop MAM priorities at the Restoration Type, cross-resource, and ecosystem levels and update the MAM Strategy. The Open Ocean TIG anticipates updating the MAM strategy with identified MAM priorities in fall 2019.

The Open Ocean TIG MAM Strategy is a living document that may be updated periodically as the TIG evaluates its MAM priorities. The version history will be clearly identified (Table 1).

Table 1. Version history of the Open Ocean TIG MAM Strategy.

Version	Date
Version 1	April 2019

References

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