Mesophotic and Deep Benthic Communities Restoration Type

Open Ocean Restoration Area

Mesophotic and deep benthic communities (MDBC) are vast and complex ecosystems on the ocean floor that are a foundation of Gulf of Mexico food webs. More than 770 square miles of deep-sea habitat and 4 square miles of mesophotic habitat were injured by the *Deepwater Horizon* (DWH) oil spill.

Draft Open Ocean Restoration Plan 2 focuses on the following MDBC restoration approaches, as well as robust resource-level monitoring and adaptive management to address critical uncertainties identified in the DWH Oil Spill Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement:

- Protect and manage MDBC.
- Place hard-ground substrate and transplant coral.

Implementation of all the proposed projects would include an initial one to two year planning and design stage, followed by a five-year field and lab-based implementation stage, and one year for final evaluation and reporting. An important aspect of the planning and design stage would be to ensure transparency in decision-making and effective approaches for stakeholder engagement, public input, and sharing data and project results over time.

MDBC Restoration Goals

- Restore mesophotic and deep benthic invertebrate and fish abundance and biomass for injured species, focusing on high-density mesophotic and deep-water coral sites and other priority hard-ground areas to provide a continuum of healthy habitats from the coast to offshore.
- Actively manage valuable MDBC to protect against multiple threats and provide a framework for monitoring, education, and outreach.
- Improve understanding of MDBC to inform better management and ensure resiliency.

The Open Ocean Trustee Implementation Group is seeking public comments on the Draft Open Ocean Restoration Plan 2 and Environmental Assessment. For more information, please visit https://www.gulfspillrestoration.noaa.gov/restoration-areas/open-ocean. You can submit your comments online via the comment portal at https://parkplanning.nps.gov/OOTIGRP2 or by U.S. mail to U.S. Fish and Wildlife Service, P.O. Box 29649, Atlanta, GA 30345.

Mesophotic and Deep Benthic Communities Restoration Type Proposed Projects

PROJECT NAME	PROJECT DESCRIPTION	EST. COST AND TIMEFRAME
REPLENISH AND PROTECT LIVING COASTAL AND MARINE RESOURCES		
Mapping, Ground-Truthing, and Predictive Habitat Modeling	The abundance and distribution of MDBC across the Gulf of Mexico are not completely known, particularly in deeper waters, presenting a challenge to decision-making for restoration, management, and protection. This project would conduct high- resolution mapping efforts in both mesophotic and deep benthic habitats and use this information to refine predictive models to improve the effectiveness and cost efficiency of future restoration and mapping efforts. This project would also analyze the abundance and distribution of these communities, as well as provide data on depth ranges, densities, and distributions of specific coral species. The data collected in this project would provide fundamental information to support MDBC protection and management activities.	$35,909,000 7-8 Years
Habitat Assessment and Evaluation	The life histories, diversity, and population structures of MDBC species in the Gulf of Mexico are not well understood. The goal of this project is to fill those data gaps, determine baseline conditions, and characterize key community conditions at both injured and reference sites. This project would involve strategically designed field surveys, with subsequent laboratory-based analyses of MDBC. The surveys would support analyses of habitats and determinations of ages, growth rates, and reproductive potential of mesophotic and deepwater corals, as well as their health and condition. In addition, the project would maximize the effectiveness of MDBC restoration and protection efforts through the use of population genetic analysis methods. The proposed project results would fill critical gaps in our understanding of the biology, ecology, health, biodiversity, recovery, and resilience of mesophotic and deep sea habitats (corals and soft sediments) and would support and inform restoration planning and implementation for MDBC.	$52,639,000 7-8 Years
Coral Propagation Technique Development	The most direct approach to restoring MDBC is to facilitate the growth of new corals of the same species as those damaged by the DWH oil spill. The objective of this pilot project is to develop techniques that can be used for direct restoration of MDBC at a scale that is meaningful relative to the injury to these communities. The project proposes both field and lab work to test a variety of methods and substrates to enhance coral recruitment and growth, and to test a variety of coral propagation techniques, including fragmentation and transplantation. This project would primarily test substrates and techniques in the field, in areas where mesophotic and deep-water coral habitats naturally occur. Additional lab work would be conducted to develop coral cultivation techniques. Fragments grown in the laboratory would be used where possible to minimize impact on populations of corals obtained from the field.	$16,951,000 7 Years
Active Management and Protection	Despite the depth at which MDBC occur, human activities threaten the health and resiliency of these communities. The proposed project aims to protect and manage these communities through a framework for management and protection, including monitoring, education, outreach, and engagement. Project activities would include education and outreach targeting resource users and the public; engagement of stakeholders and development of socioeconomic analyses to evaluate potential impacts of management or protection actions; and directly addressing threats to MDBCs through management activities such as mooring buoy installations, removal of invasive species such as lionfish, documentation and removal of marine debris and derelict fishing gear, and assessing and remediating risks associated with leaking and abandoned oil and gas infrastructure.	$20,689,000 7-8 Years

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