

# Marine Restoration Priorities & Science Principles: Results of the Expert Panel Workshop in St. Petersburg, Florida on April 24-25, 2012

## Executive Summary

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Recognizing that the large-scale, multi-dimensional nature of the Deepwater Horizon (DWH) oil disaster in the Gulf of Mexico requires novel and expanded approaches for marine restoration, Ocean Conservancy and the Gulf of Mexico University Research Collaborative (GOMURC) convened experts from academic, governmental, and non-governmental institutions and from fishing groups to serve as panelists in a workshop hosted by the Florida Institute of Oceanography. At this workshop, 17 marine resource experts identified and ranked 69 marine restoration priorities across the four themes of ocean habitats, fishery resources, marine wildlife and human uses.

This report first summarizes those restoration options in priority order to guide the nomination, selection and monitoring of projects addressing injuries to or lost uses of marine natural resources resulting from the DWH disaster. Second, the report describes scientific principles for effective restoration – a checklist of key issues to help government agencies develop and implement a successful Gulf restoration program.

The DWH disaster originated offshore, and the discharged hydrocarbons persisted at depth due to chemical dispersant use at the well head rather than solely on the surface, creating unanticipated problems for offshore deepwater, midwater and pelagic habitats. Exposure of living marine resources to petroleum hydrocarbons, dispersants and response activities likely resulted in injuries to and lost human uses of those resources. In addition, the timing and location of the disaster coincided with important biological phenomena in the Gulf (e.g., fish spawning), which raises additional concerns about the disaster's marine impacts.

Because the DWH hydrocarbon discharge was unprecedented in size, depth, duration, and distance from shore, there is relatively little experience to guide the planning and implementation of restoration measures specifically for the marine environment, with emphasis on offshore habitats, species and human uses. This report focuses on marine ecosystem priorities in order to supplement and complement the assessments and resources that are devoted, appropriately, to the restoration of coastal environments.

### Summary of marine restoration priorities

Regardless of the marine focus, the reality is that terrestrial, coastal and marine environments are inextricably intertwined. As such, restoring the resiliency and productivity of U.S. Gulf of Mexico waters will require a comprehensive, ecosystem-wide approach with significant investments in the upland watershed, coastal (e.g., wetlands) and marine environments. This report identifies key ways in which marine restoration can be a significant part of the plans for overall Gulf of Mexico restoration.

Specifically, the cosponsors recommend that the DWH Natural Resource Damage Assessment (NRDA) Trustee Council, the Gulf Coast Ecosystem Restoration Task Force, and the Gulf Coast Ecosystem Restoration Council consider projects along the

full ecological spectrum in order to address injuries to marine benthic and pelagic resources and to help strengthen the resilience of coastal communities. The following table identifies the projects that are the highest priorities as ranked by the expert panel.

**Table 1.** Top five marine restoration priorities from each of the four themes identified by marine resource experts in the workshop

<b>Workshop Theme</b>	<b>Purpose</b>
<b>Ocean Habitats</b>	
Create a targeted monitoring program to understand current threats of existing oil and gas infrastructure and pollution (including chronic pollution) to Gulf biota	Detect harm from oil spill disaster
Establish permanently-funded, long-term, Gulf-wide ecosystem monitoring, ocean observation, research and modeling programs	Track recovery of affected biota and improve knowledge of ecosystem function, structure and condition for adaptive management
Identify, explore, map and characterize ecologically and economically important habitats	Increase knowledge of habitat and biological community associations for improved stock assessments and informed recovery strategies
Protect from incompatible uses the continental shelf and slope benthic "live bottom" habitats and adjacent "halo" of soft bottom areas	Maintain productivity of areas important to foraging and fishery species, macro-invertebrates and mesophotic and deep sea coral communities to compensate for harm to impacted areas
Re-establish or protect oyster reefs focusing on production and non-production reefs in areas of historic abundance	Increase productivity and function of habitat important to marine species and key ecosystem service of recreational and commercial fishing
<b>Fishery Resources</b>	
Supplement existing and develop new fishery-independent surveys to collect abundance and life history data	Use data to determine rates of recovery for impacted species and to inform adaptive fishery management
Invest in field and lab research to better understand acute and chronic effects of oil and dispersants on fish and invertebrate species	Derive better estimates of mortality to inform population health assessments and management decisions
Collect, compile, and synthesize existing biological and socioeconomic data and identify and prioritize data needed to undertake ecosystem assessments in the Gulf of Mexico, followed by an Integrated Ecosystem Assessment (IEA)	Apply IEAs to better understand trade-offs of different recovery strategies for impacted marine resources or ecosystem services
Conduct more frequent stock assessments for impacted finfish species that are overfished or near overfished	Determine whether catch limits may need to be adjusted to account for changes in populations detected in years after oil spill
Develop a large-scale fish DNA and smart tagging program	Produce more accurate estimates of stock abundance and examine population connectivity within Gulf fishes and better understand species-specific resiliency
<b>Marine Wildlife</b>	
Assess the impacts of low-level exposure and breakdown of oil, oil products and chemical dispersants on wildlife	Enhance understanding of DWH impacts and inform restoration planning
Develop a large-scale innovative tagging	Improve estimates of abundance, movement

program for sea turtles, seabirds and marine mammals to contribute to baseline information on their abundance and distribution	patterns, somatic growth, mortality and reproductive vital rates and help determine recovery trajectories and impacts of future episodic events on populations
Fund research and development of new techniques for reducing impacts to wildlife resulting from fisheries interactions	Reduce mortality associated with fisheries interactions and hasten recovery of injured populations
Protect existing sea turtle nesting beaches, reduce incompatible human activities and study the effectiveness of nest relocation programs.	Facilitate recovery of injured sea turtle populations
Expand and improve wildlife stranding networks and response capacity throughout the Gulf	Gather important biological information on impacted species for monitoring population status, detect distressed animals for rehabilitation and release back into the wild and evaluate rehabilitation effectiveness
<b>Human Uses</b>	
Conduct baseline and annual socioeconomic valuations of Gulf of Mexico fisheries; invest in standardization of socioeconomic fisheries data collection among Gulf states.	Ensure relevant information is accurate, consistent and readily available for use in claims preparation and NRDA compensation for eligible services
Examine chronic socioeconomic impacts of DWH on commercial, recreational and subsistence fisheries	Track lingering impacts of disaster on fisheries and relevant communities so that assistance can be directed accordingly
Conduct a baseline assessment and establish benchmarks for a socioeconomic valuation of Gulf of Mexico nonuse ecosystem services	Develop accurate estimates of lost services such as tourism and wildlife viewing so that communities dependent on them can be fairly compensated
Gather baseline data on subsistence use of resources, using the Alaska-based methodology as a model for this activity	Ensure subsistence uses of Gulf resources are documented to develop accurate estimates of lost uses
Fund overarching database management that includes the following: 1) sustaining integrated Gulf-wide Digital Atlas (NOAA ERMA), and 2) developing data management agreement between funding agencies and vendors that defines data management requirements and resolves proprietary use issues	Improve public access to information on the Gulf's biological and socioeconomic value in ways that encourage actions to protect the environment

### Guiding principles for restoration program success

The following 15 guiding principles would help ensure that the restoration program is science-based and rigorous, ecologically comprehensive (from coast to offshore marine), integrated across state and federal jurisdictional lines, adaptive and open to public input.

**Table 2.** In short, a restoration program should:

<ul style="list-style-type: none"> <li>• Rely on an understanding of the ecosystem, reflected in a descriptive model and updated periodically based on results of monitoring and research activities</li> <li>• Embrace science to support, guide and evaluate projects, with increased knowledge itself seen as a form of restoration and recovery if incorporated into management</li> <li>• Include a commitment to gather necessary data to advance understanding of the ecosystem, including basic processes, and to inform restoration</li> <li>• Support integrated long-term monitoring, research, observing and modeling</li> </ul>
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<ul style="list-style-type: none"> <li>• Integrate restoration project planning and implementation within and across programs (DWH NRDA, GCERTF/Council) to avoid duplication, promote ecological balance in project portfolio, maximize efficiencies and support common goals</li> </ul>
<ul style="list-style-type: none"> <li>• Take into account and monitor climate change (especially temperature and pH) and other types of environmental change and degradation that impact ecosystem resilience (e.g., pollution, overfishing, habitat destruction and invasive species)</li> </ul>
<ul style="list-style-type: none"> <li>• Embrace a Gulfwide ecosystem approach, including interdisciplinary studies and Integrated Ecosystem Assessments, based on a regional science plan to guide the investments that should be made in monitoring, research, observing and modeling</li> </ul>
<ul style="list-style-type: none"> <li>• Commit to ongoing synthesis of results and communication to scientists, policy-makers and the public – including annual Gulf restoration science symposia and building upon Gulf of Mexico Research Initiative (GoMRI) annual science meetings</li> </ul>
<ul style="list-style-type: none"> <li>• Rely on independent peer review at both program and project levels, including proposals, reports, plans and publications</li> </ul>
<ul style="list-style-type: none"> <li>• Work with Gulf regional planning and management organizations to anticipate, coordinate and expedite project environmental compliance and research – including permitting – for project implementation and timeliness in data collection</li> </ul>
<ul style="list-style-type: none"> <li>• Apply lessons of the DWH oil spill to future NRDA and other assessment programs to promote improved baseline information and more rapid acquisition of data on natural resource damage, which is critical as ultra-deepwater drilling increases</li> </ul>
<ul style="list-style-type: none"> <li>• Maintain data to facilitate access and appropriate uses by scientists, resource managers and the public, consistent with national guidelines and metadata and archive standards. Potential models/outlets: National Coastal Data Development Center, GoMRI and Gulf of Mexico Alliance data management programs.</li> </ul>
<ul style="list-style-type: none"> <li>• Sustain monitoring required for adaptive management to inform and improve project design and resource management</li> </ul>
<ul style="list-style-type: none"> <li>• Rely on periodic open requests for proposals (RFP); the results and performance of prior projects should inform the RFP content.</li> </ul>
<ul style="list-style-type: none"> <li>• Promote public awareness, accountability and transparency and meaningful participation</li> </ul>

If this report's marine restoration priorities and principles are adopted in overall Gulf restoration, the entire Gulf ecosystem and the Gulf Coast economy will benefit. A robust, long-term, Gulfwide monitoring, research and observation program would contribute the supporting science needed not only to restore the resources on which the Gulf states depend, it would also provide the stream of information needed to assess environmental harms that may become evident in the future. The Gulf of Mexico is a national treasure, and the DWH disaster has provided an opportunity to ensure that the Gulf is understood scientifically and restored to pre-spill natural resource productivity. Combined with the potential under the RESTORE Act for correcting long-term degradation, a comprehensive, Gulfwide restoration program that includes both applied science and innovative marine restoration projects has the potential not only to help the Gulf ecosystem recover, but also to enable Gulf Coast economies to use the Gulf in ways that ensure its sustainability for the future. This report and the work of the experts who served on the marine restoration panel offer concrete recommendations and a path forward as the NRDA Trustees, the Gulf Coast Ecosystem Restoration Task Force and the Gulf Coast Ecosystem Restoration Council make decisions about restoration plans and projects.

For an in-depth look at the Gulf of Mexico ecosystem, impacts of the DWH disaster and Ocean Conservancy's Framework for Restoring the Gulf, please visit [www.oceanconservancy.org/gulf](http://www.oceanconservancy.org/gulf).