Fish and Water Column Invertebrates

Open Ocean MAM Strategy Workshop

Fish and water column invertebrates are one of the six restoration types assigned to the Open Ocean Restoration Area as part of the *Deepwater Horizon* settlement and Consent Decree. Water-column resources injured by the spill include species from all levels in the food chain, from estuarine-dependent species, such as red drum, shrimp, and sea trout, to large predatory fish (e.g., tuna and marlin) that can migrate from the Gulf of Mexico into the Atlantic and as far as the Mediterranean Sea. The purpose of this workshop is to obtain input on information needed for restoration planning, implementation, and evaluation given the established goals.

RESTORATION GOALS

- Restore injured fish and invertebrate species across the range of coastal and oceanic zones by reducing direct sources of mortality
- Increase the health of fisheries by providing fishing communities with methodologies and incentives to reduce impacts to fishery resources.

RESTORATION FOR FISH

- Coastal and nearshore habitat restoration
- Offshore habitat restoration,
- Mortality reduction by addressing direct threats to resources

FOCUS FOR FISH

- Reducing bycatch and bycatch mortality
- Targeted reef fish, highly migratory species, and coastal migratory pelagic species.
- Overfished species, including blue marlin, greater amberjack, gray triggerfish and gray snapper.
- We may broaden or change our focus in the future.

Breakout Group Guiding Questions

There are a number of unknowns in fish and water column invertebrate restoration; however, the workshop's goal is to focus on what science and monitoring needs may be most helpful to inform restoration planning, implementation, and understanding restoration outcomes.

- **What information is needed for prioritization of restoration and planning? Species, populations, geography, threats, or restoration techniques?**
- **How should we evaluate restoration success? At what scale should we be focusing: project, population, or ecosystem?**
- **What are the most important aspects of adaptive management?**
- **What type of data management systems or system improvements would help us manage information?**
- **How do we integrate with the existing platforms and programs?**
  - **Are these systems already in existence**
- **How should we continue engagement with the academic/management community to develop MAM?**

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Example Monitoring Priorities

- Understand catch, bycatch, and release mortality in commercial and recreational fisheries; understand effectiveness of measures and rates of compliance.
- Understand the scale and threats of illegal, unreported, and unregulated fishing in the U.S. Gulf and Atlantic for injured species.
- Characterize cultural and socio-economics of fishing communities. Understand ecosystem services provided by fish.
- Investigate risks of current and potential species invasions; understand pathways of invasion and relationship to anthropogenic stressors.
- Understand effects of artificial habitats, changing climate, and hypoxia on species abundance and distribution.