

# Ecosystem Approaches to Fishery Management In the Gulf of Mexico

**White Paper**

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# INTRODUCTION

Ecosystem-based fisheries management (EBFM) attempts to manage the ecosystem as an entity in order to account for species/interactions of interest. The NOAA Fisheries definition of EBFM is “a systematic approach to fisheries management in a geographically specified area that contributes to the resilience and sustainability of the ecosystem, recognizes the physical, biological, economic, and social interactions among the affected fishery-related components of the ecosystem, including humans; and seeks to optimize benefits among a diverse set of societal goals.” In EBFM, managers make decision that span the system by including multiple species, linkages, and components (such as environmental variables or the human environment).

Ecosystem approaches to fisheries management (EAFM) attempts to manage species while considering the broader interactions within the ecosystem. The following aspects were identified as components for fishery ecosystem (FEPs): system inventory and conceptual model; selection of indicators; identification of threats; strategic objectives with risks and priorities; and performance measurements of objectives, management, and models (Essington et al 2016). To address ecosystem management, several avenues can be explored. FEPs do not necessarily have management authority; instead FEPs may act as guidance documents highlighting specific objectives, environmental conditions, and policies that the Council would like monitor. Though there is guidance on what could be included in an FEP, regional differences are common, and each FEP that has been produced, or is under development, has been tailored to the specific Council’s needs.

The Gulf Council, while not in the process of developing any particular FEP, has been incorporating ecosystem considerations into management measures (EAFM). Many fishery management plans (FMPs) already have management measures that take into consideration factors outside of a single species harvest and biological information. Using the definitions of both EBFM and EAFM as well as the Lenfest EBFM blueprint (Essington et al. 2016), each original FMP and subsequent amendments were reviewed for implemented (or are awaiting implementation) management measures which incorporated ecosystem considerations. Though not labeled as such, in each FMP several management decisions have already taken ecosystem priorities into consideration. Below is a brief summary of the progress other regional Councils have made in addressing ecosystem management and ways the Gulf Council is already engaged in ecosystem management.

# OTHER REGIONAL APPROACHES TO ECOSYSTEM MANAGEMENT

## New England Fishery Management Council

**Status:** Initiated the development of an FEP

- Outlined purpose and objectives
- Asked specific questions of the Council on scale and approaches
- Undergoing simulated management strategy evaluations (MSEs) for a review panel to comment on
- Will be moving forward in 2018 on the MSE review and other FEP decisions
- Have provided the Council with an example FEP based on Georges Bank

## Mid Atlantic Fishery Management Council

**Status:** Developed an EAFM policy

- Started with a series of workshops hosted by the Council
  - o forage fish, climate change, species interactions, and an ecosystem level habitat workshop.
- Policy
  - o data considerations for single species and habitat information
  - o developed an unmanaged forage species omnibus (generic) amendment to reduce impact of directed commercial fisheries on the unmanaged forage species

## South Atlantic Fishery Management Council

**Status:** Completed an FEP and is working on a second FEP

- Current issues:
  - o Forage fish action
  - o Several iterations of methodology for completion of the FEP
  - o Preliminary priorities have been established
  - o Using EBFM roadmap to tailor discussion

## Caribbean Fishery Management Council

**Status:** Initiated the development of an FEP

- Preliminary (April 2017 presentation)
- Working on providing the Council with an outline and strategy as well as ecosystem model, data compilation, and assessing data gaps
- Will likely lead to 'island-based' FEPs

## North Pacific Fishery Management Council

**Status:** Completed one FEP (not implemented yet) and initiated a second FEP

- Policy and planning document (Aleutian islands)
  - o a guidance document that outlines specific information that should be included in management decisions
  - o identifies information and indicators
  - o develops and refines management tools and goals
  - o identifies sources of uncertainty
- Currently working on a similar document for the Bering Sea ecosystem

## Pacific Fishery Management Council

**Status:** Completed FEP

- California Current FEP
- Informational document
- Identifies knowledge gaps
- Annual review of how ecosystem initiatives are progressing
  - o e.g. one initiative prohibited commercial fishing on unmanaged forage stocks; considered them ecosystem species
- Thorough review of the California Current ecosystem status report at the Council level
- Contains suggestions for future Council initiatives such as: investigation of maintaining broad age and size structure of managed stocks; further division of ecosystems by habitats; cross FMP reviews for bycatch, safety, economics, and climate change; addressing/incorporating human components of fisheries

## Western Pacific Fishery Management Council

- Status: Island based plans (5 different FEPS) Hawaii FEP established in 2009

# GULF OF MEXICO ECOSYSTEM INITIATIVES AND APPROACHES

## Overarching Ecosystem Initiatives

- Ecosystem workshops (nine throughout the Gulf in 2004-2010)
- Collaborated with 4 Councils and NMFS in an attitudes and value survey (Wallmo and Getner 2007)
- Conducted a series of Ecosystem Modeling workshops
- Provide comments on ecosystem related NMFS products, such as the Ecosystem Roadmap and the Gulf of Mexico Ecosystem Status Report
- Works with collaborators (SEFSC and FWRI) to incorporate red tide events and impacts into reef fish stock assessments
- Established an Ecosystem Scientific and Statistical Committee (SSC) (2005-2015)
  - o Standing SSC has 3 ecosystem positions (only one filled)

## Reef Fish

Original FMP considered habitat (including artificial reefs), predators, and catastrophic events for artificial reefs, as well as the competing shrimp industry. Many amendments are multispecies and share a common list of management objectives assigned to the Reef Fish FMP. The creation of a stressed area to limit harvest was based on heavy fishing activity affecting the multiple reef fish stocks and their environment. An FMP objective is to conserve and increase reef fish habitats in appropriate areas and to provide protection for juveniles while protecting existing and new habitats, which acknowledges the multi-species reliance on these habitats. Establishing the total allowable catch (TAC) and optimum yield (OY) for reef fish species takes into consideration social, economic and biological components. A multispecies aggregate bag limit was established for reef fish that do not already have a bag limit. Management decisions are based on the status of other benchmarks in other fisheries – quota was increased on the success of bycatch reduction (BRDs) in the shrimp fishery. There have been marine reserves and fishing closures established for spawning grounds of reef fish species. Gear and spatial/temporal management restrictions are in place for the protection of other species (sea turtle interactions with longline gear). Amendments have been developed that adjust harvest in response to environmental events (such as red tide). The Gulf Council ABC control rule was developed to incorporate known environmental events when determining uncertainty in ABC yield stream projections. Multiple amendments incorporate multispecies complexes or multiple species that need similar management benchmarks (such as annual catch limits [ACLs]), or species interactions. For example, the commercial individual fishing quota (IFQ) program assigns quota to species complexes, such as deepwater grouper.

## Shrimp

Original FMP incorporated spatial management; gear conflicts; and seasonal closures to allow brown shrimp to get larger in Texas (uses ecosystem components for management). Linkages to

other species include reducing bycatch of red snapper and turtles by gear modifications and reporting methodologies. A permit was established so that effort in federal waters could be accounted for to limit bycatch and provide better science. The aggregate OY was based on factors outside of shrimp biology – bycatch limitations and high yields, marine reserves. Electronic logbooks were established to better base conservation and management measures.

## **Spiny Lobster**

FMP and amendments established marine reserves, prohibited the import of undersized lobsters in an effort to eliminate fishing of undersize lobsters which form source populations (broader linkage to areas outside of managed area), and protect threatened species (such as coral) from possible interactions with lobster fishing gear. The ACL was established based on the likely status of environmental conditions affecting stocks (new low levels based on changing climate) and re-evaluated when it was thought conditions had improved. A ‘low landings trigger’ was included for alerting a review panel if stocks seemed to have declined.

## **Coral**

Multispecies amendments; closed areas for habitat areas of particular concern (HAPCs) including closures to bottom tending gear; provide habitat for other species. All coral amendments deal with multiple species and could be considered as ecosystem type amendments.

## **Coastal Migratory Pelagics**

FMP has established joint management plans based on species range (not just map boundaries). The environmental influences on migratory patterns and changes over time (warming seas due to climate change) resulted in modifications to migratory group management boundaries.

## **Stone Crab**

FMP was primarily focused on reducing conflict between overlapping fisheries, but also contains detailed description of trophic relationships. In 2011, stone crab was removed from the Gulf Council FMP, and designated to the Gulf states, primarily Florida Fish and Wildlife Conservation Commission, for management.

## **NMFS EBFM Roadmap Regional Draft**

NMFS produced an EBFM roadmap that published in November 2016; the Council provided comments on the roadmap on June 30, 2016. Each region is now developing a regional roadmap highlighting current research that achieves the objectives and goals outlined in the national policy. A staff member from each Council has been designated as a point of contact to help develop plans as time allows. Below is the timeline for the regional plans:

- October - December 2017 – Draft implementation plans developed.

- January 2018 – Discussion/Presentation of draft regional and headquarters implementation plans with EBFM workgroup and Council staff representatives from the regional teams.
- February – March 2018 – Revisions to implementation plans based on EBFM Workgroup/Council staff feedback.
- March – April 2018 – Regional Leadership (RA, SD, Council ED/Executive Committee) review of draft regional plans and headquarters plan review by HQ Office Directors, NMFS Regulatory and Science Boards, and Council EDs.
- April 2018 – Update and review of draft plans by NMFS Leadership (AA, DAARP, Chief Scientist).
- May 2018 – Draft plans/status briefing to Council Coordination Committee.
- June - August 2018 – Draft implementation plans presented for full Council review and made available for public comment.
- September - October 2018 – Revision of regional and headquarters implementation plans based on input.
- November 2018 – Review of final plans by Regional Leadership (RA, SD, and Council ED/Executive Committee) and headquarters plan review by HQ Office Directors, NMFS Leadership Council, and CCC.
- December 2018 – Review, approval, and public release of final plans by HQ leadership.

## REFERENCES

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