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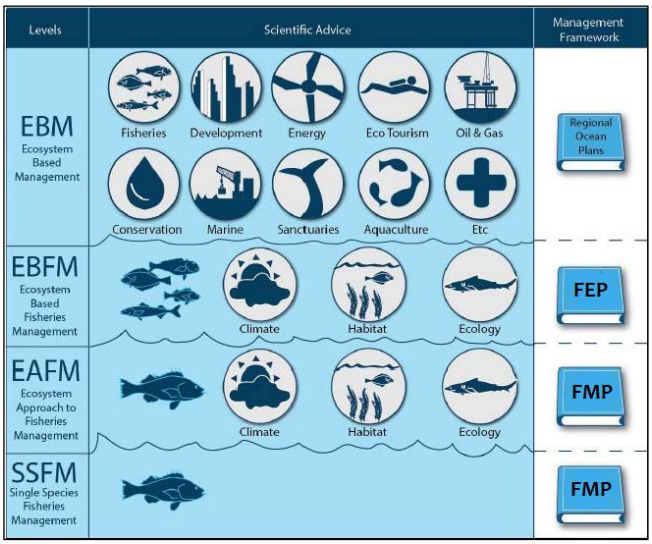
Ecosystem-Based Fisheries Management

Ecosystem-based fisheries management (EBFM; **Figure 1**) is a systems-level management approach for living marine resources (LMRs) that accounts for an ecosystem's physical, biological, economic, and social components. This approach to fisheries management aims to maintain ecosystems and their dependent fisheries in healthy, productive, and resilient conditions to ensure they can provide services to human and biological communities. EBFM provides various benefits to complement traditional single-species (or single-stock) fisheries management, according to some experts. For example, EBFM may provide additional information regarding how ecosystems function and how ecosystems may respond to multiple stressors and their cumulative impacts. EBFM also may provide insight into trade-offs among different stakeholder priorities for LMRs and their fisheries. This information can inform fisheries management decisions. Experts also have identified challenges regarding EBFM and its implementation (e.g., potential lack of resonation with stakeholders). Congress continues to be interested in LMR management that includes considerations for marine ecosystems. Congress has authorized the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) to manage U.S. LMRs under multiple mandates, such as the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. §§1807-1891d) and the Marine Mammal Protection Act (16 U.S.C. §§1361-1423h). In these laws, Congress has included directives for LMR management to account for species' roles in marine ecosystems.

Figure 1. Various Levels of Ecosystem Management



Source: CRS, modified from National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS).

Notes: Illustration of the various hierarchical levels of ecosystem management, particularly focused on the fisheries sector. From bottom to top, it depicts management of fisheries and other sectors in a marine ecosystem, building from (1) single species fisheries management of a particular stock in a fishery management plan (FMP) to (2) an ecosystem approach to fisheries management accounting for environmental effects (i.e., climate, habitat, ecology) on an individual stock (also in an FMP), to (3) ecosystem-based fisheries management, accounting for multispecies interactions and environmental drivers (in a fishery ecosystem plan; FEP), and to (4) ecosystem-based management of the fisheries sector, together with all other ocean-use sectors, as captured in a regional ocean plan.

NMFS assesses and manages more than 500 regulated fishery stocks and *stock complexes*, over 100 marine mammal species, and approximately 100 threatened and endangered species, some of which are marine mammals. Over the past decade, NMFS and partners (e.g., Regional Fishery Management Councils [FMCs]) have worked toward implementing EBFM in consideration of these simultaneous mandates and multiple species, including through the incorporation of ecosystem considerations into management actions and assessments.

NMFS Policy, Road Map, and Implementation Plans

With the goal of addressing its LMR mandates in a broader ecosystem context, NMFS produced an EBFM policy and implementation "road map" in 2016; both underwent updates in 2024. The NMFS policy defines EBFM and includes six EBFM guidelines for the agency:

- Implement ecosystem-level planning (e.g., support development of fishery ecosystem plans (FEPs) by FMCs; incorporate EBFM goals and objectives into the agency's research and its operational and strategic planning);
- Advance scientific understanding of ecosystem processes;
- Prioritize vulnerabilities and risks to ecosystems (e.g., through climate vulnerability assessments)
- Explore and address trade-offs within an ecosystem (e.g., through the use of management strategy evaluations that provide ecosystem-level analyses to inform management decisions);
- Implement ecosystem considerations into management;
- Support ecosystem resilience via monitoring and adjusting of management actions.

NMFS's EBFM policy aligns with other ecosystem-guided efforts by NOAA and NMFS collectively intended to improve and modernize fisheries management and assessments, such as NOAA's Integrated Ecosystem Assessment Program and its associated regional ecosystem

status reports (ESRs), the NMFS Climate Science Strategy and associated regional action plans, among other NMFS plans and strategies.

In 2019, NMFS released nine EBFM implementation plans (i.e., seven regional plans, one NMFS headquarters plan, and one plan for Atlantic highly migratory species management) in accordance with its EBFM road map. Each plan includes specific milestones over a five-year period for implementing EBFM in a given location, including information on current ecosystem approaches, and planned EBFM practices and engagement strategies for that location. For example, the Alaska EBFM implementation plan includes information on coordinated EBFM actions by NMFS and the North Pacific Fishery Management Council (NPFMC), such as continuing ESRs for Alaskan regions to inform NPFMC actions; the recent development of a Climate Action Module in the Bering Sea FEP; and joint efforts to advance the understanding of Alaskan ecosystems through the Alaska Climate Integrated Modeling project. According to NMFS scientists, progress on implementing NMFS's EBFM "road map" has varied among its regions.

Selected Efforts by NMFS and Partners

With support from NMFS, some FMCs have developed, or are in the process of finalizing, FEPs for their respective geographic areas of authority (**Table 1**). According to NMFS, FEPs provide a comprehensive description and understanding of the ecosystems in which fisheries are managed; direct how that information should be used in the context of *fishery management plans*; and set policies that guide fishery management.

Table 1. Fishery Ecosystem Plans (FEPs) Produced or in Development by Regional Fishery Management Councils (FMCs)

FMC	FEP Geography	Release Date
CFMC	U.S. Caribbean	Anticipated in 2025
GFMC	Gulf of America	TBD
NEFMC	Georges Bank	TBD
NPFMC	Aleutian Islands	December 2007
	Bering Sea	January 2019
PFMC	U.S. West Coast Region	July 2013
SAFMC	U.S. South Atlantic Region	April 2009
WPFMC	Five separate FEPs for the American Samoa, Mariana, and Hawaii Archipelagos; Pacific Remote Islands; and Pelagic Fisheries	September 2009

Sources: NOAA, NMFS, "Ecosystem-Based Fishery Management Implementation Plans—Fishery Ecosystem Plans"; Sennai Habtes, *Ecosystem Based Technical Advisory Panel Report*, CFMC, Presentation at the 184th General Meeting, April 23, 2024, p. 5; and NEFMC, "Ecosystem-Based Fishery Management Committee."

Notes: CFMC = Caribbean FMC; GFMC = Gulf FMC; NEFMC = New England FMC; NPFMC = North Pacific FMC; PFMC = Pacific FMC; SAFMC = South Atlantic FMC; TBD = to be determined; WPFMC = Western Pacific Regional FMC. Several FEPs have been amended since their initial release dates. The GFMC produced a draft FEP in March 2022. The Mid-Atlantic FMC uses an Ecosystem Approach to Fisheries Management Guidance Document (i.e., not an FEP per se). *Pelagic Fisheries* refers to fisheries for species in the western Pacific region that live in the water column (i.e., do not live on the sea bottom).

NMFS and partners have included ecosystem considerations in some fishery management actions and LMR assessments. For example, NMFS and the NPFMC implement a 2 million metric ton annual limit for all groundfish in the Bering Sea and Aleutian Islands Management Area. This limit has been in effect for decades to achieve sustainable catch levels and is intended to preserve ecosystem function. As another example, to facilitate EBFM in the U.S. Caribbean, NMFS and the Caribbean FMC implemented three island-based FMPs in 2019 to replace fishery-specific FMPs. In another example, NMFS and partners are working to develop *Ecosystem-Level Reference Points* (ELRPs) that account for ecosystem benchmarks and thresholds and that can help with setting aggregate harvest limits in consideration of an entire ecosystem (e.g., ratio of total catch to total fisheries biomass). Further, some experts have found that NMFS has incorporated ecosystem considerations (e.g., habitat, predation) into approximately 25% of its fishery stock assessments as part of its progress toward EBFM.

Considerations for Congress

Over the past three decades, Congress has taken certain actions related to EBFM and fisheries ecosystem research. Actions included directing the Secretary of Commerce, in the Sustainable Fisheries Act (P.L. 104-297), to establish the Ecosystem Principles Advisory Panel. The panel provided recommendations to Congress about FEP contents, some of which FMCs implemented. Also, MSA amendments in 2007 authorized the Secretary to support regional pilot projects to implement the panel's recommendations into FEPs and to examine ways to integrate ecosystem considerations into regional fishery management. Congress may evaluate related actions, such as the advantages and disadvantages of specifying EBFM as a type of management approach for FMCs and NMFS in MSA. Congress also may continue to evaluate the level of funding and resources to support EBFM approaches, including for ecosystem modeling, surveys, assessments, and regional operational capacity. Congress also could consider the pros and cons of directing NMFS and FMCs to enhance system-level considerations in management, such as through efforts that address elements of the ecosystem (e.g., forage fish, non-target catch, habitat, oceanic factors) jointly, including with potential applications to developing ELRPs. Some of these considerations and approaches are proposed in H.R. 3718 in the 119th Congress. (Similar appeared in H.R. 8788 and H.R. 8862 in the 118th Congress, and in H.R. 59 and H.R. 4690 in the 117th Congress.) Congress also may assess how elements of Executive Order 14276, "Restoring American Seafood Competitiveness," may align with regulating fisheries via EBFM approaches.

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