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<b><i>Fisheries Management</i></b>	
<b><i>Ecosystem-Based Fisheries Management Policy</i></b>	
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## **Ecosystem-Based Fisheries Management Policy**

**of the**

## **National Marine Fisheries Service**

## **National Oceanic and Atmospheric Administration**

### **POLICY STATEMENT**

NOAA's National Marine Fisheries Service (NOAA Fisheries) strongly supports the implementation of Ecosystem-Based Fisheries Management (EBFM), to better inform decisions and help achieve and optimize the benefits from marine fisheries by evaluating trade-offs among and between fisheries (commercial, recreational, and subsistence), aquaculture, protected species, biodiversity, and habitats, while maintaining resilient and productive ecosystems.

### **BACKGROUND**

NOAA believes ecosystem-based management (EBM<sup>1</sup>) will assist the agency in better meeting its mandates to sustainably manage the nation's trust living marine resources (LMR). In this

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<sup>1</sup> EBM is defined as "geographically specified, adaptive, takes account of ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse societal objectives." NOAA 2004. New Priorities for the 21st Century- NOAA's Strategic Plan: Updated for FY 2005-FY 2010, 28 pp.

context, NOAA Fisheries has taken several steps to advance the ecosystem-based fisheries management (EBFM) portion of this strategic EBM goal<sup>2</sup>. Coordinated implementation of EBFM across mandates will lead to greater efficiency and will enable NOAA Fisheries to explicitly consider trade-offs between fisheries, fishery species, and other ecosystem components (e.g. other species, habitats, humans) and processes that affect, or are affected by, fisheries.

## PURPOSE

The purpose of this policy is to:

- Define EBFM;
- Describe the benefits of EBFM;
- Clarify how EBFM relates to existing LMR management legal authorities and requirements;
- Establish a framework of guiding principles to enhance and accelerate the implementation of EBFM within NOAA Fisheries, and in cooperation with NOAA Fisheries partners, when EBFM would further improve fisheries decision-making, and/or ecological outcomes; and
- Build on the agency's past progress and clarify the agency's commitment to integrating its management programs for living marine resources and their habitats under changing climate, ecological and ocean conditions.

## DEFINITION OF ECOSYSTEM-BASED FISHERIES MANAGEMENT

NOAA Fisheries defines EBFM as *a systematic approach to fisheries management in a geographically specified area that ensures the resilience and sustainability of the ecosystem<sup>3</sup>; recognizes the physical, biological, economic, and social interactions among the affected components of the ecosystem, including humans; and seeks to optimize benefits among a diverse set of societal goals.*

For the purposes of this policy, EBFM includes considerations of interactions among fisheries, protected species, aquaculture, habitats, and other ecosystem components, including the human communities that depend upon these ecosystem services.

## CONTEXT OF ECOSYSTEM-BASED FISHERIES MANAGEMENT

Within NOAA Fisheries, managers and scientists frequently describe EBFM as one level along a continuum of ecosystem approaches to management: 1) ecosystem approach to fisheries management (EAFM), 2) EBFM, and 3) ecosystem-based management (EBM). NOAA Fisheries

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<sup>2</sup> Ibid.

<sup>3</sup> In the NOAA Fisheries context, the term "ecosystem" means a geographically specified system of fishery resources, the persons that participate in that system, the environment, and the environmental processes that control that ecosystem's dynamics. (c.f. Murawski and Matlock, 2006, NMFS-F/SPO-74)

and its partners (such as the Fishery Management Councils, State Fishery Commissions, Tribes, and others) are already making progress in implementing EAFM through Magnuson-Stevens Fishery Conservation and Management Act (MSA) Fishery Management Plans (FMP), Marine Mammal Protection Act (MMPA) Take Reduction Plans, and Endangered Species Act (ESA) Recovery Plans. These efforts include incorporating ecosystem and environmental factors into single species management actions or stock assessments, enhancing understanding of living marine resource and coastal community dynamics, protecting key ecosystem components, and better informing management decisions for a particular stock. Implementing EBFM supports NOAA's broader goals for EBM across multiple sectors and mandates to wisely manage multiple ecosystem goods and services, and with other agencies, to maintain productive and resilient ecosystems.

## BENEFITS

Implementing EBFM can help NOAA Fisheries and its partners optimize societal benefits across its multiple federal mandates by considering environmental and ecological factors and identifying trade-offs among its trust resources, including fisheries, protected species, and their habitats. Through EBFM, NOAA Fisheries and its partners can better evaluate management options and their effectiveness. Additionally, it can help communicate risks, uncertainties, and implications of management decisions across marine fisheries and a range of affected species. Better understanding, articulation and quantification of the trade-offs will ensure more transparent decision processes, outcomes, and more efficient use and management of NOAA Fisheries and partner resources.

Management advice from EBFM will be more comprehensive, accurate, and help reduce uncertainty, by taking into consideration interacting elements in the ecosystem. EBFM can maintain ecosystem function, and fishery sustainability, which support economic and social stability and fishing community well-being. EBFM applies the best available scientific information to improve decision-making via consideration of the holistic impact of management decisions. EBFM also can use forecasts of future ecosystem conditions and services, incorporating natural variability, anthropogenic forcing, and change in climate and ocean conditions to predict and evaluate outcomes from a range of alternative management strategies. Combined, there are stability and efficiency outcomes for business and regulatory planning that come from adopting EBFM.

## GUIDING PRINCIPLES

The implementation of EBFM should reflect the following six guiding principles. These principles flow from the foundational basis of science, through strategic planning, prioritization, and tradeoff analyses, and into management advice, all with the ultimate aim of maintaining productive and resilient ecosystems (Figure 1).

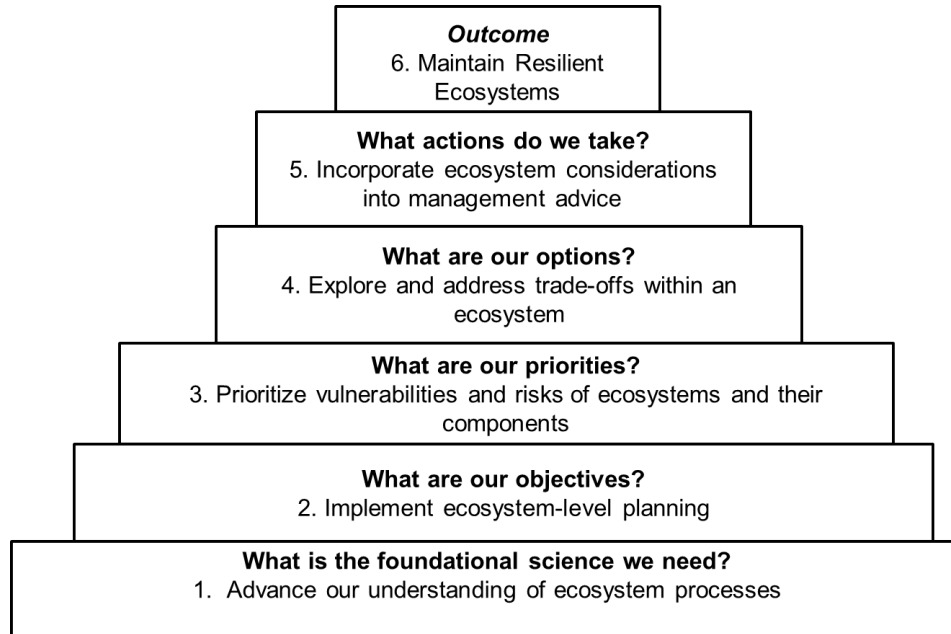


Figure 1. Illustration of the interconnected and interdependent nature of the major EBFM guiding principles.

To meet its policy supporting increased implementation of EBFM, NOAA Fisheries will, to the extent practical:

**1) Advance our understanding of ecosystem processes**

NOAA Fisheries shall work to better understand the broader suite of ecosystem processes, drivers, threats, and status of the nation’s marine ecosystems to inform all levels of management advice, including:

- Conducting science to understand ecosystem processes, drivers, and threats including:
  - Measurable biogeochemical, biophysical, and ecological factors, processes, and interactions
    - Population dynamics of living marine resources
    - Trophic relationships
    - Oceanographic features and other environmental factors (including climate change and ocean acidification)
    - Habitat status and predominant threats to ongoing habitat quality, and linking habitat to production
    - Ecosystem productivity patterns
  - Social and economic considerations
    - Social and economic drivers factors that influence fishers and other users of the marine environment
    - Economic welfare and social well-being of resources users
    - Community vulnerability and resilience
    - Non-market and existence values of marine mammals, turtles, seabirds, and other marine resources

- Employment
  - Increase domestic seafood supply and security
  - Ocean use sectors beyond fisheries (e.g. mining, energy, shipping, non-fishing recreational use)
- Developing Integrated Ecosystem Assessment science capabilities and products to provide more ecosystem-level management advice
- Maintaining sufficient and increasingly efficient monitoring systems
- Conducting process-oriented research to understand key mechanisms and relationships
- Providing regular ecosystem status updates and reports to better inform regional decision-making processes

## **2) Implement ecosystem-level planning**

NOAA Fisheries supports the use of Fishery Ecosystem Plans (FEPs) or similar documents to describe ecosystem goals, objectives, and priorities for fisheries and ecosystem research, conservation, and management across multiple fisheries within an ecosystem. These include:

- Supporting FEPs as umbrella strategic planning documents to guide coordination and trade-off evaluation among FMPs.,
- Seeking long-term ecological, economic, and social goals, objectives, and priorities for FEPs that are based on the results of inclusive strategic planning with diverse stakeholders
- Basing regular reviews and updates of FEPs on indicators established for measuring progress toward established goals and objectives
- Taking into account the direct effect of fisheries on trust LMR and habitats, and the cumulative impact of fisheries on the entire ecosystem
- Taking into account the ecosystem functional and structural roles of trust LMR and habitats
- Taking into account past and possible future changes in climate and ecosystem conditions
- Facilitating the participation of external federal, state (including territories), and tribal partners in the EBFM process by assessing the cumulative effects of human activities on marine ecosystems to help partners minimize the effects of non-fishing activities on trust LMR and habitats

## **3) Prioritize vulnerabilities and risks to ecosystems and their components**

NOAA Fisheries should evaluate and address the individual and cumulative drivers for the physical, chemical, biological, social, and economic components of marine ecosystems. This should take into account the comprehensive and systematic risk, vulnerability and susceptibility of LMRs and ecosystems, including:

- Identifying the living marine resource assets and associated fisheries communities in each region/jurisdiction and their relative vulnerability to human and natural pressures
- Identifying the individual and cumulative pressures that pose the most risk to those vulnerable resources and dependent communities

- Developing and evaluating management strategies within each region or jurisdiction to address or account for those pressures

#### **4) Explore and address trade-offs of fisheries management alternatives to achieve ecosystem objectives**

In close cooperation with its partners, NOAA Fisheries supports the consideration of and efforts to take into account various trade-offs when considering the cumulative effects of decision-making processes on the ecosystem, including:

- Analyzing trade-offs on optimizing benefits from fisheries within each ecosystem or jurisdiction, taking into account ecosystem-specific policy goals and objectives, cognizant that ecosystems are composed of interconnected components
- Developing and monitoring ecosystem-level reference points to inform LMR management efforts
- Developing management strategy evaluation capabilities to better conduct ecosystem-level analyses that provide ecosystem-wide management advice

#### **5) Incorporate ecosystem considerations into management advice**

NOAA Fisheries recognizes the value of placing its resource management efforts into a broader ecosystem context. LMR management should consider best available ecosystem science in decision-making processes, including:

- Encouraging living marine resource assessments, control rules, and management decisions to incorporate the appropriate (as determined from the risk analysis under item 3 above and as feasible) ecosystem considerations (inclusive of those factors noted under item 1)
- Supplementing our species-by-species recovery and rebuilding efforts by considering the effects of biogeochemical, ecological, and biophysical processes, other human activities, and other drivers on managed species within marine ecosystems
- Evaluating and adopting integrated management processes and features that can be applied systematically and efficiently across all trust living marine resource species in an ecosystem
- Developing best practices for bringing ecosystem considerations into assessments of and management advice for all LMRs stocks, particularly those in data-poor fishery situations
- Evaluating cumulative impacts of proposed management actions for trust resources and their ecosystems

#### **6) Develop operating protocols to maintain resilient ecosystems**

NOAA Fisheries recognizes that its mandates are intended to sustain resilient and productive LMR populations and habitats, to maintain overall ecosystem structure and function, and to support the contributions that fisheries make to the socio-economic resiliency of coastal human communities. Actions in support of these mandates include:

- Assessing and appropriately accounting for uncertainty when making management decisions for trust LMR

- Evaluating essential fish habitat (EFH; MSA) and critical habitat (ESA) throughout the ecosystem for those habitat types and areas that may be essential to multiple taxa, unique within the larger ecosystem, or particularly vulnerable to the negative effects of human uses
- Minimizing or eliminating discards within individual fisheries while moving toward whole ecosystem assessments of total non-target species removal levels
- Evaluating ecosystem-level measures of resilience to ensure core ecosystem structure, biodiversity, production, energy flow, and functioning are maintained
- Evaluating the effects of EBFM action on coastal fishing community well-being

## LEGAL AUTHORITIES AND MANDATES

Multiple laws, executive orders and policies authorize NOAA Fisheries to implement ecosystem-based fisheries management. This policy summarizes a subset of the authorities used by NOAA Fisheries and our partners to take actions that directly affect fisheries-associated ecosystems' structure and function. This policy also recognizes other NOAA Fisheries authorities and responsibilities and those of other federal natural resource management agencies, Regional Fishery Management Councils, interstate marine fisheries commissions, states, tribes, and advisory bodies. A systematic and coordinated approach must be taken to fully execute our authorities within and across all authorities to effectively implement EBFM.

The **Magnuson-Stevens Fishery Conservation and Management Act** (MSA), 16 U.S.C. §§ 1801 *et seq.*) authorizes federal fishery management within the U.S. exclusive economic zone by regional fishery management councils (Councils) and NOAA Fisheries. The MSA provides for: 1) integrating ecosystem considerations into fishery conservation and management actions, 2) minimizing the impacts of fishing on ecosystem components, and 3) conserving important ecosystem components from non-fishing threats. The MSA also authorizes NOAA Fisheries to provide technical advice and assistance to the Councils to develop and design regional EBFM programs (16 U.S.C. § 1882). The MSA's National Standards (16 U.S.C. § 1851) provide overarching requirements for conservation and management measures, including EBFM-supporting measures that shall prevent overfishing, while achieving optimum yield; be based on the best scientific information available; to the extent practicable, manage interrelated stocks as a unit or in close coordination; take into account the importance of fishery resources to fishing communities; and to the extent practicable, minimize bycatch and bycatch mortality. The MSA also stipulates that FMPs must identify and describe EFH, minimize to the extent practicable adverse effects from fishing on EFH and its ability to support fishery ecosystems, and identify other actions to encourage conservation and enhancement of EFH (16 U.S.C. § 1853(a)(7)). In addition, the Act requires rebuilding of overfished fish stocks (16 U.S.C. § 1854), and as noted above, requires that FMPs be consistent with the National Standards. The Act provides authority for FMPs to include measures to protect deep sea corals and to conserve target and non-target species and habitats (16 U.S.C. § 1853(b)(2), (12)).

The **Marine Mammal Protection Act** (MMPA) protects all marine mammals. NOAA Fisheries manages cetaceans (whales, porpoises, and dolphins) and pinnipeds (seals and sea lions) under the Act, while the U.S. Fish and Wildlife Service (USFWS) manages walrus, polar bears, manatees, sea otters, and dugongs, with support from NOAA Fisheries. The primary objective of the MMPA specifies that marine mammals should not be allowed to diminish beyond the point at which they cease to be a significant functioning element in the ecosystem of which they are a part (16 U.S.C. § 1361). The MMPA further notes that marine mammals are resources of great international aesthetic, recreational, and economic significance. As such, the primary objective of their management should be to maintain the health and stability of the marine ecosystem and to obtain an optimum sustainable population, commensurate with the carrying capacity of the habitat. In furtherance of this objective, the MMPA prohibits the “taking” or importing of marine mammals except in certain limited circumstances (16 U.S.C. § 1371). Among other provisions, the MMPA requires NOAA Fisheries to prepare assessments of marine mammal populations (16 U.S.C. § 1386) and includes a framework for reducing the incidental mortality and serious injury of marine mammals during the course of commercial fishing operations (16 U.S.C. § 1387). The MMPA allows for intentional lethal taking of individually identifiable pinnipeds that are having a significant negative impact on the decline or recovery of salmonid stocks, including those listed as threatened or endangered under the Endangered Species Act (16 U.S.C. § 1389).

The **Endangered Species Act** (ESA, 16 U.S.C. §§ 1531-1543) provides for the conservation of threatened and endangered species and their ecosystems. The listing of a species as endangered makes it illegal to “take” (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. Similar prohibitions usually also extend to threatened species. It is meant to provide “a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved...” and directs NOAA Fisheries and the USFWS to designate “critical habitat”, for instance, by identifying areas that contain physical or biological features essential for the conservation of the species. Federal agencies are directed under ESA section 7 to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Federal agencies must also consult with NOAA Fisheries on activities that may affect a listed species (e.g., Federal commercial fisheries).

Under the **National Aquaculture Act** (NAA; 16 U.S.C. §§ 2801-2810), NOAA Fisheries supports the development of the U.S. marine aquaculture industry, an increasingly important economic component of marine ecosystems. Under the **Coral Reef Conservation Act** (CRCA; 16 U.S.C. §6401), NOAA Fisheries maps, monitors, assesses, restores, and conducts scientific research to benefit the understanding, sustainable use, and long-term conservation of coral reef ecosystems and cooperatively conserves and manages coral reef ecosystems with local, regional, and international programs and partners. Under the **Federal Power Act** (FPA; 16 U.S.C. § 811), NOAA Fisheries has the authority to prescribe safe, timely, and effective fish passage at federal hydropower projects to ensure access to upstream and downstream spawning grounds and other habitats. Several sections in the NAA, CRCA, and FPA address ecosystem issues,



including sections 2803 of the NAA; sections 203, 204, and 207 of the CRCA; and sections 10j, 18, and 30 of the FPA (16 U.S.C. §§ 803(j), 811, 823a).

The **National Environmental Policy Act** (NEPA) of 1969 (42 U.S.C. §§ 4321 *et seq.*) is a procedural statute that seeks to encourage productive and enjoyable harmony between man and his environment, promote efforts to prevent or eliminate damage to the environment, and enrich understanding of ecological systems and natural resources important to the Nation (42 U.S.C. § 4321). Pursuant to NEPA and its implementing regulations (40 C.F.R. §§ 1501 *et seq.*), NOAA Fisheries prepares environmental impact statements (EIS) for major federal actions significantly affecting the quality of the human environment (42 U.S.C. § 4332), and in other instances, prepares environmental assessments (EA). Through an EIS or EA, NOAA Fisheries analyzes the ecological, economic and social effects of proposed actions, alternatives to the proposed actions, and emphasizes cumulative impacts of actions on LMRs and their habitats, connections, and ecosystems. NOAA Fisheries also evaluates the environmental effects of federal actions on fishery resources through the MSA, ESA, and **Fish and Wildlife Coordination Act** (FWCA; 16 U.S.C §661 *et seq.*). Under the FWCA, NOAA Fisheries evaluates impacts of proposed activities to fish species and their habitats that fall outside the scope of the MSA (including many forage species that serve as prey for federally managed fisheries), and provides comments to other federal agencies to reduce environmental impacts.

#### NOAA FISHERIES RESPONSIBILITIES

NOAA Fisheries' Leadership, including the Assistant Administrator for Fisheries, the Deputy Assistant Administrators for Regulatory and Scientific Programs, the Regional Administrators and Science Directors, and the Agencies' ST level Senior Scientists, are responsible for agency-wide implementation of this policy.

This policy is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents or any other person.