

ECOSYSTEM-BASED OCEAN & COASTAL MANAGEMENT



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Ecosystem-based management (EBM) is a key strategy for comprehensively managing the nation's ocean and coastal environment. The Environmental Law Institute's new *Ecosystem-Based Management Implementation Handbook* summarizes central concepts, suggests options for overcoming implementation challenges, and provides concrete examples of EBM strategies in action.¹ This brief summary highlights key issues addressed in the *EBM Implementation Handbook*.

Why Ecosystem-Based Management?

In 2002, 775,000 salmon returned to California rivers to spawn. In 2008, scientists predicted only 58,200 would return. In response, the Pacific Fishery Management Council announced the closure of the California salmon fishery. What is the cause? According to the Council, "[m]any biologists believe a combination of human-caused and natural factors are to blame, including freshwater in-stream withdrawals, habitat alterations, dam operations, construction, pollution, and changes in hatchery operations."²

While all these causes are under investigation, what is the solution? By itself, the Council has only one regulatory option: reduce fishing pressure. The available solution is single-sector, but the actual causes are many. This raises two issues. First, fairness—is it fair to put the entire burden of the resource decline on fishers? And second, assuming the decline is caused or exacerbated by human activities other than fishing, will a reduction in fishing solve the problem?

The salmon collapse highlights the challenge that EBM strives to address—how to manage for the overall health of the ocean and coastal environment, considering multiple impacts

¹ ENVIRONMENTAL LAW INSTITUTE, OCEAN & COASTAL ECOSYSTEM-BASED MANAGEMENT: IMPLEMENTATION HANDBOOK (2009).

² See Anon., *PFMC Meeting to Set Fisheries; Seeks Task Force on Causes for Decline*, COLUMBIA BASIN FISH & WILDLIFE NEWS BULLETIN, Mar. 21, 2008, at <http://www.cbulletin.com/free/266402.aspx>.

across time and space in a way that explicitly and transparently makes tradeoffs among potentially competing uses.

Guiding EBM Principles³

There is a consensus among leading marine scientists about key EBM principles needed to minimize the myriad impacts facing U.S. ocean and coastal management:

- Make protecting and restoring marine ecosystems and all their services the primary focus, even above short-term goals for single services.
- Consider cumulative effects.
- Facilitate connectivity among and within marine ecosystems.
- Create complementary and coordinated policies across geographic and jurisdictional scales.
- Maintain historical levels of native biodiversity.
- Adopt the precautionary approach.
- Develop indicators to measure ecosystem status and management effectiveness.
- Involve all stakeholders through participatory governance.

Critical elements that relate to governance include: (1) ecosystem plans that establish accountability mechanisms and support adaptive management, (2) programs that appropriately connect ecosystem science to management, and (3) governance approaches that minimize cumulative impacts and make tradeoffs among different ocean uses.

Major Gaps and Current Opportunities

Ecosystem Planning

Ecosystem-based planning involves complex issues and requires input from a broad set of stakeholders. One of the chief challenges is to create a plan that is strategic, targeted, and achievable. A variety of adaptive management frameworks can be adopted to help overcome

³ KAREN MCLEOD ET AL., SCIENTIFIC CONSENSUS STATEMENT ON MARINE ECOSYSTEM-BASED MANAGEMENT (2005).

this challenge. Concrete goals and measurable indicators may help drive and evaluate success. Goals and indicators are part of the adaptive management process and create accountability mechanisms in the management system.

Ecosystem Science and Information

EBM requires incorporating the best available science into decision-making processes. A major challenge to achieving this objective is the lack of appropriate scientific data. Continued funding for data collection to establish baseline conditions, along with continued monitoring to inform the adaptive management process, are both essential to support EBM initiatives.

Inefficient transfer of data to and utilization by governing institutions is another key challenge. One increasingly popular way to inform and engage stakeholders and decision-makers is to develop digital maps that link ecological and social data. This approach also fits well with expanding efforts to engage in marine spatial planning and management. Additional approaches to overcoming these hurdles include the development of regional information systems and standardization of data collection and requirements across jurisdictions and sectors.

Accountability and Adaptive Management

Accountability and adaptive management are linked—a good adaptive management system should create information and procedures for evaluating and reporting that information in a way that creates accountability. Major challenges to effective adaptive management include creating concrete goals and measurable benchmarks and conducting effective and consistent monitoring. A major accountability

challenge is the lack of EBM mandates that require agency participation and implementation action. A few coastal states have passed laws to support EBM, including Washington, New York, and Massachusetts.

Cumulative Impacts and Tradeoffs

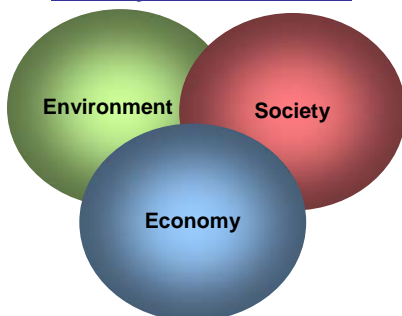
At the heart of ecosystem-based management is the need to minimize the cumulative human impacts on ecosystems in order to maintain the services upon which humans depend. Inadequate scientific information and legal and institutional structures that react rather than act proactively hinder efforts to consider and make decisions about potential human impacts. This challenge includes the lack of existing structures for making well-informed tradeoffs among competing and/or conflicting uses that affect marine ecosystems. One of the most promising and most often recommended approaches to overcoming these hurdles is ecosystem-based marine spatial planning, which leads to designation of specific areas for different uses based on the sensitivity of species and habitats and the social and economic needs of the stakeholders.

Moving Forward

As practitioners, managers, and decision-makers move forward to advance EBM, ELI's *EBM Implementation Handbook* should provide useful options and concrete examples that can be applied and expanded upon in new settings. With this, other research products, and ongoing efforts, ELI is working to support EBM implementation using sound law, policy, and management strategies.

What management structure, processes, and substantive requirements will help minimize adverse impacts while allowing sustainable human use?

Primary Considerations



Structures & Processes

- Regional
- Collaborative
- Science-based
- Plan-based
- Adaptive
- Precautionary
- Accountability mechanisms
- Tradeoff & cumulative impact mechanisms

Legal Challenges

- Linking funding (incentives, research, restoration) to program implementation
- Linking the regulatory system to an ecosystem plan & program
- Creating enforceable laws & policies based on an ecosystem plan & program

Contact Jamien Payne at payne@eli.org for a free copy of the Handbook (also available at http://www.elistore.org/reports_detail.asp?ID=11350).

Environmental Law Institute, 2009.