



Ecosystem-based Fisheries Management

FISHERIES FACT SHEET

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Conventional fisheries management focuses on a single species or stock and generally assumes that the productivity of that stock is a function only of its inherent population characteristics. Following this model, fisheries management has, at best, only been partially successful. Major problems have emerged due to uncertainty of the status and dynamics of the stock; a tendency to give priority to short-term social and economic needs versus long-term sustainability of the stock; and poorly defined and often conflicting objectives and institutional weaknesses.

To address these concerns, discussions of marine ecosystems now recognize that they are composed of both natural and human elements. Fish populations are one portion of complex marine ecosystems that are affected by many natural and human-induced factors. In turn, fisheries should be considered as systems in which social systems and ecological systems are in fact linked. This perspective calls for a new way of managing fisheries, that is, through an ecosystem-based approach. An ecosystem-based approach to fisheries management is geographically specified fisheries management that takes account of knowledge and uncertainties about and among living marine resources, their habitat, and human components of ecosystems, and strives to balance diverse societal objectives. The aim is to ensure that, despite variability, uncertainty and likely natural changes in the ecosystem, the capacity of aquatic ecosystem health, both natural and human, is maintained indefinitely for the benefit of present and future generations.

Key considerations and elements of ecosystem-based management of fisheries include:

- The ability to predict ecosystem behavior is limited.
- Ecosystems have real thresholds and limits which, when exceeded, can cause major system restructuring, sometimes referred to as "regime shifts".
- Once thresholds and limits have been reached, changes can be irreversible.
- Biological diversity is important to ecosystem functioning.
- Ecosystem processes operate at multiple scales – some processes are local, while others are wide-ranging. Similarly, some interactions involve many species, while others affect only a few.
- Components of ecosystems are linked.
- Ecosystem boundaries are constrained but "leaky" (movement of fish in and out of the boundaries).
- Ecosystems change with time.

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An ecosystem-based approach to fisheries management addresses human activities and environmental factors that affect an ecosystem, the response of the ecosystem, and the outcomes in terms of benefits and impacts on humans. Human activities include commercial and recreational activities from which coastal communities derive income, pleasure, and cultural identity. Human benefits and impacts can also include non-consumptive values arising from nature watching, or the value that an inland resident may place on knowing that an ecosystem is healthy.

The goal of ecosystem-based fisheries management is to maintain ecosystem health, integrity and sustainability. One of the distinguishing features of ecosystem-based fisheries management is an emphasis on protecting the productive potential of the system that produces resource flows, as opposed to protecting an individual species or stock as a resource. For an ecosystem that is already degraded, however, sustainability requires restoring those parts of the ecosystem that will sustain a diversity of species. The restoration of degraded ecosystems poses particularly difficult decisions related to balancing human needs with resource productivity requirements. The human component of marine ecosystems may exhibit irreversible regime shifts with poorly understood thresholds and limits, similar to those more commonly associated with the living marine resource components. The ecosystem approach also recognizes the complexity and uncertainty in predicting responses to management actions.

An ecosystem approach to fisheries management should include:

Goals, objectives and constraints that characterize the desired state of the fishery, including fish, fishermen, and habitat, should be stated clearly, and be based on societal choice, bounded by an ecological understanding of how the system functions, for the other components of the fisheries management system to be effective.

Conservation of fisheries resources that is precautionary, takes account of species interactions, and is adaptive.

Governance arrangements that are participatory and transparent and address cross-sectoral institutional arrangements at multiple levels/scales with multiple parties.

Management measures that allocate fishing rights and access in a manner that provides incentives for conservation and efficient use of living resources.

Ecosystem protection for habitat, and for species vulnerable to extinction or deemed by society to warrant special protection.

Monitoring of biological and human elements of the ecosystem including measurement of stresses and benefits and behavior of people and their institutions.

Management support that provides information, enforcement and performance evaluation.

The ecosystem-based approach to fisheries management sees the linkages between human and natural systems and recognizes the need for management approaches that address these linkages. It is also an approach with a human face and a people focus – fishermen and fishing communities. It will require creativity and innovation. Combinations of both tried and true and new and unfamiliar management approaches will be used. There will be learning and adaptation. The communities of fishermen, resource managers and researchers will need to work together to decide the best combination of approaches to address their situation.

