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Witness Statement

Statemnt of William T. Hogarth, Ph.D., Acting Assistant Administrator for Fisheries, National Marine Fisheries Service, U.S. Department of Commerce

Mr. Chairman and Members of the Subcommittee, thank you for inviting me to this hearing on ecosystem-based fishery management. I am William T. Hogarth, the Acting Assistant Administrator for Fisheries for the National Oceanic and Atmospheric Administration.

ECOSYSTEM-BASED FISHERY MANAGEMENT

Landings of many marine fisheries worldwide have declined in recent years. The causes of these declines are complex and include overharvesting, habitat alteration and loss, pollution, and natural environmental change. At the same time, fisheries managers are increasingly called upon to address the potential direct and indirect impacts of fisheries on protected species and other values and services the ocean provides. Ecosystem-based management is one approach that is being developed to improve upon single species management to ensure sustainable fisheries and a healthy marine environment. By viewing fisheries in an ecosystem context, we can begin to understand how these multiple factors affect fisheries, and how our fishing activities affect the broader ecosystem.

A basic premise of ecosystem-based management is that the relationships among living marine resources and the ecosystem within which they exist must be addressed. This requires a more comprehensive understanding and approach to fisheries research than is necessary for traditional single-species management approaches, although single-species stock assessments have become increasingly sophisticated and some now incorporate environmental parameters. The stock assessment models are only limited by our ability to collect and assimilate the relevant environmental data. Successful implementation of ecosystem-based management will require consideration of, among other things, habitat requirements, hydrography, environmental and climate changes, predator-prey relationships, and physical and biological processes. It will also require adaptive management and implementation that recognizes the current limits of our understanding of ecosystems.

Humans, too, are part of the ecosystem. The interests, values, and motivations of participants in a fishery and others who use or benefit from the ocean must be understood and factored into fishery management decisions. Information on human influences and impacts is as important as that from natural systems and must be included in any ecosystem research and management effort. In particular, we need to more broadly implement economically and socially efficient management programs like the cooperatives in the Alaska factory trawling fleet or the individual fishing quota system in the Pacific halibut fishery. These programs allow the industry to apply the appropriate level of capital investment and to make market-based allocations without unnecessary interference from the federal government. A reduction in capitalization will reduce the pressure to over fish and its attendant economically disastrous side effects and increase the safety of fishermen at sea.

In developing an ecosystem approach to research and management, it is important to recognize that a good deal is already known about marine ecosystems. Research into the oceans' role in climate variability has unlocked new understandings about how marine ecosystems function. However, this scientific information is not consistently applied in current management efforts, is insufficient data to construct the necessary models from which management frameworks can be derived. Therefore, emphasis must be placed on what new information is required and on how to effectively apply existing information. It must also be recognized that both science and management are ongoing processes and that new scientific, social, cultural, economic, and institutional information must be incorporated into the management process as it becomes available.

The complicated legislative and institutional framework that currently governs resource management decision-making poses both a significant challenge to, and an opportunity for, the implementation of ecosystem-based fisheries conservation and management. Although the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) is the principal legislation governing U.S. marine fisheries, other Federal legislation including the Marine Mammal Protection Act and the Endangered Species Act, as well as state laws and international agreements, provide for the conservation and management of marine resources. Coordination of these legislative and institutional responsibilities, as well as the appropriate involvement of all stakeholders in the decision making process, is currently conducted on a case-by-case and often ad hoc basis. Implementing an ecosystem-based management approach requires making this coordination far more integral and explicit.

Ecosystem-Based Management Reports

Two recent reports addressed the use of ecosystem-based management in marine fisheries. The National Research Council published Sustaining Marine Fisheries and the National Marine Fisheries Service published Ecosystem-Based Fishery Management. I will briefly highlight the findings from both of these reports.

The National Research Council's Sustaining Marine Fisheries Report

The National Research Council's Ocean Studies Board established the Committee on Ecosystem Management for Sustainable Marine Fisheries (Committee) to assess the current state of fisheries resources; to determine the basis for success and failure in marine fisheries; and to evaluate the implications of fishery activities for ecosystem structure and function. The Committee's findings are contained in its 1999 Sustaining Marine Fisheries report. The Committee concluded that the most comprehensive and immediate ecosystem-based approach to rebuilding and sustaining fisheries and ecosystems is a significant overall reduction in fishing mortality. The Committee also recommended an ecosystem-based approach to fishery management that addresses overall fishing mortality. The Committee's specific recommendations were to use a conservative approach to single-species management; incorporate ecosystem considerations into management; deal with uncertainty; reduce excess capacity and use assignment of rights; use marine protected areas; reduce bycatch and discards; develop institutional structures; and get a better understanding of the structure and functioning of marine ecosystems.

The NOAA Fisheries Ecosystem Principles Advisory Panel Report

An amendment to the Magnuson-Stevens Act in 1996 directed NOAA Fisheries to establish an Ecosystem Principles Advisory Panel (Panel) to provide expert guidance on how to incorporate an ecosystem approach in NOAA Fisheries' research, conservation and management activities.

Composed of individuals with expertise in the structures, functions, and physical and biological characteristics of ecosystems, as well as representatives from the Fishery Management Councils, states, fishing industry and conservation organizations, the Panel produced a report that outlines basic principles, goals, and policies necessary to implement an ecosystem approach. It includes specific recommendations, including the adoption of Fishery Ecosystem Plans (FEP) for each ecosystem under the Regional Fishery Management Councils' (Council) areas of authority. The FEP is envisioned to be a document that serves as an umbrella under which individual Fishery Management Plans (FMPs) would be developed and with which they must be consistent. An FEP would contain information on the structure and function of the ecosystem in which fishing activities occur, so that managers can be aware of the effects that their decisions have on the ecosystem, and the effects other components of the ecosystem may have on fisheries. The adoption of this approach would help to ensure that individual FMPs do a better job of incorporating ecosystem considerations. The report concluded that the ultimate benefits of adopting ecosystem-based fishery management and research would be more sustainable fisheries and marine ecosystems, as well as more prosperous coastal communities.

The Panel specified several steps that Councils should take to develop FEPs. These include: delineate the geographic extent of the ecosystems that occur within the Council's authority; develop a conceptual model of the food web; describe the habitat needs of the significant food web; calculate total removals, including incidental mortality; assess stock assessment uncertainty; develop indices of ecosystem health as targets for management; describe available long-term monitoring data and how they are used; and assess elements of the ecosystem that most significantly affect fisheries. Taken together, these provide the information necessary for a Council to make fisheries decisions in an ecosystem context.

NOAA Fisheries' Response to the Reports

Based, at least partially, on the Panel's report and on the NRC's report, "Sustaining Marine Fisheries," the concept of ecosystem-based fishery management is gaining momentum. Taken as a whole, NOAA Fisheries applauds the Panel's effort to develop pragmatic suggestions to incorporate ecosystem approaches into the existing framework of the NOAA Fisheries/Council system. NOAA Fisheries is developing plans for a workshop to develop technical guidelines for implementation of the Panel's recommendations. NMFS will be looking to these reports and elsewhere for ideas as we continue to move toward ecosystem-based fisheries management.

For example, NOAA Fisheries focused its National Stock Assessment Workshop last year on ecosystem based management. About 100 NMFS and academic scientists attended the workshop and evaluated where we are in developing ecosystem based management, and what research must be done. The research needs are broad and include economic analyses on the desirability of alternative ecosystem states; effects of changes in ocean conditions on species and the ecosystem; how fishing affects productivity; effects of discard of undersized or unwanted species on the target species and on energy flow in the ecosystem. They noted the importance of long-term, fishery independent ecosystem monitoring and research, and on observer programs for tracking ecosystem changes and building predictive models. Because there is much information needed, they noted the need for partnerships to collect and share data from comprehensive ecosystem monitoring programs. To have effective ecosystem based management, there is much we will need to learn and understand about ecosystems.

NOAA Fisheries and the eight Councils have already begun investigating how ecosystem considerations can be incorporated into the existing fisheries management structure. Generally, the approach is to conduct detailed single-species assessments and embed them in an ecosystem context. In other words, consideration

of ecosystem effects tends to be qualitative or semi-quantitative, rather than fully quantitative. Multi-species and ecosystem models are being developed in all NOAA Fisheries Science Centers and by a few academic institutions, but they are usually difficult to validate and frequently suffer from lack of adequate baseline biological and environmental data. Extensive monitoring programs for federally managed species, associated and dependent species, oceanographic data, habitat mapping, and climate effects are needed to completely fulfill the data requirements of ecosystem models.

To address such needs and to implement the recommendations of the National Research Council report Improving Fish Stock Assessments, NOAA Fisheries is currently preparing a Stock Assessment Improvement Plan. The Stock Assessment Improvement Plan identifies three "Tiers of Excellence." In brief, these Tiers are to enhance stock assessments using existing data, to elevate all assessments to nationally acceptable standards (which, among other things, will require adequate baseline monitoring for all managed species), and to develop and conduct "next generation" assessments involving ecosystem considerations and environmental and spatial effects. As part of the FY 02 Budget Request, NOAA Fisheries has requested funding that will enable achievement of Tier 2, which includes adequate baseline monitoring of all managed species. When Tier 2 of the NOAA Fisheries Stock Assessment Improvement Plan is achieved, an important step towards ecosystem-based fisheries management will have been made. The next step will be to conduct the assessments needed to incorporate the baseline information into the decision making process for ecosystem and fishery management planning.

Examples of Ecosystem Approaches to Fishery Management

Although fishery management based on an ecosystem approach is still a relatively new and evolving concept, NOAA Fisheries is beginning to implement ecosystem-oriented approaches to the management of a few living marine resources. Some examples of ecosystem-based approaches are: the FEP being developed for the Chesapeake Bay; the Coral Reef Ecosystem FMP being developed by the Western Pacific Council; the ecosystem-related provisions of all FMPs, particularly relating to essential fish habitat (EFH); and the ecosystem-based restoration planning that guides many of our habitat restoration projects.

Development of a Chesapeake Bay Fisheries Ecosystem Plan

NOAA is a strong Chesapeake Bay Program (CBP) partner and is relied upon as an objective voice of science. The NOAA Chesapeake Bay Office (NCBO) is leading an exciting initiative to develop an FEP for the Bay that will result in gradual implementation of ecosystem-based fishery management. The Chesapeake Bay FEP will clearly describe the structure and function of the Bay ecosystem, including key habitats and species interactions. It will recommend actions to gradually implement ecosystem-based approaches to fisheries management for Bay resident and coastal species, and specific research needed to acquire knowledge of the ecosystem and its fisheries that will achieve long-range management objectives.

In response to the Ecosystems Advisory Panel's recommendation to develop a demonstration FEP, and commitments in the Chesapeake 2000 Agreement, the NCBO, together with the Program=s Scientific and Technical Advisory Committee, convened regional and national experts, scientists, and managers to participate in the Chesapeake Bay FEP Workshop to build the framework and establish guidelines from which to develop an FEP for the Chesapeake Bay.

As follow-up to the FEP Workshop, NCBO has appointed an FEP Technical Advisory Panel of sixteen prominent Bay scientists to: (1) develop an FEP for the Chesapeake Bay (with strong support from NCBO), (2) guide the implementation of ecosystem-based management of Chesapeake Bay fisheries, and (3) foster

the continual development of the FEP to reflect expanded knowledge of the ecosystem.

A draft of the initial FEP, which will include such important elements as ecosystem boundaries, a conceptual model of the food web, indices of ecosystem health, ecosystem effects on fishing, and economic and social aspects, is expected by the end of 2001, with a completed FEP by spring 2002. The FEP will be an iterative process; it will undergo continual development as understanding increases of the Bay fisheries within an ecosystem context.

Draft Coral Reef Ecosystem Fishery Management Plan

The Western Pacific Fishery Management Council, with the assistance of NOAA Fisheries, is preparing a new Coral Reef Ecosystem Fishery Management Plan (CRE-FMP). Over 90% of coral reefs under U.S. jurisdiction are in the Pacific Ocean. However, the Council foresees a significant expansion of new fisheries for food, aquarium fishes, corals, and pharmaceuticals, especially given the increasing overfishing occurring in state waters. Addressing the potential ecosystem impacts of fisheries on protected species such as the Hawaiian monk seal is also an increasing concern. Key approaches that are being incorporated in the draft CRE-FMP are: including all reef species not currently covered by existing FMPs; using a precautionary approach based on a system of permits and reporting; incorporating zoning, which includes fully protected marine reserves as an integral component; prohibiting fishing gears known to damage coral reef habitats; and providing a framework for adaptive management. The Council hopes to finish work on the CRE-FMP in the near future.

Essential Fish Habitat

The EFH provisions of the Magnuson-Stevens Act emphasize the importance of habitat in sustainable fisheries and the need to address unintended adverse effects of fishing activities on important habitats. The EFH provisions require every FMP to identify and describe EFH, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH.

NOAA Fisheries and the Councils have identified EFH for all 41 existing FMPs. The EFH designations take an ecosystem approach, consistent with the definition of EFH in the Magnuson-Stevens Act, by encompassing habitats needed throughout the full life cycle of managed species. Thus EFH designations include important habitat areas for all life stages of fish and not just the spawning grounds or the areas where adult fish are found in high densities. To provide additional focus for conservation and management, NOAA Fisheries encourages Councils to identify Habitat Areas of Particular Concern (HAPCs) within EFH to highlight priority areas that have especially important ecological functions, and/or areas that are particularly vulnerable to degradation. Importantly, the Councils are beginning to use EFH and HAPC information in fishery management decisions. For example, when the New England Council voted to reopen closed areas on Georges Bank to scallop harvesting, the Council specifically decided to exclude an HAPC for juvenile cod as well as other hard bottom habitats that are susceptible to impacts from scallop dredging. Likewise, the North Pacific Council last year approved a measure to prohibit directed fishing for corals and sponges because it recognized that those living substrates provide essential habitat for a variety of fishery resources. These types of ecosystem considerations are becoming increasingly important to the sustainable management of our nation's fishery resources.

Habitat Restoration Planning

NOAA Fisheries is also applying ecosystem principles to our habitat restoration planning. Through the NOAA Restoration Center, we work with other agencies, industries, and interest groups to develop regional restoration plans at the spatial scale of a watershed or larger ecological unit. We are using regional restoration plans to restore important coastal and anadromous fish habitats in Washington State, New York, and Florida. These bay-wide approaches address habitat restoration needs in a comprehensive and systematic fashion, prioritizing and linking individual projects to increase the effectiveness and efficiency of restoration activities.

SUMMARY

The need for a much more comprehensive understanding of living marine resources and the

ecosystems that support them is clear. While we have a considerable way to go in conducting the types of research and implementing integrated and adaptive decision making processes that would support true ecosystem management plans, some important steps have been made. I look forward to continuing to work with the House Resources Committee and a wide range of stakeholders to make additional progress in this area.

CONCLUSION

Mr. Chairman, this concludes my testimony. With me on the panel today are two of NMFS's finest scientists, Dr. Patricia Livingston and Dr. Steve Murawski. Dr. Livingston is the leader of our fishery ecosystem research in the Bering Sea and Gulf of Alaska. Dr. Murawski is our chief stock assessment scientist for our northeastern fisheries. They will each give you a synopsis on the state of our ecosystem knowledge and research in their respective geographic areas. Again, I want to thank you for the opportunity to testify today and discuss ecosystem management. I am prepared to respond to any questions that you and other Members of the Committee may have.

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