Improving the Management of U.S. Marine Fisheries

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Improving the Management of U.S. Marine Fisheries

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Ocean Studies Board
Commission on Geosciences, Environment, and Resources
National Research Council

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Preface

Marine fish and shellfish are a living renewable resource of vital importance to the nation, and sound management practices are required to ensure their long-term sustainability. Fish are a significant source of protein in human and animal diets; the associated health benefits are becoming increasingly apparent to U.S. consumers. Fishing provides a commercial livelihood on all U.S. coasts, and offers recreational opportunities for millions of Americans.

To assess the effectiveness of the present U.S. fisheries management, a Committee on Fisheries was established in 1992 under the auspices of the Ocean Studies Board of the National Research Council. The committee's charge was to study and report on means of improving our nation's capability to manage its marine fishery resources. Consistent with the policy of the National Research Council, committee members were selected with a wide range of expertise—resource economics, commercial fishing, fisheries policy, fisheries science, oceanography, marine ecology, marine technology, and fisheries management—and viewpoints, to ensure balance and fair treatment.

Since fisheries management encompasses a broad spectrum of issues, the committee used a number of means to gather information from fishery experts. Two meetings were organized so that the committee could hear about critical fisheries issues from panels of interest groups that included congressional staff, federal and state fisheries managers, and representatives of federal agencies, the fishing industry, and environmental organizations. Another meeting was held in conjunction with a national conference, Conserving America's Fisheries: A National Symposium on the Magnuson Act, to provide committee members with an opportunity to participate in a national debate on future U.S. fisheries policy.

The committee also reviewed summaries of testimony submitted for congressional hearings on the reauthorization of the Magnuson Act.

The objective of this report is to present recommendations while Congress considers changes in the Magnuson Fishery Conservation and Management Act of 1976 (MFCMA). The committee acknowledges that the report does not represent an in-depth evaluation or assessment of all of the issues relevant to the MFCMA. Rather it reflects the collective, deliberated views and recommendations of experts, who are well familiar with all aspects of the MFCMA, on how the act might be improved in the reauthorization process. The committee's recommendations are designed to enhance the most effective aspects of the present MFCMA and to introduce critically needed clarifications and structural improvements. Where consensus could not be reached, the committee agreed to accept differences of opinion and to present these differences in the report text.

The committee would like to express its gratitude to Dr. Brian Rothschild for serving as chairman during the development of this report. Under his leadership as chairman, the committee made significant steps toward completing a final draft. The committee would also like to thank Eldon Greenberg for his valuable contributions to the committee's efforts, which include preparation of a review paper on the MFCMA and the evolution of fisheries management, and participation in several discussions on fisheries law and policy.

The committee hopes that this report will serve as a useful resource, contributing proactive recommendations for improving fisheries management, while Congress is engaged in national debate and deliberation related to the MFCMA reauthorization.

John J. Magnuson
Chairman

Contents

SUMMARY 1
Prevent Overfishing 2
Improve the Institutional Structure 3
Improve the Quality of Fishery Science and Data 5
Move Toward an Ecosystem Approach to Fishery Management 6
Reduce Bycatch/Discard Problems 7
Protect Fish Habitats 7

CHAPTER 1: INTRODUCTION 9

CHAPTER 2: THE MAGNUSON FISHERY CONSERVATION AND MANAGEMENT ACT 12

CHAPTER 3: CRITICAL ISSUES IN FISHERY MANAGEMENT 16
Overfishing 17
Optimum Yield 18
Entry and Capitalization 20
Institutional Structure 22
Quality of Fishery Science and Data 25
Ecosystem Approach to Fishery Management 27
Bycatch/Discard 28
Fish Habitats 29

CHAPTER 4: RECOMMENDATIONS 31
Prevent Overfishing 32
Improve Institutional Structure 34
Secretary of Commerce 34
Regional Marine Fishery Management Councils 35
Body for Oversight and Conflict Resolution 39
Improve the Quality of Fishery Science and Data 41
Move Toward an Ecosystem Approach to Fishery Management 42
Reduce Bycatch/Discard Problems 43
Protect Fish Habitats 44

APPENDIX 1. Reports Reviewed by the OSB Committee on Fisheries 45

APPENDIX 2. Executive Order 12866 of September 30, 1993 47

APPENDIX 3. Biographical Information on Members of the
OSB Committee on Fisheries 60

Summary

Harvested marine species, including finfish, crustaceans, shellfish, and marine plants, are a valuable national resource. Managers of marine fisheries[1] have a responsibility to maintain fish stocks at or above levels of abundance that can sustain maximum yields over the long term while providing opportunities for commercial and recreational fishing. In addition to balancing stock maintenance and harvesting, effective management must also minimize waste, protect habitats and/or non-targeted vulnerable populations, and maintain the health of marine ecosystems, e.g. productivity, diversity, and environmental quality, on which fish depend.

Fishery management in the United States has not achieved the success in conserving fish stocks that was anticipated when the original fisheries management law was passed in 1976. In 1991, fish stocks were reportedly less abundant than before 1976, and out of 236 fish species reviewed, National Marine Fisheries Service of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration reported 67 as being over-utilized. Reauthorization of the Magnuson Fishery Conservation and Management Act (MFCMA), the current law governing fisheries management, provides an opportunity to make changes that will improve our management capabilities. To assess the effectiveness of present U.S. fisheries management, a Committee on Fisheries was estab-

[1] In this report reference to fishery resources or fish is intended to be general and inclusive of all marine species that are under federal fisheries management, including for example, many species of finfish, some shellfish (surf clams, ocean quahogs, and Atlantic sea scallops), and some crustaceans (American lobsters, stone crabs, shrimp, spiny lobsters, and king and tanner crabs).

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The objective of this report is to present recommendations while Congress considers changes in the Magnuson Fishery Conservation and Management Act of 1976 (MFCMA). The committee acknowledges that the report does not represent an in-depth evaluation or assessment of all of the issues relevant to the MFCMA. Rather it reflects the collective, deliberated views and recommendations of experts, who are well familiar with all aspects of the MFCMA, on how the act might be improved in the reauthorization process. The Committee on Fisheries identified the following topics to be considered for change during reauthorization: overfishing, including entry, capitalization, and the definition of optimum yield; institutional structure; the quality of fishery science and data; and an ecosystem approach to fishery management, including bycatch and fish habitats. The committee's recommendations are designed to enhance the most effective aspects of the present MFCMA and to introduce critically needed clarifications and structural improvements. Chapter 1 provides introductory material on the report. Subsequent chapters present background material on the MFCMA (Chapter 2), identify and discuss critical issues in fisheries management (Chapter 3), and make specific recommendations for improving fishery management under the Act (Chapter 4).

PREVENT OVERFISHING

The MFCMA specifies in its National Standard One that the purpose of fisheries "conservation and management" is to prevent overfishing while achieving "optimum yield from each fishery for the United States fishing industry". Furthermore, the MFCMA definition of optimum yield is based on the maximum sustainable yield modified by economic, social, or ecological factors. This definition of optimum yield is so broad that it can be applied to almost any quantity of catch. It is the committee's view that the MFCMA does not contain adequate measures to prevent harvest from reducing the stock below a level at which it can sustain maximum yield over the long term, to control entry and wasteful capitalization in order to prevent overfishing of a stock of fish, and to promote rebuilding of stocks reduced to low levels.

Recommendation 1: Fishery management should promote full realization of optimum yields as originally envisioned in the MFCMA by ensuring that harvest does not reduce stock abundance below levels that can sustain maximum yields over the long term. For currently overfished stocks, harvest levels must allow rebuilding the stock over specified periods of time to a level that can support sustainable maximum yields. Any departure from the above must be supported by persuasive

evidence regarding natural variability, ecosystem interdependence, sustainable national income gains, or truly exceptional socio-cultural considerations.

In fishery management plans developed by a regional fishery management council or the Secretary, the realization of optimum yield for fisheries should be promoted by maintaining stock abundance at or above the maximum sustainable yield level. Specifically, when a stock is below its level of maximum biological productivity, allowable catch levels should not be increased by optimum yield adjustments but should be kept below the current replacement level to allow rebuilding of the stock over a specified period of time. This recommendation applies to single-species fisheries. Ideally, allowable catch should take into account the effect of fishing activity on each species in the ecosystem, but much of the information needed for such an approach is not yet available. For multiple-species fisheries, the allowable catch must be determined on a case-by-case basis.

One important technique for achieving optimum yield is to control the number of units of gear such as vessels, traps, and nets. The MFCMA establishes guidelines for council consideration of fishing vessel restrictions and limited access systems. When unlimited entry is permitted, each fisherman increases the number and harvesting capacity of vessels and gear in order to capture the largest share of the allowed catch. The committee believes that open access to fisheries and the resulting overcapitalization are major problems that are inadequately addressed in most contemporary fisheries management. Although most of the important fisheries are now under management plans that include some form of limited entry or are considering such plans, overcapitalization is still inadequately addressed.

Recommendation 2: Fishery management should control entry into and wasteful deployment of capital, labor, and equipment in marine fisheries.

It is increasingly apparent that a remedy for the overfishing problem caused by open-access fisheries is to be found in some controls on entry. However, limited entry alone has not prevented and will not prevent overcapitalization or reduce the pressure to exceed acceptable biological catch levels; some form of control of fishing effort and/or total catch is also needed. To be effective, the methods used to control entry and capitalization must be responsible and equitable, and have adequate phase-in periods.

IMPROVE THE INSTITUTIONAL STRUCTURE

The committee attributes the present condition of many U.S. stocks as overutilized and depleted to inadequacies in fisheries management (see discussion in

Chapter 3). A principal finding of the committee is that the lines of authority and responsibility between the Secretary of Commerce and the regional fishery management councils regarding management of marine fishery resources are unclear, and therefore confuse participants, create inefficiencies, and generate adversarial positions without a satisfactory mechanism for conflict resolution. In addition, the committee finds that except for the traditional oversight function of Congress, the present system of fisheries management lacks independent checks and balances.

> **Recommendation 3:** Congress should clarify the authority and responsibility of the Secretary of Commerce and of regional fishery management councils with respect to allocation and capitalization controls, implementation and enforcement of fisheries management plans, strategic planning, review of management decisions and actions, and conflict resolution.

The committee recommends a management structure consisting of three major components: the Secretary of Commerce, as the official of the federal government; the regional fishery management councils, as legislatively provided representing regional expertise, knowledge, and interests; and an independent oversight body, as an independent advisor to the Secretary, the councils, and Congress.

The oversight body should be established as an independent mechanism responsible for strategic planning, review of management decisions and actions, and conflict resolution by providing recommendations to the Secretary, the councils, and Congress (see description in Chapter 4). This structure is not envisioned as a substitute for action by other properly constituted bodies action, or for conflict resolution among entities empowered to resolve their own conflicts. The committee envisions an oversight body that should be a standing entity with stable funding appropriated by Congress, whose charge is to review and report to the Congress on performance and problems in U.S. marine fisheries under the MFCMA, as amended. Included in this charge, among other factors, might be scientific and technical issues, management goals and strategies, jurisdictional problems, and environmental and conservation concerns. At the request of either the Secretary of Commerce or a regional council, and at its sole discretion, the body may engage in ad hoc conflict resolution by considering and rendering a non-binding decision upon those in conflict, including the Secretary, the councils, and other interested parties. In order to provide that recommendations from the body are given serious consideration, federal officials should be required to respond to any recommendations within 120 days, and to explain in detail any decisions not to follow them.

The regional fishery management councils should continue to bear the responsibility for allocation and capitalization controls. All councils should main-

tain and use scientific and statistical committees to ensure that the "best scientific information available" is up to date and unbiased. The Secretary should continue to have the primary responsibilities for providing scientific and technical information to the councils and for implementing and enforcing approved fishery management plans, but should not be involved in the allocation process, except at the review level.

The committee believes that the establishment of acceptable biological catches should be a scientific determination. This can be accomplished by having the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service, state agencies, and other interested scientists provide initial views regarding appropriate levels of acceptable biological catches. Each council would be required to establish a scientific advisory committee with the responsibility for setting the acceptable biological catches. This scientific committee could be the council's scientific and statistical committee, a group drawn mainly from the NOAA/National Marine Fisheries Service, or a separate new committee. Actual total allowable catches may, of course, be modified by adjustments to the optimum yield by council members provided that, first, maximum sustainable yield can be sustained over the long term, and second, for currently overfished stocks, the permissible harvests allow rebuilding these stocks over specified periods of time to levels that can support sustainable maximum yields. This process of determining harvest levels is, in fact, the status quo for some councils. However, such a mechanism needs to be codified so all councils will follow this procedure. Furthermore, the reports of the Scientific and Statistical Committee should be transmitted by the committee chairman to the council, NOAA/National Marine Fisheries Service, state agencies, the Secretary, and other interested parties as independent reports.

The issues of conflict of interest and competence arise in considering restructuring of the councils. The councils should be balanced in terms of their representation, so as to include individuals knowledgeable about the various fisheries under the councils' jurisdiction. Congress should consider subjecting council members to more stringent provisions to prevent conflict of interest, but should examine the impact that such provisions might have on participation by interested parties and on the efficiency of the council decision-making process.

IMPROVE THE QUALITY OF FISHERY SCIENCE AND DATA

The MFCMA requires that conservation and management measures be based upon the best scientific information available. The information needed includes stock data, clear descriptions of these data and the analysis techniques applied to them, and, finally, a best estimate of stock histories and a related estimate of the reliability of the stock-assessment analysis. The information collected by the

NOAA/National Marine Fisheries Service and used by the fishery management councils is frequently insufficient for making management decisions. On the biological side, some assessments rely on fishery performance information that may have so much bias and variability as to prevent accurate assessment of population condition. For many fisheries, the magnitude of bycatch/discard mortality is unknown, and consequently the effects of fishing cannot be accurately evaluated. Furthermore, insufficient information about the effects on the environment and multi-species interactions may prevent correct assessment of current and future recruitment.

Recommendation 4: The Secretary of Commerce should improve the NOAA/National Marine Fisheries Service's scientific programs by making them responsive to management needs and to possible societal and economic effects. Improved data collection, analysis, and dissemination are needed to make evaluations and policy decisions.

Better data are needed for management decision-making and fishermen are an obvious source for providing catch data. Therefore, it is the committee's view that all fishermen should be obligated by law to report their catch (including bycatch, fishing effort, and related biological information) to the program, and confidentiality must be assured. Economic information on fishermen's catch is very useful; it must be obtained by methods that provide reliable data. The information should be accessible to personnel involved in fisheries research, management, and operations. Aggregate summaries of the resulting statistics should be available to all parties.

MOVE TOWARD AN ECOSYSTEM APPROACH TO FISHERY MANAGEMENT

Habitats and the biota that occupy them constitute interacting systems called ecosystems. The maintenance of sufficient fish stocks depends directly on the integrity of these ecosystems. Fisheries can directly affect an ecosystem's structure through overfishing or habitat damage, and thus have the potential to alter its productivity or the quality of its products. Fisheries also can be affected by habitat alterations resulting from damage by other users or from pollution. The most serious forms of coastal degradation are the physical destruction of important habitats, water pollution, and the introduction of exotic species. These issues need to be addressed by the rules to be used in the conservation and management of fishery resources.

Recommendation 5: Fishery management should increase the use of the ecosystem approach to management, and include environmental protection goals in the development of fishery management plans.

Reduce Bycatch/Discard Problems

An important starting point for increasing the use of an ecosystem approach to fishery management would be the implementation of multispecies management.[2] A significant first step would be to incorporate bycatch/discard[3] information into fishery management decisions—in particular, to use in estimating the total mortality for specific fish stocks imposed as a result of fishing. Fishery management plans must deal with direct and indirect effects of bycatch/discards as well as with other fishery mortality not now reported for target and non-target species—including threatened and endangered species. Management plans should also include procedures designed to reduce the general wastage found in many types of fishing.

The Secretary of Commerce through the NOAA/National Marine Fisheries Service should undertake multispecies approaches to fishery management to evaluate the need for and, if necessary, implement a formal bycatch reduction program. The bycatch reduction program should identify a set of goals involving biological, ecological, economic, and ethical concerns.

> **Recommendation 6:** The Secretary should provide adequate funding for collection of reliable discard data and for a major new fishery technology program to improve gear and fishing techniques needed to reduce the bycatch/discard problem.

A bycatch incentives/disincentives program should be considered at the vessel or fleet level. The bycatch initiative should also quantify bycatch data for all major U.S. fisheries, because analysis of bycatch/discards will provide the basis for effective catch management and greatly facilitate understanding of the ecosystem components, species interactions, and multispecies management requirements.

Protect Fish Habitats

The stability and productivity of fish resources depend in large part on the number and environmental quality of the habitats in which fish breed, spawn, mature, and live their adult lives. Habitat alterations are perhaps the least under-

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[2]Multispecies management as used in this document means that all of the species of fish found together in an area are managed as a unit, insofar as possible.

[3]The committee defines bycatch as discards plus incidental catch that is sold. In this report we are particularly interested in the volume and numbers of fish and other marine life that are discarded from fishing vessels and the mortality involved in these discards. The committee also recognizes that unreported mortalities often occur, e.g., (1) losses resulting from mortalities imposed on fish and other sea life escaping fishing gear, (2) losses due to ghost fishing, (3) discard of spoiled fish, and (4) unreported catch.

stood of the important effects of fishing. Even the cessation of all fishing activities will not guarantee future stocks if there are inadequate habitats to support fish reproduction and growth. Nonetheless, to ensure adequate habitats to support fish stocks, some form of habitat protection is essential. Although the MFCMA allows councils to comment and make recommendations on any activity proposed by a federal or state agency that may affect the habitat of a fishery resource under a council's jurisdiction, this provision does not address the effects of fishing activities on non-target organisms, and on the physical and chemical environment.

> **Recommendation 7:** The Secretary of Commerce, through the NOAA/ National Marine Fisheries Service and under advisement from regional fishery management councils, should be empowered to protect the habitats necessary to sustain fishery resources. A major national program should be developed to determine what habitats are critical for fish reproduction and growth, and how they can be protected.

The recommended program would bring the problem of degradation of fish habitats to national attention, and would provide a means of coordinating measures to achieve adequate protection. The more a fishery depends on riverine and coastal environments, the more critical is the habitat issue. Two early tasks would be to define the environmental components essential for survival and production of populations affected by the fisheries, and to identify and understand current causes of habitat degradation.

1

Introduction

Marine fish, shellfish, crustaceans, and plants are living renewable resources of vital importance to the nation, and sound management practices are required to ensure their long-term sustainability. Fish are major components of marine food webs, serving as predators on plankton and other fish, as well as food for marine mammals; an intact food web is essential for maintaining a healthy ecosystem. Fish are also a significant source of protein in human and animal diets; the health benefits of eating fish are becoming increasingly apparent to U.S. consumers. Fishing provides a commercial livelihood on all U.S. coasts, and offers recreational opportunities for millions of Americans.

The United States has abundant fishery resources[1] within its Exclusive Economic Zone (EEZ). The EEZ, which extends 200 miles offshore of U.S. coastal states and territories, contains both finfish and shellfish of considerable value. According to the U.S. Department of Commerce, National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service, in 1991 domestic commercial fisheries had a total impact (direct, indirect, and induced) on the U.S. Gross National Product of more than $50 billion.[2]

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[1] In this report reference to fishery resources or fish is intended to be general and inclusive of all marine species that are under federal fisheries management, including for example, many species of finfish, some shellfish (surf clams, ocean quahogs, and Atlantic sea scallops), and some crustaceans (American lobsters, stone crabs, shrimp, spiny lobsters, and king and tanner crabs).

[2] Our Living Oceans, 1992. U.S. Department of Commerce. U.S. Government Printing Office, Washington, DC 20402.

The value of fisheries also accrues to a wide range of industries that directly or indirectly benefit from fishing activities, through a multiplier effect. Value is added, for example, as fish pass from harvest vessel to restaurant. Also, approximately 17 million people participated in U.S. recreational marine fishing in 1991. Sales of recreational tackle, rental of charter boats, and other fishing-related expenditures all add to local and national economies. Economists also recognize other tangible and intangible value measures, such as "the recreational experience," that cannot easily be defined in terms of their monetary value or their contribution to the U.S. Gross National Product.

Today, after 17 years of comprehensive federal fisheries management, the viability of many resources and associated industries is not yet secure. A number of marine fish resources adjacent to our nation are overexploited, and fisheries management has become more complex with the added regulations requiring protection of certain species of marine mammals, turtles, and birds. Extended environmental and natural resource legislation has given additional responsibilities to MFCMA managers. Furthermore, allocation disputes between domestic users have increased since the phase-out of foreign fisheries. Clearly, the overall goal of public policy for marine fisheries cannot be simply the maximization of revenues to the fishing industries or of benefits to any single user group. Policy must be concerned with the conservation and future availability of fish stocks, elimination of waste, maintenance of productive ecosystems, and equitable distribution of the resources between user groups.

A variety of fishery-resource values must be considered, including those of cultural and recreational fishing and the desire to protect marine mammals, turtles, and other vulnerable species. In short, public policy must be concerned with the ecosystem. To achieve these goals requires effective management, minimization of waste, and conservation of species and critical habitats. The challenges to effective fisheries management are enormous: pressure on the stocks; intense user-group conflicts; loss or degradation of critical habitat; conflicts among state and federal managers in decision-making; lack of coordination of management and conservation between these fishery resources within and those outside of U.S. jurisdiction; and complex and fragmented harvesting, processing, and marketing sectors.

To achieve maximum benefit from fisheries resources it is necessary to find means to balance the pursuit of various benefits by many participants. Because the resources and the ecosystems of which they are part are so complex, and because so many individuals, groups, and entities in the private and public sectors have a stake in management outcomes, achievement of significant progress will require an integrating theme and national policy that can focus the interests of all participants on the same goals.

Reauthorization of the Magnuson Fishery Conservation and Management Act of 1976 (MFCMA), the law governing fisheries management, provides an opportunity to make changes that will improve our management capabilities. To

assess the effectiveness of the present U.S. fisheries management, a Committee on Fisheries was established in 1992 under the auspices of the Ocean Studies Board of the National Research Council. The committee's charge was to study and report on means of improving our nation's ability to manage its marine fishery resources.

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2

The Magnuson Fishery Conservation and Management Act

The need for coordinated fisheries management became apparent as the United States approached the mid-1970s. In the early 1970s, it was recognized that intensive foreign fishing off U.S. coasts had depleted many fish stocks and reduced the profitability of U.S. fishermen and U.S. processors. As a result, the United States extended its fishing jurisdiction to 200 miles from shore in the mid-1970s (an action that had already been taken by many other coastal nations). The reductions in fish stocks also raised the issues of efficiency, waste, and conservation to prominence, thus providing the impetus for the articulation of a new scheme for managing U.S. fishery resources—the Fishery Conservation and Management Act of 1976 (FCMA).

The Fishery Conservation and Management Act of 1976 (Public Law 94-265, 16 U.S.C. 1801 et seq.) was signed into law on April 13, 1976, and went into effect on March 1, 1977. The Act was officially retitled "The Magnuson Fishery and Conservation and Management Act" in 1980 by Public Law 95-561, to honor the late Senator Warren Magnuson, who was instrumental in developing and passing the original legislation. With the enactment of the FCMA, the United States established a physical zone within which fish populations would be managed and a set of mechanisms for controlling marine fishing activities.

The principles and purposes of the MFCMA are summarized below.

1. Establish a geographic zone adjacent to the United States over which the U.S. government is responsible for fishery resource management, with limited exceptions.

2. Promote conservation and achieve optimum yields from the nation's fishery resources. Social and economic factors are to be given equal importance for modifying optimum yield.

3. Create a legal and economic environment that stimulates harvest of fisheries resources within the area of extended jurisdiction, and subsequent processing of such catches by U.S. fishermen and companies.

4. Establish an institutional structure and enforcement authority that allows the United States to carry out the goals and objectives explicit and implicit within the Act.

5. Ensure that conservation and management under the Act is based on the best scientific information available.

The Act sets goals for fishery management via a set of seven national standards in Title III, Section 301 (a):

"(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

(2) Conservation and management measures shall be based upon the best scientific information available.

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C)
carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

(5) Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication."

The MFCMA has four major titles. Title I describes the United States' rights and authority regarding fish and fishery resources. Title II contains the international aspects of the Act. Title III describes the management scheme designed to regulate domestic and foreign fishing within the EEZ. Title IV

contains miscellaneous provisions. This report focuses on provisions found in Titles I and III.

Title I of the Act, "United States Rights and Authority Regarding Fish and Fishery Resources," established a FCZ (Fisheries Conservation Zone, later changed to the EEZ) extending 197 miles from the seaward boundary of the then existing 3-mile U.S. territorial sea. States retain management authority within the territorial sea, unless state action infringes substantially upon a federal fishery management plan, and within the EEZ in instances where no federal fishery-management plan exists. For fish species that live on or above U.S. continental shelves, and for species that live part of their lives in inland waters (anadromous species), the MFCMA's claimed fishery-management authority was not limited to the region within 200 miles of shore. The United States claimed the right to manage all living resources of the continental shelf—even beyond 200 miles, such as in parts of the Bering Sea—and to manage anadromous species throughout their range in the ocean. Originally, the MFCMA exempted highly migratory species (e.g., tuna) from its regulatory coverage. However, the 1990 amendments brought tuna under exclusive U.S. fisheries jurisdiction within the U.S. EEZ, effective January 1, 1992. Beginning with the Presidential Proclamation of a U.S. Exclusive Economic Zone in 1983, and culminating in 1986 with PL 99-659, the EEZ superseded the Fisheries Conservation Zone as the coastal area within which the United States exerts the right to control marine fishing activity.

Title III of the Act specifies the seven national standards (listed earlier) and establishes a management scheme designed to regulate domestic and foreign fishing within the EEZ through the development of fishery management plans. Eight regional fishery management councils were established to draft these plans: the New England, Mid-Atlantic, South Atlantic, Caribbean, Gulf, Pacific, North Pacific, and Western Pacific Fishery Management Councils. These councils are an imaginative combination of local and federal expertise. They were designed to consider the social and economic needs of fishermen and fishing communities, the biological characteristics and ecological relationships of each species under consideration, and the interests of domestic and foreign consumers of fishery products.

The MFCMA was successful in reducing the amount of foreign fishing in the U.S. EEZ. Foreign fishing comprised 61% of the total EEZ commercial catch in 1981 and only 1% in 1991, as U.S. fishing expanded. (This apparent Americanization of the harvesting and processing sectors of fisheries conducted in the U.S. EEZ obscures the fact that although the fisheries are now conducted by U.S. citizens, many of them may in large part be owned by foreign entities, particularly in the Pacific Northwest and Alaska.) The MFCMA successfully established a framework for fishery management that gave preference to U.S. fishing over foreign fishing in the EEZ, and provided for public participation in the decision-making process. Within the established framework, the Secretary

of Commerce and the regional fishery management councils have made substantial progress in implementing fishery management; as of September 1, 1993, 33 fishery management plans have been put into effect and a number of others are in various stages of preparation.

The MFCMA could hardly have anticipated the rapid rate of expansion of the U.S. industry, and did not provide for adequate controls on capitalization and fishing effort. Furthermore, the expansion of the U.S. industry was accelerated when Congress passed the Processor Preference Amendment, which gave priority to U.S. fish processors over foreign floating fish processors, and the American Fisheries Promotion Act, which stimulated the export of U.S. fish products. The implementation of federal programs for financing fishing vessels, for example, the Fishing Vessel Obligation Guarantee Program and the Fishing Vessel Capital Construction Fund Program, also contributed to the rapid expansion of the U.S. fleet. As a result, domestic fishing quickly replaced foreign fishing in the U.S. EEZ, and the stocks depleted by foreign fishing did not have sufficient time to rebuild before the U.S. fishing pressure increased.

Over the 17 years since enactment of the MFCMA, fisheries law has reacted to events rather than anticipated problems. Indeed, the MFCMA has been amended at least 18 times since its enactment, with major amendments adopted in 1978, 1980, 1983, 1986, and 1990. Many of the earlier problems continue to exist in varying degrees as described by Parsons in reference to U.S. fisheries: "continued overfishing of some stocks; lack of coordination between councils and the NOAA/National Marine Fisheries Service in setting research agendas; conflicts among users; the vulnerability of the fishery management process to delays and political influence; lack of accountability; inconsistency in state and federal management measures; and adoption of unenforceable management measures."[1]

Reauthorization of the MFCMA provides an opportunity to address fishery management problems that relate to provisions in the existing law. The National Research Council's Committee on Fisheries has identified four problem areas that need to be addressed during the reauthorization in order to move our nation towards sustainable fishery management: 1) uncontrolled entry, excess capitalization, and overfishing, including its definition in relationship to an optimum yield definition; 2) institutional structure; 3) the quality of fishery science and data; and 4) an ecosystem approach to fishery management, including bycatch and fish habitats. These critical issues in fishery management are discussed in detail in Chapter 3, and the committee's recommendations pertaining to each appear in Chapter 4.

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[1]Parsons, L.S. 1993. Management of Marine Fisheries in Canada. Canadian Bulletin of Fisheries and Aquatic Sciences, 225:763pp.

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Critical Issues in Fishery Management

As mentioned in Chapter 2, one of the stated purposes of the MFCMA is to conserve and manage U.S. fishery resources. Overall, fisheries management in the United States has not achieved the conservation of fish stocks that was anticipated when the FCMA was passed in 1976. This assertion is supported by the findings in a 1990 National Fish and Wildlife Foundation study which reported that one-third of all stocks under council management were, at that time, less abundant than they had been before the councils assumed jurisdiction. In addition, a 1992 NOAA/National Marine Fisheries Service report, *Our Living Oceans*,[1] estimated that of the 236 species whose status was reviewed, 67 species were over-utilized, 61 as fully utilized, and 28 as under-utilized. The data were inadequate to determine the status of the 80 other species. The information from these reports supports the committee's view that changes in approach to the nation's stewardship of its living resources are essential for achieving fisheries that are sustainable in the long term.

In addition to the expertise of individual committee members, the committee obtained additional background information for its assessment of fisheries management performance. The committee reviewed numerous reports on fisheries management (see listing in Appendix 1); received briefings about federal fisheries research and management programs from agency representatives, including staff from the NOAA/National Marine Fisheries Service, the NOAA's

[1]Our Living Oceans, 1992. U.S. Department of Commerce. U.S. Government Printing Office, Washington, DC 20402.

Sea Grant program, and the U.S. Fish and Wildlife Service; heard presentations about critical fisheries issues from a wide range of fisheries experts who were invited to committee meetings, including representatives of commercial and recreational fishing industries, federal and state fisheries managers, environmental organization representatives, and congressional staff; and participated in a national debate on the MFCMA while attending the National Symposium on Conserving America's Fisheries held in New Orleans March 8-10, 1993. The committee also met in Galveston, Texas and Solomons, Maryland to solicit input on regionally important issues.

After reviewing the background information, the committee has noted a number of inadequacies in fisheries conservation and management that have contributed to the present condition of U.S. fish stocks. These inadequacies include not only failures to identify and regulate the development and growth of fishing industries, but also failures to reduce fishing capacity and effort in response to conservation needs and environmental changes. Consequently, stocks are overutilized and depleted, and are not allowed to recover. Often, political pressure for absolute certainty about the status of an overexploited population deters managers from taking prompt remedial action. Unfortunately, such certainty is rarely attainable under present conditions, given the limited resources available to managers and scientists, the lack of adequate fishery data for the assessment of stocks and the effects of fishing mortality, and the lack of proper statistical treatment of uncertainty. Additional factors contributing to inadequate management and conservation actions include a lack of understanding of, or the information on, what features and processes at the ecosystem level are important to fisheries management; an unwillingness to plan or respond to relevant information on the fishery ecosystem; and/or a failure of managers to adequately define the attributes of an ecosystem that can and should be managed.

For the purposes of this report, the committee identified four topics that need to be addressed during reauthorization if U.S. fisheries management and conservation efforts are to be successful. These topics are overfishing, including the related issues of entry, capitalization, and the definition of optimum yield; the institutional structure for fisheries management; the quality of fishery science and data; and ecosystem approaches to fishery management, including the issues of bycatch and fish habitats. The remainder of this chapter discusses the problems associated with these topics, and Chapter 4 suggests how inadequacies in these four areas, which have contributed to failures in marine fisheries management, might be rectified through legislative changes.

OVERFISHING

Fisheries management plans are, in theory, designed to include a variety of mechanisms that balance the obligations of sustaining fish stocks and providing opportunities for fishing, while achieving various biological, ecological, eco-

nomic, and social goals. Fishery plans can use total allowable catch levels, limited entry, fishing seasons, minimum catch sizes, gear restrictions, and other limitations to achieve such a balance. Unfortunately, they have not balanced conservation and use effectively. Even with the allocative mechanisms mentioned above, the problems of overfishing, which have been exacerbated by technological improvement of gear and harvesting techniques, have not been eliminated.

Overfishing can affect productivity in two basic ways: first, by removing too many reproductively mature adults (decreasing recruitment), and second, by removing too many young organisms (reducing the yield that can be expected from a given number of recruits). Removal can occur both through intentional fishing activities targeted at a species and through bycatch/discards in the complex of fisheries active in a region. In addition, stress caused by degradation of the environment required by the species can reduce the sustainable removal levels. Under appropriate environmental conditions, most fish stocks will produce a biological surplus in excess of that needed to maintain stock equilibrium, and thus, a sustainable yield. Fishing and other forms of stress decrease the reproductive output of each recruit: i.e., spawning per recruit decreases monotonically. Stress resulting from the depletion or removal of one species can affect populations of other interacting species in that ecosystem, thus altering community structure.

Two primary solutions to the overfishing problem are discussed below: the definition of optimum yield; and the control of fishing effort, including the aspects of entry and capitalization. These areas must be addressed in the MFCMA reauthorization in order to provide for sustainable fisheries.

Optimum Yield[2]

One reason that overfishing occurs is the definition of optimum yield specified in the MFCMA. MFCMA Section 301(a)(1); 16 U.S.C. 1851 (a)(1), the national standard relating to prevention of overfishing and achievement of optimum yield, states that the purpose of conservation and management is to prevent overfishing while achieving optimum yield from each fishery for the United States fishing industry.[3] Nearly all of the specific criteria set forth in Title III of

[2]In this report, optimum yield refers to the biological optimum unless otherwise specified. In the MFCMA, optimum yield is not specified in biological or economic terms.

[3]The MFCMA offers certain limited exceptions (Section 301(b)) to its requirement of preventing overfishing. "Harvesting the major component of a mixed fishery at its optimum level may result in the overfishing of a minor (smaller or less valuable) stock component in the fishery. A council may decide to permit this type of overfishing if it is demonstrated by analysis (paragraph (f)(5) of this section) that it will result in net benefits to the Nation, and if the council's action will not cause any stock to require protection under the Endangered Species Act."

the MFCMA are designed to ensure that catch is limited to the optimum yield. The optimum-yield concept has been criticized, however, for its failure to establish adequate usable guidelines for decision-making. To the extent that there has been explicit acceptance of the concept of optimum yield, it has frequently been used as an excuse for exceeding the maximum sustainable yield.[4] Optimum yield is defined in MFCMA Section 3 (21) as "the amount of fish a) which will provide the greatest overall benefit to the Nation, with particular reference to food production and recreational opportunities; and b) which is prescribed as such on the basis of the maximum sustainable yield from such fishery, as modified by any relevant economic, social, or ecological factor." Unfortunately, this definition is so broad that it can be used to justify almost any quantity of catch. Consequently, an "optimum yield" might easily conflict with conservation goals. The implementing regulations, known as the "602 guidelines," do not provide the specification and guidance needed. It is clear that there are two often mutually exclusive issues involved in trying to achieve "optimum yield." One issue is a concern for biological overexploitation of fishery resources; the second is a concern for attaining economic efficiency as moderated by social concerns.

Each council is required by law to assess and specify the maximum sustainable yield and the optimum yield in any fishery management plan under its jurisdiction. The optimum yield figure sets the upper limit of allowed harvest in each fishery, including both domestic and foreign fishing allowed in the EEZ. Typically, political and social pressures are exerted on councils; scientific uncertainty due to inadequate information and to a lack of consensus about what the data indicate weaken scientific input and lessen the weight given to the biological component; complexity of ecological systems makes achievement of optimal levels a trial-and-error process; and large natural variability often masks overexploitation until it is too late. Some councils are therefore taking the more conservative approach of setting "effective total harvest" levels (including directed catch and discards) and "overfishing" levels (developed from species-specific exploitation rates), which ensures that the spawning biomass will be adequate to produce populations near maximum sustainable yield, rather than managing directly for maximum sustainable yield. While a move in the right direction, this approach still fails to account for ecosystem requirements adequately.

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[4]Maximum sustainable yield (MSY) from a fishery is the largest annual catch or yield in terms of weight of fish caught by both commercial and recreational fishermen that can be taken continuously from a stock under existing environmental conditions. A determination of MSY, which should be an estimate based upon the best scientific information available, is a biological measure necessary in the development of optimum yield (p. 110 in *Fisheries of the United States, 1991,* National Marine Fisheries Service).

Entry and Capitalization

The political and socio-economic pressures that propelled the growth, expansion, and overcapitalization of distant-water fleets continue to shape fishery development and management policies. Overcapitalization, a shorthand term used here and elsewhere throughout the report, means excessive private expenditures for boats, labor, and other resources required for fishing. Overcapitalization can be encouraged by free access to public stocks because there is an incentive for individual fishermen to maximize their share of the permissible harvest. Excess capacity creates political pressure for an increased harvest quota. If this policy continues, species other than the targeted fish may also be negatively affected, and ultimately the structure of a whole ecosystem may be affected.

When unlimited entry is permitted, each fisherman increases the number and harvesting capacity of vessels and gear in order to capture the largest share of the allowed catch. All of the allowable catch is then harvested early in the fishing season, and the excess capacity of fishermen, vessels, and processing capacity either remain idle or are redirected to other fisheries, exacerbating pressure on them. In extreme cases (for example, the Alaskan longline halibut fishery[5]) the annual fishing season, disparagingly referred to as a derby, has been reduced to a few days, and fresh fish are available to consumers for only a short period of time.

MFCMA Section 303(b) (4,6) now establishes guidelines for councils' consideration of fishing vessel restrictions and limited access systems. Limitations on entry are expressly authorized "in order to achieve optimum yield," although National Standard Five specifies that economic allocation cannot be the sole purpose of a conservation and management measure. However, the MFCMA offers little direction to the councils or the Secretary as to whether the nature and scope of limited-entry or other allocative programs create property or quasi-property rights. The one legal case that has been decided in this area upholds the broad discretion of the councils and the Secretary in establishing limited-entry schemes.[6]

Possible mechanisms for limiting entry include:

1. license limitations—i.e., restricting fishing rights to a group of identified license holders;
2. assignment of annual harvesting rights usually for specific quantities of catch (including individual fishing quotas (IFQs), individual transferable quotas (ITQs), enterprise allocations, or share quotas) but sometimes for effort units such as days of fishing;

[5]Note that the derby-style halibut fishery will end in 1994 because the council has voted to adopt a new management plan.

[6]Sea Watch International, Ltd. v. Mosbacher, 762F. Supp. 370 (D.D.C. 1991).

3. selective charges on landings of fish or taxes on vessels, so as to discourage new entry and encourage exit;
4. assignment of full property rights; and
5. reservation of fishery resources to a public enterprise.

License limitations are being used in the Hawaiian Islands pelagic longline fishery and Alaskan salmon fishery in the United States, as well as elsewhere throughout the world. This form of restricted entry also requires an overall catch quota—or, an in-season run assessment in the case of salmon—because it is rarely possible to foresee the imaginative means harvesters may employ to increase their rate of catch. However, the problem of overcapitalization remains, and the race to catch fish faster continues.

Individual fishing quotas and *individual transferable quotas* have been implemented in fisheries throughout the world and in a few U.S. fisheries, such as the Mid-Atlantic surf clam fishery. In many instances an individual quota system succeeds because catch does not exceed the desired objective, economic waste (including overcapitalization) is greatly reduced, and product quality is substantially enhanced. Individual quota systems, once introduced, have been amended and revised but never rescinded, to the committee's knowledge.

Experience with individual quotas where they have been introduced indicates some or all of the following concerns must be addressed for higher benefits to conservation and society to be realized: preventing overconcentration of the quotas; effectively discouraging the practices of bycatch discard and highgrading (keeping only the larger, more valuable fish); providing opportunities for future entrants to a sustainably managed fishery through future quota reserves or other means; ensuring certainty of tenure in order to reduce risk created by ambiguities in the legal fabric; preserving and promoting the economy and way of life of coastal fishing villages;[7] addressing distributional or equity issues that arise with the disposition of access rights to a public resource in a manner that bestows potentially large windfall profits on the initial private recipients of the newly created marketable privileges; and ensuring that, at least initially, any increases in administration and enforcement costs necessary for a successful transition to, and implementation of, large-scale individual quota systems is adequately funded by the owners of quotas and/or increased budget allocation for the agency. Expanded enforcement of individual fishing quotas is a critical component of this management technique.

At present, only license limitations and allocation of individual quotas are available in the United States under the MFCMA. Under either form of restricted entry, the collection of resource rentals (which could address both distribu-

[7]In the North Pacific, for example, community development quotas (CDQs) are allocated to fishing organizations identified by local communities.

tional and equity questions and implementation cost problems) is currently prohibited under the Act.

Charges on landings or taxes on vessels at levels that make entry unprofitable is a third feasible option, often advocated by economists but less frequently adopted, perhaps because of political opposition. However, charges would have to be set at reasonable amounts initially so as not to jeopardize the security of existing participants' businesses.

The last two limited-entry schemes are more novel. The first resembles a regulated monopoly in which *full property rights*, including determination of sustained stock and harvest levels, are assigned to a single management entity. This option may be less attractive when stocks migrate and biological interdependence with other valuable species is critical. In this case, the public must be assured that the monopolist is regulated in consonance with public values, and that the monopolist properly accounts for its effects on the larger biological system. However, regulated sole owners tend to keep monitoring and enforcement costs low by their nature, and they do not wantonly discard the fish they "own." The second limited-entry scheme transfers harvesting rights to a *public enterprise*. This option may be less attractive because the jurisdiction of the public enterprise is unlikely to cover all the geographic ranges of the species and their prey and predators. A town or cooperative, for example, could allocate the harvesting rights in a manner which best suits its goals. Expensive monitoring and enforcement can be carried out at lower cost when cultural and other noneconomic relationships among the individual holders induce greater conformance to the harvesting regulations.

INSTITUTIONAL STRUCTURE

To implement its purposes, the Act provided for the establishment of eight regional fishery management councils, each with the task of developing fishery management plans that would meet the national standards. The eight councils, working in conjunction with the NOAA/National Marine Fisheries Service, have made substantial progress in implementing the existing MFCMA. As of September 1, 1993, 33 fishery management plans are in effect and a number of others are in various stages of preparation.

Council memberships are drawn from states adjacent to the ocean region being managed, with the exception of the North Pacific Fishery Management Council, which at present provides voting representation from Washington and Oregon for fisheries conducted off Alaska. The 1990 amendments to the MFCMA require that the voting council members nominated by state governors be individuals who "by reason of their occupational or other experience, scientific expertise, or training, are knowledgeable regarding the conservation and management of the commercial or recreational harvest of the fishery resources of the geographical area concerned." In addition to voting members, whose numbers

may differ among councils, each council has a specified number of non-voting members who provide additional expertise and coordination when council decisions affect other states or federal agencies.

The committee supports a legislative instruction that councils include members who are knowledgeable and/or experienced in matters being discussed and decided, whether or not such persons have a direct or indirect financial interest in the outcome. Regrettably, such a process raises the twin specter of conflict of interest and self-regulation in the public disinterest. The present conditional exemption in MFCMA Section 1852(k)(7) from the federal conflict-of-interest law (18 USC Section 208) only sharpens and lends reality to that image, as does the blanket exemption from the Federal Advisory Committee Act (5 USC App. 2). Valid or not, such perceptions cloud council credibility. In an era of intense public scrutiny, public challenges to council action can readily be launched, thereby impairing council effectiveness. Clearly, there is a need to reduce such risks and thus enhance council productivity.

The process for developing, approving, and implementing a fishery management plan needs to be improved. The speed of the implementation process is important because fisheries generally cannot be regulated if a management plan is not is place, and lack of a plan can allow over-capitalization and over-harvest. The MFCMA currently provides two procedures for establishing and implementing fishery management plans. The usual procedure entails the development of a plan (with alternatives) by a council, a public review process, and review and approval by the Secretary of Commerce of all or part of the plan. This process can require several years. The other procedure entails giving the Secretary of Commerce the authority to impose emergency actions, but these actions are limited in duration to 90 days, and only one renewal is possible.

A council's management plan cannot be approved unless it has been subjected to a process of public review. Therefore, an initial plan needs to contain a wide range of options, to avoid the necessity of re-initiating the review process or reverting to emergency action by the Secretary of Commerce, if none of the originally proposed options is acceptable. Existing plans can be amended as conditions warrant; however, they are subject to the same lengthy review process as that for developing a new plan. A controversial amendment can take several years to complete the approval process and thus cannot respond to an immediate issue.

The regional fishery management councils are required by Section 302 (g) to establish and maintain scientific and statistical committees, but the use of these committees varies. For example, the committee notes that the Pacific councils regularly use their scientific and statistical committees while the New England and the Mid-Atlantic councils do not. Inadequate committee use needs to be addressed. Some councils maintain scientific and statistical committees and advisory panels that have been effective and independent sources of scientific advice. Other councils maintain these committees, but do not use them effectively.

The MFCMA specifies the tasks of the Secretary of Commerce in developing fishery management plans that meet the national standards; these include establishing guidelines for the development of fishery management plans, reviewing and approving the fishery management plans, implementing approved plans, and appointing the voting council members. In addition, the Secretary is responsible for administering the NOAA/National Marine Fisheries Service. Also, among the Secretary's responsibilities are a number of fishery-relevant programs, including stock assessment, data collection and analyses, enforcement, and judicial review (administrative-law judges).

There is currently no entity specifically charged with overseeing the implementation of the MFCMA and reporting to Congress. Congress itself has functioned in this capacity in part through the General Accounting Office and mostly through congressional approval processes. In general, the General Accounting Office, the investigative arm of Congress, performs a variety of services, the most well-known of which are independent audits and evaluations of government programs and activities. The General Accounting Office has reported to Congress on a few very specific fisheries-related issues in response to congressional requests, for example in 1991, they reported on the foreign investment in the seafood processing industry in Alaska, Oregon, and Washington.[8] Congressional approval processes are not appropriate for fishery management issues because of the technical and scientific complexity of these issues, the fact that management must operate within many applicable laws (ESA, MMPA, CWA, CZMA, MPRSA, and NEPA),[9] the jurisdictional limits of existing congressional committees, and the intersection of federal fishery management with state regulatory bodies, including interstate commissions and compacts. State policies and regulations vary widely. For example, some states ban commercial fishing of certain species; others require recreational saltwater fishing licenses. Most regulations developed by regional interstate fisheries commissions are voluntary (with the notable exception of Atlantic striped bass regulations, which have the force of a federal moratorium imposed in the waters of those states that do not comply with the Atlantic States Marine Fisheries Commission's regulations). Some form of independent mechanism is needed to address the issues of adequate oversight of management and implementation of the MFCMA, resolution of conflict involving objection to specific management measures and/or actions, and development of long-term strategic planning for securing the future viability of U.S. fish stocks and the U.S. fishing industry.

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[8]United States General Accounting Office. 1991. Seafood Processing, Foreign Ownership of Facilities in Alaska, Oregon, and Washington. GAO/RCED-91-127. 22 pp.

[9]The Endangered Species Act; Marine Mammal Protection Act; Clean Water Act; Coastal Zone Management Act; Marine Protection, Research, and Sanctuaries Act; and National Environmental Policy Act, respectively.

QUALITY OF FISHERY SCIENCE AND DATA

MFCMA Section 301 (a)(2) includes the national standard requiring conservation and management measures to be based upon the best scientific information available. To use the best available science implies that management decisions will be scientifically based, will use the information that is available, and will contribute to the science necessary to make better decisions. The backbone of fishery management plans is the stock assessment, since it provides the most recent account of the status of fish stocks for use by the managers. Research and survey efforts related to stock assessment are crucial for ensuring that the best scientific information available is adequate for producing effective fishery management plans. At present, this is accomplished through routine analysis by and operation of the National Fisheries Statistics program. The NOAA/National Marine Fisheries Service regional science centers and regional offices are routinely involved in the processing of the fishery, survey, and biological information necessary for stock assessments. Personnel at the science centers perform most stock assessments and some participate in Council Fishery Management Plan Teams and Scientific and Statistical Committees.

The NOAA/National Marine Fisheries Service must be given credit for its efforts to improve assessments by convening a National Stock Assessment Committee and participating in workshops and symposia throughout the country. Major advances in methodology have occurred over the last few years. The information collected by the NOAA/National Marine Fisheries Service is frequently insufficient for making management decisions. For example, some assessments for the biological data rely on fishery performance information that may have bias and variability large enough to prevent accurate assessment of a population's condition. Even when fishery-independent information from the NOAA/National Marine Fisheries Service or state research surveys is available, it may not be adequate for assessing particular species. Another example is that for many fisheries, the magnitude of bycatch mortality is unknown, preventing accurate assessment of stock reduction due to fishing activities. Furthermore, insufficient information about the effects of the environment and multi-species interactions may prevent accurate assessment of current and future recruitment. Councils also make decisions about management actions in light of the socio-economic effects of these actions. Frequently, insufficient economic and sociological information exists to permit accurate determination of these effects, due to lack of data on fishing costs, supply and demand relationships, and effects on employment and micro- and macro-economic impacts and other distributional effects as described within the new Executive Order 12866 (see Appendix 2). This condition is exacerbated by the reluctance of harvesters to provide economic data and by the inability of economists to analyze individual data due to legal protection of privacy.

Information about the status of changing stock populations will always reflect a degree of uncertainty. Fishery management decisions must be made in

the absence of perfect information. In all circumstances, it is essential that managers weigh the costs and benefits—and risks—of alternate actions, and of lack of action as well. When there is significant risk of serious consequences that may be reversible only over the long term, and the best scientific evidence available is inadequate, precautionary measures such as moratoria, effort reductions, area closures, time limits, and gear restrictions may be needed. The costs and benefits of such measures needs to be assessed in relation to the costs and benefits of alternative measures, including those of doing nothing.

Study of the role of uncertain information in population assessments is in its infancy. The NOAA/National Marine Fisheries Service has recently convened workshops on risk assessment and the effects of uncertainty on decision-making, and two symposia, one convened by Canada Fisheries and Oceans and one by the Alaska Sea Grant College Program, have addressed this issue. However, risk analysis has not yet been routinely incorporated into stock assessment, and greater efforts along these lines are needed.

Overall, national leadership is needed in the various federal and state programs for

- collection, storage, and dissemination of biological, fishing, and economic data;
- development of operational alternative plans and options for specific and general fisheries with expected outcomes;
- development of new stock assessment and management techniques;
- design of measurement models to achieve a better understanding of the interconnection between the ocean environment and fish stock variability; and
- data aspects of programs for improved gear development and habitat protection.

The NOAA/National Marine Fisheries Service should provide such leadership in these specified areas to other agencies with programs involving fisheries research and data, including federal natural resource agencies, state fisheries agencies, and interstate fisheries commissions. In addition, another part of the National Oceanic and Atmospheric Administration, namely the National Sea Grant Program, supports coastal fisheries research, including such aspects as management, development of fishing technology, and sampling for management data. The NOAA/National Marine Fisheries Service should seek to identify and coordinate their programs with existing programs to avoid unnecessary duplication of effort.

It has long been recognized that the most appropriate mix of fisheries science should include not only catch and biological information pertaining to the species being fished, but also relevant information on life history, behavior, and ecology. Although a number of assessments and management recommendations have been made on the basis of such broadly based information and approaches, most have relied on single-species assessments without regard to ecological con-

text. Single-species models will continue to be a key element in making decisions on harvest rates, as indeed they should. However, this should not deter fishery managers from increasing the breadth of ecological and environmental information to be collected and applying ecological approaches to fishery management decision-making. Such an approach would result in the availability of more comprehensive and better scientific management decisions.

Furthermore, the committee is acutely aware of the growing concerns regarding management under uncertainty, its linkages to biological and socioeconomic inputs, and the interface between science and policy. Following the passage of the MFCMA, most science centers of the NOAA/National Marine Fisheries Service became increasingly engrossed in the development and analysis of databases concerned with the state of exploited marine resources. Committee members recognize the manager's need for scientific information on the status of exploited marine resources, but at the same time, note that a reasonable, balanced science program should allow for increased exploration of environmental and biological information that can augment fishery management decision-making. It is understood that inherent uncertainties in dynamics of natural systems will always limit the effectiveness of the continued search for increasing precision.

There are some funding issues that the committee believes are important. Current funds are insufficient for conducting appropriate stock assessment surveys. In addition, the necessity of funding observer programs to collect bycatch/discard information is paramount. Finally, in some situations, both the personnel and time required to process information collected for management purposes are lacking, resulting in long delays in getting the needed information to the fishery managers.

ECOSYSTEM APPROACH TO FISHERY MANAGEMENT

Biological habitats and the biota that occupy them constitute interacting systems called ecosystems. The maintenance of sufficient fish stocks depends directly on the integrity of these ecosystems. Fisheries can directly affect an ecosystem's structure through removals or habitat damage, and thus have the potential to alter its productivity or the quality of its products. Fisheries also can be affected by habitat alterations resulting from damage by other users or from pollution. The most serious forms of coastal degradation are the physical destruction of important habitats, water pollution, and the introduction of exotic species. Overfishing and habitat damage need to be addressed by the fishery conservation and management rules. Healthy fish populations are a good index of the health of an ecosystem because fish depend on the continued well-being of many ecosystem components.

Recognition of the importance of the environments on which fish stocks depend will require fishery management to expand into the arena of ecosystem

conservation and protection. A fishery ecosystem is the network of feedbacks between the fish of interest and the biotic and abiotic environment essential to its well-being and productivity. Major losses of fishery resources may already have resulted from overexploitation and human-induced changes in habitat. In the long term, it is not possible to conserve and manage fisheries without including ecosystem-level analyses. Long-term fishery research, management, and conservation will require knowledge, responsibilities, and decisions at an ecosystem level.

Fisheries scientists and managers have given virtually no consideration to consequences of removing target species on the structure, dynamics, and productivity of the ecosystem of which the target species are a component. Decreases in the populations of both target and bycaught species may change food-web relationships at many levels. Such effects have been observed in benthic and demersal systems that have been altered by heavy fishing of important predators. In a few situations the non-marketed discarded species are ones known to have been overfished.

In a fishery ecosystem, the interdependency between species (including target and non-target species) and their habitats, requires that fishery managers address critical issues for both of these components in order to provide for effective conservation and management. In particular, the removal of species through bycatch/discard practices and the degradation of habitats are issues of immediate concern in fishery management.

Bycatch/Discard[10]

Bycatch is the capture of species or sizes other than those designated as target species. Some portion of the bycatch may be sold; other portions may be discarded. In this report, discard refers to the portion of the bycatch that is not retained for sale, but rather is discarded. For some fisheries, discard of bycatch may result in considerable waste. There is some data that demonstrates that overutilized target species suffer from high bycatch levels and in some instances, levels so high that they exceed reported landed catches; however, there is a lack of quantitative data on bycatch and its direct and indirect effects. Bycatch is a particularly acute problem when species such as marine mammals, turtles, and birds, or fish like sharks and rays that have exceptionally low reproductive rates, are taken because they may be more easily affected even when bycatch/discard rates are low. Most fisheries (and the applicable management plans) focus on

[10]In this report the committee is particularly interested in the volume and numbers of fish and other marine life that are discarded from fishing vessels and the mortality involved in these discards. The committee also recognizes that unreported mortalities often occur, e.g., (1) losses resulting from mortalities imposed on fish and other sea life escaping fishing gear, (2) losses due to ghost fishing, (3) discard of spoiled fish, and (4) unreported catch.

species with relatively high reproductive rates, yet these fisheries at times take and discard species with relatively low reproductive rates. However, it is also true that discarding of high-fecundity species has also been shown to produce high mortality levels, e.g. greater than 0.8 mortality in younger age classes. Managers need to identify and determine the levels of discard mortalities and take appropriate conservation actions. Although some discards consist of species having little commercial value, other discards involve species or sizes or sexes of species important to other users or useful to the same fisheries at later times.

The extent of bycatch problems varies from one fishery to another by area and time, but virtually all types of fishing gear catch some individuals of non-target species. Disposal at sea of incidentally caught organisms and fish-processing wastes can cause significant changes in the behavior, distribution, and abundance of scavenging species. For example, the nesting behavior of birds may be affected, resulting in unnatural population changes.[11] The discarded organic material itself can have very significant and long-lasting effects, such as altering the species composition of natural benthic predators by selecting for highly mobile species such as crabs or fish rather than sea stars, smothering or altering suspension-feeding communities in favor of deposit-feeding associations, covering nursery grounds, and in some cases causing local depletion of oxygen. Thus, both target and non-target species and the species they interact with are affected by heavy fishing. Discard studies should focus on the quantifications of the total mortalities imposed as the result of fishing including discard mortality, unobserved fishing mortality,[12] ghost fishing, and unreported waste.[13]

Fish Habitats

Human activities have often altered habitats important for sustaining fishery resources. Coastal degradation frequently has very serious impacts on fisheries, and measures to rehabilitate damaged ecosystems need to be included in regional coastal-zone management plans. The most serious forms of coastal degradation are those that involve the destruction of important habitats such as coastal wetlands, bays, coral reefs, oyster beds, deep-water coral forests, kelp forests, benthic areas serving as larval nurseries, and in particular river systems with anadromous stocks. In many areas habitats are severely affected by pollution, including nutrient loading from point and non-point source discharge, agricultural runoff, and aquaculture; dumped foreign substances such as toxic material, dredge spoils,

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[11]Bailey, R.S. 1991. Interactions Between Fisheries, Fish Stocks and Seabird Populations - a Case History at Shetland. ICES Study Group on Ecosystem Effects of Fishing Activities 11-15 March 1991.

[12]Mortalities resulting from wounded fish that escape from nets and hooks.

[13]Catch of a quality unacceptable to buyers.

or oil spills; thermal discharges; and excessive light and noise. Finally, the introduction of exotic species, or of man-made structures such as artificial reefs that modify beach sand budgets, also alter habitats of both target and non-target species.

Habitat alteration by the fishing activities themselves is perhaps the least understood of the important environmental effects of fishing. Alterations to resource habitats due to fishing may result from the loss of habitats of non-target species, such as species encrusting cobbles, or of other epibenthic habitats, which may be important nursery areas for juvenile fish; from the alteration of nutrient levels and bottom sediment, including destruction of habitat by bottom trawling, dredging, and other fishing and processing operations; and from the generation of suspended debris that can have lethal effects long after fishing activities have ceased.

Currently, fishery habitat concerns can be addressed under Section 302(i) of the MFCMA, which allows councils to comment and make recommendations on any activity proposed by a federal or state agency that may affect the habitat of a fishery resource under its jurisdiction. A more proactive means of preserving habitat important to fishes is needed that can prevent incremental loses of these habitats by a multitude of little changes.

4

Recommendations

During the past 17 years the United States has attempted to fine-tune fisheries management by making adjustments to parts of the Magnuson Fishery Conservation and Management Act (MFCMA) in reaction to specific problems, rather than collectively addressing the problems in the context of the entire law. This approach has created inconsistencies within the law and has confused the respective authorities and responsibilities of the Secretary of Commerce and the councils. To achieve significant improvements in the conservation and management of fish stocks, it will be necessary to set a national strategy, to develop some long-range strategic goals, and to find mechanisms to achieve these goals. Indeed, proactive management will require a change in the scope and allocation of the responsibilities of those institutions under which the United States manages its fishery resources.

In its review of the MFCMA, the Congress once again has the opportunity to reauthorize, and to amend, this important law. The challenge now is to articulate an economically and ecologically sound vision of fisheries management for the remainder of this decade and into the twenty-first century. The recommendations in this chapter are intended to aid Congress in their deliberations during the MFCMA reauthorization.

Now that foreign fishing in the U.S. EEZ has been significantly reduced, fisheries management needs a new focus. The primary goal of management should be the conservation of fish stocks for long-term sustainable use. A secondary goal should then be the allocation of total allowable catch according to economic and social criteria among the competing domestic user groups, both recreational and commercial, that have increased their fishing capacity since the original implementation of the MFCMA.

PREVENT OVERFISHING

The MFCMA specifies in its National Standard One that the purpose of fisheries conservation and management is to prevent overfishing while achieving optimum yield from each fishery for the United States fishing industry. Furthermore, the MFCMA definition of optimum yield is based on the maximum sustainable yield modified by economic, social, or ecological factors. This definition of optimum yield is so broad that it can be interpreted as justifying almost any quantity of catch. It is clear that two mutually exclusive issues are involved in trying to achieve "optimum yield." One issue is the apprehension about overexploitation of fisheries resources, and the second is the desire for attaining economic efficiency moderated by social factors.

It is the committee's view that the MFCMA needs to be clarified and strengthened to ensure that harvest does not reduce the stock below a level at which it can sustain maximum yield over the long term, to control entry and overcapitalization in order to prevent overfishing stocks of fish, and to cause recovery plans to be put into place for currently overexploited species. The national standards should require conservation and management measures to prevent overfishing and to promote rebuilding of stocks reduced to low levels. In addition, a definition of optimum yield that is consistent with preventing overfishing, and that allows overfished stocks to be brought back to a level that can support maximum yield over the long term, should be a mandatory element in all fisheries management plans. Economic pressures must not influence the establishment of optimum yields to the extent that the maximum sustainable yield cannot be achieved over the long term. Achievement of optimum yield should encourage the development of fishery management plans that limit, and in many instances reduce, investment in fishing fleets, and also encourage full utilization of fisheries resources.

> **Recommendation 1:** Fishery management should promote full realization of optimum yields as originally envisioned in the MFCMA by ensuring that harvest does not reduce stock abundance below levels that can sustain maximum yields over the long term. For currently overfished stocks, harvest levels must allow rebuilding the stock over specified periods of time to a level that can support sustainable maximum yields. Any departure from the above must be supported by persuasive evidence regarding natural variability, ecosystem interdependence, sustainable national income gains, or truly exceptional socio-cultural considerations.

In fishery management plans developed by a council or the Secretary, the realization of optimum yield for fisheries should be promoted by maintaining stock abundance at or above the maximum sustainable yield level. Specifically, when a stock is below its level of maximum biological productivity, allowable

catch levels should not be increased by optimum yield adjustments, but should be kept below the current replacement level to allow rebuilding of the stock over a specified period of time. This recommendation applies to single-species fisheries.

Ideally, allowable catch should take into account the effect of fishing activity on each species in the ecosystem, but much of the information needed for such an approach is not yet available. For fisheries that are part of multi-species complexes, the allowable catch must be determined on a case-by-case basis, but consideration needs to be given to the complex as a whole and to whether some components of the fishery are biologically and/or economically more important.

The first national standard should specifically mention recreational fisheries, since recreational fishing significantly affects the yield for some fisheries. Also, because of our improved understanding of fish stocks as genetically as well as geographically distinct populations, the first national standard should specify optimum yield from each stock, rather than from each fishery.

One important technique for achieving optimum yield is to control the number of units of fishing gear such as vessels, traps, and nets. The MFCMA establishes guidelines for council consideration of fishing vessel restrictions and limited access systems but until recently few plans including limited access systems had been implemented. When unlimited entry is permitted, each fisherman increases the number and harvesting capacity of vessels and gear in order to capture the largest share of the allowed catch. The committee believes that open access to fisheries and the resulting overcapitalization are major problems that are inadequately addressed in most contemporary fisheries management. Although most of the important fisheries are now under management plans that include some form of limited entry, or are being considered for such plans, limited entry alone cannot prevent overcapitalization or reduce pressure to exceed acceptable biological catch levels; some form of control of fishing effort and/or total catch is also needed. Prevention of overcapitalization requires individual allocations of catch or effort; the latter works only if units of effort are strictly defined.

> **Recommendation 2:** Fishery management should control entry into and wasteful deployment of capital, labor, and equipment in marine fisheries.

To be effective, the method used to control entry and capitalization must be responsible and equitable, and have adequate phase-in periods. The form of controlled entry should be decided by the councils, which can tailor the approaches to the regions and species fished. Management plans or amendments should address restriction of entry, although this action should be modified to provide a phased expansion for those fisheries which are not yet overcapitalized. Each council should be required to prepare and implement a plan for controlling entry and capital in order to prevent overfishing and to rebuild stocks reduced to low levels.

IMPROVE INSTITUTIONAL STRUCTURE

In Chapter 3 the committee identifies a number of inadequacies in fisheries management and conservation that have contributed to the present condition of many U.S. stocks as overutilized and depleted. A principal finding of the committee is that the lines of authority and responsibility between the Secretary of Commerce and the regional fishery management councils regarding management of marine fishery resources are unclear, and therefore confuse participants, create inefficiencies, and generate adversarial positions without a satisfactory mechanism for conflict resolution. In addition, the committee finds that except for the traditional oversight function of Congress, the present system of fisheries management lacks independent checks and balances. Therefore, the committee recommends a management structure consisting of three major components: the Secretary of Commerce, as the official of the federal government; the regional fishery management councils, as legislatively provided representing the expertise, knowledge, and interest regarding the conservation and management or the commercial or recreational harvest of regional fishery resources; and an independent oversight body, as an independent advisor to the Secretary, the councils, and Congress. The regional fishery management councils should continue to bear the responsibility for allocation and capitalization controls. The Secretary should continue to have the primary responsibilities for providing scientific and technical information to the councils and for implementing and enforcing approved fishery management plans, but should not be involved in the allocation process, except at the review level. The oversight body should be established as an independent mechanism responsible for strategic planning, review of management decisions and actions, and conflict resolution by providing recommendations to the Secretary, the councils, and Congress.

Recommendation 3: Congress should clarify the authority and responsibility of the Secretary of Commerce and of regional fishery management councils with respect to allocation and capitalization controls, implementation and enforcement of fisheries management plans, strategic planning, review of management decisions and actions, and conflict resolution.

Secretary of Commerce

As the nation's primary fishery manager, the Secretary of Commerce has the responsibility of administering an effective and cost-efficient fishery management system. To meet this obligation, the Secretary must balance the need to separate appropriately the responsibilities of the scientific, fishery management, and enforcement sections of the department with the necessity for promoting close cooperation between them. However, scientific and technical fishery management functions should be clearly separated from the enforcement of regulations.

The Secretary should establish a program that assures the councils and the public at large that the scientific and technical advice provided by the NOAA/ National Marine Fisheries Service is of the highest scientific quality and based on the best available scientific information on the fished population and its environmental constraints (see the listing of responsibilities for the Secretary in Table 1). The NOAA/National Marine Fisheries Service's scientific and technical personnel should be able to cooperate with council staff and with university, state, and private scientific colleagues to procure the best scientific advice available for the councils including estimates of maximum sustainable yield and/or the current replacement yield for the stocks under study. However, such scientific advice should be provided by scientists and technical staff who are not directly involved with enforcement of regulations, and should not be subject to influence by intra-agency conflicts of interest. This separation of advice from scientific and technical staff and enforcement staff would help clarify the issue of legal representation within the councils that often arises with the NOAA/ National Marine Fisheries Service's legal counsel being expected to represent both the council's and the Secretary's interest. Perhaps consideration should be given to the need for separate legal representation for the councils.

TABLE 1. Recommended revised responsibilities for the Secretary of Commerce in the area of marine fisheries management and conservation.

The responsibilities of the Secretary of Commerce, in regard to the NOAA/National Marine Fisheries Service, should include:
(A) Providing to the councils the technical and scientific information required for creation of fishery management plans and for follow-on technical and scientific support in the actual operation of the fishery management technical program. Compliance with present or modified national standards will require considerable quantitative analysis and technical expertise. Development of the array of technical management alternatives is a complex task, requiring highly trained technicians and scientists; accurate stock assessments are needed, within state of the art and reasonable costs.
(B) Implementing and enforcing responsibilities relevant to fishery management plans developed by the councils.
(C) If requested by councils, assisting in the development of a set of regional allocation goals reflecting the national interest, or involving socio-economic objectives, together with documentation required for allocation.
(D) Reviewing management plans for compliance with existing federal laws

Regional Marine Fishery Management Councils

The function of the councils is to prepare and submit management plans and amendments, to set optimum yield levels, and to make allocations. The control of capital is part of writing a plan or amendment (see the listing of responsibili-

ties for the councils in Table 2). Scientific and statistical committees should be maintained and used by all councils to ensure that the "best scientific information available" is indeed up to date and unbiased. Councils and the Secretary must be required to consider the advice provided by the councils' scientific and statistical committees. Furthermore, the reports of a scientific and statistical committee should clearly express the basis of the science used to determine the acceptable biological catch levels and the reports should be transmitted by the committee's chairman to the council, the NOAA/National Marine Fisheries Service, state agencies, the Secretary of Commerce, and other interested parties as independent reports. After a council submits a fishery management plan to the Secretary of Commerce for approval, the Secretary reviews the plan for consistency with the national standards (including the standard requiring that conservation and management measures be based on the best scientific information available), other provisions in the MFCMA, and other applicable law. The Secretary either approves or disapproves of a plan based on these criteria.

The committee believes that establishment of acceptable biological catches should be a scientific determination. This can be accomplished by having the NOAA/National Marine Fisheries Service, state agencies, and other interested scientists provide initial views regarding appropriate levels of acceptable biological catches. To prevent overfishing, it is desirable that a group of scientists be given responsibility for determining acceptable biological catch (ABC) levels for a stock, group of stocks, or multi-species complex. The complexity of population interactions requires that this be done on a case-by-case basis. What is needed is is a consistent organizational process for scientific decision-making nationwide.

Therefore, the committee recommends:

1. The Magnuson Act should be amended to specify that acceptable biological catches be set by scientific advisory committees to the regional Councils;

2. Each Council should be mandated to establish a scientific advisory committee that could be the Council's Scientific and Statistical Committee (SSC), a group drawn mainly from the NOAA/National Marine Fisheries Service Science Center(s), or a separate, new committee.

3. Each such scientific advisory committee would be subject to the following membership and operational provisions to be specified in amendments to the Act.

   a. A majority of committee members should have expertise in marine population dynamics, stock assessment, biology, or ecology; remaining members should also have expertise in natural or social sciences (such as natural resource management, economics, anthropology, or sociology).

   b. The committee should have at least one member from the NOAA/National Marine Fisheries Service, and one from each state agency, if possible, involved in marine fisheries except that the total from such state agen-

cies should not be greater than the total membership from outside such agencies, so that the perspective of the committee is broad and inclusive.

c. If a member has a perceived or actual conflict of interest, that member must divulge the conflict and recuse his (or her)self from participation in discussion or decision.

d. Committees should attempt to reach decisions by consensus, rather than formal vote. Committee reports should reflect any major division of opinion.

4. National standards to guide the operations of the Committee should be promulgated by the Secretary of Commerce, except for the membership and operational norms cited in (3), above.

Actual total allowable catches may, of course, be modified by adjustments to the optimum yield by council members provided that, first, maximum sustainable yield can be sustained over the long term, and second, for currently overfished stocks, the permissible harvests allow rebuilding these stocks over specified periods of time to levels that can support sustainable maximum yields. This process of determining harvest levels is, in fact, status quo for some councils. However, such a mechanism needs to be codified so all councils will follow this procedure.

TABLE 2. Recommended revised responsibilities for the regional fishery management councils concerning marine fisheries management and conservation.

Each council should have the responsibility and exclusive authority for:
(A) Developing management plans, and also developing an operational plan for allocation that fulfills all the national standards and regulations, and supports national social and economic objectives.
(B) Making allocation decisions. Because allocation issues are so volatile, decisions not based on historical performance data should require the agreement of greater than a simple majority of council members.[1]
(C) Voting on operational plans for allocation. Federal representatives on councils should not be voting members, but should serve as liaisons between the councils and federal agencies.
(D) Maintaining and using scientific and statistical committees to ensure that the best available scientific information is being used.

[1]Some members of the Committee on Fisheries believe that the current status of a simple majority should not be changed.

The issues of conflict of interest and competence arise in considering restructuring of the councils. The councils should be balanced in terms of their representation, so as to include individuals knowledgeable about the various fisheries under the councils' jurisdiction. Congress should consider subjecting council members to more stringent provisions to prevent conflict of interest, but should examine the impact that such provisions might have on participation by interested parties and on the efficiency of the council decision-making process.

A variety of remedial actions are available to obviate the conflict-of-interest problem. Administrative remedies exist, including reimposition of the Federal Advisory Committee Act, adoption of a recusal mechanism where financial interests conflict, and extended financial disclosure.

At the outset, renewal of the application of the Federal Advisory Committee Act seems to be a partial solution to the conflict-of-interest problem. However, mandatory reimposition of Federal Advisory Committee Act requirements upon a council, its committees, and its panels would seriously encumber council processes with principles and procedures largely irrelevant to their operation. Faced with this dilemma, a majority of the committee members concludes that the risk entailed in imposing an encompassing federal legislative remedy is less threatening to effective council operation than the risk now posed by inaction. A majority of committee members recommends that the MFCMA be changed as follows:[2]

a. Reimpose the applicability of the Federal Advisory Committee Act to the regional fishery management councils, excluding the scientific and statistical committees and advisory panels from its operation;

b. Provide that council members must disclose their financial interests on the record at the time a council is to vote on a matter related thereto and recuse themselves from voting on that matter, subject to a waiver if a council member's participation is essential to reach a decision;

c. Mandate that each council create, adopt, and adhere to a conflict-of-interest policy suited to its own regional circumstances, but subject to the requirements in (b) above.

The main feature of the Federal Advisory Committee Act is the requirement that advisory committees must adhere to specified administrative requirements, including notice of all meetings in the Federal Register and other public notices as well, allowing interested persons to appear before the committee, requirements for making available to the public all records, reports, drafts, and studies that are made available to or by each advisory committee, detailed minutes of each meeting containing specified information. The committee must be chaired

[2]The minority view holds (1) that Congress appropriately exempted the councils from the Federal Advisory Committee Act with significant benefits to operational efficiency and effectiveness, and (2) that conflict-of-interest concerns are best addressed by requiring each council to create and adopt a formal conflict-of-interest policy addressing, at a minimum, those provisions within 50 CFR Chapter VI Section 601.37.

by a federal official. This description of the substantive requirements for advisory committee operations indicates the significant logistic and record-keeping requirements for these committees. They are inappropriately burdensome for the operations of scientific and statistical committees and advisory panels. The paperwork and procedural requirements would overwhelm the system. Furthermore, the expected gains from imposing these requirements on groups that are advisory to the councils, which in themselves are advisory committees, is not considered sufficient to warrant the burdens and costs involved.

Body for Oversight and Conflict Resolution

The present level of oversight of fisheries management by Congress is not sufficient. Based on our analysis it does not appear to provide appropriate independent checks and balances. We believe that this could best be remedied by establishing an independent body for strategic planning, review, and conflict resolution. The committee does not envision this structure is not envisaged as a substitute for action by other properly constituted bodies, or for conflict resolution among entities empowered to resolve their own conflicts. As we envision it, this would be a body whose charge would be to review and report to the Congress on performance and problems in U.S. marine fisheries under the MFCMA, as amended. Included in this charge, among other factors, might be scientific and technical issues, management goals and strategies, jurisdictional problems, and environmental and conservation concerns. At the request of either the Secretary or a council, and at its sole discretion, the body may engage in ad hoc conflict resolution by considering and rendering a non-binding decision upon those in conflict.

Some mechanism is needed to provide strategic management, and to deal with issues where science and technology are not making progress. We believe that the independent body described above would fill these roles. Such a body could be tasked with making recommendations related to needed research and to improving cooperation among agencies. Other functions that could be accomplished by this body include reviewing both the scientific methodology and the concordance of national goals with other areas of environmental management, and working with other bodies, such as the Marine Mammal Commission, toward the protection and conservation of habitat, marine mammals, birds, and fish. The new body should be able to develop or contract for reports on issues of interest and concern, and should be assisted by a group of science advisors in providing recommendations to Congress and to the new body. Such an independent oversight body was envisioned in bills introduced in the Ninety-Fourth Congress, and is part of the official legislative history of the MFCMA.[3]

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[3]Anonymous. 1976. A legislative history of the Fishery Conservation and Management Act of 1976 together with a section-by-section index. 94th Congress, 2d Session—Committee Print. U.S. Government Printing Office, Washington, D.C., 1176 pp.

The form of this independent body should be defined by its duties (the recommended responsibilities are described in Table 3), but it should be a standing entity with stable funding appropriated by Congress. The body should be independent of both the Secretary of Commerce and the regional councils, so as to provide objective advice and review. Its membership should be balanced in terms of expertise in areas related to fisheries (including science, management, industry, environment, and consumers). Members should be subject to both public financial disclosure and conflict-of-interest provisions, and their terms should be staggered. Members should be appointed by the President, subject to approval by the Senate. To encourage serious consideration of recommendations from the body, federal officials should be required to respond to any recommendations within 120 days, and to explain in detail any decisions not to follow them. There is a wide range of existing federal review and advisory bodies that could serve as a model, including the Marine Mammal Commission, the Federal Communications Commission, the National Transportation and Safety Board, the Federal Energy Regulatory Commission, the Securities and Exchange Commission, and the Federal Trade Commission. The committee did not review nor assess all of these federal bodies regarding their appropriateness for fulfilling the roles and functions described for the new independent body. Congress will have to decide on the exact form of the new body that will be most appropriate for fisheries management.

TABLE 3. Recommended revised responsibilities for the newly proposed independent body in the area of marine fisheries management and conservation.

The new body would be responsible for executing the following functions that are lacking in the existing management process:

(A) Reviewing and commenting on
  (1) Scientific and technical issues underlying the councils' and Secretary's fishery-management decisions.
  (2) Philosophical aspects of emerging management strategies.
  (3) National management goals.
  (4) Overlapping provisions and jurisdiction among the MFCMA, the Marine Mammal Protection Act, and the Endangered Species Act.
  (5) Environment and habitat-protection issues.
  (6) Performance of the councils and the Secretary.

(B) Mediating or rendering non-binding conclusions on
  (1) Challenges to councils by the public on issues related to conflict of interest and improper statistical decisions.
  (2) Conflicts between the councils and the Secretary.

(C) Reporting annually to Congress on the implementation of the MFCMA and to the President on the effectiveness of the implementation agencies: NOAA/NMFS (data collection and analysis), the Coast Guard (enforcement), and the Department of State (international).

IMPROVE THE QUALITY OF FISHERY SCIENCE AND DATA

The information collected by NOAA/NMFS and used by the fishery management councils is frequently insufficient for making management decisions. On the biological side, some assessments rely on fishery performance information that may have bias and variability large enough to prevent accurate assessment of population condition. For many fisheries, the magnitude of bycatch mortality is unknown, which precludes precise assessment of the effects of fishing. Furthermore, insufficient information about the effects of the environment and multi-species interactions may prevent accurate evaluation of current and future recruitment. Finally, in some situations, both the personnel and the time needed to process the information collected are lacking, resulting in long delays.

Councils must make decisions about management actions in light of their potential socio-economic effects. Frequently, insufficient economic and sociological information exists to determine these effects accurately, due to a lack of data on fishing costs, demand and supply relationships, employment, and micro- and macro-economic impacts and distributional effects as called for within the new Executive Order 12866 (see Appendix 2). Risk assessment techniques could help councils make rational decisions by clarifying the sources and levels of uncertainty. Unfortunately, it will always be difficult to compare scientific data on such things as fish ecology with personal testimony on economic and social impacts.

> **Recommendation 4:** The Secretary of Commerce should improve the NOAA/National Marine Fisheries Service's scientific programs by making them responsive to management needs and to possible societal and economic effects. Improved data collection, analysis, and dissemination are needed to make evaluations and policy decisions.

The NOAA/National Marine Fisheries Service should improve its programs for collection, analysis, and dissemination of data for fisheries management and scientific research. The information should include stock data, clear descriptions of these data and the analysis techniques applied to them, and, finally, the best estimate of stock histories and an appropriate estimate of the reliability of the analysis. The data should be easily accessible to all personnel involved in the process of fisheries research, management, and operations.

The present Act, with its reliance on management of individual populations without regard to the ecological context of these species, has emphasized the use of population-level analyses. From the perspective of fish and fisheries ecology, several elements of ecology on which effective fishery management depends are not required or encouraged in the existing Act. Two of these elements are the ecological interactions in the biological communities in which these populations exist, and the ecological dependencies on the physical and chemical environment on which these populations depend. Both are serious omissions if sus-

tained yields of high-quality fishery products are to be obtained from U.S. waters over the long term. The science of multispecies fishery management has a long history, but has had little influence to date on fisheries management as practiced.[4] The Act should incorporate concepts related to species interactions into the requirement to use best available science.

Decisions will be very hard to make without better data. Fishermen are an obvious source for providing catch data. The committee believes that obtaining accurate catch data is essential. Therefore, it is the committee's view that all fishermen should be obligated by law to report their catch (including bycatch, fishing effort, and related biological information) to the program, and confidentiality must be assured. Economic information on fishermen's catch is very useful; it must be obtained by methods that provide reliable data. These data should be available to fisheries managers in a readily accessible data base that includes information and documentation about the methods, access, and limitation of the data[5] and proper quality checks. Aggregate summaries of the resulting statistics should be available to all parties. Implementation of this recommendation will require mechanisms to encourage data submission, data analysis, quality control, and easy access to data by remote users.

MOVE TOWARD AN ECOSYSTEM APPROACH TO FISHERY MANAGEMENT

The long-range goal of ecosystem management is to develop a comprehensive management framework that ensures sustainable levels of natural resources, and that minimizes the effects of human actions both on the ecosystem as a whole and on the individual components of the ecosystem—for example, species' habitats and food-web structure. Because the cause-and-effect interactions of most of the environmental factors in an ecosystem are not understood, and methods of ecosystem management are not well defined, considerable research to quantitatively determine the relationships among the various environmental factors must be undertaken before the long-term goal of full ecosystem management can be attained. In the meantime the NOAA/National Marine Fisheries Service and the councils should do everything in their power to prevent further habitat degradation and to minimize losses of non-target species.

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[4]Sissenwine, M. P., and N. Daan, 1991. An overview of multispecies models relevant to management of living resources. ICES Mar. Sci. Symp. 193:6-11.

[5]This information about the data is referred to as "metadata" and allows the user to retrieve pertinent information about how the data was obtained, who is an expert on it, and where supporting data sets reside. The committee uses the term "metadata" to refer to all the descriptive information that supports and describes the background of the data, for example, season, year, depth, and effort.

Recommendation 5: Fishery management should increase the use of the ecosystem approach to management, and include environmental protection goals in the development of fishery management plans.

Reduce Bycatch/Discard Problems

An important starting point for increasing the use of an ecosystem approach to fisheries management would be the implementation of multispecies management.[6] A significant first step would be to incorporate bycatch/discard information into fishery management decisions—in particular, into estimating the total mortality for specific fish stocks imposed as a result of fishing. Fishery management plans must deal with direct and indirect effects of bycatch/discards[7] as well as with other fishery mortality not now reported for target and non-target species—including threatened and endangered species. Management plans should also include procedures designed to reduce the general wastage found in many types of fishing. The possible direct and indirect effects of bycatch on non-target commercial, endangered, and protected species as well as target species should be investigated. Fishery management councils should incorporate provisions to minimize both bycatch and waste in fishery management plans.

The Secretary of Commerce, through the NOAA/National Marine Fisheries Service, should undertake multispecies approaches to fishery management to evaluate the need for, and implement, a formal bycatch reduction program. The bycatch reduction program should identify a set of goals involving biological, ecological, economic, and ethical concerns. Such a program should require a significant reduction in effort, or modification of capture size, for those fisheries involving overfishing. The bycatch initiative should also quantify bycatch data for all major U.S. fisheries, because analysis of bycatch/discards will provide the basis for effective catch management and greatly facilitate understanding of the ecosystem components, species interactions, and multispecies management requirements. The program should provide major funding for the collection of reliable discard data and for a new fishery technology program to improve gear and introduce fishing techniques needed to reduce the bycatch/discard problems.

The stability and productivity of fish resources depend in large part on the number and environmental quality of the habitats in which fish breed, spawn, mature, and live their adult lives. The more a fishery depends on riverine and

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[6]Multispecies management as used in this document means that all of the species of fish found together in an area are managed as a unit, insofar as possible.

[7]The committee defines bycatch as discards plus incidental catch that is sold. In this report we are particularly interested in the volume and numbers of fish and other marine life that are discarded from fishing vessels and the mortality involved in these discards. The committee also recognizes that unreported mortalities often occur, e.g., (1) losses resulting from mortalities imposed on fish and other sea life escaping fishing gear (2) losses due to ghost fishing (3) discard of spoiled fish and (4) unreported catch.

coastal environments, the more critical is the habitat issue. Perhaps the least understood environment problems involve habitat alterations, including (1) loss of habitats of species, especially those which form "nursery habitats," (2) alteration of sediments, (3) the generation of debris such as ghost nets and plastic waste that can kill animals, and 4) the effects of fishing on habitats. Even the cessation of all fishing activities will not guarantee future stocks if there are inadequate habitats to support fish reproduction and growth. To ensure that habitats will be adequate to support fish stocks, some form of habitat protection is essential. Although the MFCMA allows councils to comment and make recommendations on any activity proposed by a federal or state agency that may affect the habitat of a fishery resource under a council's jurisdiction, this provision does not constitute the comprehensive approach that would be most effective in maintaining fishery resources. To be effective, a comprehensive approach must address problems resulting from multi-agency shared responsibility under a number of different federal and state laws; efforts and programs for habitat protection and management of habitat resources must be coordinated. Also, this provision does not address the effects of fishing activities on non-target organisms, and on the physical and chemical environment.

> **Recommendation 6:** The Secretary should provide adequate funding for collection of reliable discard data and for a major new fishery technology program to improve gear and fishing techniques needed to reduce the bycatch/discard problem.

Protect Fish Habitats

A major national program should be developed to determine what habitats are critical for fish reproduction and growth and how they can be protected. Such a program would bring the problem of degradation of fish habitats to national attention, and would provide a means of coordinating measures to achieve adequate protection. Two early tasks would be to define the environmental components essential for fish reproduction, survival, and production at the level needed for maintenance of fisheries resources, and to identify and understand current causes of habitat degradation. These, along with the multispecies and bycatch measures discussed earlier, constitute essential pieces in the application of an ecosystem approach to fisheries management.

> **Recommendation 7:** The Secretary of Commerce, through the NOAA/ National Marine Fisheries Service and under advisement from regional fishery management councils, should be empowered to protect the habitats necessary to sustain fishery resources. A major national program should be developed to determine what habitats are critical for fish reproduction and growth, and how they can be protected.

Appendix 1

Reports Reviewed by the OSB Committee on Fisheries

Anderson, Lee G. 1992. *Consideration of the Potential Use of Individual Transferable Quotas in U.S. Fisheries.* Vol. 1. Contractor paper prepared for the National Oceanic and Atmospheric Administration.

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Griffin, Wade L., Kenneth Roberts, Antonio B. Lamberte, John M. Ward, and Holly M.Hendrickson, eds. 1992. *Consideration of the Potential Use of Individual Transferable Quotas in the Gulf of Mexico Shrimp Fishery.* Vol 3. Contractor paper prepared for the National Oceanic and Atmospheric Administration.

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U.S. General Accounting Office. 1983. *Need to Improve Fishery Management Plan Process: Report to the Secretary of Commerce.* Washington, D.C.: U.S. General Accounting Office.

U.S. Marine Mammal Commission. 1992. *Annual Report to Congress, 1992.* Washington, D.C.: U.S. Marine Mammal Commission.

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Wise, John P. 1991. *Federal Conservation and Management of Marine Fisheries in the United States.* Washington, D.C.: Center for Marine Conservation.

Appendix 2

Executive Order 12866 of September 30, 1993

The American people deserve a regulatory system that works for them, not against them: a regulatory system that protects and improves their health, safety, environment, and well-being and improves the performance of the economy without imposing unacceptable or unreasonable costs on society; regulatory policies that recognize that the private sector and private markets are the best engine for economic growth; regulatory approaches that respect the role of State, local, and tribal governments; and regulations that are effective, consistent, sensible, and understandable. We do not have such a regulatory system today.

With this Executive order, the Federal Government begins a program to reform and make more efficient the regulatory process. The objectives of this Executive order are to enhance planning and coordination with respect to both new and existing regulations; to reaffirm the primacy of Federal agencies in the regulatory decision-making process; to restore the integrity and legitimacy of regulatory review and oversight; and to make the process more accessible and open to the public. In pursuing these objectives, the regulatory process shall be conducted so as to meet applicable statutory requirements and with due regard to the discretion that has been entrusted to the Federal agencies.

Accordingly, by the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1. Statement of Regulatory Philosophy and Principles.

(a) The Regulatory Philosophy. Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private

markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people. In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

(b) The Principles of Regulation. To ensure that the agencies' regulatory programs are consistent with the philosophy set forth above, agencies should adhere to the following principles, to the extent permitted by law and where applicable:

(1) Each agency shall identify the problem that it intends to address (including, where applicable, the failures of private markets or public institutions that warrant new agency action) as well as assess the significance of that problem.

(2) Each agency shall examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation pg 51736 is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively.

(3) Each agency shall identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.

(4) In setting regulatory priorities, each agency shall consider, to the extent reasonable, the degree and nature of the risks posed by various substances or activities within its jurisdiction.

(5) When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. In doing so, each agency shall consider incentives for innovation, consistency, predictability, the costs of enforcement and compliance (to the government, regulated entities, and the public), flexibility, distributive impacts, and equity.

(6) Each agency shall assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs.

(7) Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.

(8) Each agency shall identify and assess alternative forms of regulation and shall, to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt.

(9) Wherever feasible, agencies shall seek views of appropriate State, local, and tribal officials before imposing regulatory requirements that might significantly or uniquely affect those governmental entities. Each agency shall assess the effects of Federal regulations on State, local, and tribal governments, including specifically the availability of resources to carry out those mandates, and seek to minimize those burdens that uniquely or significantly affect such governmental entities, consistent with achieving regulatory objectives. In addition, as appropriate, agencies shall seek to harmonize Federal regulatory actions with related State, local, and tribal regulatory and other governmental functions.

(10) Each agency shall avoid regulations that are inconsistent, incompatible, or duplicative with its other regulations or those of other Federal agencies.

(11) Each agency shall tailor its regulations to impose the least burden on society, including individuals, businesses of differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining the regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations.

(12) Each agency shall draft its regulations to be simple and easy to understand, with the goal of minimizing the potential for uncertainty and litigation arising from such uncertainty.

Sec. 2. Organization. An efficient regulatory planning and review process is vital to ensure that the Federal Government's regulatory system best serves the American people.

(a) The Agencies. Because Federal agencies are the repositories of significant substantive expertise and experience, they are responsible for developing regulations and assuring that the regulations are consistent with applicable law, the President's priorities, and the principles set forth in this Executive order. pg 51737

(b) The Office of Management and Budget. Coordinated review of agency rulemaking is necessary to ensure that regulations are consistent with applicable law, the President's priorities, and the principles set forth in this Executive order, and that decisions made by one agency do not conflict with the policies or actions taken or planned by another agency. The Office of Management and Budget (OMB) shall carry out that review function. Within OMB, the Office of Information and Regulatory Affairs (OIRA) is the repository of expertise concerning regulatory issues, including methodologies and procedures that affect more than one agency, this Executive order, and the President's regulatory policies. To the extent permitted by law, OMB shall provide guidance to agencies

and assist the President, the Vice President, and other regulatory policy advisors to the President in regulatory planning and shall be the entity that reviews individual regulations, as provided by this Executive order.

(c) The Vice President. The Vice President is the principal advisor to the President on, and shall coordinate the development and presentation of recommendations concerning, regulatory policy, planning, and review, as set forth in this Executive order. In fulfilling their responsibilities under this Executive order, the President and the Vice President shall be assisted by the regulatory policy advisors within the Executive Office of the President and by such agency officials and personnel as the President and the Vice President may, from time to time, consult.

Sec. 3. Definitions. For purposes of this Executive order:

(a) "Advisors" refers to such regulatory policy advisors to the President as the President and Vice President may from time to time consult, including, among others: (1) the Director of OMB; (2) the Chair (or another member) of the Council of Economic Advisers; (3) the Assistant to the President for Economic Policy; (4) the Assistant to the President for Domestic Policy; (5) the Assistant to the President for National Security Affairs; (6) the Assistant to the President for Science and Technology; (7) the Assistant to the President for Intergovernmental Affairs; (8) the Assistant to the President and Staff Secretary; (9) the Assistant to the President and Chief of Staff to the Vice President; (10) the Assistant to the President and Counsel to the President; (11) the Deputy Assistant to the President and Director of the White House Office on Environmental Policy; and (12) the Administrator of OIRA, who also shall coordinate communications relating to this Executive order among the agencies, OMB, the other Advisors, and the Office of the Vice President.

(b) "Agency," unless otherwise indicated, means any authority of the United States that is an "agency" under 44 U.S.C. 3502(1), other than those considered to be independent regulatory agencies, as defined in 44 U.S.C. 3502(10).

(c) "Director" means the Director of OMB.

(d) "Regulation" or "rule" means an agency statement of general applicability and future effect, which the agency intends to have the force and effect of law, that is designed to implement, interpret, or prescribe law or policy or to describe the procedure or practice requirements of an agency. It does not, however, include:

(1) Regulations or rules issued in accordance with the formal rulemaking provisions of 5 U.S.C. 556, 557;

(2) Regulations or rules that pertain to a military or foreign affairs function of the United States, other than procurement regulations and regulations involving the import or export of non-defense articles and services;

(3) Regulations or rules that are limited to agency organization, management, or personnel matters; or

(4) Any other category of regulations exempted by the Administrator of OIRA.

(e) "Regulatory action" means any substantive action by an agency (normally published in the Federal Register) that promulgates or is expected pg 51738 to lead to the promulgation of a final rule or regulation, including notices of inquiry, advance notices of proposed rulemaking, and notices of proposed rulemaking.

(f) "Significant regulatory action" means any regulatory action that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive order.

Sec. 4. Planning Mechanism. In order to have an effective regulatory program, to provide for coordination of regulations, to maximize consultation and the resolution of potential conflicts at an early stage, to involve the public and its State, local, and tribal officials in regulatory planning, and to ensure that new or revised regulations promote the President's priorities and the principles set forth in this Executive order, these procedures shall be followed, to the extent permitted by law:

(a) Agencies' Policy Meeting. Early in each year's planning cycle, the Vice President shall convene a meeting of the Advisors and the heads of agencies to seek a common understanding of priorities and to coordinate regulatory efforts to be accomplished in the upcoming year.

(b) Unified Regulatory Agenda. For purposes of this subsection, the term "agency" or "agencies" shall also include those considered to be independent regulatory agencies, as defined in 44 U.S.C. 3502(10). Each agency shall prepare an agenda of all regulations under development or review, at a time and in a manner specified by the Administrator of OIRA. The description of each regulatory action shall contain, at a minimum, a regulation identifier number, a brief summary of the action, the legal authority for the action, any legal deadline for the action, and the name and telephone number of a knowledgeable agency official. Agencies may incorporate the information required under 5 U.S.C. 602 and 41 U.S.C. 402 into these agendas.

(c) The Regulatory Plan. For purposes of this subsection, the term "agency" or "agencies" shall also include those considered to be independent regulatory agencies, as defined in 44 U.S.C. 3502(10).

(1) As part of the Unified Regulatory Agenda, beginning in 1994, each agency shall prepare a Regulatory Plan (Plan) of the most important signifi-

cant regulatory actions that the agency reasonably expects to issue in proposed or final form in that fiscal year or thereafter. The Plan shall be approved personally by the agency head and shall contain at a minimum:

(A) A statement of the agency's regulatory objectives and priorities and how they relate to the President's priorities;

(B) A summary of each planned significant regulatory action including, to the extent possible, alternatives to be considered and preliminary estimates of the anticipated costs and benefits;

(C) A summary of the legal basis for each such action, including whether any aspect of the action is required by statute or court order;

(D) A statement of the need for each such action and, if applicable, how the action will reduce risks to public health, safety, or the environment, as well as how the magnitude of the risk addressed by the action relates to other risks within the jurisdiction of the agency; pg 51739

(E) The agency's schedule for action, including a statement of any applicable statutory or judicial deadlines; and

(F) The name, address, and telephone number of a person the public may contact for additional information about the planned regulatory action.

(2) Each agency shall forward its Plan to OIRA by June 1st of each year.

(3) Within 10 calendar days after OIRA has received an agency's Plan, OIRA shall circulate it to other affected agencies, the Advisors, and the Vice President.

(4) An agency head who believes that a planned regulatory action of another agency may conflict with its own policy or action taken or planned shall promptly notify, in writing, the Administrator of OIRA, who shall forward that communication to the issuing agency, the Advisors, and the Vice President.

(5) If the Administrator of OIRA believes that a planned regulatory action of an agency may be inconsistent with the President's priorities or the principles set forth in this Executive order or may be in conflict with any policy or action taken or planned by another agency, the Administrator of OIRA shall promptly notify, in writing, the affected agencies, the Advisors, and the Vice President.

(6) The Vice President, with the Advisors' assistance, may consult with the heads of agencies with respect to their Plans and, in appropriate instances, request further consideration or inter-agency coordination.

(7) The Plans developed by the issuing agency shall be published annually in the October publication of the Unified Regulatory Agenda. This publication shall be made available to the Congress; State, local, and tribal governments; and the public. Any views on any aspect of any agency Plan, including whether any planned regulatory action might conflict with any other planned or existing regulation, impose any unintended consequences on the public, or confer any unclaimed benefits on the public, should be directed to the issuing agency, with a copy to OIRA.

(d) Regulatory Working Group. Within 30 days of the date of this Executive order, the Administrator of OIRA shall convene a Regulatory Working Group ("Working Group"), which shall consist of representatives of the heads of each agency that the Administrator determines to have significant domestic regulatory responsibility, the Advisors, and the Vice President. The Administrator of OIRA shall chair the Working Group and shall periodically advise the Vice President on the activities of the Working Group. The Working Group shall serve as a forum to assist agencies in identifying and analyzing important regulatory issues (including, among others (1) the development of innovative regulatory techniques, (2) the methods, efficacy, and utility of comparative risk assessment in regulatory decision-making, and (3) the development of short forms and other streamlined regulatory approaches for small businesses and other entities). The Working Group shall meet at least quarterly and may meet as a whole or in subgroups of agencies with an interest in particular issues or subject areas. To inform its discussions, the Working Group may commission analytical studies and reports by OIRA, the Administrative Conference of the United States, or any other agency.

(e) Conferences. The Administrator of OIRA shall meet quarterly with representatives of State, local, and tribal governments to identify both existing and proposed regulations that may uniquely or significantly affect those governmental entities. The Administrator of OIRA shall also convene, from time to time, conferences with representatives of businesses, nongovernmental organizations, and the public to discuss regulatory issues of common concern.

Sec. 5. Existing Regulations. In order to reduce the regulatory burden on the American people, their families, their communities, their State, local, and tribal governments, and their industries; to determine whether regulations pg 51740 promulgated by the executive branch of the Federal Government have become unjustified or unnecessary as a result of changed circumstances; to confirm that regulations are both compatible with each other and not duplicative or inappropriately burdensome in the aggregate; to ensure that all regulations are consistent with the President's priorities and the principles set forth in this Executive order, within applicable law; and to otherwise improve the effectiveness of existing regulations:

(a) Within 90 days of the date of this Executive order, each agency shall submit to OIRA a program, consistent with its resources and regulatory priorities, under which the agency will periodically review its existing significant regulations to determine whether any such regulations should be modified or eliminated so as to make the agency's regulatory program more effective in achieving the regulatory objectives, less burdensome, or in greater alignment with the President's priorities and the principles set forth in this Executive order. Any significant regulations selected for review shall be included in the agency's annual Plan. The agency shall also identify any legislative mandates that require

the agency to promulgate or continue to impose regulations that the agency believes are unnecessary or outdated by reason of changed circumstances.

(b) The Administrator of OIRA shall work with the Regulatory Working Group and other interested entities to pursue the objectives of this section. State, local, and tribal governments are specifically encouraged to assist in the identification of regulations that impose significant or unique burdens on those governmental entities and that appear to have outlived their justification or be otherwise inconsistent with the public interest.

(c) The Vice President, in consultation with the Advisors, may identify for review by the appropriate agency or agencies other existing regulations of an agency or groups of regulations of more than one agency that affect a particular group, industry, or sector of the economy, or may identify legislative mandates that may be appropriate for reconsideration by the Congress.

Sec. 6. Centralized Review of Regulations. The guidelines set forth below shall apply to all regulatory actions, for both new and existing regulations, by agencies other than those agencies specifically exempted by the Administrator of OIRA:

(a) Agency Responsibilities.

(1) Each agency shall (consistent with its own rules, regulations, or procedures) provide the public with meaningful participation in the regulatory process. In particular, before issuing a notice of proposed rulemaking, each agency should, where appropriate, seek the involvement of those who are intended to benefit from and those expected to be burdened by any regulation (including, specifically, State, local, and tribal officials). In addition, each agency should afford the public a meaningful opportunity to comment on any proposed regulation, which in most cases should include a comment period of not less than 60 days. Each agency also is directed to explore and, where appropriate, use consensual mechanisms for developing regulations, including negotiated rulemaking.

(2) Within 60 days of the date of this Executive order, each agency head shall designate a Regulatory Policy Officer who shall report to the agency head. The Regulatory Policy Officer shall be involved at each stage of the regulatory process to foster the development of effective, innovative, and least burdensome regulations and to further the principles set forth in this Executive order.

(3) In addition to adhering to its own rules and procedures and to the requirements of the Administrative Procedure Act, the Regulatory Flexibility Act, the Paperwork Reduction Act, and other applicable law, each agency shall develop its regulatory actions in a timely fashion and adhere to the following procedures with respect to a regulatory action:

(A) Each agency shall provide OIRA, at such times and in the manner specified by the Administrator of OIRA, with a list of its planned

regulatory actions, indicating those which the agency believes are significant regulatory pg 51741 actions within the meaning of this Executive order. Absent a material change in the development of the planned regulatory action, those not designated as significant will not be subject to review under this section unless, within 10 working days of receipt of the list, the Administrator of OIRA notifies the agency that OIRA has determined that a planned regulation is a significant regulatory action within the meaning of this Executive order. The Administrator of OIRA may waive review of any planned regulatory action designated by the agency as significant, in which case the agency need not further comply with subsection (a)(3)(B) or subsection (a)(3)(C) of this section.

(B) For each matter identified as, or determined by the Administrator of OIRA to be, a significant regulatory action, the issuing agency shall provide to OIRA:

(i) The text of the draft regulatory action, together with a reasonably detailed description of the need for the regulatory action and an explanation of how the regulatory action will meet that need; and

(ii) An assessment of the potential costs and benefits of the regulatory action, including an explanation of the manner in which the regulatory action is consistent with a statutory mandate and, to the extent permitted by law, promotes the President's priorities and avoids undue interference with State, local, and tribal governments in the exercise of their governmental functions.

(C) For those matters identified as, or determined by the Administrator of OIRA to be, a significant regulatory action within the scope of section 3(f)(1), the agency shall also provide to OIRA the following additional information developed as part of the agency's decision-making process (unless prohibited by law):

(i) An assessment, including the underlying analysis, of benefits anticipated from the regulatory action (such as, but not limited to, the promotion of the efficient functioning of the economy and private markets, the enhancement of health and safety, the protection of the natural environment, and the elimination or reduction of discrimination or bias) together with, to the extent feasible, a quantification of those benefits;

(ii) An assessment, including the underlying analysis, of costs anticipated from the regulatory action (such as, but not limited to, the direct cost both to the government in administering the regulation and to businesses and others in complying with the regulation, and any adverse effects on the efficient functioning of the economy, private markets (including productivity, employment, and competitiveness), health, safety, and the natural environment), together with, to the extent feasible, a quantification of those costs; and

(iii) An assessment, including the underlying analysis, of costs and benefits of potentially effective and reasonably feasible alternatives to the planned regulation, identified by the agencies or the public (including improving the current regulation and reasonably viable nonregulatory actions), and an explanation why the planned regulatory action is preferable to the identified potential alternatives.

(D) In emergency situations or when an agency is obligated by law to act more quickly than normal review procedures allow, the agency shall notify OIRA as soon as possible and, to the extent practicable, comply with subsections (a)(3)(B) and (C) of this section. For those regulatory actions that are governed by a statutory or court-imposed deadline, the agency shall, to the extent practicable, schedule rulemaking proceedings so as to permit sufficient time for OIRA to conduct its review, as set forth below in subsection (b)(2) through (4) of this section.

(E) After the regulatory action has been published in the Federal Register or otherwise issued to the public, the agency shall:

(i) Make available to the public the information set forth in subsections (a)(3)(B) and (C); pg 51742

(ii) Identify for the public, in a complete, clear, and simple manner, the substantive changes between the draft submitted to OIRA for review and the action subsequently announced; and

(iii) Identify for the public those changes in the regulatory action that were made at the suggestion or recommendation of OIRA.

(F) All information provided to the public by the agency shall be in plain, understandable language.

(b) OIRA Responsibilities. The Administrator of OIRA shall provide meaningful guidance and oversight so that each agency's regulatory actions are consistent with applicable law, the President's priorities, and the principles set forth in this Executive order and do not conflict with the policies or actions of another agency. OIRA shall, to the extent permitted by law, adhere to the following guidelines:

(1) OIRA may review only actions identified by the agency or by OIRA as significant regulatory actions under subsection (a)(3)(A) of this section.

(2) OIRA shall waive review or notify the agency in writing of the results of its review within the following time periods:

(A) For any notices of inquiry, advance notices of proposed rulemaking, or other preliminary regulatory actions prior to a Notice of Proposed Rulemaking, within 10 working days after the date of submission of the draft action to OIRA;

(B) For all other regulatory actions, within 90 calendar days after the date of submission of the information set forth in subsections (a)(3)(B)

and (C) of this section, unless OIRA has previously reviewed this information and, since that review, there has been no material change in the facts and circumstances upon which the regulatory action is based, in which case, OIRA shall complete its review within 45 days; and

(C) The review process may be extended (1) once by no more than 30 calendar days upon the written approval of the Director and (2) at the request of the agency head.

(3) For each regulatory action that the Administrator of OIRA returns to an agency for further consideration of some or all of its provisions, the Administrator of OIRA shall provide the issuing agency a written explanation for such return, setting forth the pertinent provision of this Executive order on which OIRA is relying. If the agency head disagrees with some or all of the bases for the return, the agency head shall so inform the Administrator of OIRA in writing.

(4) Except as otherwise provided by law or required by a Court, in order to ensure greater openness, accessibility, and accountability in the regulatory review process, OIRA shall be governed by the following disclosure requirements:

(A) Only the Administrator of OIRA (or a particular designee) shall receive oral communications initiated by persons not employed by the executive branch of the Federal Government regarding the substance of a regulatory action under OIRA review;

(B) All substantive communications between OIRA personnel and persons not employed by the executive branch of the Federal Government regarding a regulatory action under review shall be governed by the following guidelines:

(i) A representative from the issuing agency shall be invited to any meeting between OIRA personnel and such person(s);

(ii) OIRA shall forward to the issuing agency, within 10 working days of receipt of the communication(s), all written communications, regardless of format, between OIRA personnel and any person who is not employed by the executive branch of the Federal Government, and the dates and names of individuals involved in all substantive oral communications (including meetings to which an agency representative was invited, but did pg 51743 not attend, and telephone conversations between OIRA personnel and any such persons); and

(iii) OIRA shall publicly disclose relevant information about such communication(s), as set forth below in subsection (b)(4)(C) of this section.

(C) OIRA shall maintain a publicly available log that shall contain, at a minimum, the following information pertinent to regulatory actions under review:

(i) The status of all regulatory actions, including if (and if so, when and by whom) Vice Presidential and Presidential consideration was requested;

(ii) A notation of all written communications forwarded to an issuing agency under subsection (b)(4)(B)(ii) of this section; and

(iii) The dates and names of individuals involved in all substantive oral communications, including meetings and telephone conversations, between OIRA personnel and any person not employed by the executive branch of the Federal Government, and the subject matter discussed during such communications.

(D) After the regulatory action has been published in the Federal Register or otherwise issued to the public, or after the agency has announced its decision not to publish or issue the regulatory action, OIRA shall make available to the public all documents exchanged between OIRA and the agency during the review by OIRA under this section.

(5) All information provided to the public by OIRA shall be in plain, understandable language.

Sec. 7. Resolution of Conflicts. To the extent permitted by law, disagreements or conflicts between or among agency heads or between OMB and any agency that cannot be resolved by the Administrator of OIRA shall be resolved by the President, or by the Vice President acting at the request of the President, with the relevant agency head (and, as appropriate, other interested government officials). Vice Presidential and Presidential consideration of such disagreements may be initiated only by the Director, by the head of the issuing agency, or by the head of an agency that has a significant interest in the regulatory action at issue. Such review will not be undertaken at the request of other persons, entities, or their agents.

Resolution of such conflicts shall be informed by recommendations developed by the Vice President, after consultation with the Advisors (and other executive branch officials or personnel whose responsibilities to the President include the subject matter at issue). The development of these recommendations shall be concluded within 60 days after review has been requested. During the Vice Presidential and Presidential review period, communications with any person not employed by the Federal Government relating to the substance of the regulatory action under review and directed to the Advisors or their staffs or to the staff of the Vice President shall be in writing and shall be forwarded by the recipient to the affected agency(ies) for inclusion in the public docket(s). When the communication is not in writing, such Advisors or staff members shall inform the outside party that the matter is under review and that any comments should be submitted in writing.

At the end of this review process, the President, or the Vice President acting at the request of the President, shall notify the affected agency and the Administrator of OIRA of the President's decision with respect to the matter.

Sec. 8. Publication. Except to the extent required by law, an agency shall not publish in the Federal Register or otherwise issue to the public any regulatory action that is subject to review under section 6 of this Executive order until (1) the Administrator of OIRA notifies the agency that OIRA has waived its review of the action or has completed its review without pg 51744 any requests for further consideration, or (2) the applicable time period in section 6(b)(2) expires without OIRA having notified the agency that it is returning the regulatory action for further consideration under section 6(b)(3), whichever occurs first. If the terms of the preceding sentence have not been satisfied and an agency wants to publish or otherwise issue a regulatory action, the head of that agency may request Presidential consideration through the Vice President, as provided under section 7 of this order. Upon receipt of this request, the Vice President shall notify OIRA and the Advisors. The guidelines and time period set forth in section 7 shall apply to the publication of regulatory actions for which Presidential consideration has been sought.

Sec. 9. Agency Authority. Nothing in this order shall be construed as displacing the agencies' authority or responsibilities, as authorized by law.

Sec. 10. Judicial Review. Nothing in this Executive order shall affect any otherwise available judicial review of agency action. This Executive order is intended only to improve the internal management of the Federal Government and does not create any right or benefit, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

Sec. 11. Revocations. Executive Orders Nos. 12291 and 12498; all amendments to those Executive orders; all guidelines issued under those orders; and any exemptions from those orders heretofore granted for any category of rule are revoked.

William J. Clinton
The White House
September 30, 1993

Appendix 3

Biographical Information on Members of the OSB Committee on Fisheries

John J. Magnuson, *chairman*, serves as Professor of Zoology and Director of the Center for Limnology at the University of Wisconsin, Madison. His research interests are in fish and fisheries ecology, the behaviorial and distributional ecology of fishes and macroinvertebrates in lakes and oceans, community ecology of lakes as islands, ecology of the Great Lakes, and long-term ecological research on lake ecosystems including climate change effects.

Dayton Lee Alverson is an affiliate professor in the Department of Marine Studies at the University of Washington and serves as President of Natural Resources Consultants. He has been involved with a number of international fisheries conferences including Law of the Sea. Dr. Alverson possesses considerable expertise in fisheries biology and management.

Charles A. Black is President of the Mardela Corporation and Chairman of the Marquest Group, Inc. He is a pioneer in commercial marine and freshwater aquaculture, and has extensive experience in marine resource assessments and related onshore infrastructure, in marine territorial boundaries, and in operating both commercial and research fishing vessels. Associated with Woods Hole Oceanographic Institution and the Oceanic Institute (Hawaii), he has served as a delegate to both the United Nations Law of the Sea negotiations and the United Nations International Maritime Consultative Organizations, and has served on the U.S. National Advisory Committee, including MAFAC, NACOA, and OAMAC.

Gardner M. Brown, Jr. is Professor of Economics and adjunct Professor in the Institute of Environmental Studies currently with the Department of Economics at the University of Washington. His research interest is in marine resource economics policy and multispecies population dynamics.

William Burke is Professor of Law and Marine Affairs at the University of Washington School of Law. He has an interest in international law and fisheries policy issues.

Paul Dayton is Professor of Oceanography at the University of California's Scripps Institution of Oceanography. His research interest is in the area of coastal ecology and coastal habitats.

Jacob J. Dykstra is a retired New England commercial fishermen with over thirty years of commercial fishing experience. He served as President of the Point Judith Fishermen's Cooperative Association in Rhode Island for thirty years and also, he served on a number of marine fisheries advisory committees including as Chairman of the New England Fishery Management Council. He has an honorary doctorate from the University of Rhode Island.

James Joseph is the Director of the Inter-American Tropical Tuna Commission. He has served on various panels concerning marine science and fisheries and has served as advisor to all levels of government. Dr. Joseph's research interests are in the areas of the relationship of exploitation by man on the dynamics of the stocks of marine fishes and the development of international arrangements for the conservation and management of living marine resources.

William J. Merrell, Jr. is the Vice Chancellor of the Texas A&M University System. He also currently serves as chairman of the NRC Ocean Studies Board. Dr. Merrell's background is in the area of physical oceanography.

Charles Meacham is the Deputy Commissioner for Fish & Game with the state of Alaska. He is a Commissioner on the Pacific States Marine Fisheries Commission, the Pacific Salmon Commission and sits on the Pacific Fisheries Management Council.

Donald Olson is a Professor of Oceanography at the Rosenstiel School of Marine and Atmospheric Sciences at the University of Miami. His expertise is in the area of ocean circulation dynamics, mesoscale phenomena, and ecosystem dynamics.

Terrance J. Quinn II is an Associate Professor at the Juneau Center, School of Fisheries and Ocean Sciences at the University of Alaska Fairbanks. His research is in the areas of fish population dynamics and biometrics.

Brian J. Rothschild is a Professor at the Chesapeake Biological Laboratory at the University of Maryland's Center for Environmental and Estuarine Studies. His areas of professional expertise are population dynamics, fishery development, and domestic and international fishery policy.