NOAA Technical Memorandum NMFS-F/NEC-37

Regional Action Plan:

Northeast Regional Office

&

Northeast Fisheries Center

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts
April 1985

NOAA TECHNICAL MEMORANDUM NMFS-F/NEC

Under the National Marine Fisheries Service's mission to "Achieve a continued optimum utilization of living resources for the benefit of the Nation," the Northeast Fisheries Center (NEFC) is responsible for planning, developing, and managing multidisciplinary programs of basic and applied research to: (1) better understand the living marine resources (including marine mammals) of the Northwest Atlantic, and the environmental quality essential for their existence and continued productivity; and (2) describe and provide to management, industry, and the public, options for the utilization and conservation of living marine resources and maintenance of environmental quality which are consistent with national and regional goals and needs, and with international commitments.

The timely need for such information by decision makers often precludes publication in formal journals. The *NOAA Technical Memorandum NMFS-F/NEC* series provides a relatively quick and highly visible outlet for documents prepared by NEFC authors, or similar material prepared by others for NEFC purposes, where formal review and editorial processing are not appropriate or feasible. However, documents within this series reflect sound professional work and can be referenced in formal journals. Any use of trade names within this series does not imply endorsement.

Copies of this and other *NOAA Technical Memorandums* are available from the National Technical Information Service, 5285 Port Royal Rd., Springfield, VA 22161. Recent issues of *NOAA Technical Memorandum NMFS-F/NEC* are noted below:

21. ***MARMAP Plankton Survey Manual.*** By Jack W. Jossi and Robert R. Marak. March 1983. xvii + 260 p., 41 figs., 3 tables, 2 app. NTIS Access. No. PB83-210203.

22. ***Status of the Fishery Resources Off the Northeastern United States for 1982.*** By Resource Assessment Division, Northeast Fisheries Center. June 1983. iii + 128 p., 44 figs., 44 tables. NTIS Access. No. PB83-236554.

23. ***Nantucket Shoals Flux Experiment Data Report I. Hydrography.*** By W. Redwood Wright. June 1983. i + 105 p., 100 figs., 1 table. NTIS Access. No. PB83-236562.

24. ***Residual Drift and Residence Time of Georges Bank Surface Waters with Reference to the Distribution, Transport, and Survival of Larval Fishes.*** By John B. Colton, Jr., and Jacquelyn L. Anderson. June 1983. ix + 45 p., 22 figs., 2 tables, 1 app. NTIS Access. No. PB84-107820.

(continued on inside back cover)

NOAA Technical Memorandum NMFS-F/NEC-37

This TM series is used for documentation and timely communication of preliminary results, interim reports, or special purpose information, and has not received complete formal review, editorial control, or detailed editing.

Regional Action Plan: Northeast Regional Office & Northeast Fisheries Center

Bruce E. Higgins[1], Ruth Rehfus[1], John B. Pearce[2], Robert J. Pawlowski[2], Robert L. Lippson[1], Timothy Goodger[1], Susan Mello Roe[1], and Douglas W. Beach[1]

[1] *Northeast Regional Office, National Marine Fisheries Serv., 14 Elm St., Gloucester, MA 01930*
[2] *Northeast Fisheries Center, National Marine Fisheries Serv., Water St., Woods Hole, MA 02543*

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldridge, Secretary
National Oceanic and Atmospheric Administration
Anthony J. Calio, Acting Administrator
National Marine Fisheries Service
William G. Gordon, Assistant Administrator for Fisheries
Northeast Fisheries Center
Woods Hole, Massachusetts
April 1985

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....v

ACKNOWLEDGMENTS.....ix

1.0 INTRODUCTION TO REGIONAL ACTION PLANNING.....1

1.1 Need for RAP.....1
1.2 RAP Concept, Purpose, and Objectives.....2
1.3 Benefits of RAP.....3
1.4 Plan Development and Implementation.....4

2.0 RAP MANAGEMENT STRUCTURE.....6

2.1 Major Elements..... 6
2.2 Board Structure..... 6
2.3 Board Functions..... 8
2.4 Working Groups.....10
2.5 RAP Coordinators.....10
2.6 RAP Coordination Mechanism.....11

3.0 PRIORITIES.....12

3.1 Statement of Northeast Threats/Priorities.....12
3.2 Priorities for the Future.....13

4.0 STRATEGIES.....14

4.1 Principles.....14
4.2 NMFS Guidance.....15
4.3 Procedures and Options for Influencing Decisions.15
4.4 Strategy Development.....16
4.5 General Guidance for Working Groups.....17
4.6 Guidance for WMU Working Groups.....18
4.7 Strategy Implementation.....19

APPENDIX A. WATER MANAGEMENT UNITS

APPENDIX B. MULTIPLE-USE ISSUES, THREATS TO RESOURCES, AND NMFS ACTIVITIES

APPENDIX C. PROCEDURES AND OPTIONS FOR INFLUENCING DECISIONS

APPENDIX D. ORIGINAL RAP PLANNING TEAM AND A BRIEF HISTORY OF THE NORTHEAST RAP (1981-84)

APPENDIX E. DUTIES AND RESPONSIBILITIES OF THE NORTHEAST REGIONAL ACTION PLAN (RAP) COORDINATORS

APPENDIX F. HABITAT CONSERVATION POLICY FOR NMFS

APPENDIX G. EVOLUTION OF NORTHEAST RAP THREATS/PRIORITIES

APPENDIX H. ANALYSIS OF MARINE MAMMAL INFORMATION NEEDS IN THE NORTHEAST REGION

APPENDIX I. GENERIC STRATEGY FOR PROVIDING INFORMATION TO DECISION-MAKERS ON HABITAT CONSERVATION ISSUES

EXECUTIVE SUMMARY

Why A Regional Action Plan?

The National Marine Fisheries Service (NMFS) has developed a Regional Action Plan (RAP) process to foster coordinated management/research responses to major habitat conservation issues and problems, and to develop better steps to address them in the future.

The RAP process is intended to provide the means to (1) identify the major habitat conservation issues; (2) develop comprehensive NMFS strategies to address the priority issues; (3) provide a mechanism to allocate the NMFS's human and fiscal resources to deal with issues and problems; (4) foster delivery of research and managerial solutions to the public, other agencies, and interested user groups; and (5) provide a forum in which the agency can evaluate its ongoing habitat conservation programs for appropriateness to the NMFS's Habitat Conservation Policy and responsibilities. Because of increased pressure on Northeast offshore and coastal habitats, and the concomitant demands on time and resources of fisheries scientists and managers, the NMFS began development of the RAP process in the Northeast.

The RAP Purpose and Structure

The purpose of the Northeast RAP is to strengthen the research/management interface among the Northeast Region, the Northeast Fisheries Center, and the NMFS Washington Office so that needs for conservation of living marine resources and their habitats are addressed. The goals of the NMFS's Strategic Plan and Habitat Conservation Policy may be more readily achieved using this process.

The RAP process serves to plan strategies, direct human and fiscal resources of the Northeast Regional Office and the Northeast Fisheries Center, and concentrate them on effective resolution of environmental issues. A managerial structure addresses issues comprehensively and systematically. Within this structure, research and management personnel can develop unified strategies and positions on both recent and long-standing issues. Moreover, the process provides an enduring planning and coordination mechanism for arriving at solutions to new issues as they arise.

When an important environmental issue is identified, it is brought to the attention of the Northeast Habitat Conservation Board (the Board). The Board addresses the matter in relation to existing priorities, and may arrange for action by a special "working group." Working groups may be staffed with individuals

from the Region, Center, and Washington Office, depending on the issue and talent needed to address it. The NMFS's expertise may be augmented by people from outside the agency.

Working groups may address long-term, generic issues, such as ocean disposal of waste materials, petroleum exploration and development, or non-point sources of pollution. They also may develop specific NMFS/Northeast regionial positions on controversial issues, assess effects of a particular contaminant on a "Water Management Unit" (WMU), or write descriptions of WMUs. A WMU is an area of coastal and shelf habitats having enough uniform characteristics and fauna to provide a context or framework within which specific management decisions can be made. The working groups' products include state-of-the-art reports on particular contaminants, waste disposal issues, or problems associated with a particular WMU or WMU subunit.

The RAP Strategy For Dealing With Issues

Strategies for dealing with major issues and problems begin with the identification of the most urgent and important threats to resources. The selection of strategies is accomplished in several ways:

1. The RAP Board evaluates current threats to living marine resources and their habitats, based on the Board members' cumulative experience and knowledge, and ranks them according to the nature of the resources at risk; the severity and immediacy of the issue; and the capability of, and necessity for, the NOAA/NMFS to address the problem. The Board has determined that the most important present habitat issues in the Northeast are urban and port development, non-point source pollution, and ocean disposal of waste materials.

2. When the NOAA/NMFS is requested to respond to a major proposed Federal action requiring substantial input from the Region and Center, the RAP Coordinators and NMFS staff evaluate the situation and identify necessary NMFS/NOAA actions and resources. If a WMU description exists for the geographic area of concern, it can be used to describe the species at risk and their habitat requirements. Available reviews on the sources, fates, and effects of contaminants and habitat alterations are used with the WMU description to begin the evaluation. If available information is not adequately synthesized for the purpose at hand, the RAP Coordinators may establish a working group to draft the required materials.

3. The working group analyzes the problem and the options available for its resolution, and develops a strategy. This strategy may include analyzing data, synthesizing information, developing conceptual models of man-induced effects on living marine resources and their habitats, performing risk assessments, and identifying data gaps and research needs. The working group formulates recommendations to minimize environmental impacts, and

reports to the RAP Coordinators, who then report to the Center and Regional Directors, the Washington Office, or the requesting agency, as appropriate.

Benefits Of The RAP Process

Rather than duplicating earlier NMFS activities or simply imposing another layer of bureaucracy on NMFS offices and laboratories, the RAP process provides a formal mechanism to coordinate research and management activities and ensure that the Region and Center properly address the principal issues facing the NMFS. The formal mechanism, in turn, results in improved informal communication between the Region, Center, and Washington Office in developing coordinated responses to major environmental issues.

The RAP process enhances the ability of the NMFS to deal promptly with issues that have a "short lead time," and with issues that require numerous inputs over protracted periods. Examples include OCS oil and gas exploration on Georges Bank, ocean dumping in the Middle Atlantic Bight, and the habitat section of the Striped Bass Fishery Management Plan.

The RAP process facilitates the synthesis of numerous and often disparate data sets, thereby resulting in syntheses that are far more valuable than the individual data sets. Thus, the NMFS is better able to provide advice and direction early in the planning process, thereby helping to resolve major problems, avoid later conflict and controversy, and save project proponents time and money.

RAP products are being used by NOAA/NMFS management, as well as by other Federal and State agencies, Fishery Management Councils, the Atlantic States Marine Fisheries Commission, commercial and recreational fishing groups, various conservation and environmental organizations, academia, and the general public.

Because RAP priorities are guiding syntheses of information and assessments of habitat issues, environmental managers and decision-makers at different levels of government are becoming better informed. Administrators are being provided with information necessary to take advantage of the many opportunities to conserve, manage, restore, and enhance fisheries and fish habitats. Under the auspices of RAP, major habitat issues are becoming better defined, and issue papers are being developed on the research and management strategies that should be followed to address major environmental issues most effectively.

In addition to providing an improved basis for decision-making, RAP products are important in the NMFS's program planning efforts. Results of research and monitoring studies supplied to the Region affect decisions there and in Washington, as well as in the Center. Conversely, information transferred from

Washington to the Region and Center provide for better integrated planning and consistency with NMFS policy.

Conclusion

In a time when great emphasis is placed on regulatory reform and wise use of available federal funds, adoption of the RAP process provides a strong means to set priorities and develop strategies for carrying out the NMFS's environmental research and habitat conservation activities so as to yield the most effective products. RAP implementation helps avoid unnecessary resource damage and resource-use conflicts by providing project proponents with information and well-substantiated recommendations early in the planning process.

In addition to providing an improved basis for decision-making, RAP products are important in the NMFS's program planning. The RAP process ensures better planning for research and monitoring, and more effective use of resulting information in addressing management problems. Accordingly, the Northeast Region, the Northeast Fisheries Center, and the Washington Office have made a long-term commitment to the success of this endeavor.

ACKNOWLEDGMENTS

We are indebted to Dean Parsons for conceiving the RAP process and encouraging its experimental development and testing in the Northeast.

We are also very grateful to John R. Hall, Robert W. Hanks, Robert R. Kifer, George J. Ridgway, Jon C. Rittgers, and Charles K. Walters for helping the original RAP "planning team" (see Appendix D) during the planning phase of RAP in the Northeast.

For participating in the often frustrating, always difficult, and apparently never-ending task of setting priorities and developing strategies to address major habitat conservation issues in the Northeast, we thank Anthony Calabrese; James R. Chambers; Edward W. Christoffers; Ronald D. Gatton; Stanley W. Gorski; Marvin D. Grosslein; Michael Ludwig; Christopher L. Mantzaris; Tracey P. McKenzie; John E. O'Reilly; Anthony L. Pacheco; Robert N. Reid; Michael P. Sissenwine; Frank W. Steimle, Jr.; James P. Thomas; and Stuart J. Wilk.

We also thank Kenneth L. Beal; Thomas E. Bigford; James R. Chambers; Allen E. Peterson, Jr.; William C. Phoel; Michael P. Sissenwine; and Robert F. Temple for critically reviewing various drafts of the manuscript, and for offering many helpful suggestions.

Finally, we are especially grateful to Michelle R. Cox for designing the RAP logo (the last and best of several versions), and to MaryLou Settipani and Gertrude Benjamin for the great patience and good humor they displayed while word processing the many revisions of the document.

1.0 INTRODUCTION TO REGIONAL ACTION PLANNING

1.1 Need for RAP

Several powerful forces combined to bring the Regional Action Plan (RAP) concept to the forefront of the National Marine Fisheries Service's (NMFS) planning efforts for habitat conservation in the 1980s.

Changing Federal and State roles under Administration policies and reduced Federal and State budgets, combined with efforts directed at regulatory reform and energy independence, stress the need for each agency to evaluate its programs carefully to ensure that they are as cost-effective and efficient as possible in addressing the most important issues and problems.

Meanwhile, ever-increasing demands are being placed on the NMFS's programs and personnel to improve inter- and intra-agency coordination and cooperation; participate in planning and policy-making efforts; attend workshops and meetings; perform research and monitoring to support management's needs; assess status and trends, evaluate effects, and contribute to knowledge of ecosystems; respond to requests for data, information, and advice; prepare management plans; promulgate and enforce regulations; and prepare reports to plan for, describe, or document these and other activities.

The trends of the late 1960s and early 1970s coincided with the passage of environmental legislation that strongly emphasized the need to conserve, manage, protect, utilize, and develop wisely our Nation's coastal and offshore resources, while accommodating numerous, often conflicting, uses. The pressure on coastal and ocean habitats is nowhere greater than in the densely populated, industrialized Northeast, and it is now obvious that we need to implement new systems to conserve habitats and living marine resources, while facilitating the completion of necessary, compatible economic developments that allow for multiple uses of living marine resources and their habitats.

The NMFS's emphasis on "research coordination" and "objective planning" during the mid- and late-1970s laid the groundwork for further strengthening of the "research/management interface" between the NER and the NEC. In addition, the NER and the NEC (and sometimes other components of the NMFS and the National Oceanic and Atmospheric Administration (NOAA)) had already collaborated on several efforts to assess the impacts of various major activities. Therefore, when the NMFS's Washington Office proposed, in 1981, that the NMFS Regions and Centers implement the strategic planning concept by jointly developing RAPs, the NER and the NEC chose to use the RAP concept and, in collaboration with the Washington Office, formed a "planning

team" (see Appendix D) to (1) develop the basic structural components of the Northeast RAP (see Section 2) and (2) begin developing a plan to better coordinate the NEC's and the NER's habitat-related research and management efforts.

The RAP concept was given further impetus when, in November 1983, the NMFS issued its formal Habitat Conservation Policy (see Appendix F). This new Policy provides a focus for the NMFS's habitat conservation activities, while integrating habitat conservation considerations throughout the NMFS's major programs and activities. Twelve strategies are set forth to implement the Policy. The Policy's "boss strategy" (Implementation Strategy 1) directs the Regions, Centers, and Washington Office to establish a formal planning and coordination mechanism to implement the Policy on a continuing basis. The Northeast RAP describes and embodies one such planning and coordination mechanism.

Developing the RAP involved several interrelated activities that are described in subsequent sections. Budget constraints resulting in personnel and funding restrictions obviously affect the level of effort. However, the RAP process of planning, coordination, and priority setting will continue, thereby resulting in more refined objectives and goals and more effective use of available funds and personnel.

1.2 RAP Concept, Purpose, and Objectives

The basic RAP concept encourages all NMFS elements to work together more effectively to support the NMFS's mission and achieve its goals. The process of RAP development implements strategy No.1 of the NMFS's Habitat Conservation Policy.

The purpose of the Northeast RAP is to strengthen the research/management interface among the NER, NEC, and Washington Office in planning, policy development, research and monitoring, assessment, and impact evaluation, to accomplish goals C (Habitat Conservation) and D (Protected Species) of the NMFS's Strategic Plan. Less directly, the RAP also supports goals A (Management) and B (Utilization).

The RAP provides a management structure for Regions and Centers to identify and develop strategies for jointly addressing the primary threats to living marine resources and habitats in the various Water Management Units (WMUs). The major objectives of the Northeast RAP are to (1) utilize the available NMFS resources and options as efficiently as possible for habitat conservation and species protection ; (2) influence decisions regarding habitat conservation and species protection to the maximum extent possible; (3) develop and maintain habitat conservation programs that effectively address the most important problems and issues identified in the long-term planning process; (4) identify and set priorities for additional long-term environmental monitoring, research, and management; and (5)

provide a better basis for making adjustments in programmatic activities, as required.

Once the RAP is fully operational, the NMFS will be able to anticipate and respond more quickly and thoroughly to certain kinds of requests than it could previously. Moreover, information derived from the NMFS's involvement with various planning and regulatory processes, the results of research and monitoring programs, and the needs of managers and "decision-makers" will be fed back through the system, thereby influencing future program priorities and directions in a positive way. This formal kind of planning, coordination, and priority setting process has become essential in the Northeast in the face of stringent budget restrictions. Therefore, a long-term commitment to the RAP process is necessary, and is a high priority for the NER and the NEC.

1.3 Benefits of RAP

The RAP will focus the actions of the NMFS on major environmental issues so as to have the maximum possible influence on decisions that affect living marine resources and habitats of the Northeastern coastal zone, continental shelf, and contiguous waters. Implementation of the RAP will help meet the Department of Commerce's goals to (1) provide balanced management of the marine environment and (2) increase the domestic fisheries' contribution to the gross national product.

Full implementation of the RAP will aid the planning efforts of the NMFS and NOAA and help implement the NMFS's Habitat Conservation Policy. The early benefits of RAP are already evidenced by better coordinated NMFS habitat programs focusing on the most important habitat issues and problems.

We expect that the continuing implementation of the RAP will result in better organized, more complete, and more timely responses to future priority habitat conservation issues. The planning process accomplished through RAP will specify the objectives of habitat conservation activities and focus on achieving goals. Communication among the NER, the NEC, and the Washington Office on habitat issues will continue to improve. All three NMFS groups will be able to acquire, analyze, and access information more efficiently, thereby replacing the "ad hoc" mode of operation characteristic of past response efforts with a more organized and efficient approach. Full implementation of RAP should reduce frustration, save program managers and their staffs time and money, and enhance the overall habitat conservation efforts of the NMFS.

The benefits of RAP begin at the points of implementation and will gradually expand outward to include many user groups in the public and private sector. Benefits accrue to the general public in the form of better public service provided through efficient and effective expenditure of tax dollars for

conservation of fish habitats. The products of the RAP process are intended to synthesize and communicate effectively to others pertinent information on the distribution, abundance, importance, and vulnerability of living marine resources and their habitats. These descriptions and assessments will be published or made generally available to State and Federal agencies, commercial and recreational fisheries representatives, elected officials, conservation and development organizations, and other users.

As the NEC's data bases become better organized and as information becomes better synthesized for the various WMUs, the NMFS will be better able to supply well-substantiated answers to specific questions from various users and assist them in making more informed decisions. Information and recommendations will become more readily available so that more timely and better informed decisions can be made regarding issues related to coastal urbanization, waste disposal, fishery management, ocean mineral development, etc. The NMFS's services to user groups that represent such activities will increase. These groups and their research scientists will, in turn, share information and expertise to meet mutual goals, and will subsequently provide feedback on further needs for habitat and fisheries information and research.

1.4 Plan Development and Implementation

This plan (1) identifies and characterizes the WMUs of the Northeast, (2) identifies the most important living marine resources and threats to those resources within each WMU, (3) describes examples of priority ranking for environmental issues in the WMUs, (4) develops a formal program management structure and coordination mechanism for RAP implementation, and (5) provides tactical program guidance for developing strategies to address these issues in current and future budget years.

In developing the RAP, the planning team first divided the area into six WMUs (see Appendix A), and then prepared a general description of their living marine resources. Each WMU represents a large, cohesive zoogeographic area that provides a context or framework within which specific management decisions can be made. WMUs may be revised and/or divided into smaller sub-units, as necessary.

The planning team then identified and ranked priority issues that pose threats or problems to resources and habitats within each WMU. (See Section 3 and Appendices B and G.)

To implement the RAP, the NER, the NEC, and the Washington Office appointed members to the Northeast Habitat Conservation Board (hereinafter, "the Board"). After receiving the Board's recommendations, the NER and the NEC appointed interim "RAP Coordinators" (RCs) and assigned people to the various working groups. (See Section 2.)

The Board develops priorities, evaluates options, and recommends the most effective strategies for dealing with immediate, short-term, and long-term threats to living marine resources and their habitats. In a more general context, the Board's evaluation of efforts to describe and monitor resources and threats provides a long-term basis for assessing environmental conditions, setting research and management priorities, evaluating habitat-related decisions, and selecting from among available options. It also provides a strategy for taking action to influence future decisions early in the planning stages so as to avoid creating problems that result in unnecessary conflicts and controversies. (See Sections 3 and 4.)

Those people responsible for developing strategies should thoroughly consider the many options available to the NMFS for positively influencing decisions on critical environmental issues affecting living marine resources and their habitats. (See Appendix C.) Analyses of the critical issues, prepared in advance, will identify the options leading to various positions. These analyses will provide a sound basis for formulating recommendations based on the best fisheries and habitat information available.

NMFS personnel will choose those options that are most relevant to the issue at hand. They will combine them into the best possible strategies to achieve cost-effective habitat conservation and species protection, while recognizing other compatible, essential uses of fish habitat areas. (See Section 4.)

Coordinated responses developed for various priority issues will lead to generic regional responses covering many issues. Recommendations on specific projects, if needed, will be based on the principles established in the generic responses. The need for site-specific studies and individual handling of requests should decrease as special area management plans, conditions for general permits, and generic responses are developed to cover most of the problems in each WMU. Site-specific NMFS efforts eventually should be necessary only for certain projects that appear to pose high risk to important species and habitats, or that are in areas for which sufficient information is not yet available or has not been adequately synthesized.

Increased activities in the RAP mode will modify some individual research efforts, thereby allowing for an increase in data analysis and synthesis. There will be a decrease in ad hoc research and analysis and an increase in well-planned, long-term research and data acquisition on high priority issues. Although RAP implementation required an intensive effort from relatively few participants during the initial planning phase, the effort is expected to be distributed more evenly among NMFS personnel as habitat considerations become integrated throughout the NMFS's programs. (See Appendix F.)

2.0 RAP MANAGEMENT STRUCTURE

2.1 Major Elements

The major organizational elements responsible for planning, developing, and implementing the RAP were the NER, the NEC, and the Washington Office. Within these major elements, the primary implementors of the RAP were the NER's Habitat Protection Branch (HPB), the NEC's Environmental Assessment Division (EAD), and the Washington Office's Habitat Conservation Division (HCD; formerly the Office of Habitat Protection).

As the RAP process continues to evolve, other components of the NMFS and NOAA will become actively involved. Other agencies and interested groups will also become involved as they use the NMFS's data, information, and recommendations on specific projects, or as the NMFS uses opportunities to work jointly with these groups to address environmental problems. Individuals and groups that use RAP products will tend to become a network of cooperators, sharing ideas, information, and resources. This network can go beyond transfer of data to the synthesis and exchange of knowledge, and to the development of new ideas, hypotheses, and strategies to accomplish habitat conservation.

2.2 Board Structure

The central management feature of the RAP is the Northeast Habitat Conservation Board. The Board is a team of NER, NEC, and Washington Office people with extensive experience in habitat conservation issues. Its meetings are alternately chaired by NEC and NER members.

The Board was initially composed of the Chief of the NER's HPB; the NER's Mid-Atlantic and New England Regional Liaison Officers; the NER's Executive Director; the NEC's Planning Officer; the NEC's Deputy Center Director; and the Chief of the NEC's EAD. The interim RAP Coordinators (liaison to the Board) were the NEC's Assistant Planning Officer and the NER's OCS Coordinator. A representative from the Washington Office's HCD was liaison to the Board.

The Board's membership has evolved considerably since the Board's inception, and new RAP Coordinators have been appointed. (See Appendix D and Section 2.5).

The Board is supported by working groups assigned to develop WMU characterizations and to address major issues or threats to living marine resources and habitats (see Section 2.4).

Within the existing NEC and NER organizational structures, the EAD and the HPB provide the major NMFS involvement in habitat

research and conservation activities related to species for which the NMFS bears responsibility. These groups can involve other NEC and NER programs and personnel when needed.

The NEC's long-term research and monitoring programs form the scientific core of the RAP. In addition to the EAD's research and monitoring programs, the NEC conducts fishery resource surveys and performs analyses that generate data essential to understanding ecological relationships, managing species, and conserving their habitats. From these ongoing programs, information is made available to support the NMFS's efforts to resolve major generic environmental issues that affect living marine resources in the Northeast.

In special cases, the NEC undertakes short-term research projects that address specific problems and respond to high-priority requests for data and information. Results of short-term studies are also integrated with the long-term programs for evaluating and guiding future program direction.

The NEC holds multi-disciplinary workshops, meetings, and symposia that summarize and evaluate available information and provide input for research direction and management actions needed to address major problems. NEC scientists also serve on interagency and international committees where they interact with other scientists to identify problems, transfer information, and plan coordinated research programs.

The NER's HPB performs activities that help fulfill the NMFS's Habitat Conservation Policy and the NMFS's habitat-related responsibilities mandated by numerous laws, including the Magnuson Fisheries Conservation and Management Act (Magnuson Act); the Fish and Wildlife Coordination Act (FWCA); the National Environmental Policy Act (NEPA); the Endangered Species Act (ESA); the Marine Mammal Protection Act (MMPA); the Coastal Zone Management Act (CZMA); the Marine Protection, Research, and Sanctuaries Act (MPRSA); and other authorities.

The HPB forms a major link between the NMFS and various Federal and State regulatory and natural resource agencies regarding proposed activities that threaten living marine resources and their habitats in Northeast coastal and offshore areas. HPB personnel participate in a wide range of interagency planning activities and advise Federal regulatory and other State and Federal agencies on a day-to-day basis. Through these efforts, HPB personnel are intimately familiar with potential habitat-degrading problems and alternatives for mitigating adverse impacts. Personnel also serve on various task forces, steering committees, and advisory or planning groups that address and attempt to solve important habitat problems. The HPB often cooperates with or is assisted by NEC personnel in these efforts.

The Washington Office performs the important role of providing guidance on RAP development and assisting the Board

with recommendations for implementing RAP strategies. Through serving on the Board, Washington Office personnel provide a two-way communication link between regional (NER/NEC) and national programs: In one direction, they represent regional RAP interests and programs in policy, budget, legislative, regulatory, and strategic planning matters with the NMFS's Assistant Administrator for Fisheries, NOAA, the Department of Commerce, other Federal agencies, and interest groups of national stature (e.g., fisheries and conservation groups). In the other direction, they integrate policy, budget, and strategic planning matters with the RAP process to provide consistency with NMFS policy. The Washington Office is therefore in a good position to support and promote concepts developed in the RAP during the NMFS's and/or NOAA's strategic planning, long-range planning, and Management by Objectives (MBO) processes.

2.3. Board Functions

The Board performs an advisory function to the Regional Director and the Center Director by evaluating and recommending priorities, options, and strategies to address habitat-related issues. It also develops tasks for working groups and RAP Coordinators, as well as others who compile information, make recommendations, and take action to avoid or minimize impacts, solve problems, and resolve conflicts between multiple-use activities and living marine resources and their habitats.

The work required to accomplish most of these tasks is carried out by existing NER and NEC staff already engaged in habitat-related programs. These efforts are supplemented, where needed and possible, by other Federal and State personnel. When broad and important fisheries problems are being addressed, allocation of additional NMFS resources may be required from within NER and NEC, the Washington Office, or other Regions and Centers.

The initial major activity of the Board was to set priorities and implement better coordinated actions between NER and NEC to address environmental problems that affect living marine resources, their food webs, and their habitats. Where appropriate, problems were identified in relation to specific WMUs or smaller subdivisions (e.g., watersheds of major river systems, individual estuaries, ocean disposal areas, or offshore submarine canyons). Planning was concentrated on determining the most effective means of influencing decisions regarding the higher-priority multiple-use activities that threaten living marine resources.

For these priority activities, the Board seeks to (1) define problems and recommend improved ways to deal with them, (2) identify the work that must be done to support these recommendations, (3) review and revise the strategic plan for habitat conservation activities in the Northeast, (4) review

programmatic activities and re-establish priorities, and (5) recommend needed programmatic adjustments.

The Board encourages coordination within NOAA and between NMFS and other Federal and State agencies having mandated or logical interests in habitat conservation within estuarine and marine habitats. Improved intra-agency coordination will help other appropriate NMFS and NOAA components work together to provide a well-coordinated NOAA position on important issues. Coordination efforts will improve communications within NOAA and between NOAA and other Federal regulatory and natural resource agencies such as the Environmental Protection Agency (EPA), the Fish and Wildlife Service (FWS), the Army Corps of Engineers (COE), the Minerals Management Service (MMS), the Soil Conservation Service (SCS), and the Food and Drug Administration (FDA).

The Board also seeks to strengthen coordination with the marine fisheries and coastal planning departments of the various coastal States, interstate and regional fisheries commissions and committees, international organizations, and the New England and Mid-Atlantic Fishery Management Councils (FMCs) to encourage consideration of effective habitat conservation measures. Some coordination is already carried out by the NMFS, but it is usually for specific, relatively short-term purposes such as licensing a development project or approving a fishery management measure. The purpose of the Board's coordination is longer term, primarily to determine and satisfy information needs, and to take action on environmental issues before they result in short-term, controversial problems.

The Board meets at least quarterly. To help coordinate environmental research within estuarine, coastal, and shelf waters, the Board attempts to consolidate its meetings with those of other related groups, including the NEC's Board of Directors, the NEC's Ocean Pulse program, the NEC's Marine Resource Monitoring, Assessment, and Prediction (MARMAP) program, and the NOAA's Northeast Monitoring Program (NEMP). Such consolidation provides for more effective communication and coordination, and reduces travel and meeting costs.

Annually, one of the Board meetings includes a workshop or symposium. This meeting is devoted to reporting the results achieved during the past year, bringing those results to the attention of the larger scientific and management community, and developing strategies or action plans to address pending habitat conservation issues.

The aforementioned activities place emphasis on dealing with important issues "up front." The Board is responsible for anticipating principal issues so that NMFS can develop plans and strategies to address them, and can appropriately allocate funds and personnel to deal with them.

2.4 Working Groups

The continuing, long-term functions of working groups are to (1) develop data bases and other information on WMUs and their sub-units, (2) identify problems and define strategies to address them, and (3) develop review and synthesis papers. Their short-term functions are to respond to immediate tasks identified by the Board or the RCs.

Working groups are composed of a nucleus of NEC and NER staff with subject area expertise, assisted when appropriate by cooperators from the NMFS, the NOAA, other State and Federal agencies, and others. The participation of other groups is important to ensure that all aspects and ramifications of the issues are considered. The participation of State personnel is particularly important for the coastal WMUs and for those offshore WMUs where oil and gas lease sales and drilling activities occur, since the environment and economy of several States may be directly or indirectly affected by OCS development.

One or more working groups will develop, review, and periodically update the original WMU descriptions. The WMUs are based on historical information on their physical, chemical, and biological characteristics. Results of long-term monitoring studies, for example, may indicate that changes must be made in one or more of the WMU characterizations.

Other working groups will be established to deal with high priority issues. These groups are charged with (1) solving short-term problems posed by particular threats and (2) developing and implementing strategies and contingency plans to deal with long-term environmental issues.

The size and composition of each working group depends on several factors, including the urgency of the problem, the magnitude of the problem, and the availability of NMFS staff. Working groups receive assistance from NEC and NER programs, as needed. Working group members and any alternates work closely with the RCs to ensure continuity. For longer-term problems, working groups will develop strategies, identify data gaps, and recommend to the RCs or the Board any studies or other actions that should be undertaken to address important issues, solve problems, and avoid conflicts. (See Section 4.)

2.5 RAP Coordinators

The RAP Coordinators appointed by the NER and the NEC must be familiar with regional habitat-related problems and research. They are jointly responsible for (1) maintaining day-to-day coordination and informal communication among the RAP elements; (2) ensuring that all tasks referred through the RAP coordination mechanism are completed adequately within agreed-upon time frames; and (3) bringing to the Board's attention

any serious unresolved problems, accompanied by recommendations for their resolution. (See Appendix E.)

RAP Coordinators have now been named at the Region and Center Directorate level, rather than at the Branch or Division level. The elevation of this position ensures that appropriate attention and resources are devoted to priority tasks identified by the Board.

2.6 RAP Coordination Mechanism

Both the NER and the NEC receive numerous requests for environmental data, information, and advice. Many requests are handled routinely, according to established priorities and subject to availability of sufficient staff and time. Some requests, however, can cause confusion and duplication of effort between the NEC and the NER. Therefore, the following procedures will be followed:

Requests made by other agencies or individuals to the NEC that involve Federal permits, licences, EISs, projects, or other proposed Federal actions that are clearly within NMFS's responsibilities for consultation, review, and comment under the FWCA, NEPA, MMPA, ESA, MPRSA, or CZMA are referred to or cleared with the NER's HPB before formal action is taken.

Conversely, requests that the NER receives that require the NEC's assistance in supplying scientific data, information, or advice, or that are clearly and solely a research or monitoring matter without direct implication to NER's responsibilities are referred to the NEC.

The RAP coordination mechanism is triggered when a generic issue or specific problem cannot be resolved solely by NER or NEC. Although the RAP coordination mechanism must be flexible to allow participants discretion to deviate from established procedures when they believe it is essential, the following procedures are generally followed:

After deciding that a request may warrant handling through the RAP coordination mechanism, NER and NEC staff and the RCs communicate informally. The RCs then utilize available information and NMFS staff expertise to decide what immediate actions need to be taken. A working group may be formed to synthesize information from WMU descriptions, available literature, and pertinent data garnered from long-term research and monitoring programs. The assistance of other NMFS/NOAA elements and other cooperators is sought, as needed. When necessary, the NEC or the NER undertakes short-term projects to answer specific questions.

The working group analyzes and interprets the results of its studies and reports to the RCs. The RCs then resolve outstanding issues, help formulate recommendations, and prepare written

inputs to the final response to the requesting agency or other user. The HPB or the EAD generally prepares the final, formal response for the NER or the NEC. Copies of pertinent correspondence are sent to all RAP participants. The RCs or other NMFS personnel report significant events, problems, and recommendations to the Board for consideration and action.

3.0 PRIORITIES

3.1 Statement of Northeast Threats/Priorities

Using the RAP approach enhances the NMFS's ability to determine priorities and develop strategies to address key issues in the Northeast over both the long and short terms. Priorities established and approved by the Regional Director and Center Director are expected to guide program managers in the selection of long-term projects and, at an accelerating rate, to become the major factor in determining day-to-day activities. The NMFS's monetary and personnel resources thus will be directed at high-priority problems that pose the greatest risk to resources of primary concern to the agency.

Many factors affect the assignment of "risk" or "high priority." A rating for the severity of a given threat considers the perceived degree to which the entire ecosystem may be affected. It also weighs the importance of individual species, their habitat requirements, the condition of those habitats, and any factors that affect those habitats adversely.

It is difficult in any rating system to consider all the various socio-economic factors that may greatly influence establishing priorities. Nor is it easy to consider living marine resources other than fish, fish habitats, and food chain organisms. For example, the special protection afforded marine mammals and endangered species under the MMPA and the ESA may change the priority placed on a particular situation. Therefore, although a certain threat may be classified as "medium risk" to the ecosystem within a given WMU (e.g., OCS oil and gas activities on Georges Bank), the presence of large numbers of endangered species, or some other factor, may warrant assigning a high priority to some tasks associated with the problem.

The RAP Board determined that the greatest threats to living marine resources in the Northeast are "urban and port development," "non-point source pollution," and "ocean disposal." Several approaches to ranking issues have been applied since the inception of RAP. All yielded essentially the same results (see Appendix G.) This ranking was reconfirmed by the Board in December 1983 (Table 1).

One must not infer, of course, that an absolute correlation exists between the "greatest threats" and the "highest priority

activities." Two examples illustrate: (1) the RAP Board has determined that synthesizing basic information is a prerequisite to addressing any of these threats effectively, and therefore gives high priority to developing WMU descriptions and data bases; and (2) the Regional Director is charged with certain tasks that must be accomplished because they are NOAA/NMFS responsibilities (e.g., ESA Section 7 consultations and OCS oil and gas activities).

With such constraints and trade-offs in mind, the NER and the NEC will give highest priority to program activities focused on the three greatest threats. Low-risk threats will be addressed only when one or more of the following conditions exists: (1) the size or precedent-setting nature of a proposed project or activity raises its priority; (2) it can be addressed quickly through a mechanism that already exists (e.g., interagency permit review, or "joint processing"); (3) many cases of the same kind can be addressed by attention to a general or innovative solution (e.g., development of general permits, widely applicable conflict-resolution mechanisms, or special area management plans); or (4) when long preparation time would be needed to address an activity that is now perceived to present a low risk, but that may become a high-risk threat in the future.

The top-ranked threats identified for the Northeast are complementary to those recently identified for increased future research emphasis on a national basis by NOAA's Marine Environmental Quality (MEQ) Task Force:

NOAA/MEQ		NE/RAP
Habitat alterations	correlates with	**Urban and port development**
Synthetic organics	"	Ocean disposal
Biostimulants	"	**Non-point source pollution**
Pathogens	"	**All the above**

3.2 Priorities for the Future

RAP priorities will change over time as other priority-setting methods are developed, new information becomes available, our perception of the severity of certain threats changes, problems are solved, and new issues arise that require the NMFS's attention. Changes in the state-of-the-art of risk analysis will

be an important factor in priority reassessment.

The RAP Board continues to explore risk analysis methodologies and other ways of refining its approach to ranking threats and establishing priorities. NER/NEC staff developed some alternative approaches (see Appendix G), and the Board heard a presentation on the Delphi Technique used by the NMFS and the Fishery Management Councils to list fisheries in the order of their need for management. A modified Delphi Technique may be useful when the RAP Board is ready to broaden its audience and seek consensus on the threats and priorities among the FMCs, the States, and other users of RAP products.

For the present, the RAP participants will continue to (1) synthesize data and information into WMU characterizations and other usable products and (2) develop strategies for the high-priority issues (i.e., urban and port development, ocean disposal, and non-point source pollution).

4.0 STRATEGIES

4.1 Principles

The basic RAP strategy implements the NMFS's Habitat Conservation Policy. The NER's and the NEC's programs and activities are becoming increasingly linked through the management structure so that, in both the long- and short terms, the NMFS's activities influence decisions effectively and positively. Strategies for dealing with specific threats are being outlined by the Board in general terms, and working groups are charged with their implementation.

The most important criteria for these strategies are that they be (1) based on scientifically credible information, (2) effective in promoting habitat conservation, (3) efficient in their use of Federal staff and funds, and (4) focused to achieve maximum public benefits. We must choose wisely from among the array of procedures and options to influence decisions that are listed in Appendix C, and seek new and better ways to do business. To this end, we are seeking ways to multiply our effectiveness by encouraging others to act in concert with us.

The initial step of formalizing the RAP structure mobilizes and organizes NMFS participants to make the best possible use of the information available within NMFS. This information, along with that from other sources, is synthesized and used to influence multiple-use decisions in many ways: directly, by NMFS personnel who participate in advisory or consultative functions; and indirectly, by contributing to various planning, research, and management groups, or by catalyzing other groups that can themselves influence decisions that affect living marine resources and their habitats.

The NMFS often may be able to accomplish more by working through others. At other times, the NMFS can more effectively influence decisions directly by actively participating in, or promoting establishment of, interagency workshops, discussion groups, and arbitration mechanisms to solve problems before they reach a confrontational stage. Through the RAP process, we are choosing the mix of tools and options that will give us the most effective way to approach any given habitat-related problem.

4.2 NMFS Guidance

Two NMFS concepts provided important procedural and philosophical guidance for the Board's efforts to develop strategies: the NMFS's Strategic Planning process and the operational philosophy that is commonly referred to as "the State/Federal process."

The NMFS's Strategic Planning process is used to establish the agency's mission, goals, and objectives, and to channel its resources to achieve those goals and objectives. As the NER and NEC have worked on subgoals and objectives to meet national goals, activities have become more closely aligned and coordinated. RAP was a logical outgrowth of Strategic Planning, and the RAP process has brought the research and management arms of NMFS closer together in the Northeast for purposes of habitat conservation. As the process gains momentum, it will be applied more broadly and involve other NMFS programs, NOAA groups, other Federal agencies, States, Fishery Management Councils, and academic institutions (and thereby accomplish Implementation Strategy 1 of the NMFS's Habitat Conservation Policy).

The State/Federal philosophy encourages working cooperatively so that funds, personnel, programs, and policies of interested parties are harmonized to the mutual benefit of all. Each group contributes what it can do best: resources and avenues of action are pooled or operated in complementary ways so that State and Federal agencies not only achieve their own goals, but also support each others' goals. These agencies can then bring in other government and private groups with similar or related concerns. Eventually a network develops that enables managers to take concerted action on issues of mutual concern, and the whole becomes greater than the sum of its parts.

4.3 Procedures and Options for Influencing Decisions

The NMFS has many options and procedures for influencing decisions that affect fish and their habitats. The Fish and Wildlife Act of 1956 established a strong Federal role in fisheries. The Fish and Wildlife Coordination Act mandated an active role for the NMFS in influencing the policies and decisions (and therefore the people) that affect the habitats of fish and other living marine resources. Other laws provide the tools the NMFS can use to implement strategies that influence decisions. (Appendix C lists many of these tools, procedures,

and other options used by NMFS personnel.) Additional options can and will be developed over time.

4.4 Strategy Development

The Board will recommend establishing working groups and general strategies based on the priorities developed during the characterization process. These groups will utilize the options in Appendix C to refine the strategies (following the general guidance in Section 4.5), achieve the NMFS's objectives and goals, and accomplish specific tasks. The tasks assigned to working groups may be categorized as either "anticipatory" (long-term) or "responsive" (short-term). Between Board meetings, short-term working groups may be established through consultations among RCs and program managers. Successful strategy building presupposes that the RAP organizational elements are not limited exclusively to any one option or combination of options. They will use whatever options are best suited to achieving results, whether they are planning to meet anticipated threats or are acting to respond to current threats.

The RAP structure is intended to anticipate issues that pose threats to living marine resources and their habitats so that the NMFS is prepared to deal with them in conceptual or planning stages before multiple-use conflicts develop. The options that are most suitable are baseline establishment and monitoring, studies to define the relationship of habitats to fish production, biological effects studies, data management, issue papers, planning activities, and policy development. (See Appendix C.)

The RAP process will also help the NMFS respond effectively when the opportunity arises. When the NMFS is responding to a specific request or proposal, some of the anticipatory options will be immediately useful (e.g., WMU descriptions, issue papers, and retrieval of information from data management systems). Other options (joint processing; coordinated inter/intra-agency recommendations; biological effects assessments; and recommendations for mitigation, enhancement, and alternatives) will be the primary avenues the NMFS uses to influence decisions.

The RAP process works best if the anticipatory and responsive modes are continuously integrated. Feedback mechanisms must be built into the process so that (1) the challenges and opportunities to which the NMFS responds guide program planners to develop anticipatory tools to meet those challenges in the future, and (2) anticipatory planning raises the consciousness level of all RAP participants and helps screen the challenges and opportunities to which the NMFS responds. The degree to which this feedback and integration are achieved will control the NMFS's ability to take full advantage of the options it possesses, and to combine those options into effective, dynamic strategies.

Options should be used in combinations that will lead to the resolution of short-term problems, while permitting movement toward long-term solutions for larger issues. Theoretically, when coastal zone and ocean management planning and background data are adequate, the NMFS will be able to concentrate solely on the larger issues, such as (1) understanding ecosystems, (2) assessing major new types of development, (3) conserving and managing fisheries, and (4) influencing decision-makers. Until then, we will be pursuing long-term and short-term approaches concurrently.

4.5 General Guidance for Working Groups

Upon its formation by the Board, a working group should follow the generic strategy for providing information to decision-makers depicted in Appendix I, and should use the following general guidance to develop an action strategy. The maximum benefit to the NMFS will result from each working group evaluating and integrating anticipatory and responsive strategies for long-term and short-term issues to arrive at the best strategy for solving any particular problem.

Refine the Problem and Relate to Key Resources: Although the Board identifies the major issues to be addressed, it remains for the various working groups to refine the problems, relate them to specific key resources in the affected WMUs, and focus the scope of impact or conflict as much as possible (e.g., by establishing threshold levels). Each working group should relate its efforts as closely as possible to the proposed developmental activities, so that it can identify the best course of action.

Determine Data Availability and Needs: Based on an analysis of the data in the WMU characterization, each working group should then determine if sufficient information exists to resolve the issue. When an anticipatory strategy needs to be developed, each working group should assess the data needs and formulate a detailed plan to obtain the required information. Each working group should strive to obtain the needed information from existing sources or through modification of ongoing research. When a response strategy to a current activity is required, each working group should determine if a scientifically supportable response can be developed utilizing the data on hand, and should provide to the RAP Coordinators a complete assessment of the scientific supportability of the response.

Identify the Action Group: The Board and working groups must consider how and by whom any particular problem can be controlled. For example, the problem may be controllable at the source or at the discharge point; it may be controllable by planners, regulators (State, local, or Federal), or developers; or it may be most practical and efficient to inform other parties that might have an interest in becoming involved. The NMFS could take the lead or call upon one or more scientific experts and opinion leaders. The idea is to draw on all effective sources of

assistance, supply them with scientific advice and synthesized information, and work on the problem from as many different angles as may be effective.

Formulate the Strategy: Utilizing the information garnered from the activities described above, each working group, in cooperation with the RAP Coordinators, should develop a strategy to solve the problem from among the options listed in Appendix C.

Identify the "Limiting Factors": If particular limiting factors are associated with the chosen strategy, it is important for each working group to recognize them early, and to either resolve them or adopt alternatives. Such limiting factors as lack of funds and staff, lack of regulatory or legislative mechanisms, or lack of key data will warrant immediate effort by others to find long-term solutions, at the same time as the working group is doing what it can through other options.

Examine the Remaining Options: If limiting factors rule out one or more of the options, the working group and the RAP Coordinators should determine if adjustments are practical that would eliminate the limiting factor and allow the option to be included in the strategy. If not, the working group should reconsider the remaining options and formulate a strategy from among those options (informational and action) that show the most promise for solving the problem effectively.

This pattern of strategy development should be applied to all major problems. Each problem will yield to a different tactical mix of options, and the working groups, the RAP Coordinators, and the Board will continuously review progress and reexamine options to ensure that the most effective mix is being used. The process is dynamic, and participants should be constantly on the alert for new ways to approach problems and enlist the support of others.

4.6 Guidance for WMU Working Groups

A WMU working group will develop data bases, analyze data, review literature, and summarize relevant information in a standard format to (1) define habitat usage by living marine resources and people; (2) define essential habitats and areas of concern; and (3) identify the risks that various human activities pose to living marine resources, habitats, and people in that particular WMU. (See Appendix I.) Special attention will be placed on species for which NMFS bears primary responsibility for management, conservation, and protection under the Magnuson Act, the ESA, or the MMPA (as dictated by the Habitat Conservation Policy).

Products of these initial efforts will include WMU characterization documents, maps of habitat usage, and issue papers on data gaps and research needs. Such products will help the Board, the NMFS, and others reach or evaluate management

decisions related to the components of the ecosystem forming each WMU. Although WMU characterization documents are primarily intended to provide information to problem-solvers, they will be prepared in a form suitable for peer review, publication, and use by the scientific community.

A WMU characterization document should provide (1) an executive summary; (2) a discussion of the commercial and recreational fisheries of the area, including a discussion of their socio-economic importance, trends, and relationships (i.e., commercial and recreational fisheries values and employment, tourism, consumer demand, etc.); (3) a description of "the system" (physical, chemical, and biological); (4) information on existing and potential perturbations (natural and man-induced), including an estimation of their effects on long-term yields and marketability of each species; and (5) an identification of the human activities and perturbations of greatest concern. For the Mid Atlantic WMUs, the first WMU working group developed a model format for WMU characterization documents. Once this format is tested, it will be applied to other WMUs to ensure that all such documents are consistent in their treatment of ecosystem components and useful in responding to specific multiple-use issues and threats to living marine resources.

Subsequent working group efforts will focus on assessing the risks of priority threats to living marine resources, habitats, and people. The activities and products of these efforts are listed in Appendix I.

4.7 Strategy Implementation

The Board, through its RAP Coordinators, will request and obtain approval from the Regional and Center Directors before taking any action that would involve a major commitment of either staff or funds to accomplish the options outlined in the strategy. This practice will be followed during implementation of strategies for all anticipatory (long-term) issues. Strategies for responsive (short-term) issues will be implemented in a similar manner, but they will of necessity be done more quickly and less formally.

Table 1. **Ranking of the major threats to living marine resources and habitats in the Northeast. RAP Board Meeting, Narragansett, RI, December 8, 1983.***

THREATS	1	2	3	4	5	6	7	8	9	10	11	TOTAL	RANK
Urban & Port Development	5(5)	1(2)	1(3)	1(4)	2(10)							24	1
Non-Point Source Pollution	3(3)	2(4)	4(12)		1(5)							24	2
Ocean Disposal	2(2)	4(8)	2(6)		1(5)	1(6)						27	3
Industrial Waste Discharge		3(6)	1(3)	1(4)	2(10)	3(18)						41	4
Domestic Waste Discharge			1(3)	2(8)	2(10)	2(12)	3(21)					54	5
OCS Oil & Gas			1(3)	2(8)	1(5)	3(18)		2(16)			1(11)	61	6
Dams				2(8)			3(21)	2(16)	1(9)		2(22)	76	7
Water Diversion				1(4)	1(5)		2(14)	1(8)	3(27)	1(10)	1(11)	79	8
Power Generation				1(4)			1(7)	5(40)	1(9)	1(10)	1(11)	81	9
Sand & Gravel Mining							1(7)		4(36)	3(30)	2(22)	95	10
Insect Control						1(6)			1(9)	5(50)	3(33)	98	11

* The listed values represent the number of participants who gave a threat a certain ranking. The number in () is the listed value multiplied by the RANK. The TOTAL is a sum of the values in () that provides a final rank for each threat. The single tie was broken by awarding the higher rank to the threat with the most first place votes. (See Appendix B for a discussion of multiple-use issues, threats to living marine resources and habitats in Northeast WMUs, and NMFS's present methods of dealing with them.)

APPENDIX A

WATER MANAGEMENT UNITS

A-1.0 Introduction

The Northeast region has been divided into six Water Management Units (WMUs), as portrayed in Figure A-1. The boundaries of each WMU were established on the basis of our present understanding of the biogeographic consistency of the entire WMU and its distinctness from other WMUs. Each WMU is relatively consistent in its physical and chemical characteristics, within normal latitudinal and seasonal variations in temperature, salinity, and nutrient content. The biota include both endemic and migratory species that exhibit normal seasonal fluctuations in species composition, individual population size, and geographic distribution. The boundaries between each WMU extend to the heads of drainages, as individual and combined drainages exhibit significant influence on the coastal WMUs.

A-2.0 Coastal Gulf of Maine

The Coastal Gulf of Maine WMU encompasses an area bounded seaward by the observable limits of coastal processes, including riverine and estuarine plumes, coastal upwelling and diurnal tidal fluxes (about 30 nm), and landward by the fall line, in general, and more specifically to the head of drainage for the significant anadromous fish rivers. Geographically, the area is bounded on the northeast by the Canadian Border and on the southwest by Cape Cod. This zone is generally marked by steep terrain and bathymetry, joining at a rock-bound coastline with numerous isles, embayments, pocket beaches, and relatively small estuaries. Six major rivers, the St. Croix, Penobscot, Kennebec, Androscoggin, Saco, and Merrimack, provide input from drainage of over 44,000 sq km of Maine, New Hampshire, Vermont, Massachusetts, and southeastern Canada. In addition, the Bay of Fundy outflows through the Grand Manan Channel, influencing the northern section of this zone and providing an area of mixing in which right whales congregate each summer to feed, nurse their young, and mate. Circulation is generally to the southwest, along Stellwagen Bank, and finally offshore at Cape Cod. In the embayments, axial currents associated with large tidal fluxes dominate the local circulation.

The Coastal Gulf of Maine provides boreal habitats for important fish (e.g., Atlantic herring; Atlantic cod; haddock; cusk; winter, summer, and yellowtail flounder; Atlantic halibut; bluefish; redfish; and scup), shellfish (e.g., American lobster, hard and soft clams, ocean quahog, bay scallop, and northern shrimp), anadromous fish (e.g., shortnose sturgeon, American shad, and Atlantic salmon), coastal cetaceans and pinnipeds

(e.g., harbor seal; dolphins; harbor porpoise; and humpback, fin, minke, and right whales), sea turtles, and significant birdlife. The habitats are presently affected by ocean disposal and effluents from major urban areas (e.g., Eastport, Bangor, Bath, and Portland ME; Portsmouth NH; and Boston MA), along with significant non-point source pollution associated with the various rivers. Continued pressure to fill already-depleted marsh and shallow-water areas occurs in most parts of the area. Efforts are being made to restore anadromous fish runs in the Penobscot, Kennebec/Androscoggin, and Merrimack rivers where dams have blocked fish passage.

A-3.0 Gulf of Maine

The Gulf of Maine is a semi-enclosed sea of 90,700 sq km separated from the Atlantic Ocean below 50 m by Browns and Georges Banks. For the purpose of establishing this WMU, its limits are defined by the Great South Channel and the northern edge of Georges Bank to the south, and by the Coastal Gulf of Maine WMU to the north and west. It is an area of five major basins (250-377 m), floored with clays and gravelly silts, and broken by rocky outcroppings, numerous ledges, and banks. These banks and ledges rise to depths of less than 75 m, shoaling to about 8 m over Ammen Rock on Cashes Ledge.

The circulation is only generally understood: a seasonal clockwise gyre swings around the Gulf and joins the clockwise gyre on the northern edge of Georges Bank. Above 50 m, input to the Gulf of Maine is from the Scotian Shelf and the various rivers emptying into the coastal Gulf of Maine WMU. The Northeast Channel provides the majority of input below 50 m, where a basin-to-basin exchange characterizes the deep circulation pattern.

The area has three significant hydrographic regimes: the Maine Surface Water, which has seasonal temperatures and salinities (31-33 ppt); the Maine Intermediate Water, which has a temperature minimum in all but the winter months and salinities of 32-33 ppt; and the Maine Bottom Water, which has temperatures and salinities of 6-8°C and 34-35 ppt below 150 m. The Maine Surface Water appears to be derived from the Scotian Shelf and coastal zone waters; the Maine Bottom Water, from slope water flowing through the Northeast Channel. The Maine Intermediate Water is resident, and is derived from dynamic processes.

The Gulf of Maine offers significant boreal deepwater habitat for fish (e.g., Atlantic cod, haddock, pollock, redfish, winter flounder, and Atlantic halibut), shellfish (e.g., American lobster and northern shrimp), and pelagic species (e.g., Atlantic herring, Atlantic mackerel, swordfish, and bluefin tuna). Significant populations of cetaceans (dolphins, harbor porpoise, and humpback, fin, minke, and right whales) occur seasonally; whales feed on sand lance and other prey in the fringe areas of Jeffreys Ledge, Stellwagen Bank, Lower Bay of Fundy, and the

northwest edge of Georges Bank. Presently, threats to the area are from non-point source pollution entering from the Scotian Shelf, from the coastal Gulf of Maine, and from ships transiting the area.

A-4.0 Georges Bank West to Block Channel

This WMU includes Georges Bank, the Great South Channel, and Nantucket Shoals -- areas that have similar habitats, biota and hydrographic regimes. For clarity, each of these areas will be discussed as a sub-unit, as each has distinctive and significant characteristics to consider.

Georges Bank is an internationally recognized fishing ground east of Massachusetts, bounded on the north by the Gulf of Maine, on the east by the Northeast Channel, and on the the south by the shelf-slope front at the shelf break. The physical environment is characterized as a shallow, sandy bank, marked by numerous shoals along its northern half, that gently slopes off to the shelf break on its southern and eastern half. Its edges are characterized by steep slopes descending to greater than 200 m in the Gulf of Maine, Northeast Channel, and at the continental slope. The southern edge is also intersected by numerous submarine canyons that provide significant habitat for important fishery resources.

Hydrographically, strong rotary tidal currents maintain relatively homogeneous conditions on Georges Bank; salinities are stable (32.5-33 ppt), and temperatures reflect seasonal warming and cooling. Overlying this, a general clockwise gyre brings predominantly Gulf of Maine water around Georges Bank and along the shelf-slope front. Significant levels of primary production (up to 665 gm $C/m^2/yr$) occur within this regime. Along the shelf-slope front, the passage of warm core rings indicates that warm saline frontal waters are forced onto the shelf and entrain colder shelf waters into the slope water regime.

The Great South Channel is a broad, gentle, sandy break with numerous rock piles and a sill depth of 75 m. It lies between Georges Bank and Nantucket Shoals. Hydrographic conditions are similar to those on Georges Bank. The overall circulation is not distinct, being masked by a strong diurnal tidal flow axially in the channel. Evidence exists for exchange of water between the Gulf of Maine, Georges Bank, and along the shelf-slope front. The Great South Channel is a major migration route for large baleen whales entering the Gulf of Maine to feed in the summer.

Nantucket Shoals are the sandy shoals that extend north of Cape Cod from the western edge of the Great South Channel and the Gulf of Maine. These shoals are a series of sand ridges that rise to 3-10 m and have troughs of 10-30 m between ridges. They diminish offshore around the 40-m contour and form into a gentle sloping plain to the continental shelf break. The area has significant diurnal tidal currents along the troughs that keep the

the water constantly overturned. The general circulation indicates that the shoals provide a major offing for Maine Surface Waters. These areas, especially Jeffreys Ledge and Stellwagen Bank, are major summer feeding areas for large numbers of humpback and fin whales.

The "mud patch" is a geologic anomaly south of Martha's Vineyard that offers a significant habitat area. Studies indicate that high levels of trace elements are present in the sediments. The origin of these sediments remains unresolved.

Overall, this is a highly productive WMU, and heavy fishing pressure is exerted on its numerous fish (e.g., Atlantic cod; haddock; pollock; yellowtail, winter, and summer flounder; gray sole; silver, red, and white hake; butterfish; redfish; cusk; wolffish; tilefish; Atlantic mackerel; and Atlantic herring) and shellfish (e.g., American lobster, sea scallop, surf clam, and squid). Numerous cetaceans (e.g., dolphins; harbor porpoise; and humpback, fin, minke, and right whales) frequent the area. It is threatened by OCS exploratory drilling and by non-point source pollution from atmospheric fallout, general circulation patterns, and marine transportation activities.

A-5.0 Coastal Middle Atlantic

The Coastal Middle Atlantic WMU encompasses a zone from Cape Cod southwest to Cape Hatteras, and from the 30-m contour inshore to the heads of drainages. The area is characterized by a series of sounds, broad estuaries, large river basins (e.g., Connecticut, Hudson, Delaware, and Susquehanna), and barren islands. A relatively smooth plain gently slopes from the offshore rim of the sounds and estuaries out past the 30-m contour to the 200-m contour. The predominantly sand bottom is characterized by a ridge-and-swale topography.

The waters of the Coastal Middle Atlantic have a complex and seasonally dependent pattern of circulation. Seasonally varying winds and irregularities in the coastline result in the formation of a complex system of local eddies and gyres. Currents tend to be strongest during the peak river discharge period in late spring and during periods of highest winds in the winter. In late summer, when winds are light and estuarine discharge is minimal, currents tend to be sluggish, and the water column is generally stratified.

The waters of the Coastal Middle Atlantic undergo annual temperature and salinity cycles. Temperatures range from sub-zero in estuaries in February to 27°C off Cape Hatteras. The region's annual salinity is chiefly the result of (1) freshening by river and stream water entering close to the surface inshore and (2) salting by wind-induced indrafts of shelf waters over the bottom from offshore. Seaward of the estuaries, salinities are 30-33 ppt.

The chemical composition of these waters reflects the impact of local usage and/or conditions immediately to the northeast. Carbon, nitrogen, trace metal, and contaminant levels vary between each estuary. Productivity also varies, reflecting the influence of elevated levels of primary productivity.

The Coastal Middle Atlantic provides major habitats for anadromous, estuarine, and endemic Virginian Province species. Migratory species play a major role in the WMU, and make up the predominant stocks in various seasons. Common species include American oyster; hard, soft, and surf clams; ocean quahog; bay scallop; blue crab; menhaden; striped bass; bluefish; scup; spot; croaker; weakfish; tautog; black sea bass; butterfish; silver hake; summer, yellowtail, and winter flounders; American shad; alewife; blueback herring; Atlantic herring; shortnose sturgeon; loggerhead and leatherback turtles; harbor and gray seals; dolphins; and fin and minke whales. Estuaries provide major spawning and nursery areas for many of the endemic and migratory species of this WMU. These species are presently affected by non-point and point sources of pollution from major rivers and urban areas (e.g., New York, Philadelphia, Baltimore, Washington, and Norfolk), as well as by direct loss of habitat caused by filling of wetlands, damming and diversion of rivers, and mosquito ditching in marshes.

A-6.0 Middle Atlantic Shelf

The Middle Atlantic Shelf WMU covers the area from the Block Island Front (cross sectioning the shelf from Montauk Point SSE to the shelf-slope front) southward to Cape Hatteras. The inshore boundary follows the observable limits of coastal processes, primarily estuarine plumes, and lies approximately 45 km from the coast. Offshore, the shelf-slope front provides a dynamic boundary that is generally located 17 km seaward of the 200-m isobath. The shelf width varies from 24 km at Cape Hatteras to 190 km southeast of New York.

This WMU generally is characterized as a sandy plain, with a ridge-and-swale topography. Sediment grain size is generally coarse in the inshore areas and becomes finer, with a greater percentage of silt, at the shelf edge.

Bathymetrically, the shelf increases in slope seaward of the 100-m isobath. Numerous submarine canyons intersect this area. Hudson Canyon, in particular, extends into the shelf as the Hudson Shelf Valley and effectively sections the WMU into two zones, southwest and northeast of the shelf valley.

The surface circulation over the Middle Atlantic Shelf can be divided into a two-celled system, separated at the Hudson Shelf Valley and consistent with the two-zone structure of the WMU. The northern cell receives indrafts of Georges Bank and offshore waters in the spring and transports these toward

Massachusetts and Rhode Island. The water then begins a southward flow and joins a compensating offshore drift east of Hudson Canyon. A westerly drift results from this pattern. The southern cell, southwest of the shelf valley, has a general southwesterly flow. Inflow to the cell is primarily from coastal rivers and estuaries, with few indrafts of offshore waters.

The subsurface and bottom circulation tends to flow in a westerly-southwesterly direction that varies with the passage of weather systems and offshore warm core rings. A line of divergence exists generally between the 60-m and 70-m isobaths, where the currents have an inshore component shoreward of the line and an offshore component seaward.

Hydrographic conditions vary seasonally from vernal freshening and warming, through summer stratification, to fall-winter breakdown and cooling. Temperatures and salinities are 3-20°C and 33-35 ppt, depending on season and location.

The Middle Atlantic Shelf is part of the Virginian biographic province and has a different faunal composition than the Gulf of Maine or Georges Bank. Fish populations are predominantly migratory, and species composition varies with season. When water temperatures rise in spring and summer, there is a large influx of warm-water species (e.g., drums, bluefish, and jacks) from the south, and several cold-water species (e.g., Atlantic cod, Atlantic herring, alewife, Atlantic mackerel, spiny dogfish, and American shad) migrate north. In the fall, warm-water species (e.g., summer flounder, butterfish, longfin squid, hakes, black sea bass) move offshore and migrate south. Cold-water species move south into the Mid-Atlantic area again in winter. Other seasonal inhabitants include loggerhead and other sea turtles, dolphins, baleen whales (e.g., fin, humpback, and minke), and sperm whales. The area supports a major shellfish fishery for surf clams and ocean quahogs. It is threatened by OCS exploratory drilling; by non-point source pollution from atmospheric fallout, general circulation patterns, and marine transportation activities; and by ocean disposal of sewage and industrial wastes.

A-7.0 Offshelf

The Offshelf WMU encompasses the zone defined by the mean observable limits of the shelf-slope front seaward to the mean axis of the Gulf Stream. The geographic limits for the area can be generally defined by a line from the continental shelf east along 35°N latitude (Cape Hatteras) and south along 65°30'W longitude (Cape Sable). The area is overlain by the Slope Water Regime, a mass of relatively warm saline water (35-36 ppt) having a generally weak circulation to the southwest. The borders of this regime, the shelf-slope front and the Gulf Stream edge, are both dynamic areas, fluctuating over a wide band with time, season, and atmospheric and hydrographic events.

At its inner boundary, the shelf-slope front characteristically joins the shelf at the 100-m isobath and intersects the surface 50-70 km seaward. It is an upwelling area of high productivity that is rich in commercially valuable fish and shellfish (e.g., bluefin tuna, other tunas, swordfish, marlin, Atlantic mackerel, tilefish, lobster, and red crab). Sperm whales, other cetaceans, sea turtles, and large numbers of seabirds also frequent this area.

Offshore, the Gulf Stream undulates as it moves to the northeast, forming a dynamic boundary from which warm core rings are borne. These rings, spawned at a rate of about 8 per year, are about 80-160 km in diameter; they break off east of the area and transit to the southwest, eventually coming in contact with the shelf at southwestern Georges Bank. Satellite imagery shows evidence of forcing of warmer, more saline waters onto the shelf preceding a ring, while cooler shelf waters are entrained offshore following its passage. The passage of each ring marks a major event in the hydrographic regime and may significantly affect the biota of the shelf-slope front and possibly of the shelf itself.

Other than ring passages, impacts on the offshelf waters are primarily from non-point source pollution from atmospheric fallout and marine transportation, and from point source pollution from ocean dumping at Deepwater Dumpsite (DWD) 106.

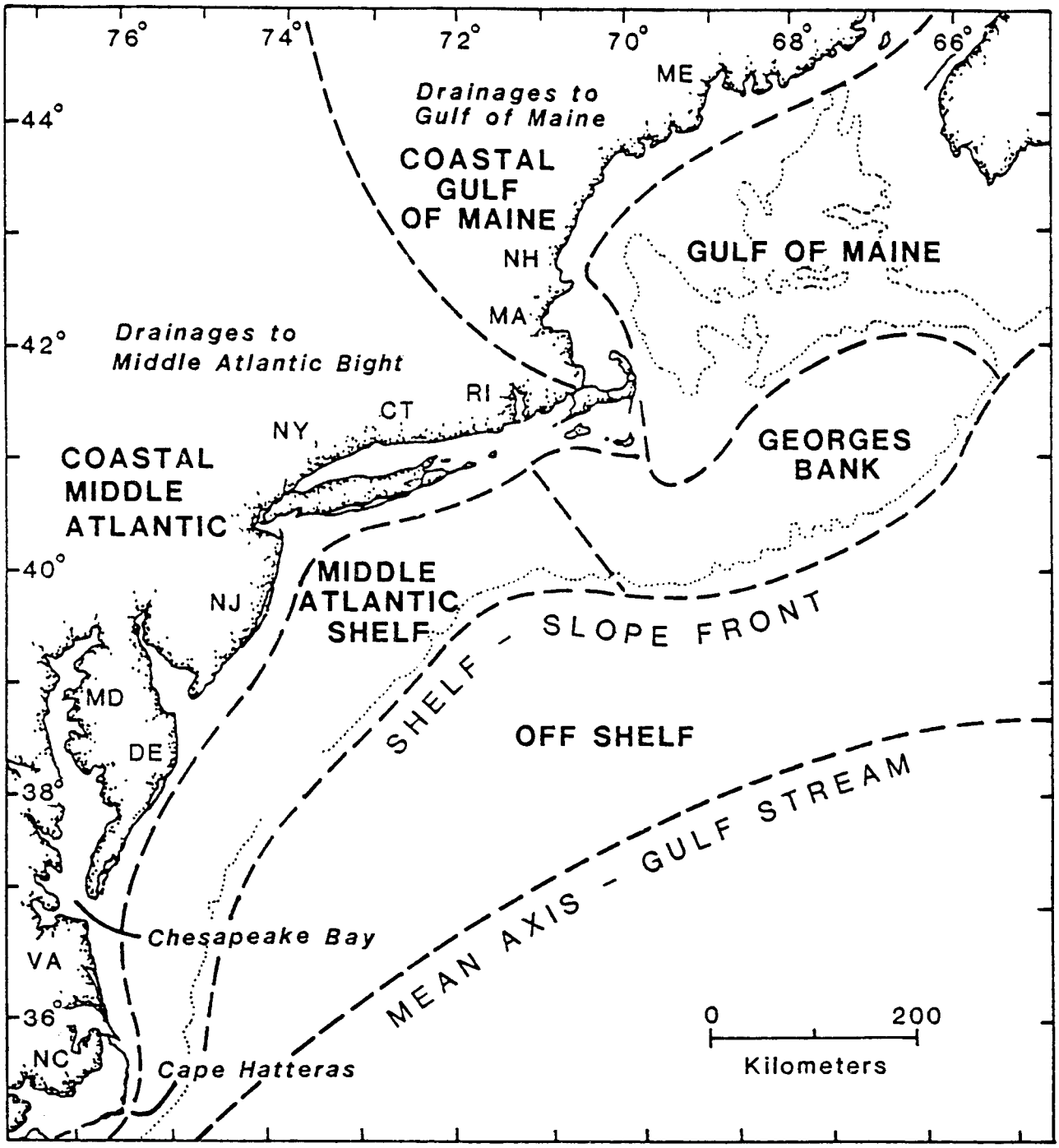

Figure A-1. Northeast Regional Action Plan
Water Management Units

APPENDIX B

MULTIPLE-USE ISSUES, THREATS TO RESOURCES, AND NMFS ACTIVITIES

Introduction

Estuarine and coastal lands and waters are used for many purposes that often result in conflicts for space and resources. Some uses may result in the absolute loss or long-term degradation of the general aquatic environment or specific aquatic habitats, and pose theoretically significant, but as yet unquantified, threats to the biota and their associated habitats. Issues arising from these activities, and the perceived threats associated with them, are of serious concern to the public. The National Marine Fisheries Service (NMFS) and other agencies are required to expend substantial effort to collect and analyze data, perform assessments, and develop recommendations for balancing the need to conserve productive fish habitat with other societal needs.

Multiple-use issues are constantly changing, as are the real or perceived impacts of certain activities on living marine resources. For example, concern over Outer Continental Shelf (OCS) oil and gas drilling may become greater in the future (see Section B-3.1) if significant petroleum discoveries are made during the current exploration phase. However, if exploratory drilling does not indicate that commercial quantities of oil or gas are present in the Mid- or North Atlantic, then OCS activities will cease to be a significant immediate or near-term future threat to resources and habitats in the Northeast. Therefore, the discussion of multiple-use issues and threats, as well as their priority ranking, should be considered merely as a guide to contemporary coastal and oceanic activities that do, or that probably will, require considerable attention by the NMFS's Northeast Region (NER) and Northeast Fisheries Center (NEC). These issues will be reconsidered periodically by the Northeast Habitat Conservation Board to determine priorities for future program emphasis and direction.

The coastal and oceanic activities that generate these issues can threaten living marine resources and their habitats. Threats to resources (organisms and habitats) occur when human activities cause changes in physical habitat, water and sediment chemistry, and structure and function of biological communities.

Coastal and Offshore Issues and NMFS Activities

The Coastal Middle Atlantic and Coastal Gulf of Maine Water Management Units (WMUs) share similar activities that threaten habitats and the well-being of living marine resources in

estuarine and nearshore areas. Likewise, the Gulf of Maine, Georges Bank, Middle Atlantic Shelf, and Offshelf WMUs share similar activities that threaten the welfare of biota and habitats in offshore areas.

Coastal: Most human activities that affect resources of concern to the NMFS occur in the coastal zone. Therefore, the primary focus of the NER's Habitat Protection Branch (HPB) program is on those human activities that are perceived to have the greatest potential long-term impact on living marine resources and their habitats in the coastal zone. Primary emphasis is placed on activities that would eliminate or disrupt habitats of living marine resources or cause contaminant build-up in sediments and biota.

Under the Fish and Wildlife Coordination Act (FWCA), the National Environmental Policy Act (NEPA), the Marine Mammal Protection Act (MMPA), and the Endangered Species Act (ESA), federal agencies and others must consult with the NMFS on any project they propose to construct, operate, or authorize that may affect fishery resources, marine mammals, or endangered species for which the NMFS bears responsibility. The HPB acts to ensure that these resources and habitats are given adequate consideration and protection in the planning and accomplishment of human developmental activities. The HPB worked closely with the States during development of their Coastal Zone Management programs, and continues to interact with State agencies and other groups on fishery and habitat matters. In addition, the NER provides grants-in-aid to States to fund studies under the Commercial Fisheries Research and Development Act and the Anadromous Fish Conservation Act.

Although the NEC generally has not directed its major program efforts toward the coastal zone, it has supplemented its open-shelf, region-wide studies with coastal activities that provide mutual benefits for the NMFS and the States. These efforts complement those of international educational agencies and other elements of the National Oceanic and Atmospheric Administration (NOAA) working on environmental issues.

The NEC interacts with others to address threats to living marine resources in Northeast estuaries and river drainages. Significant program effort is expended to assess the recreational fisheries of the Northeast and to establish a baseline of existing coastal habitats. Cooperative efforts with the coastal States enable the NEC to expand its ongoing resource assessment program, including compilation of commercial fisheries statistics, into State waters. The Ocean Pulse and Coastal Monitoring, Assessment and Prediction programs, as well as specialized studies of the aquaculture and pathobiology programs, also play significant roles in the coastal zone.

Offshore: The NEC has maintained its primary responsibility in the areas of assessment, monitoring, and overall understanding

of the living marine resources inhabiting the continental shelf. On-going programs provide a comprehensive perspective on the current status of fish stocks and environmental health of the region. The comprehensive, expanding data base also provides the substantiated information necessary for developing policy positions on the various threats affecting offshore habitats and living marine resources.

The NER's major focus offshore is on fishery management issues associated with the NMFS's responsibilities under the Magnuson Fishery Conservation and Management Act. The Magnuson Act and the NMFS's guidelines and standards for preparing fishery management plans (FMPs) indicate that habitats should be considered during the preparation of FMPs. The HPB works closely with the NER's Plan Administration Branch and the Regional Fisheries Management Councils to implement this mandate and the NMFS's recently adopted Habitat Conservation Policy, especially with regard to the habitat sections of FMPs (see Appendix F, Implementation Strategy 3). The NER and the NEC also have been heavily involved with major issues related to ocean disposal and OCS oil and gas development (e.g., see Sections B-1.1 and B-3.1).

Policy development is a major responsibility of the NER and the NEC that involves preparation of issue papers and regional policy statements. Recent interactions have provided such guidance for ocean dumping. Further joint NER/NEC efforts using RAP procedures will lead to development of generic policy statements on high-priority regional issues. In these efforts, the coastal zone will continue to receive much of management's attention, since resolution of problems stemming from the coastal zone will benefit living marine resources of the shelf.

The following discussion identifies and describes each multiple-use issue, the potential threat(s) associated with that issue, and its preliminary priority designation. It also summarizes the NMFS's present activities relative to addressing these threats as they affect coastal (nearshore) and oceanic (offshore) WMUs. For the purposes of this discussion, the reader should keep in mind that:

(1) An "issue" is a point of debate or controversy evolving from any human activity, or group of activities, that results in an effect, product, or consequence. Environmental and socio-economic issues remaining to be resolved satisfactorily with regard to their impacts on marine organisms, their habitats, and man developed from the multiple, often conflicting uses of coastal lands and waters.

(2) A "threat" is a perception of potential damage or harm related to any human activity or group of activities. The adverse effects to marine organisms, their habitats, and man resulting from any given threat are demonstrable, but usually not completely quantifiable. More than one threat can be, and often is, associated with each multiple-use issue.

B-1.0 Issue: Waste Disposal and Ocean Dumping

The Atlantic Ocean off the northeastern United States has been and continues to be used for the disposal of wastes, including sewage sludge, dredged material, chemical wastes, cellar dirt, and radioactive material. Some waste treatment methods, such as chlorination, pose additional problems to aquatic species.

Ocean disposal, in contrast to land-based disposal, offers an attractive economic alternative, particularly if the waste materials can be dumped in nearshore waters rather than in deepwater disposal sites 100 miles or more offshore. In addition, there is growing concern by the public that land-based disposal poses an unacceptable threat to human health through contamination of the soil and drinking water supplies.

Habitats and associated organisms have been degraded by long-term ocean disposal, particularly of sewage wastes. Sewage pollution causes closure of shellfish beds and, occasionally, of public swimming areas. Additional research on the impacts of ocean disposal at deepwater dumpsites is urgently needed.

In a 1977 amendment to the Marine Protection, Research, and Sanctuaries Act (MPRSA), Congress specified that by December 31, 1981, there could be no further ocean dumping of sewage sludge that might "unreasonably" degrade or endanger human health or the marine environment. However, ocean dumping policies are being reassessed in light of what constitutes "unreasonable degradation," and ocean dumping of sewage sludge continues while alternatives are being evaluated.

B-1.1 Threat: Ocean Disposal (High Priority for Nearshore and Offshore WMUs)

Nearshore: Ocean disposal of sewage sludge, industrial waste products, dredged material, and radioactive wastes degrades water quality and associated habitats. Concentrations of toxic heavy metals (e.g., cadmium and lead), chlorinated hydrocarbons (e.g., PCBs and DDT), and petroleum products all contribute significantly to degradation of waters off the northeastern states. Organic loading of estuarine and coastal waters is an emerging problem. Symptoms of elevated levels include algal blooms, shifts in abundance of algal species, and increases in oxygen-demanding substances in sediments of heavily affected sites that have contributed to anoxic events in coastal waters. Changes in biological components are a consequence of long-term ocean disposal. Human pathogens and parasites can be found in biota and sediments in the vicinity of ocean dumpsites, thereby resulting in the prohibition of shellfish harvesting in some areas.

The NER and the NEC work jointly on ocean disposal matters to assess impacts and provide management options that mitigate

habitat disruptions associated with ocean disposal activities. To exert its influence, the NMFS may participate on interagency technical committees (e.g., the Ocean Disposal Steering Committee and the New England Interagency Committee for Disposal of Dredged Materials) with the Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (COE), and others that assess dredged material disposal activities. Coordinated efforts with NOAA's Office of Marine Pollution Assessment and the EPA are underway concerning ocean sewage disposal. By providing information and making recommendations on permits and projects, conducting ESA Section 7 consultations, and participating in NEPA scoping and Environmental Impact Statement (EIS) reviews, the NER and the NEC provide information and expertise that support the NMFS's position on disposal issues. NEC and NER personnel present scientific information and express the positions of the NMFS at symposia, and participate in public hearings on disposal matters.

The NEC's environmental monitoring generates spatial and temporal data on the fates of contaminants associated with ocean disposal, whereas NEC's biological monitoring provides estimates on the effects of contaminants on biota. These and other data provide the scientific basis for developing regional position papers that lead to the development of policy statements by the NMFS's Washington Office.

The NEC deals with research and monitoring of ocean disposal on both site-specific and shelf-wide bases. Specificially, the ocean disposal activities in the New York Bight Apex are being studied by occupying a series of stations located within and adjacent to the Christiansen Basin. In addition, personnel from the NEC, NOAA, EPA, and COE are involved in analyses of water and sediment samples and biological specimens. Repeated analyses indicate that the centers of the respective dumpsites represent foci from which materials are being dispersed during the actual dumping process.

Pathobiological studies continue to monitor the distribution of pathogens associated with ocean disposal and the effect of these pathogens on marine fauna. Cooperative work with the U.S. Public Health Service provides guidance toward evaluating the potential human impacts of ocean waste disposal.

Offshore: Use of the oceans for disposal of wastes poses continued, renewed, and increased threats to the biota and their habitats. The deeper waters of the offshore WMUs present a different set of problems, compared with shallower waters, with respect to oceanic currents, warm core rings, and other physical and chemical oceanographic processes. Furthermore, less is known and understood about deepwater ecosystems than their shallow water counterparts. Wastes now being dumped in nearshore waters may be transported to the shelf/slope region. It is imperative that studies be undertaken to reveal the fate and role of contaminants in deepwater ecosystems, and to refine information

on the shelf ecosystem through which these materials may be transported. Additional ocean dumping along the entire northeast continental shelf at numerous sites is a real possibility.

The NER and the NEC participate on interagency committees for the assessment and management of ocean disposal of dredged materials, sewage sludge, and industrial waste. Washington Office NMFS personnel have participated on, and will continue to interact with, these committees. From such interactions, criteria for ocean disposal of these materials will be developed. The NER and NEC have developed a regional policy statement on Ocean Dumping of Sewage Sludge.

The NEC is actively participating with the EPA in providing site characterizations of various potential waste disposal sites such as Deepwater Dumpsite (DWD) 106 and the Philadelphia and 65-mile sites. Results from these characterizations will be available for NER to use during the permitting process.

The HPB reviews, evaluates, provides resource information, and makes recommendations on ocean disposal permits and projects. In addition, the HPB attends NEPA scoping meetings, reviews EISs, and conducts ESA Section 7 consultations.

The NEC has dealt with ocean dumping by monitoring sediment characteristics, including contaminant levels, and by analyzing contaminant burdens in tissues of organisms taken at stations over the continental shelf from the Gulf of Maine to Cape Hatteras.

Because of the difficulty of sampling benthic habitats at DWD 106, information from this site is relatively limited compared with other dumpsites and Ocean Pulse stations located on the shelf and in coastal waters. Nevertheless, preliminary benchmark data have been compiled for DWD 106 based upon previous NEC efforts and reports from other NOAA elements and federal agencies.

Ocean dumping off the harbor at Portland, Maine (Casco Bay), is being monitored through contracts with the Bigelow Laboratory, Boothbay Harbor, ME, and the University of New Hampshire. Sediments and biota are being analyzed for contaminants, and extensive benchmarks are being developed for benthic populations. NEC personnel also are conducting studies on the distribution and abundance of planktonic organisms.

The NEC is cooperating with other NOAA elements and Federal agencies to develop remote sensing techniques for measuring possible transport of wastes from disposal sites to mid-shelf and coastal waters.

B-2.0 Issue: Coastal Urbanization

Tremendous developmental pressures exist throughout the coastal area of the Northeast Region. About 2,000 permit applications are now processed annually by the COE for commercial, industrial, and private marine construction proposals. (Note: This is about one-half the number of permit applications the COE received annually a few years ago, which reflects the COE's increasingly greater reliance on General Permits, Nationwide Permits, and Letters of Permission.) The proposals range from generally innocuous open-pile structures to objectionable fills that encroach on aquatic habitats, thereby eliminating their productive contribution to the marine ecosystem. The projects range from small-scale recreational endeavors to large-scale commercial ventures for revitalizing urban waterfronts.

The large array of construction activities includes, but is not limited to, bulkheads and revetments for erosion control, ramps and piers for water access, wharfs and piers for dockage, and dredging for navigational improvements.

Associated with marine construction are several impacts that affect living marine resources directly and indirectly through habitat loss or modification (see Section B-2.1). Many of these projects are of sufficient scope to singly cause significant, long-term, or permanent impacts on aquatic biota and habitat; however, most are small-scale projects causing minor losses or temporary disruptions to organisms and environment. The significance of small-scale projects lies in the cumulative and synergistic effects resulting from the large number of these activities.

Urban construction is not limited to the shoreline. Upland development also can adversely affect aquatic areas. One of the major problems arising from urban development is the increase in non-point source contamination of estuarine and coastal waters (see Section B-2.2). Construction of impervious surfaces, such as highways, parking lots, and removal of terrestrial vegetation and fringe marshes facilitate runoff loaded with soil particles, fertilizers, biocides, heavy metals, grease and oil products, PCBs, and other materials deleterious to aquatic biota and their habitats. Atmospheric emissions resulting from certain industrial processes contain sulphurous and nitrogenous compounds that contribute to acid precipitation, a growing source of concern in the Northeast, where the increasing acidity of some poorly buffered lakes and streams has adversely affected or eliminated sensitive resident and anadromous species of fish. Non-point source pollution is incorporated in water, sediments, and living marine resources. Although non-point sources of pollution do not usually cause acute problems, they can contribute to subtle changes and increases of contaminants in the environment.

As residential, commercial, and industrial growth continues, the demand increases for potable, process, and cooling water; wastewater treatment and disposal; and electric power. As groundwater resources become depleted or contaminated, greater demands are placed on surface water through dam and reservoir construction, or some other method of freshwater diversion. The consumptive use of significant volumes of surface freshwater causes reduced river flows that can affect downstream salinity regimes as saline waters intrude further upstream. (See Sections B-2.3 and B-2.4.)

Water that is not lost through consumptive uses is returned to the river or streams as point-source wastewater discharges. Although the wastewater generally is treated to some degree, it usually still contains contaminants. Domestic wastewater contains residual chlorine compounds, nutrients, suspended organic compounds, trace metals, and bacteria. Industrial discharges may contain many dissolved and suspended pollutants, including metals, toxic substances, halogenated hydrocarbons, petroleum products, nutrients, organics, and heat. (See Sections B-2.5 and B-2.6.)

B-2.1 Threat: Construction Activities (High Priority for Nearshore WMUs; Low Priority for Offshore WMUs)

Construction in and adjacent to waterways often involves dredging and/or filling activities, which result in elevated suspended solids emanating from the project area. The distance the turbidity plume moves from the point of origin is dependent upon tides, currents, nature of the substrate, scope of work, and preventive measures employed by the contractor. Excessive turbidities can abrade sensitive epithelial tissues, clog gills, decrease egg buoyancy, and reduce light penetration, thereby affecting photosynthesis of phytoplanktonic and submerged vegetation and causing localized oxygen depression. Suspended sediments subsequently settle, which can destroy or degrade productive shellfish beds and spawning sites.

The effects of turbidity and siltation are generally, but not always, temporary and short-term. Other construction activities can result in permanent loss or long-term disruption of habitat. Highway construction often involves stream straightening or relocation. Dredging can degrade productive shallow water and destroy marsh habitat or resuspend pollutants, such as heavy metals, pesticides, herbicides, and other toxins. Concomitant with dredging is spoil disposal, which traditionally occurred on marshes or in open water where the effects were temporary (both short- and long-term) or permanent in terms of its degradation or destruction. Shoreline stabilization can cause gross impacts when intertidal and sub-tidal habitats are filled, or when benthic habitats are scoured by reflective wave energy. It can also cause subtle effects that result in gradual elimination of the ecotone between the shore and the water.

The NER performs a variety of activities to reduce, eliminate, or compensate for habitat perturbations during coastal construction. The HPB reviews projects requiring Federal authorization for their potential impacts on living marine resources and habitat. The HPB exercises its consultative authority through the FWCA, ESA, and NEPA. Projects are reviewed and evaluated, resource information is provided, and recommendations are made in response to individual public notices, EISs, and ESA Section 7 consultation requests, or at pre-application, scoping, standing technical committee, (e.g., dredged spoil management committees, urban waterfront action groups), and cooperative interagency project evaluation ("joint processing") meetings. The NER and the NEC work closely together on major, controversial projects such as the Pittston and Portsmouth refineries and the "Westway" highway.

A primary concern of the HPB is the consistency and effectiveness of its recommendations. To evaluate these criteria relative to broad categories of construction projects, two studies were contracted: "Seasonal Restrictions on Dredging Projects by NMFS in the Northeast" (1980) and the "Study to Determine the Impact of Landward Bulkheads or Alternative Structures on Marshes" (1981). The purpose of the former study was to determine the consistency and effectiveness of the NMFS's recommendations and past involvement with the COE's dredge and fill (Section 10/404) permit review program. The latter study was designed to determine the effectiveness of the NMFS's recommendations to protect fish habitats by constructing bulkheads, revetments, etc., landward of marshes.

Due to the volume of projects that the HPB reviews annually, a practical and efficient method had to be devised to facilitate the storage and retrieval of information. Consequently, the regional data base has been computerized and all field offices are on-line and inputting project information. This system was developed to enable HPB to (1) monitor trends; (2) improve management information about WMU sub-units; (3) report and analyze project data more accurately and quickly than in the past; and (4) provide the database necessary to evaluate (a) the extent to which the NMFS's recommendations were incorporated as conditions of the applicable Federal license or permit, or of the project planning or construction, and (b) the results and effectiveness of the compliance of the Federal agency having jurisdiction over the proposed project.

B-2.2 Threat: Non-Point Source Pollution (High Priority for Nearshore WMUs; Low Priority for Offshore WMUs)

Another aspect of urban development is non-point source pollution, which is caused by land-based activities that result in materials being transported to aquatic areas (see Sections B-5.0 and B-6.0). Certain pollutants from non-point sources are demonstrable problems in Atlantic coastal and estuarine waters. These include the following:

(1) Concentrations of pathogens and indicator organisms exceed standards for shellfish harvesting and, occasionally, for swimming.

(2) Nutrient loading, especially phosphorus, creates problems in headwater areas of estuarine sub-tributaries, producing excessive enrichment (eutrophication) and unacceptably low levels of dissolved oxygen in the summer.

(3) Sediments eroded by construction or farming activities in urban, suburban, and rural areas cause sedimentation in harbors and navigation channels that requires dredging and creates spoil disposal problems.

(4) Heavy metals and toxic materials concentrate in the sediments and tissues of organisms. The critical concentrations of these contaminants and their effects on marine plants and animals are not well understood.

(5) Acid precipitation is of significant concern to the U.S. and Canada due to its effect on freshwater spawning areas of Atlantic salmon and other anadromous species.

Non-point source pollution appears to be a chronic threat that will affect the Northwest Atlantic Ocean in the upcoming decades. The NEC is dealing with the non-point source pollution problem through its ongoing monitoring activities. The NEC is measuring levels of excess nutrients in estuarine, coastal, and shelf habitats. The measurements of nutrients (a principal component of non-point source pollution) and related variables, such as primary production and concentration of chlorophyll, are indicative of eutrophication due to unusually high levels of nutrients entering specific estuaries and coastal waters via terrigenous export from rivers and land masses.

The NEC's efforts emphasize the long-term monitoring aspects of pollution research. Contracts and cooperative efforts with academic institutions and certain states result in relatively short-term research, monitoring, and developmental findings that serve to augment long-term efforts.

Ecological studies involving phytoplankton and benthic organisms also allow the NMFS to assess the effects of contaminant loadings on these principal components of the marine food web that culminate in important fish stocks. NEC scientists have noted that where nutrient loading occurs, demonstrable changes have occurred in the quality of phytoplankton populations; for example, within the last decade, significant changes have occurred in the principal species found in highly polluted coastal zones. Evidence collected to date indicates that similar changes may be occurring in mid-shelf waters in the Mid-Atlantic.

Benthic studies also indicate that in areas that are highly perturbed because of pollution inputs, either from point or non-point sources, major changes have occurred in benthic populations. NEC scientists have observed that in the last 1-2 decades, organisms such as benthic amphipods, which are extremely important as forage for fish, have disappeared completely from certain polluted embayments, estuaries, and dumpsites.

The NEC is participating in a series of cruises that will allow the regular sampling and measurement of contaminant levels in discrete fish stocks to provide information on aquatic animal health. Once the relative levels of specific contaminants are known for individual species and habitats, the NEC can conduct laboratory research to determine how these levels of contaminants affect biochemical, behavioral, physiological, and genetic responses of test organisms.

Remote sensing methodology has been applied to documenting coastal habitat changes, analyzing estuarine and ocean disposal plume dynamics, and performing snyoptic monitoring of ocean temperature, seston, and chlorophyll a fields. The NEC/NER's Coastal Habitat Assessment, Research, and Mensuration (CHARM) program is addressing the problem of coastal habitat change by establishing a coastal habitat base year and comparing this with present (LANDSAT) and historical Soil Conservation Service (SCS) areal coverage. Plume dynamics, being studied under the "Superflux" experiments, are integrated into ongoing Northeast Monitoring Program (NEMP) studies on variation in major estuarine plumes and associated contaminant loading in the coastal zone. Additionally, NEMP studies are providing synoptic analyses of the behavior of ocean disposal plumes for modelling of dispersive timescales. Remote sensing is increasing the understanding of environmental factors related to ecosystem production and dynamics.

The NEC regularly monitors inorganic and organic contaminants in sediments and biota taken from coastal and shelf waters. The resulting data are indicative of fates (but not sources) of contaminants, and they relate to measurements of effects on selected sentinel organisms.

The NEC contributes substantially to NOAA's new "Status and Trends" (S&T) Program. A goal of this program is to assess and document the status and long-term changes of environmental quality of the Nation's coastal and estuarine environments. Work on two components of the S&T program began in the summer of 1984: The National Mussel Watch Program, conducted under contract to NOAA, will measure toxic chemicals in mussels or other suitable bivalve molluscs collected from about 150 coastal sites. At least one-half of these sites will coincide with those occupied by the former National Mussel Watch Program supported by the EPA from 1976 to 1978. The Benthic Surveillance Program, conducted by the NMFS, will measure toxic chemicals in surface sediment and in tissues of bottomfish taken from the same area as

the sediment. About 3 sites will be sampled in each of 11 estuaries along the Northeast coast.

The NER and the NEC will continue to cooperate to protect habitats and ensure that living marine resource values are considered in urban development planning by providing information pertinent to recreational and commercial fisheries interests and life history aspects of various important coastal and anadromous marine fauna.

B-2.3 Threat: Power Generation (Low Priority for Nearshore WMUs)

Electric power generation facilities (fossil fuel and nuclear) share similar requirements: access to a large volume of water for cooling and a means of returning or cooling the heated water. In certain circumstances, heated water effluent returned to the receiving waters may cause stress and death to the local populations. Reverse thermal shock is caused when fish and other organisms that are thermally adjusted to artificially elevated temperatures during winter are exposed suddenly to cooler water after a temporary shutdown of an electrical generating facility. The use of biocides to reduce fouling organisms is of concern and, although subtle, contributes to toxic loading in estuaries. Entrainment and impingement of plankton, early life stages of fishes and invertebrates, and adults may contribute to significant mortalities in certain locales. Endangered species, such as sea turtles, have occasionally been injured or killed at generating facilities. Proposed tidal power projects in Maine and Canada may have significant, far-reaching impacts on the marine and coastal environment.

The HPB, individually or through joint processing, reviews, evaluates, provides resource information, and makes recommendations on permits and licenses for power generation activities. Additionally, the HPB attends NEPA scoping meetings, reviews EISs, conducts ESA Section 7 consultations, and provides recommendations.

Current NEC environmental monitoring programs are providing significant data regarding habitat conditions and resources at risk in coastal and shelf areas likely to be affected by the siting of large fossil fuel and nuclear electric generating facilities. Considerable data are being garnered concerning temperature and other variables that are important to understanding how the discharge of heated waters affects living marine resources.

A program is being conducted jointly by the NEC's Milford Laboratory and Yale University on the effects of chlorine used in discharged cooling waters to prevent fouling.

The results of resource and environmental assessments should be available prior to site selection. Coordinated NER/NEC

assessments of the resources at risk in specific WMUs will be of considerable value in projecting possible effects of power plant siting and in developing region-wide policy guidance for this potential threat.

The impacts associated with hydroelectric power generation are addressed in Section B-5.0.

B-2.4 Threat: Freshwater Diversion (Low Priority for Nearshore WMUs)

Diversion of freshwater to other streams, reservoirs, industrial plants, power plants, and municipalities can change the salinity gradient downstream and displace spawning and nursery grounds. Patterns of estuarine circulation necessary for larval and plankton transport could be modified. Such changes can expand the range of estuarine diseases and predators associated with higher salinities that affect commercial shellfish.

The HPB, individually or through joint processing, reviews, evaluates, provides resource information, and makes recommendations on permits and licenses for water diversion projects. Additionally, the HPB attends NEPA scoping meetings, reviews EISs, conducts ESA Section 7 consultations, and provides recommendations.

NEC programs designed to monitor habitat quality are resulting in the development of a considerable data base concerned with temperatures and salinities of coastal and shelf waters. Such data will be very important as we begin to examine the possible effects of freshwater diversion and tidal power projects on east coast estuaries and shelf waters.

Remote sensing techniques being developed with the involvement of NEC personnel will make it possible to track the broad-scale and far-field thermal and salinity regimes and suspended sediment distributions that result from diversions or discharges of fresh water.

Coordinated NER/NEC assessment of existing resources and habitats at risk prior to site selection should facilitate consideration of alternative sites that are less biologically sensitive and measures that would mitigate impacts on those habitats.

With particular reference to anadromous and endangered species, freshwater diversion may seriously affect the availability of necessary habitat for various life history stages or create obstructions that increase mortality. Coordinated efforts by the NER, NEC, and others will address these problems as they arise.

B-2.5 Threat: Domestic Wastewater Discharge (Medium Priority for Nearshore WMUs)

Sewage treatment effluent produces near-field changes in biological components as a result of chlorination and increased contaminant loading. Exclusion areas for shellfish harvesting are generally maintained as a safeguard for human health. Sewage treatment plants constructed where the soils are highly saturated often allow suburban expansion in areas that would have otherwise remained undeveloped, thereby exacerbating already severe pollution problems in some areas.

The NEC conducts research and monitoring in coastal habitats that receive sewage discharged from point source outfalls along the New Jersey and Long Island coastlines. Monitoring to date indicates that point source discharges of domestic sewage often result in increased seabed oxygen consumption and reduced dissolved oxygen levels. Increases in heavy metals and other contaminants also have been measured at and around point source discharges. Laboratory and field research concerned with the effects of chlorination on survival of bivalve mollusc larvae is being conducted by the NEC under a contract with Yale University.

The HPB reviews, evaluates, provides resource information, and makes recommendations on National Pollutant Discharge Elimination System (NPDES) permits and on sewage treatment waivers. Major projects undergo NEPA scoping meetings and EIS reviews. Any activities that would jeopardize threatened or endangered species are also considered under Section 7 of the ESA.

The NER and NEC foresee playing a major role in Northeast regional waste management planning. Present coordinated activities with EPA and NOAA, as well as our previous involvement in NMFS's regional ocean disposal policy development, are predecessors to this planning.

B-2.6 Threat: Industrial Wastewater Discharge (Medium Priority for Nearshore WMUs)

Industrial wastewater effluent is regulated by EPA through NPDES permits. The NPDES provides for issuance of waste discharge permits as a means of identifying, defining, and, where necessary, controlling virtually all point source discharges. The problem remains, however, that it is difficult or impossible to estimate the singular, combined, and synergistic effects of industrial (and domestic) wastewater discharges on aquatic ecosystems.

The NEC has conducted research and monitoring in estuaries such as Raritan Bay and Long Island Sound. The discharge of industrial waste from point source outfalls into estuarine water can be shown to increase specific contaminants near outfalls. Although the movements of contaminated waters within estuaries

often obscure the effect of specific outfalls, it is assumed that the total materials being discharged result in greatly increased levels of contaminants in sediments in the west portion of Raritan Bay and the eastern third of Long Island Sound.

Specific harbor areas in Long Island Sound have also been shown to have greatly increased levels of heavy metals and certain organic contaminants. It is assumed that these increased levels are due to industrial discharges into harbor areas such as New Haven and Bridgeport.

The HPB reviews, evaluates, provides resource information, makes recommendations on NPDES permits, and considers impacts on endangered species under Section 7 of the ESA.

The NER and the NEC will continue to work with the EPA, the U.S. Fish and Wildlife Service (FWS), other NOAA elements, and the coastal states to develop plans that will minimize discharges that affect habitats of living marine resources.

B-3.0 Issue: Energy Production and Transport

Energy production facilities are widespread along Atlantic coastal areas. Electric power is generated by various methods, including land-based nuclear power plants, hydroelectric plants, fossil fuel stations, and possibly future offshore floating nuclear power plants (see Section B-2.3) and tidal power projects. These facilities compete for space along the coastal zone; they require water for cooling and, in the case of coal-fired plants, generate voluminous amounts of fly ash, as well as electricity. In addition, hydroelectric plants, with their need for dams, substantially modify river courses and affect anadromous fish runs and/or restoration programs (see Section B-5.1).

The impacts on the marine and estuarine environment resulting from the various types of power plants include water consumption, heated water and reverse thermal shock, entrainment and impingement of organisms, discharge of heavy metals and biocides in blowdown water, destruction and elimination of habitat, and disposal of dredged materials and fly ash.

Coal- and oil-fired power plants and shore-based refineries are served by various sized vessels. Additional navigation channels may be required, which could result in habitat disruption initially and periodically, and the need to find appropriate sites for placement of dredged materials. Shipping accidents may result in major spills of oil and other hazardous materials that could cause serious environmental and economic impacts.

OCS exploratory and production drilling may affect biota and their habitats through the deposition of drilling muds and cuttings. Oil spills resulting from well blowouts, pipeline

breaks, and tanker accidents are of major concern. Seismic testing operations can interfere with fishing operations and damage or destroy fishing gear. In addition, exclusion areas around drilling rigs can result in conflicts between fishermen, both recreational and commercial, and the oil companies.

Oil produced on the OCS would either be pumped into tankers or transported to shoreside facilities by submarine pipelines. Pipeline emplacement affects benthic organisms and wetland areas. Pipelines and other structures may also be hazardous to commercial fishing operations unless proper mitigating measures are taken.

B-3.1 Threat: Offshore Oil and Gas Operations (Medium Priority for Offshore WMUs)

Oil and gas exploration in the Minerals Management Service's (MMS) Mid- and North Atlantic lease areas may result in loss or degradation of benthic habitat from the deposition of discharged drilling muds and cuttings. Moreover, accidental oil spills resulting from drilling or related transportation may affect sensitive egg and larval stages, adult fish or shellfish in reproductive condition, or marine mammals and endangered species. These effects might occur either directly or indirectly through the food chain of each species. Exploratory drilling is believed to have caused only minimal habitat degradation or biological impact thus far. However, exclusion areas around drilling rigs prevent commercial fishing and, therefore, may pose socio-economic problems if commercial discoveries were made and if production drilling were to take place in the future. Should production of oil and gas occur in the Mid- or North Atlantic, the transport of the products to onshore storage and processing facilities would pose other threats to coastal zone and estuarine ecosystems.

The NER and the NEC participate on and interact with various Federal agencies (e.g., MMS, FWS, and EPA) and State agencies on Biological Task Forces and other regional advisory groups for OCS activities. The HPB provides coordinated responses to the MMS on Exploration Plans, Environmental Assessments, Calls for Information, Notices of Sale, lease schedule proposals, EISs, and NPDES permits. In addition, the HPB conducts consultations and prepares Biological Opinions pursuant to the requirements of Section 7 of the ESA. The NEC often provides much of the information upon which such responses are based.

The NEC is monitoring the continental shelf and slope (including submarine canyons) in areas that might be subjected to petroleum exploration and development. The NEC regularly collects information on levels of petroleum hydrocarbons and trace metals in the tissues of fish and shellfish living in the area from Cape Hatteras to Georges Bank. In addition, sediment samples are collected and analyzed for levels of petroleum hydrocarbons, trace metals, and other contaminants.

In addition to active field work designed to provide assessments of species at risk, the NEC is developing descriptions and assessments for the WMUs that are affected by oil exploration and that may be affected by oil production and transportation. These assessments will reference the results of many of the numerous studies that have been conducted in the field and laboratory relative to the effects of petroleum and petroleum-related compounds that produce measureable changes in biological and ecological systems. The literature review includes references to studies that are on-going or that are not yet published. Observations made in offshore habitats, such as those in the North Sea, provide information that will be useful in "modelling" possible effects of oil on living marine organisms.

B-4.0 Issue: Port Development and Utilization

Major ports along the Atlantic coast include those at Norfolk VA, Baltimore MD, Wilmington DE, Philadelphia PA, New York NY, Providence RI, Boston MA, Portsmouth NH, and Portland ME. These ports handle primarily grains, coal, ores, and manufactured commodities. Some of these ports and many other smaller ports along the Atlantic seaboard (e.g., Gloucester and New Bedford MA, Rockland ME, Newport and Point Judith RI, Hampton-Norfolk VA, and Ocean City MD) also support major commercial and recreational fisheries.

All ports require shore-side infrastructure, mooring facilities, and sufficiently deep channels. Ports compete fiercely for limited national and international markets and continually strive to upgrade their facilities. Dredging and dredged material disposal, filling of aquatic habitats to create fastland for port improvement or expansion, and degradation of water quality are the most serious perturbations arising from port development.

B-4.1 Threat: Port Development (High Priority for Nearshore WMUs)

Construction activities associated with port development result in a loss of habitat diversity along the water's edge. Bulkheading, filling, and construction of attendant port features result in general water quality degradation that reduces the biotic diversity of important productive areas.

The HPB reviews, evaluates, provides resource information, and makes recommendations on COE and EPA permits, individually or through joint processing, so as to provide maximum effectiveness in mitigating habitat alteration. NEPA scoping and EIS review are conducted for major projects. Comments from the NEC are frequently integrated to make a coordinated regional response.

The NER and the NEC work closely with other agencies and groups to increase the likelihood that such activities will be

(1) compatible with, or contribute to, the regional and national fishery development, conservation, and management goals of the NMFS and (2) consistent with the local, state, and regional CZM or harbor plans. For example, HPB personnel participate on port planning and regional committees (e.g., the Delaware Estuary Urban Waterfront Action Group and the Regional Planning Council for the Baltimore Harbor Enhancement Plan) and meet with developers' associations (e.g., "Save Our Port" and American Association of Port Authorities) so as to facilitate pre-application review of development activities and resources at risk.

B-5.0 Issue: Anadromous Watershed Development and Management

The estuaries and their tributaries of the coastal Atlantic provide habitat essential to anadromous species for spawning and maturation. In many tributaries, these habitats have been modified physically and chemically to the extent that severe declines of anadromous species have occurred.

The new impetus for construction of dams for hydroelectric projects and to impound water for recreation, flood protection, water supply, and other purposes has seriously altered the spawning areas of several anadromous species. The situation is often complicated when freshwater fishery management agencies encourage the construction of dams to create artificial lakes for freshwater recreational species.

Non-point source pollution resulting from siltation, highway runoff, nutrient enrichment, and toxic chemicals has also degraded the water quality of areas important to anadromous species (see Section B-2.2).

B-5.1 Threat: Dams (Medium Priority for Nearshore WMUs)

Dams constructed for electric power generation, flood protection, water supply, and recreational purposes impose physical blockages to migratory anadromous fish (e.g., Atlantic salmon, striped bass, and American shad) and endangered species (i.e., shortnose sturgeon) enroute to natal spawning and nursery areas. In addition to blocking migratory fish runs, dams may change water chemistry (e.g., salinity) by restricting freshwater flows to estuaries, thereby perhaps extending the upstream range of oyster predators and diseases, particularly during times of prolonged drought.

The HPB screens Federal Energy Regulatory Commission (FERC) projects, comments on impacts on anadromous fish, provides information, makes recommendations for fish conservation (especially fish passage facilities), and maintains a data base for FERC projects in all watersheds in the Northeast. The NER supports state restoration efforts for anadromous fish runs by serving on interagency river basin policy and technical committees and through grants-in-aid to states under provisions

of the Anadromous Fish Conservation Act (P.L. 89-304) and the Commercial Fisheries Research and Development Act of 1964 (P.L. 88-309). The HPB also conducts ESA Section 7 consultations, prepares Biological Opinions, and recommends studies and mitigation measures for projects in rivers where shortnose sturgeon occur.

Although the NEC does not conduct research related to the effects of dams on anadromous fish, it does provide assistance to the HPB by reviewing the research findings of others and by commenting on the significance of damming activities on striped bass, Atlantic salmon, anadromous clupeids, and shortnose sturgeon. The NEC also provides information on life history aspects of various anadromous species.

The NEC monitors salinity in coastal waters and, in exceptional cases (e.g., periods of flooding and high runoff), measures salinity and other variables in major riverine plumes. This information provides the bases against which a shift of the "saltwater wedge" could be assessed following damming activities.

Finally, the NEC's expertise in molluscan pathology provides NMFS with the capability of predicting and assessing the impacts of an extension in the upstream range of various molluscan diseases and predators that could result from damming activities.

B-6.0 Issue: Agricultural Development

Agricultural development can affect fish habitats directly through physical alteration and indirectly through chemical contamination. Fertilizers, herbicides, insecticides, and other chemicals are washed into the aquatic environment with the uncontrolled non-point source runoff draining agricultural lands. These chemicals can affect the growth of aquatic plants, which in turn affects fish, invertebrates, and the general ecological balance of the water body. Additionally, agricultural runoff transports animal wastes and sediments that can affect spawning areas, shellfish productivity and harvestability, and generally degrade water quality and benthic substrate. (Also see Section B-2.2.)

B-6.1 Threat: Agricultural Practices (High Priority for Nearshore WMUs)

Farming in river basin drainage areas can alter water chemistry adjacent to and downstream from agricultural areas. Biostimulants, such as fertilizers and animal wastes, entering streams as non-point source pollutants may promote algal blooms that may, in turn, result in high biochemical oxygen demand and an increased abundance of undesirable species. Animal wastes also degrade water quality and pose a potential health hazard that can result in closure of shellfish beds to harvest. Biocides used for weed control may inhibit the growth of important submerged aquatic vegetation.

Runoff from farm fields into adjacent streams and major tributaries transports sediments into anadromous fish streams, where spawning areas are affected. Sediments transported to estuaries decrease the transparency and increase the turbidity of the water, thereby limiting the penetration of light and decreasing photosynthesis. Heavy metals and other compounds from terrigenous sources are sorbed to these sediment particles and become distributed throughout the water column and in bottom sediments. Eroded sediments can blanket the bottom and destroy oyster bar communities and other epifaunal populations. One of the most serious consequences of erosional runoff is that the frequent dredging of navigational channels results in dredged material that requires disposal, often in areas important to living marine resources for which the NMFS bears responsibility.

Specific consequences of agricultural practices are difficult to deal with and to separate from the general problem of non-point source input to estuarine, coastal, and continental shelf habitats. Therefore, specific emphasis must be given to studying certain factors to deal effectively with and describe the consequences of agricultural runoff.

The CHARM Program is coming to grips with the problem by initially establishing a coastal habitat baseline. In the future, interaction with the SCS and various state agencies will lead to a better understanding of this problem and its effects on living marine resources.

The NEC measures turbidity and suspended sediments during specific monitoring cruises, especially those relating to riverine plumes or to specific dumpsites.

The HPB reviews and makes recommendations on COE permits for irrigation impoundments, drainage ditches, or other agricultural activities in and adjacent to aquatic areas.

Studies conducted during the EPA's Chesapeake Bay Program identified non-point source runoff from the surrounding croplands as the largest single source of nutrients entering the Bay. Therefore, the NER, in cooperation with the SCS and the State of Maryland, is considering funding a demonstration project on a farm in the Chesapeake Bay area. The purpose of this project would be to demonstrate to scientists and the area's farmers the efficacy of using all the best available management practices to reduce the amount of soil erosion and its attendant pollution that reaches the Chesapeake Bay system. Development of this project would support several of Maryland's Chesapeake Bay initiatives, the Congressional striped bass initiative, the NOAA's Estuarine Policy, and the NMFS's Habitat Conservation Policy.

B-7.0 Issue: Marine Mineral Extraction

Marine mineral extraction in the Northeast now involves primarily sand and gravel operations and oyster shell dredging. Sand and gravel are in great demand, and upland sources are being exhausted. Consequently, sand and gravel deposits in rivers, estuaries, and the ocean are looked upon as important new sources for industry. Sand and gravel have been mined in nearshore coastal areas and tributaries for many years. Oyster shells also have long been dredged from estuaries where there are large deposits of fossil and new shells.

Deep ocean mining for manganese nodules and other ore-grade deposits is not likely to be conducted in the Atlantic in the near future. Such mining activities could potentially affect benthic organisms and their habitats, as well as pelagic eggs and larvae.

B-7.1 Threat: Sand and Gravel Mining (Low Priority for Nearshore WMUs)

Mining for sand, gravel, and shell stock in nearshore coastal and estuarine waters can result in the loss of infaunal benthic organisms, modifications of substrate, changes in circulation patterns, and decreased dissolved oxygen concentrations at deeply excavated sites where flushing is minimal. Sand and gravel mining tends to result in suspended materials at the mining sites, and turbidity plumes may move several kilometers from individual sites. Mining also results in ranges in sediment type or sediment quality, often over areas measurable in square kilometers. Deep borrow pits created by mining may become seasonally or permanently anaerobic.

The HPB provides resource information and makes recommendations, either with other agencies through joint processing or individually on permits and licenses for mining activities. The HPB also attends NEPA scoping meetings, reviews EISs, and conducts ESA Section 7 consultations. The NER is presently coordinating with the COE and other agencies on a technical committee that is investigating the use of gravel borrow pits for containment of dredged materials, among other alternatives.

The NEC's monitoring activities provide information on the general condition of sediments in coastal and shelf areas. Routine monitoring concerned with water transparency or turbidity provides useful data, especially for areas where such measurements are made on frequent or seasonal bases. Benthic assessments made within WMUs will be important for providing baseline information on seasonal variation in the benthos and demersal fish. Such background information is important in assessing long-term, far-field effects of sand and gravel mining.

B-8.0 Issue: Coastal and Wetland Use and Modification

Intense population pressures have adversely affected many estuarine and marine habitats along the Atlantic coast. Demand for land suitable for home sites, resorts, marinas, and industrial expansion has resulted in the loss or alteration of large areas of wetlands through dredging, filling, diking, ditching, upland construction, and shoreline modification.

As residential and commercial use of coastal lands increases, so does the recreational use of coastal waters. Marinas, public access landings, private piers, and boat ramps all vie for space. Boating requires navigational space, a place to berth for some boat owners, and boat yards for repair and storage.

As population densities increase in these areas, greater pressures are exerted to develop remaining lands, and the demand for nuisance insect control on adjacent undeveloped wetlands either through chemical or physical (i.e., ditching) methods, also intensifies.

In addition to residential and recreational development, other competing uses further contribute to the destruction or modification of wetland areas. Agricultural development can significantly affect wetlands. Common flood control measures in low-lying coastal areas include dikes, ditches, and stream channelization. Wetland drainage is practiced to increase tillable land acreage. Wildlife management techniques that also destroy or modify wetland habitat include the construction of dredged ponds, low-level impoundments, and muskrat ditches and dikes.

Each coastal State, as well as the COE, has provisions for regulating projects in wetlands. Although these regulations are restrictive and have ameliorated wetland modification and destruction, construction that is considered to be in the public interest or that is judged to be water-dependent continues to occur, as does illegal, unauthorized construction.

Many of the threats associated with this issue (e.g., coastal construction activities, non-point source pollution, power generation, freshwater diversion, and domestic and industrial waste discharges) are discussed in Sections B-2.0 through B-2.6. Therefore, only insect control activities are considered here.

B-8.1 Threat: Insect Control Activities (Low Priority for Nearshore WMUs)

Attempts to reduce infestations of spruce bud worms, gypsy moths, and salt marsh mosquitoes by the use of insecticides can be harmful to certain fish and invertebrate species. Habitat alteration of mosquito breeding grounds is accomplished

frequently by ditching of marshes to allow the flow of tidal water and passage of insectivorous fish. Diking and filling of marshes are other methods often suggested to control mosquitoes and provide waterfowl habitat. Marsh ditching can be an effective control practice; however, this technique requires careful coordination with knowledgable estuarine biologists to prevent the alteration of sheet flow across the marsh. Proper placement of spoil from ditching is critical to avoid interrupting sheet flow and to prevent undesirable plant species from invading the edges of the ditches.

The HPB reviews, provides resource information, and makes recommendations, either individually or through joint processing, on permits and licenses for insect control activities. HPB personnel are also members of several State/Federal Mosquito Control Advisory Committees.

The NEC's monitoring programs help to provide baselines against which the effects of insect control activities can be evaluated.

Coordinated responses by the NER and the NEC that are based on resource assessments and fates and effects studies provide the bases for mitigation of the impacts of such activities.

APPENDIX C

PROCEDURES AND OPTIONS FOR INFLUENCING DECISIONS

C-1.0 The NMFS has many options and procedures for influencing decisions that affect fish and fish habitats. The Fish and Wildlife Act established a strong Federal role in fisheries. The Fish and Wildlife Coordination Act (FWCA) mandated an active role for the NMFS in influencing the policies and decisions (and therefore the people) that affect the areas where fish live, as well as other areas necessary to the health and survival of fish and other living marine resources. Other laws such as the Magnuson Fishery Conservation and Management Act (MFCMA); the Coastal Zone Management Act (CZMA); the National Environmental Policy Act (NEPA); the Marine Protection, Research, and Sanctuaries Act; and the Anadromous Fish Conservation Act provide the tools the NMFS can use to effect strategies that influence decisions. The NMFS's Habitat Conservation Policy articulates 12 implementation strategies (see Appendix F). The options presented below are some of the methods now used by NMFS personnel. Additional options can and will be developed.

C-2.0 Scientific review of a potential or actual threat to resources provides a method for checking perceptions against the scientific evidence that is applicable to any situation. Such review can be (1) a starting point to garner and review the evidence on which an assessment can be based; (2) a touchstone for periodic checking to assure that the NMFS is maintaining scientific objectivity and developing and using the best information available; and (3) an evaluation technique to determine whether we are asking the right questions, doing the right things, and getting the most public benefits for the time and money invested. Scientific review can take the form of either in-house NMFS review, or review and evaluation by scientists outside the agency (by cooperative agreement or contract).

C-3.0 Synthesis documents are summaries and source documents compiled by an expert on a topic that is central to effective action. The writer reviews the literature and current research on a topic, summarizes the most pertinent and useful points, analyzes how the NMFS can use the information, and gives a practical guide to the literature and experts in the area that others can use to find more detailed information on the subject.

Syntheses have already been prepared from other sources on some aspects of Northeast species, problems, and geographic and topical areas. These will be collected and provide the bases for syntheses initiated under the RAP. When the Board determines that a synthesis is needed, it can be expedited in-house or prepared under contract.

Available syntheses vary in usefulness depending on their scope, specificity, and the degree to which they are tailored to the problem at hand. Some are general summaries, which are useful in giving managers an overview of a problem and a broad summary of the information and options available to deal with a generic problem at a policy level. Some are collections of site-specific data, which are especially useful to those involved in environmental assessments of proposed projects. Most of the RAP syntheses will attempt to bridge the gap between the general and site-specific levels; they will be written so they can be used in conjunction with one another.

C-4.0 Progress reports on research can be used to assure that NMFS is supporting its assessments and recommendations with the most recent scientific information. These progress reports from NMFS research projects, grants to the States, contracts, and other sources, will be supplied routinely to the appropriate RAP working groups. Progress reports produced by the Board and working groups on actions and opportunities to address high priority threats can be used to inform and engage others who may be able to contribute to solving problems; they may also be used as a good evaluation tool.

C-5.0 Issue papers can be used to analyze a high-priority question, to state a position on the question, or both. A well-constructed issue paper includes a problem statement, current status report, analysis of alternatives for dealing with the problem, and recommendations. Issue papers are useful in explaining the NMFS's interest and role, defining what NMFS can and should do, and enlisting the support to do it. Draft issue papers also provide useful discussion for gaining internal consensus or obtaining outside input.

C-6.0 Baseline establishment for any given WMU or sub-unit provides the data to substantiate positions on the various threats. A good baseline documents (1) biological, chemical, and physical characteristics; (2) temporal or spatial change; and (3) the importance of the habitat and resources of the area. When an adequate baseline is available that can be related to an understanding of the relative contribution of that area to the productivity and health of the entire system, a clear and legally-defensible case can be made, if necessary, for the importance of conserving the area or mitigating damage to it.

C-7.0 Baseline monitoring of a WMU or sub-unit documents the changes that take place in the biological, chemical, and physical characteristics of the system over time. The data provide a measure of chronic, long-term changes in the system, and offer evidence on which to judge the urgency of actions needed to alleviate a threat. Monitoring yields spatial and temporal data on fates of contaminants, as well as estimates of their effects on biota. Such data can provide scientific justification for issue papers and policy development.

C-8.0 Field assessments are conducted when site-specific data are required to augment long-term, regional baseline and monitoring data. The RAP process aims to anticipate data needs, and to be able to provide resource and environmental assessments on WMUs prior to decisions to develop important areas. It will sometimes be necessary, however, to augment the available information with field assessments. This situation could arise in connection with an accidental event such as a spill of toxic substances, or in response to a proposal to site a potentially damaging development.

C-9.0 Specialized laboratory and field studies measure the biochemical, genetic, ecological, physiological, and behavioral changes that result from exposure to contaminants and other perturbations. Laboratory research done in conjunction with monitoring efforts provides a connection between field measurements of levels and distributions of contaminants and field measurements of the effects of gross contaminants or pathological organisms.

Field studies on fates and effects, along with laboratory studies, provide information that NMFS can use to model the effects of contaminants and assess their significance to resources of commercial and recreational importance.

C-10.0 Program design and development will be done under direction of the Board to address anticipated problems that require long lead times, and for which there is no readily available mix of options that can be applied immediately to solve the problem. To illustrate the quandary, the planning team initially described non-point source pollution as a "low-risk" threat in offshore areas, but had many misgivings about the possibility that in the long term, the risk may be high. For coastal WMUs, on the other hand, non-point source pollution is associated with two threats identified as "high-risk": agricultural practices and urban and port development. This uncertainty of threat level, coupled with the fact that no one currently knows how to deal with non-point sources of pollution, makes non-point source pollution an ideal subject around which to design a long-term program.

C-11.0 Methodology development is essential to solve many problems. Improved methods are being developed for measuring chemical, biological, and physical characteristics, as are improved sampling techniques and other methods seemingly far-removed from addressing the highest priority issues. However, such methods may be an important step in solving a problem.

C-12.0 Data management allows maximum use of data and information generated by all kinds of research and management activities. Data should be stored so as to be retrievable in ways that can be readily applied to solving problems. The NMFS's positions on various issues can be upgraded substantially by improving our ability to display fisheries and environmental data

on maps, charts, and tables so that the meaning is clear and sharp, and so that users can readily extract data on specific geographic areas or ecosystem components. It would also be valuable to have the ability to retrieve data on habitat loss and degradation so as to show trends. Reference to existing regional scientific literature, organized in a data management system, would also ensure that existing pertinent research is considered in evaluating and responding to an issue.

C-13.0 Coordinated inter/intra-agency research and monitoring programs allow the NMFS to pool resources and expertise to address mutual problems. Where the NMFS's concerns intersect with those of other agencies (e.g., with the EPA on effects of water quality changes, with the COE on effects of marine construction activities, or with the MMS on OCS oil and gas operations), efforts can be more effective if agencies pool, or at least coordinate, their efforts. Because so many of the identified threats to living marine resources are regulated by other Federal agencies, and to some degree by the States, this option offers many economies and opportunities, especially when coupled with coordinated inter/intra-agency recommendations. (See Section 15.)

C-14.0 Symposia and workshops can be used to gather and disseminate information, identify alternative courses of action, and engage others in cooperative action to solve marine resource problems. Workshops and symposia may be large or small, depending on the objectives (generally large for information exchange, small for action planning). Information exchange will be aimed at reporting and hearing the results of recent studies, bringing these results to the attention of the larger scientific and management community, and illustrating the applicability of the results to decision-making and policy-making. Action planning workshops focus on a specific problem and bring together the people, data, and institutional mechanisms best able to deal with the problem (e.g., bioassay and bioaccumulation testing, non-point source pollution, anadromous fish declines, synergistic effects, etc.). It is particularly useful to hold two-phase symposia: information exchange on the first day, action planning on the second.

C-15.0 Recommendations for mitigation, enhancement, and alternatives to avoid impacts relate to assistance the NMFS supplies to planners, developers, and regulatory agencies. In an advisory and consultative capacity, NMFS personnel participate in planning for many large-scale programs (e.g., CZM and OCS) and small-scale projects (e.g., port dredging and filling). They also review thousands of individual permit and license applications that require, under the FWCA, recommendations on how to proceed so as to conserve fishery and habitat values. HPB ecologists take advantage of numerous opportunities to (1) encourage planners and project proponents to consider living marine resources and their habitats adequately and provide for their continued productivity, (2) recommend alternative project

designs or locations that would lessen damage to living marine resources and habitats, and (3) recommend enhancement or restoration of conditions for living marine resources (e.g., through marsh creation, artifical reef construction, or anadromous fish restoration).

Decisions are more likely to be influenced by coordinated inter/intra-agency recommendations than by recommendations put forward by a single Federal or State agency. Coordinated recommendations can be sought on both broad, policy-related issues and site-specific issues. Participants in efforts to formulate inter/intra-agency recommendations learn from the data and expertise of other agencies and gain a better understanding of their missions and concerns, thereby making negotiation or arbitration of divergent recommendations possible. Satisfactory resolution of problems is to some degree inhibited because each agency's mission is different. Nevertheless, consensus can usually be achieved on recommendations. Even if consensus is not reached, the scientific basis for positions is improved, and recommendations are better coordinated, articulated, and understood.

Joint processing (or evaluation) of COE Section 10/404 permit applications by Federal and State agencies is one type of inter-agency coordination of recommendations that is in effect throughout the Northeast Region. All proposed projects requiring such permits are reviewed through this mechanism. The COE, EPA, FWS, NMFS, and most States in the Northeast use this forum to expedite the evaluation of the thousands of applications for waterfront development projects received for review each year. Participants share responsibilities for inspecting the sites of proposed projects and for providing photographs and written field reports at joint processing meetings. They discuss the potential impacts and recommendations relative to each project. Each agency maintains its distinctive responsibilities, and each agency representative provides independent recommendations. Comments and recommendations are presented at the meetings; therefore, formal, written correspondence is usually not needed unless one or more participants recommend major project modifications. Consequently, evaluation and admin-istrative delays are avoided. Other methods related to joint processing are used to extend the NMFS's influence and reach other decision-makers. NMFS staff members promote pre-appli-cation meetings to (1) advise applicants of the potential impacts of their proposed projects on marine resources, (2) work out ways to mitigate impacts, and (3) advise applicants of alternative ways to do their projects that may save time and money. Review-ing these projects during the early planning stages generally avoids later conflict.

Coordinated recommendations are most useful for addressing generic issues, rather than questions related only to specific permits and projects. Although joint processing is generally thought of as an effective method of achieving consensus about

recommendations related to specific permits, it is important to realize that joint processing also provides an excellent forum for identifying and defining problems of a generic or chronic nature that would benefit from a longer-term analysis and lead eventually to joint recommendations. This option is valuable where (1) the formulation of recommendations will take longer than would be allowable for dealing with any one permit or project and (2) the recommendation for a solution to the problem would be applicable to a large number of small projects with potentially large cumulative impacts. Related activities can be integrated to take advantage of the expertise of all groups, avoid duplication of effort, and solve the problem through coordinated action and recommendations. The end result could be joint recommendations by several State and Federal agencies that would be more influential than the recommendations of any one agency.

C-16.0 Technical committees, advisory committees, and task forces are already functioning to develop better approaches to address many of the problems we have identified. NMFS personnel serve on committees for OCS oil and gas activities, power plants, dredged material disposal, mosquito control, anadromous fish rivers, ocean disposal sites, and port planning that facilitate pre-application review of development proposals. The NMFS's participation on committees presents opportunities for resolving conflicts and working cooperatively to solve problems, while at the same time conserving fisheries values and productivity.

C-17.0 Fishery Management Councils (FMCs) and the Atlantic States Marine Fisheries Commission (ASMFC) offer opportunities for the NMFS to effect habitat conservation measures in cooperation with others. Two procedures can be used: (1) when sufficient effort can be devoted to developing Fishery Management Plans (FMPs) that adequately describe habitats and habitat requirements of each species within the ecosystem (WMU) in question, then any proposed project or activity that may pose a threat to these species can be addressed by the NMFS, the FMCs (or the ASMFC), or both through the vehicle of the FMP; and (2) where it is deemed advisable for both the FMC and the NMFS to take action on a proposed development, the NMFS can work with the FMC to develop sound, supportable, and well-documented recommendations. The NMFS's synthesis documents and regional assessments can be used by fishery biologists, statisticians, economists, and others assigned by the FMCs to prepare FMPs. Work with other organizations, such as commercial or recreational fishing groups and conservation organizations, offers similar opportunities to involve others in joint efforts to address fisheries and habitat problems.

C-18.0 Assigning a NMFS specialist-on-location may at times help to extend NMFS's influence in habitat matters. The cost-effectiveness of assigning someone to work full-time on a specific question at a location other than the permanent duty station must be determined on a case-by-case basis. This measure

may be considered (1) when a person from the Washington Office or another Region or Center could contribute significant expertise to solving a specific regional problem or generic issue; (2) when an acute incident such as a hazardous material spill requires the presence of a NMFS coordinator; (3) when intensive effort for a period of time could result in needed legislation or improved regulations, guidelines, etc.; or (4) when a case of precedent-setting importance is referred to Washington. On rare occasions, it may be justifiable to assign (through the Intergovernmental Personnel Act or other means) NMFS personnel to a FMC, academic institution, or other organization working on a problem of demonstrable importance and utility to the NMFS.

C-19.0 Planning activities offer unique opportunities for the NMFS to influence far-reaching decisions that affect fish and their habitats. CZM programs governing land and water use, ASMFC plans for management and restoration of fish populations, FMC fishery management plans, special area management plans, port development plans, COE plans for navigational purposes and erosion control activities, and many other large- and small-scale development planning activities offer the NMFS exceptional opportunities to influence others and to have habitat conservation and mitigation measures included at the earliest stages. Ideally, problems will be solved and agreement reached before project plans are so far advanced that developers find it difficult to change their plans. Clear presentation of habitat requirements increases predictability for developers, and allows time for them to incorporate proper design measures into their plans. Participation in such planning efforts also improves NMFS's network of contacts and increases its visibility, thereby allowing NMFS spokespersons many opportunities to articulate the value of fish and fish habitats, and to enlist the aid of other people in the planning process.

The NMFS's Washington Office can take advantage of many opportunities to influence nationally recognized constituents that represent important blocks of opinion in the Northeast. These groups include the Marine Fisheries Advisory Committee (MAFAC), the National Advisory Committee on Oceans and Atmosphere (NACOA), the Sport Fishing Institute, the American Fisheries Society, the American Association of Port Authorities, the Coastal States Organizations, the National Association of Regional Councils, and the Washington headquarters of various national conservation and environmental organizations.

On a more regional or local level, the NMFS can take advantage of opportunities to provide information that will raise public consciousness of the values of fish habitats, the NMFS's role in perpetuating those values, and the complementary roles that can be filled by constituent groups and individuals. The NMFS can reach these constituents by writing articles; providing speakers; participating in conferences, symposia, and trade shows; and using other methods. For example, a brochure describing the NMFS's concerns regarding water and shoreline

construction projects could benefit potential waterfront developers and homeowners by answering many of their questions, improving their ability to predict whether or not their applications would eventually be approved, and avoiding unnecessary delays in the processing of their applications.

C-20.0 Expert testimony by NEC and NER personnel that is successful in inserting the NMFS's data and expertise into decision systems can be useful on several levels. Testimony in court may help to resolve an individual case. Testimony before adjudicatory and public hearings can offer scientific bases for use by all participants in understanding an issue and arriving at a beneficial solution. Testimony before Congress may articulate and clarify an issue in such a way as to have far-reaching fiscal or legislative effects.

C-21.0 Biological effects assessments are prerequisites to many of these options for influencing decisions. The RAP management structure is designed to increase the scientific bases of the NMFS's assessments, both through research and by using the results of research to address specific problems. Effects assessments are done in response to project proposals, or to predict potential effects of possible future development.

The ESA Section 7 consultation is a unique type of effects assessment, required of the NMFS, that gives the NMFS a special entree to, and strength in, influencing decisions that may affect a threatened or endangered species for which the NMFS is responsible in the Northeast (i.e., shortnose sturgeon, whales, and sea turtles). Another Federal agency that conducts, permits, or licenses an activity that may affect one of these species must assess the potential effects and consult with the NMFS to determine whether the proposed action might adversely affect the species. The NMFS may augment the assessment, but must rule on whether the proposed action of the other agency will be likely to adversely affect or jeopardize the continued existence of any of these species or their critical habitats. The NMFS may also make recommendations for further assessment or mitigation measures. This ESA Section 7 consultation process is applicable to many types of projects in Northeast riverine, estuarine, and marine areas. Projects include power plants, dams, water diversions, pollutant discharges, dredging and filling, ocean dumping, OCS oil and gas development, and others, if they take place in areas where protected species occur.

C-22.0 Memoranda of Understanding or Agreement (MOAs) may be used to document and publicize agreements made with other agencies regarding methods of approaching problems, solving specific problems, or adapting procedures, criteria, and guidelines to solving problems. MOAs may be useful and applicable to some of the high-priority questions addressed by the Board or its working groups. Moreover, MOAs created to solve specific habitat problems may contribute to solving broader fisheries conservation and management problems. They may be entered into between NMFS

or NOAA components, or between the NMFS and external entities to do cooperative work.

C-23.0 Legislative recommendations that the NMFS makes can influence legislation and the legal authority for regional habitat conservation activities. The Washington Office can supply information to Congressional staff to keep them well informed about the importance of fish habitats to the conservation and management of valuable recreational and commercial fisheries. Temporary assignments of NMFS personnel to Capitol Hill and briefings on Congressional activities may be used in these efforts.

C-24.0 Program monitoring, on a national or regional level, can track regional program activities and events, as well as provide program support and guidance. For example, a "follow-up" program can be used to determine the effectiveness of the NMFS's habitat conservation efforts. This program can involve (1) a continuing assessment of the use of the NMFS's recommendations by Federal construction, licensing, and permit-issuing agencies, and (2) follow-up studies on the impacts and effectiveness of these recommendations. Such a program can result in development of guidelines and criteria for protecting fish habitats affected by various types of water-use development projects. It can also result in the need to develop a computerized data logging system for screening and reviewing applications for permits and projects, and for storing and retrieving information on particular projects or classes of projects, such as the system now being used in the Northeast.

C-25.0 Policy development and establishment may be an outgrowth of many of the options discussed above. Coordinated action, issue papers, and other activities may identify issues where a policy statement is needed or desirable to achieve a more far-reaching solution to a high-priority problem. Policy development may be initiated by the Washington Office, which may identify a subject that requires a policy to be developed and published. Alternatively, policy development may be initiated by the NER and NEC if, for example, a solution cannot be achieved without national attention, or if it proves desirable to have a regional or national statement published to call attention to a problem, or to initiate a solution.

APPENDIX D

ORIGINAL RAP PLANNING TEAM AND A BRIEF HISTORY OF THE NORTHEAST RAP (1981-84)

The RAP concept was conceived in early 1980 by Dean Parsons (Office of Habitat Protection), and was proposed for adoption by all NMFS Regions and Centers in FY 1981. Other Washington Office people who contributed significantly to the genesis of RAP were John Hall and Jim Chambers. The following discussion identifies the key people involved in the planning, developmental, and operational phases of the Northeast RAP.

Planning Phase

The original (1981-82) Northeast RAP "planning team" consisted of Bob Hanks (New England Liaison Officer, NER), Bob Kifer (Deputy Regional Director), Bob Lippson (Mid Atlantic Liaison Officer, NER), Ruth Rehfus (Chief, Habitat Protection Branch, NER), Jon Rittgers (Executive Director, NER), Bruce Higgins (OCS Coordinator, HPB, NER), Carl Sindermann (Laboratory Director, Sandy Hook Laboratory), Jack Pearce (Chief, Environmental Assessment Division, NEC), George Ridgway (Planning Officer, NEC), Bob Pawlowski (Assistant Planning Officer, NEC), and Chuck Walters and Dean Parsons (Washington Office).

Developmental Phase

The first draft of the present RAP document was developed in August 1982 by Bob Lippson, with assistance from Ed Christoffers, Ron Gatton, and Tim Goodger (HPB, Oxford MD). Major contributors to subsequent drafts included Ruth Rehfus, Bruce Higgins, Bob Pawlowski, and Jack Pearce. Ruth Rehfus and Bruce Higgins completed the RAP document that was submitted to Washington in October 1982, thereby officially launching the RAP process in the Northeast.

The first formal RAP organizational meeting was held on December 1, 1982 at the NMFS's Narragansett RI laboratory. In addition to the planning team, participants included Ken Sherman, Tom Azarovitz, Carl Berman, and Mert Ingham (all of NEC). Jim Chambers, Frank Steimle (NEC), Jim Thomas (NEC), and Stan Gorski (NER) helped the planning team develop the early RAP priorities discussed in Appendix G.

Implementation Phase

The RAP Board held its first meeting on January 11, 1983 at the NMFS's Sandy Hook, NJ laboratory. The first Board members were Bob Hanks, Bob Lippson, Ruth Rehfus, Jon Rittgers (all of NER), Jack Pearce, George Ridgway, and Carl Sindermann (all of

NEC). Bob Pawlowski and Bruce Higgins, the designated interim RAP Coordinators for the NEC and the NER, Dean Parsons, and Ed Christoffers also attended.

With the addition of John Hall, the RAP Board's membership remained relatively stable throughout 1983. However, by December 1983, Mike Sissenwine had replaced George Ridgway on the Board, and Bob Hanks had retired. By early 1984, Bill Phoel had replaced the departing Bob Pawlowski as interim RAP Coordinator for the NEC, and Jim Chambers had replaced John Hall and Dean Parsons as the primary Washington Office participant.

Tracey McKenzie, Susan Mello Roe, Stan Gorski, Mike Ludwig, Bruce Higgins (all of NER), Stu Wilk, Tony Pacheco, Mike Sissenwine, and Bill Phoel (all of NEC) expended major effort in 1984 on developing strategies to address the major issues discussed in Appendices B and I. Others involved thus far in strategy development include Jay O'Reilly, Bob Reid, Tony Calabrese (all of NEC), Chris Mantzaris, Doug Beach, Ron Gatton (all of NER), and Jim Chambers (Washington Office). In addition, the working group on the Mid Atlantic WMU (chaired by Stu Wilk) and the OCS working group (chaired by Marv Grosslein, NEC) expended considerable effort in preparing useful products for various users.

After Ruth Rehfus transferred from the HPB in April 1984, Bruce Higgins continued to serve as interim RAP Coordinator and, as Acting Chief of HPB, began alternating chairmanship of Board meetings with Jack Pearce. Then, in May 1984, Center Director Allen Peterson and Acting Regional Director Dick Schaefer decided to elevate the role and organizational position of the RAP Coordinators. To do so, they appointed Carl Sindermann (Assistant Center Director for Environmental Management) and Ed MacLeod (Acting Deputy Regional Director) to be the official RAP Coordinators for the NEC and the NER.

By fall 1984, Jack Pearce had transferred to Washington, Tom Bigford had become the new HPB Chief and member of the Board, and Marv Grosslein had joined the RAP Board. Ken Beal began attending Board meetings regularly, in place of Jon Rittgers. Continued evolution of the Board's membership is expected as habitat considerations become integrated across NMFS's programs in the Northeast.

APPENDIX E

DUTIES AND RESPONSIBILITIES OF THE NORTHEAST REGIONAL ACTION PLAN (RAP) COORDINATORS

General Description

The RAP Coordinators appointed by the Northeast Region (NER) and the Northeast Fisheries Center (NEC) must be individuals familiar with regional habitat-related problems and research. They are jointly responsible for overall coordination and informal communication among the RAP elements; for ensuring that tasks are completed adequately within agreed upon time frames; and for bringing to the Northeast Habitat Conservation Board's attention any serious unresolved problems, accompanied by recommendations for their resolution.

Duties and responsibilities of the position can be generally subdivided into those that are operational functions and those that are staff functions that assist the Board.

Operational Functions

RAP Coordinators for the NER and the NEC are jointly responsible for:

(1) Establishing an effective mechanism for transferring information to RAP participants and others, and for coordinating responses to significant Northeast environmental issues and problems;

(2) Identifying environmental tasks for possible referral to the RAP coordination mechanism;

(3) Maintaining day-to-day coordination and informal communication among the NER and NEC staff participating in the RAP process;

(4) Overseeing the satisfactory and timely completion of tasks referred to the RAP coordination mechanism; and

(5) Taking appropriate independent or joint actions to resolve problems that in their judgment do not necessarily have to come before the Board or be handled through the RAP planning and coordination mechanism.

Staff Functions

RAP Coordinators for the NER and the NEC are jointly responsible for:

(1) Analyzing and recommending to the Board solutions to

problems encountered during implementation of the RAP process;

(2) Defining high priority environmental issues;

(3) Developing long-term and short-term strategies to address these priority issues;

(4) Reviewing and revising the strategic plan for habitat conservation activities in the Northeast, reviewing programmatic activities, evaluating and re-establishing priorities, and recommending programmatic adjustments;

(5) Preparing and distributing on a timely basis agendas and minutes of RAP Board meetings;

(6) Acting as focal points for receipt of reports from working groups and distributing such reports to Board members;

(7) Acting as archivists by monitoring and collating information requests, meeting and trip reports, and pertinent interactions that relate to environmental issues;

(8) Facilitating transfer and exchange of information from NEC and NER programs to other personnel in the NEC, NER, NMFS's Washington Office, NOAA, and various outside agencies;

(9) Briefing the Center Director and the Regional Director on the status of RAP activities, upcoming meetings, and personnel commitments so that personnel and travel resources can be managed effectively; and

(10) Communicating directly with and assigning tasks to appropriate Division managers (and/or their designated RAP representatives) to ensure that all matters relevant to the RAP process are given top level attention.

Responsibility

Insofar as RAP-associated duties and responsibilities are concerned, the RAP Coordinators are responsible to the RAP Board. Tasks identified by the Board will routinely be assigned by the RAP Coordinators to operating elements in the NER or the NEC, wherever these tasks can be completed most efficiently by staff with the appropriate expertise.

11-25-83
Vol. 48 No. 228

federal register

Friday
November 25, 1983

Habitat Conservation; Policy for National Marine Fisheries Service (NMFS)

AGENCY: National Oceanic and Atmospheric Administration (NOAA), Commerce.

National Oceanic and Atmospheric Administration

[Docket No. 31028-211]

Habitat Conservation; Policy for National Marine Fisheries Service (NMFS)

AGENCY: National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of effective NMFS habitat conservation policy.

SUMMARY: NOAA issues a policy for the National Marine Fisheries Service (NMFS) which provides a focus for NMFS' habitat conservation activities, while at the same time integrating habitat conservation considerations throughout the major programs and activities of the Agency. The policy also encourages greater participation by the Regional Fishery Management Councils, the States and others in habitat conservation matters. This action is necessary in order to allow NMFS to focus its habitat conservation activities on those species for which NMFS is primarily responsible or which are the subject of a NMFS program. The effect of this policy will be to make NMFS' habitat conservation activities more responsive to the goals and objectives of the Agency as set forth in the NMFS Strategic Plan, and to allow priorities to be set and defended.

EFFECTIVE DATE: November 21, 1983.

FOR FURTHER INFORMATION CONTACT: Herbert L. Blatt, Chief, Policy Group, NMFS, 202-653-7551, or Kenneth R. Roberts, Chief, Habitat Conservation Division, NMFS 202-634-7490.

SUPPLEMENTARY INFORMATION:

Background

The NMFS has primary Federal responsiblity for the conservation, management, and development of living marine resources and for the protection of certain marine mammals and endangered species under numerous Federal laws. The Agency also has responsibilities to the U.S. commercial and marine recreational fishing industry, including fishermen, and to the States and the general public. These responsibilities are inherent in NMFS' mission which is "To achieve a continued optimum utilization of living marine resoures for the benefit of the Nation." NMFS is vitally concerned about the habitats that support living marine resources since the well-being of these resources and the fishing industry depends upon healthy and productive habitats.

The U.S. commercial and marine recreational fishing industry makes an important contribution to the Nation's economy. The commercial fishing segment of the industry produces food and industrial goods that contribute $7 billion annually to the gross national product. Including fishing vessels and shoreside businesses, the commercial fishing segment employs nearly 300,000 persons. Marine recreational fishing provides opportunities for recreation as well as a substantial quantity of food for 15 to 20 million anglers in the United States. Catch by marine recreational fishermen accounts for an estimated 30 to 35 percent of the total U.S. finfish harvest used for food. Expenditures by these fishermen, the value of associated industries (such as tackle, boat, and trailer manufacturers, and the party and charter boat industries), and the value of the recreational fishing experience itself are significant components of the U.S. economy. Direct expenditures by marine recreational fishermen are estimated to be at least $5 billion annually, not to mention the indirect economic impacts generated from these expenditures.

Marine mammals and endangered species are also important to the Nation in terms of their domestic and international significance—aesthetic, recreational, ecological and economic.

Coastal and estuarine areas and their associated wetlands are vitally important as spawning and nursery grounds for both commercial and marine recreational fishery resources. Approximately two-thirds of our important fishery resources depend upon these areas which also serve as habitat for many species of marine mammals and endangered species. However, population shifts to coastal areas and associated industrial and municipal expansion have accelerated competition for use of the same habitats. By 1990, 75 percent of the U.S. population will live within 50 miles of the coastlines. Increasing efforts to develop new or alternate sources of energy are further stressing important living marine resource habitats. As a result, these habitats have been substantially reduced and continue to suffer the adverse effects of dredging, filling, coastal construction, energy development, pollution, waste disposal, and other human-relatd activities. In the case of wetlands, from 1954 to 1978 there was a average annual loss of 104,000 acres which was a ten-fold annual increase in acreage lost between 1780 and 1954.

Recognizing the importance of habitat to the management and conservation of living marine resources, NMFS proposed a new habitat conservation policy for the Agency. The notice of proposed policy, published in the **Federal Register** on July 19, 1983 (no. 139), at 48 FR 32847, solicited public comments.

Response to Public Comments

During the comment period, twenty-five letters were received from other Federal agencies, State governments, Regional Fishery Management Councils, and organizations representing millions of citizens. The commenters, in general, supported the proposed policy, stating it is long overdue and commending the approach. However, certain of the commenters had specific concerns which are set forth below along with NMFS' response.

Policy

Comment: Implicit in the goal and mission statement of NMFS is the assumption that populations concerned would be usable. This should be clarified.

Response: NMFS agrees that the policy should make clear that the habitat conservation activities of the agency are to maintain or enhance the capability of the environment to, among other things, produce fish and shellfish that are safe and wholesome. The wording has been amended accordingly.

Comment: Several commenters caution against too narrowly defining scope of policy. It should signify the need to give priority attention to those species for which direct managment presently is Agency responsibility and it should *clearly* state that NMFS has stewardship responsibility for all living marine resources under Federal jurisdiction.

Response: NMFS does not believe the language needs modification. While NMFS has overall responsibilty for living marine resources, it is necessary to focus NMFS' habitat conservation activities on those resources over which it can influence management regimes throughout the range of the species. NMFS' activities with respect to one species could benefit other species that depend on a particular habitat.

Policy Framework

Comment: Suggest clarifying paragraph 1, Policy Framework, to indicate NMFS also has management responsibility for species for which no Fishery Management Plans are planned, such as squid or herring in the Gulf of Mexico. This could be accomplished by rewording clause "(1) covered or to be covered" to "(1) covered or subject to being covered."

Response: For clarity, NMFS agrees to suggested change.

Implementation

Comment: The coordination mechanism for policy's implementation is not described. It is also not clear how interested public and conservation groups will be able to interact and have input into this important decision.

Response: The coordination mechansim will be developed by each region, following national guidelines, during the implementation phase. It is expected that NMFS Regional and Center Directors will discuss their programs with their constituents in order to make determinations with respect to priorities.

Comment: In Implementation Strategy No. 4, second sentence, urge addition of "artificial impoundments" to list of activities which have potential for habitat degradation.

Response: NMFS agrees to this addition.

Comment: Under Implementation Strategy No. 7, suggest policy cover catadromous as well as anadromous species.

Response: Suggestion refers to NMFS' involvement in fresh water. While catadromous species are not excluded, NMFS intends to focus on anadromous species.

Comment: Implementation Strategy No. 3(a) implies that fishermen may be a threat to fishery habitats. Statement should be clarified to address possible conditions under which fishing poses a threat to habitat.

Response: Under certain conditions, fishermen can cause damage to habitats, e.g., bottom gear fishing, vessel discharges, etc. The Regional Fishery Management Councils may deal with such under the Magnuson Fishery Conservation and Management Act (Magnuson Act), but may not control actions by others. There was no intention to single out fishermen as a threat to habitat as they realize the importance of healthy habitats and are beneficiaries of such.

Comment: Implementation Strategy No. 3(a) states that Fishery Management plans should include "proposal of measures to preserve, protect and restore habitat." Should be clarified to indicate range of "measures" which could be implemented. Should also indicate that no measures may be required in many fisheries where habitat issues are not significant.

Response: The range of measures is intentionally left up to each Regional Fishery Management Council, depending on needs of the fishery. The Councils will have the same prerogatives regarding habitat conservation that they have with respect to any other management measure contained in the Fishery Management Plans. The language of 3(a) has been modified to indicate that measures will be proposed only where appropriate.

Role of Regional Fishery Management Councils

Comment: Implementation Strategy No. 3(a) imposes strict requirements on the Regional Fishery Management Councils above and beyond the requirements of the Magnuson Act. Talk of a partnership between NMFS and the Councils is contradicted by a clear threat to disapprove Fishery Management Plans that do not meet requirements proposed by NMFS. Moreover, this strategy is an attempt to reduce the responsibilities of the Councils assigned by Congress.

Response: Implementation Strategy No. 3(a) strengthens, not weakens or reduces, the role of the Councils regarding habitat conservation. This strategy does not impose requirements beyond the Magnuson Act, since habitat is an important element in fishery management.

Comment: It would be appropriate to refine the planning and implementation strategies to assure the Councils a partnership level role in any actions taken under the policy once it is implemented. If workshops to further develop the policy format are being considered, the Councils would appreciate an opportunity to participate.

Response: The Councils are intended to have an important partnership role and NMFS expects to contact them from time to time during policy implementation planning and development.

Comment: Minimum Fishery Management Plan descriptions called for could impose an impractical burden on plan development. For example, 80% of salmon catch in Alaska includes fish from habitat areas outside Alaska. The Councils are conscious of importance of habitat and need to protect it, but the Councils are not in a position to carefully review the work of everyone on the coasts and oceans and assess or restate the assessments of other agencies which do monitor the impact those actions may have on the environment.

Response: NMFS believes an erroneous impression was created by wording in Implementation Strategy No. 3(a) which stated "The Regional Fishery Management Councils should address habitat considerations in their Fishery Management Plans, where applicable, based on the best available information *from all sources which can be coordinated by NMFS/NOAA.*" The underlined words have been deleted to make clear the Councils will be obliged to review only information made available to them by NMFS/NOAA and others during their plan deliberations. This will be an evolutionary process and will not impose an impractical burden on the Councils in plan development. NMFS will work closely with the Councils to make them aware of habitat conservation matters they might need to consider.

Comment: Several commenters stated that Implementation Strategy No. 3 outlines the development of a potentially powerful framework for building a constructive partnership between the Councils and NMFS for habitat conservation. Although the Councils presently may become as involved in maintenance of habitat as their authorities allow, they have played a minor role in habitat conservation to date. If this strategy is to be implemented successfully, NMFS will have to be highly responsive to Council needs with technical assistance and information delivered both timely and adequately. Parhaps Implementation Strategies Nos. 1 and 2 should make an even stronger reference to development of research priorities and programs in response to Council needs.

Response: NMFS expects that Implementation Strategy No. 3(b) will result in NMFS providing the Councils with needed information and support. Again, this will be an evolutionary process so as not to place an undue burden on the Councils. The products resulting from implementation of Strategies Nos. 1 and 2 will provide the basis for the information provided to the Councils.

Comment: Suggest following change in Implementation Strategy No. 3(a), second paragraph: "Where appropriate, existing FMPs *should* be amended to meet these standards."

Response: NMFS agrees to recommended change.

Comment: Caution against over reliance on Councils as their desires may not always lead to non-overfishing or non-resource exploitation policies that NMFS supports in conjunction with wetlands protection and fisheries management.

Response: NMFS has every confidence that the Councils, in partnership with NMFS, will not undertake actions that will lead to overfishing or over exploitation of the resource.

NMFS' Role Vis-a-Vis Regional Fishery Management Councils and States

Comment: Several commenters believe that a number of statements within the policy convey the impression that NMFS intends to inject itself into an

active role of fishery management in the Fishery Conservation Zone (which is the responsibility of the Regional Councils) and within the territorial seas (which is under States' jurisdictions). Overall conclusiom is that the policy, as written, suggests the intention of assigning to NMFS a role in fishery management which heretofore has ben filled by the Councils and concerned coastal States.

Response: The policy recognizes a partnership between NMFS and the Councils under the Magnuson Act and does not create any greater role for NMFS or the Councils than that which is currently required under the Act. The policy is not intended to usurp the Council's responsibilities. It provides the bsis for considering habitat during the Councils' development of Fishery Management Plans. Moreover, the policy does not provide for NMFS' intervention in State management of State resources in State waters. It indicates that NMFS and the Councils have an interest in conservation of the habitats of species managed under the Magnuson Act.

Comment. The policy should provide for recognition of States' roles in habitat conservation and for more definitive mechanisms for working with States in this regard. Several opportunities exist: (a) Under Implementation Strategy No. 1, Regional Directors should include State programs in their inventory of strategies to address habitat issues. There should be formal consultation with, and opportunity for comment by, States prior to adoption of regional habitat protection plans; (b) existing grant programs should recognize the validity of habitat conservation matters; and (c) procedures for NMFS' coordination with the States regarding Fish and Wildlife Coordination Act reviews should be adopted.

Response: Implementation of the policy will be in full recognition of States' roles in habitat conservation. The policy in no way evisions a reduction of State activities. It is expected that States will be consulted during planning and implementation. It is expected that NMFS' grant programs, as well as other programs, will consider habitat as part of the integration process.

Interactions With Other Agencies

Comment: One State commented that the Corps of Engineers has been traditionally recognized as the Federal agnecy for coastal habitat protection. The Corps' working relationship with coastal States is a long proven process. Implementation of the policy will add another layer of Federal involvement to what is already in place.

Response: The policy does not provide for replacement of the Corps of Engineers or any other agencies having interests in habitat conservation. NMFS, under the Fish and Wildlife Coordination Act, will continue to provide recommendatons to the Corps regarding its issuance of permits for construction which could have an impact on living marine resources. The Corps will continue to make final decisions on issuance of permits.

Comment: Several commenters stated that NMFS should coordinate its habitat conservation programs not just with other elements of NOAA, but also with other key Federal and State agencies which have interests in or responsibilities for habitat conservation.

Response: In this regard, NMFS has every expectation of building in other Federal and State agencies. Implementation Strategy No. 6 specifically addresses this concern.

Comment: Suggest development of interagency memorandum between NMFS and the Fish and Wildlife Service, perhaps with Army involved also, to remove duplication of effort when commenting on Corps of Engineers water resource projects and permit applications.

Response: If needed, such a memorandum could be one of many provided for in Implementation Strategy No. 6.

Benefit of Proposed Policy to Other Wildlife

Comment: Recommend inserting at appropriate place, language that states that migratory birds will benefit from policy.

Response: NMFS agrees. Language has been added to reflect that implementation of the policy will be beneficial to other wildlife resources, including migratory birds.

Impact of Energy Development

Comment: Quoting a statement in the Background section that coastal habitats "have been substantially reduced and continue to suffer the adverse effects of . . . energy development . . .," one commenter suggested that unless NMFS could fully document the statement, it should be deleted.

Response: The impacts of energy development on living marine resource habitats were listed along with impacts of other human-related activities such as dredging, filling, coastal construction, pollution and waste disposal. In the case of wetlands, actual loss figures were quoted from *The Coastal Almanac for 1980—The Year of the Coast* (Ringold and Clark, 1980).

Predator-Prey and Ecosystem Relationships

Comment: Recommend adding language that specifically addresses the predator-prey relationship.

Response: The proposed policy implicitly recognized the importance of prey species which support species of importance to man. However, for clarity, the policy has been revised to specifically recognize the importance of the predator-prey relationship by using the language recommended by several of the commenters.

Comment: Several commenters stated that marine life is part of an aquatic ecosystem where food and nutrient sources are so interwoven as to make precise determination of relationships between managed and non-managed species extremely difficult. Proposed policy seems not to provide explicit credence to value of ecosystems in maintaining diversity of species.

Response: The importance of ecosystem planning and research is clearly recognized and dealt with in Implementation Strategies Nos. 1 and 2. This matter is also addressed in the amendment to the policy with respect to the predator-prey relationship.

Funding/Resources

Comment: Several commenters stated that for effective implementation of the policy, an adequate funding base for habitat research and conservation activities must be maintained. Moreover, while delegation of authority to States may be appropriate, lack of money may prevent it from working properly.

Response: Implementation of the policy is not premised upon an increase in funding, but better utilization of funds available. Recognizing that State and local governments also face budget constraints, NMFS expects they will set priorities regarding utilization of resources. The Federal Government will help to the extent it can, such as acting as a catalyst.

Comment: The policy would demand a redirection of NMFS' effort. With no mention of funding for increase in habitat conservation effort, development programs and interests must necessarily diminish as environmental protection programs and emphasis expand.

Response: Although the policy is not intended to significantly diminish specific programs, NMFS cannot forecast the effect on such programs with adoption of the policy. NMFS will deal with the direction of habitat conservation and other activities during its strategic planning efforts.

Research

Comment: Applaud scientific/research thrust, but would like to see requirement for sharing research findings with a variety of non-Federal organizations concerned with habitat conservation.

Response: Implementation Strategy No. 2 has been amended to clearly reflect NMFS' obligation to disseminate information to the public.

Comment: NMFS' role in research activities should receive greater emphasis than is implied in proposed policy statement.

Response: Implementation Strategies Nos. 1, 2 and 3(b) reflect NMFS' desire to give greater emphasis to habitat research activities.

International Habitat Activities

Comment: Regarding NMFS' participation in international habitat activities in support of obligations of the U.S. under international agreements, it occurs that negotiations with foreign nations who are seeking fishing rights in U.S. waters, may offer opportunities for international habitat protection activities. Foreign nations with the best habitat protection records might be given preferential treatment in the fisheries allocation process.

Response: The policy does not preclude this suggestion. NMFS will bring it to the attention of the Department of State with which NMFS cooperates in making allocation determinations. Implementation Strategy No. 6 recognizes the need for interagency cooperation and agreements.

For the reader's benefit, the modified Statement of Policy follows.

Policy Framework

Traditionally, the habitat conservation activities of NMFS have been based primarily on the policies developed in response to the Fish and Wildlife Coordination Act (FWCA) and the National Environmental Policy Act (NEPA). These laws give NMFS an important advisory role, primarily with respect to reviewing and commenting on proposed Federal projects, licenses, permits, etc. which could affect living marine resources. Because of this advisory role, NMFS' habitat conservation activities have been determined largely by the policies, actions, and deadlines of others. For the most part, these activities have dealt primarily with general concerns of habitat loss and degradation and not with specific habitat problems relating to the species of living marine resources for which NMFS has primary management responsibilities, i.e. species (1) covered or subject to being covered under Fishery Management Plans developed under the Magnuson Fishery Conservation and Management Act (Magnuson Act) and (2) assigned to NMFS under the Marine Mammal Protection Act and the Endangered Species Act. Within this framework these activities have been successful in carrying out the objectives of the FWCA and NEPA. However, evolving mission and programs require the Agency to focus its activities on habitats important to the species referred to above.

In addition to the need for a change resulting from the foregoing, a number of events have occurred that give NMFS the opportunity to enhance substantially its overall role in habitat conservation. These include opportunities to use all of NMFS' legislative authorities to take an active role in habitat conservation and to ensure that it is appropriately considered in all of NMFS' programs, and opportunities to make the program more effective through strategic planning. Additional events include changing Federal and State roles under Administration policies and reduced Federal budgets.

Although NMFS' past role in habitat conservation was largely determined by the FWCA and NEPA, significant recent legislation, particularly the Magnuson Act gives NMFS broader authority and more opportunities for achieving habitat conservation objectives. This Act also provides comprehensive authority to integrate habitat conservation throughout the Agency's conservation, management, and development programs. This can be accomplished through the Agency's strategic planning process which is the mechanism for setting priorities based on NMFS' resources and responsibilities.

Changes in traditional Federal and State roles are expected to occur as a result of sorting out responsibilites among Federal, State, and local governments and shifting decisionmaking and responsibility for a variety of policy, budgetary, and regulatory matters to State and local governments. Implementation of this policy will give State and local governments more control over activities that may be more appropriately conducted at those levels and, as a consequence, reduce direct Federal expenditures and involvement.

With respect to living marine resources and their habitats, the sorting out of responsibilities between State and Federal governments is complex. Generally, the States have overall responsibility within their inland and coastal waters (0–3 miles from shore) for management of living marine resources with the exception of marine mammals and endangered species. NMFS has been assigned the Federal management responsibility, in partnership with the Regional Fishery Management Councils, for fishery resources in the U.S. Fishery Conservation Zone (generally 3–200 miles). However, the Magnuson Act recognizes a need for management throughout the range of the species. Moreover, many of the species of living marine resources for which NMFS is responsible spend a portion of their life cycles in habitats primarily located in State waters such as rivers, wetlands, and estuaries. Many of these common property resources cross State as well as international boundaries. Therefore, consistent with the Magnuson Act, NMFS clearly has a role with respect to certain living marine resource habitats located in State, interstate and international waters. NMFS also has a long history of cooperation and interaction with the States on State/Federal fisheries activities under number authorities other than the Magnuson Act.

Policy

Habitat conservation activities will be responsive to the mission and programs of NMFS. The goal of NMFS' habitat conservation activities will be to maintain or enhance the capability of the environment to ensure the survival of marine mammals and endangered species and to maintain fish and shellfish populations which are used, or are important to the survival and/or health of those used, by individuals and industries for both public and private benefits—jobs, recreation, safe and wholesome food and products.

NMFS will direct its habitat conservation activities to assist the Agency in (1) meeting its resource management, conservation, protection, or development responsibilities contained in the Magnuson Fishery Conservation and Management Act, the Marine Mammal Protection Act, and the Endangered Species Act; and (2) carrying out its responsibilities to the U.S. commercial and marine recreational fishing industry, including fishermen, and the States pursuant to programs carried out under other authorities.

Since most of NMFS' programs under its broad mandates are influenced by habitat considerations, habitat conservation will be considered and included in the Agency's decisionmaking in all of its programs. NMFS will bring all of its authorities to bear in habitat conservation. These authorities include those which give NMFS an active, participatory role and those, particularly the Fish and Wildlife Coordination Act, which give NMFS an advisory role.

In carrying out its programs, NMFS' activities will be conducted in a fashion designed to achieve necessary, orderly coastal development in a timely fashion, while the renewability and productivity of the Nation's living marine resources are maintained or, where possible, enhanced. This action will also benefit other wildlife resources, such as migratory birds.

Also, NMFS will use its scientific capabilities to carry out the research necessary to support its habitat conservation objectives.

Implementation

Implementation of the policy will be governed by general Federal policies such as the multiple use of coastal areas. Also, implementation will be governed by the principle that the Federal Government has an obligation to conserve the habitats of living marine resources for which it has primary management responsibility or which are the subject of NMFS program, whether such habitats are under State or Federal jurisdiction. This will require close cooperation and coordination by NMFS with other NOAA elements, Federal and State agencies, the Regional Fishery Management Councils, and the commercial and recreational fishing constituencies. It is particularly important that NMFS and the States work cooperatively to define their respective roles with each directing its habitat conservation activities according to its responsibilities and capabilities.

While this policy emphasizes NMFS' domestic habitat conservation responsibilities, it does not preclude NMFS' participation in international habitat activities in support of obligations of the U.S. under international agreements. International habitat issues will continue to be addressed on a case-by-case basis depending upon the demands of the United States under the provisions of the governing treaty or convention.

Implementation Strategies

In consultation with its Regions and Centers, NMFS' Central Office will prepare guidance for the policy implementation recognizing that each Region has unique resource and/or development issues that require flexibility in addressing particular problems. The following implementation strategies will be used.

1. Each Region, working with the appropriate Center, and the Central Office, will establish a formal planning and coordinating mechanism to implement this policy on a continuing basis. At a minimum, this mechanism will be use to: (1) Identify the living marine resources of importance and the major habitat threats to these resources; (2) enumerate the identified habitat issues in order of priority: (3) develop strategies to address these issues; and (4) oversee the integration of habitat considerations throughout all NMFS' programs. To accomplish the purposes of this planning and coordinating mechanism, NMFS will call on the Assistant Administrators of other elements of NOAA (e.g., Office of Ocean and Coastal Resource Management, Office of Oceanography and Marine Services), the States, the Regional Fishery Management Councils and others, as appropriate. The results of this mechanism will be incorporated into the objectives and subobjectives of NMFS' Strategic Plan as well as the performance contracts of its employees.

2. NMFS Research Centers will conduct environmental and ecological research, including long-term studies necessary to implement this policy. Research efforts will be coordinated with other elements of NOAA (e.g., National Ocean Service), the States and others, as appropriate. Research results will provide an integral part of the informational basis for MNFS' activities related to its conservation, management, protection, and/or development responsibilities. The needs of NMFS' decisionmakers will be the essential consideration in determining research priorities. Specific research objectives and activities will be determined through Regional and Center collaboration using the planning and coordinating mechanism described previously. Dissemination of information to the public is and will remain one of NMFS' major objectives.

3. Since the opportunities afforded by the Magnuson Act are important factors in developing and adopting this policy, in the future NMFS will rely to a greater degree on its partnership with the Regional Fishery Management Councils in habitat conservation as it affects those fisheries subject to Fishery Management Plans developed by the Councils. The Councils provide a unique mix of representatives from the commercial and recreational fishing industries, conservation groups, State and Federal Governments, and the general public. Under this partnership, NMFS will assist the Councils to the extent possible.

(a) The Regional Fishery Management Councils should address habitat considerations in their Fishery Management Plans, where applicable, based on the best available information. While threats to fishery habitat posed by sources other than fishermen are not subject to regulation under the Magnuson Act, an adequate description of the fishery, its maximum sustainable yield, or its optimum yield may require significant discussion of important habitat and threats to it.

At a minimum, Fishery Management Plans should include identification and descriptions of habitat requirements and habitats of the stock(s) comprising the management unit; assessment of the condition of these habitats, to the extent possible, as they relate to the continued abundance and distribution of the species; identification, where possible, of causes of pollution and habitat degradation; description of programs to protect, restore, preserve and enhance the habitat of stock(s) from destruction or degradation; and, where appropriate, proposal of measures intended to preserve, protect, and restore habitat determined to be necessary for the life functions of the stock(s). Failure to describe adequately the condition of the fishery habitat and any likely changes to it may raise questions under several of the national standards and under section 303(a)(1) of the Magnuson Act. Where appropriate, existing Fishery Management plans should be amended to meet these standards.

(b) NMFS must be prepared to respond to the Councils in an agreed upon time when support or information is requested. Section 304(e) of the Magnuson Act authorizes NMFS to acquire the basic knowledge necessary to meet the Councils' needs. Equally important, NMFS will establish a mechanism to systematically consider and follow up on the Councils' recommendations for habitat conservation. If Councils' recommendations are not accepted, NMFS will notify them of the reasons. If Councils' recommendations are accepted, NMFS will adopt them and keep the Councils informed on a continuing basis regarding the results of actions taken to implement the recommendations. If the Secretary does not have the authority to carry out the Councils' recommendations, the Secretary will submit the recommendations to the authorities having jurisdiction over the matter.

4. NMFS will continue to use procedures and options available under the FWCA and other advisory authorities to influence decisions about important habitats identified by NMFS. These activities will include addressing decisions regarding dredge and fill projects, OCS oil and gas development, ocean dumping, water diversion, artificial impoundments, energy facility

siting, water quality degradation, and removal or degradation of tidal and intertidal wetlands.

5. NMFS will work closely with the States, the Interstate Marine Fisheries Commissions, and the Regional Fishery Management Councils to ensure that State/Federal Fishery Management Plans and the Councils' Fishery Management Plans are fully coordinated with regard to living marine resource habitat conservation. This coordination can be served through the Coastal Zone Management, or State/Federal Action plan process which could also provide mechanisms for sharing responsibilities and costs.

6. Since other Federal, State and local agencies are involved in living marine resource habitat matters, NMFS will support existing or new interagency operating arrangements to help define and assign appropriate roles and responsibilities. These arrangements may be informal or formal.

7. NMFS will focus its freshwater habitat activities on anadromous species. This does not preclude NMFS' involvement in a freshwater project if the project could adversely affect living marine resources for which NMFS has primary management responsibility or which are the subject of a NMFS program.

8. Where possible, NMFS will become more actively involved with governmental agencies and private developers during preapplication or early planning stages. This involvement will allow NMFS to better anticipate problems, identify alternatives for achieving objectives, reduce possibility of conflict, and minimize adverse effects on living marine resources and their habitats. In the case of essential public interest projects where practical alternatives are unavailable, NMFS will recommend measures to mitigate habitat losses. Also, when appropriate, NMFS will recommend habitat enhancement measures including rehabilitation.

9. As habitat considerations are integrated across all program lines, each major program office of NMFS will review its authorizing legislation and implementing regulations in conjunction with the Office of General Counsel to determine if these adequately provide for consideration of habitat. Legislative or regulatory changes will be recommended as needed.

10. Recognizing NOAA's broad responsibilities for ocean management, NMFS will continue to cooperate with other NOAA program elements in environmental activities conducted by these elements and will emphasize those activities affecting living marine resources for which NMFS has primary responsibility. NMFS will also seek assistance from other NOAA elements with expertise in areas relating to living marine resources and their habitats.

11. During the implementation of the Federal regulatory reform processes, NMFS, particularly its Central Office, will actively review and participate in the development of evolving Federal and State laws, regulations, policies and actions (e.g., Section 404 of the Clean Water Act) that affect habitats of species for which NMFS has primary management responsibility or which are the subject of a NMFS program to ensure that habitat conservation is appropriately considered.

12. To generate greater interest in perpetuating healthy living marine resource habitats, NMFS will emphasize greater communication of its habitat conservation activities to its constituency. This includes commercial and marine recreational fishing interests, academia, environmental groups, coastal residents, marine-oriented industries, the general public, and the Congress.

Dated: November 21, 1983.

William G. Gordon,

Assistant Administrator for Fisheries, National Marine Fisheries Service.

[FR Doc. 83-31641 Filed 11-21-83; 4:27 pm]

BILLING CODE 3510-22-M

APPENDIX G

EVOLUTION OF NORTHEAST RAP THREATS/PRIORITIES

The dynamic nature of priority-setting is demonstrated by the unfolding of the process in the Northeast. To help further refine the process and to assist others who are trying to develop such a process, we provide the following background information:

The planning team first prepared preliminary descriptions of the WMUs and generally identified the living marine resources in each WMU that are of primary concern to the NMFS. (See Appendix A.) Next, the team examined the multiple-use activities occurring in each WMU and identified specific threats to those resources. Finally, the team evaluated the risk that each threat poses to living marine resources and assigned priorities to the various threats. (See Appendix B for a discussion of multiple-use issues, threats to living marine resources of the Northeast WMUs, and NMFS's present methods of dealing with them.)

Each of the various activities occurring in northeastern coastal and offshore areas then was analyzed in terms of the following criteria: (1) the perceived degree of risk the activity poses to living marine resources, (2) the type and immediacy of the activity, (3) the present level of NMFS/NOAA effort devoted to the issues associated with the activity, (4) the capability of NMFS/NOAA to address the issue (expertise, mandates), and (5) the likelihood that the NMFS's efforts would influence the "decision-making process."

This preliminary analysis provided an example of one way to establish priorities, and it gave the Board an interim set of working priorities to consider (Table G-1). Activities identified as high priority included "urban and port development," "ocean disposal," "dams," and "agricultural practices." Medium-priority activities included "industrial waste discharges," "domestic waste discharges," and "OCS oil and gas development."

The planning team recommended initiating working groups for the following significant problem areas: "ocean disposal," "dams and anadromous fish," "coastal development" (incorporates urban and port development, waste discharges, power generation, etc.), "OCS development," "marine mammals and endangered species," and "non-point source pollution." The latter two were identified as major problem areas that need attention, although they cut across rather than coincide with the ranked threats.

The Board considered the planning team's recommendations, along with its own concurrent finding that there is great need to synthesize NMFS's resource data and information so that it can be used to assess and respond to all kinds of habitat issues. Instead of establishing several working groups at the start, the Board decided to form two pilot working groups: one to synthe-

size information and develop a characterization of the Mid Atlantic WMU; the other, to develop a well-documented NMFS position on designation of sewage sludge dump sites off New York City (the 12-mile/106-mile dumpsite controversy).

Although non-point source pollution overlaps several threats and is not included as a separate item on Table G-1, the Board recommended that a strategy be developed to address non-point source pollution problems. Non-point source pollution comes from acid precipitation, marine transportation, urban and agricultural areas, coastal runoff, and riverine input. The non-point source pollution problem is severe now in nearshore areas, and is emerging as a recognized threat to offshore resources. Means to affect decisions regarding non-point source pollution are generally not yet available. The problem is not amenable to short-term, local solutions, but may be amenable to long-term solutions if NMFS/NOAA develops a strategy now that makes good use of long-term cooperative action with other interested parties. (See Appendix B, Section B-6.1.)

Although OCS exploration was not rated as a high-risk threat to living marine resources in Mid- and North Atlantic WMUs, the OCS development, production, and transportation are regarded as components of a high-priority issue whose problems appear amenable to generic resolution through the RAP process. Information syntheses are needed for future OCS "Calls for Information"; the same types of information are needed for fishery management plans, ocean disposal risk assessments, and other purposes. An OCS working group was established to respond to immediate and future requests for information on proposed lease areas in the Mid- and North Atlantic. Such information syntheses are prerequisites for developing conceptual models of anthropogenic effects, risk assessments, and recommendations. (See Appendix I.)

The Board decided not to form working groups immediately on coastal development, dams, and marine mammals/endangered species. The NER will continue to handle coastal developments and dams, with assistance from NEC on specific problems as needed. The small group of NER and NEC personnel working on marine mammals has developed, on its own initiative, a regional plan for prioritizing marine mammal research needs patterned on the RAP. (See Appendix H.)

Table G-1. **Preliminary ranking of major threats to living marine resources and habitats in the Northeast.** (See Appendix B for a full explanation of each threat.)

1. Urban and Port Development *
2. Ocean Disposal #
3. Dams
4. Agricultural Practices $
5. Industrial Waste Discharges @
6. Domestic Waste Discharges @
7. OCS Oil and Gas Development
8. Insect Control
9. Water Diversion
10. Sand and Gravel Mining
11. Power Generation

---

* Includes dredge and fill and construction activities covered by Section 10/104 permits, as well as point source pollution covered by NPDES permits and non-point source pollution.

Includes dredged material disposal in State waters, as well as actual ocean dumping of dredged material, sewage sludge, etc., covered by Section 103 permits.

$ Includes non-point source pollution (fertilizers, animal wastes, biocides, sediments, heavy metals, etc.) that affects coastal aquatic areas.

@ Point source pollution covered by NPDES permits.

APPENDIX H

ANALYSIS OF MARINE MAMMAL INFORMATION NEEDS IN THE NORTHEAST REGION

The Region and Center have been working cooperatively since 1981 to utilize the funds designated for marine mammal research in an efficient manner to meet our highest priority information needs. To assist the Center in this task, the Region initially provided an intuitive ranking of information needs by species, area, and threat, based on the regional marine mammal issues faced at that time. Competition for the static level of available Center funds increased, as did criticism of the NMFS's choice of marine mammal research proposals to fund. Recognizing that the competition and criticism would only increase with time, the Region attempted to quantify the ranking of information needs that are used to provide recommendations to the Center.

Doug Beach and Tracey McKenzie, with the assistance of Pete Major (formerly of ORES), developed a series of matrices that attempt to quantify the rankings. Although the numbers generated within each matrix remain intuitive, the complexity or number of variables used may even out some bias. Peer review of the numbers used in the matrix, or use of the Delphi Technique would provide more objective numbers. These methods would be followed if there is agreement that these matrices are useful management tools.

Table 1 shows the variables and the codes that were assigned each variable as the first step in developing the matrices. Five general human activity categories were chosen that represent the major threats to marine mammals in the Northeast Region. The Northeast Region was then broken down into seven areas that represent known zones of high marine mammal usage, and that fit into existing statistical areas already in use by the Region and Center. Eleven marine mammal species, or categories of species, were chosen for use in the analysis.

Table H-1. **Activities, Areas, and Species Codes.**

ACTIVITIES
OG - Oil and Gas
FC - Fisheries Conflict
VA - Vessel Activity
OD - Ocean Dumping
GP - General Pollution

AREAS
LBF - Lower Bay of Fundy
GOM - Gulf of Maine
MOB - Massachusetts Offshore Bank
GBK - Georges Bank
GSC - Great South Channel
MAS - Mid Atlantic Shelf
OSS - Offshore Shelf/Slope

SPECIES
RTW - Right Whale
HBW - Humpback Whale
FNW - Fin Whale
SPW - Sperm Whale
SEW - Sei Whale
MNW - Minke Whale
BLW - Blue Whale
HBS - Harbor Seal
GRS - Grey Seal
HPB - Harbor Porpoise
AWD - Atlantic White-sided Dolphin
OOD - Other Odontocetes

Throughout the analysis we attempted to identify the unknown variables so that information needs were highlighted. Therefore, variables that are unknown are given a more important (lower numerical) value. We also used numerical values from 0 to 3, with zero being the most important, so that a ranking of the totals would be achieved in all phases of any analysis.

Species/Impact Matrix

The first matrix (Table 2 and Figure 1) attempts to describe the relative importance of each area to a species, and to assess the impact of each activity on that species. Each activity was given a numerical value that represented both the immediacy and type of impact it would have on each species in each area. The sum of the two values (T1) provides a number that gives the relative impact of an activity on a species by area. The T1 values for each area can be summed to provide a ranking for all, or any portion of the Northeast Region.

The relative importance of an area to a species is determined by a sum of three variables (T); (1) number of individuals using the area relative to the North Atlantic population, (2) number of seasons the species uses the area, and (3) the sum of the species behaviors observed within the area. Since this analysis required the summing of three variables, the totals were inverted by subtracting T from 18 (the highest possible sum) to achieve an ascending ranked value (T2) as used in all other variables in the matrix. The relative importance of each area can be shown by totaling the T2 values for all species.

The total of the impact analysis (T1) and the species use analysis (T2) provides a relative ranking of how much each species may be impacted by each activity within each area (T3). These values can be analyzed in several ways according to the specific request of the user. A sample of the ranking of species by each area, according to the total impact from all five activity categories is depicted in Table 3.

Information Needs Matrix

The second matrix was developed to prioritize the type of information that is needed for each species. Numerical values from 0 to 3 (Table 4), with "Unknown" given the most important (0) value, were used as in the first matrix. Two assessments were made for each variable. The first was a quantitative assessment; "How much information do we know?" The second was a qualitative assessment; "How well does that information meet our needs?" This combination of assessments provides an indication of the relative value of the information that is now available. This technique also allowed us to make value judgements that are important in our decision making. For example, we may have no information (0) for the harbor seal in the Mid Atlantic area, but that may be enough information (3) for our purposes because the species is rarely found in that area. Conversely, we may have a lot of information (3) on the humpback whale on the Massachusetts offshore banks, but it may not be good enough (1) to make the needed management decisions due to the high level of human activity in that area.

Table H-2. **Species Impacts and Species Factors.**

Below are the numbers used to assign a numerical value to the species impact (i.e., impact immediacy and type of impact) and to three species factors (i.e., number of whales relative to the North Atlantic population, seasons in the area, and species behavior) listed on the attached sheet.

Impact Immediacy		Type of Impact	
Present/Ongoing	0	Direct	0
Unknown	1	Unknown	1
Immediate Future	2	Indirect	2
Long Range Future/None	3	None	3

The numbers assigned to impact immediacy and type of impact are summed to give a T1 value that provides a relative value of impact to species.

Number of Whales Relative to the North Atlantic Population

None	0
Few	1
Some	2
Most	3
All	4

Seasons in the Area

None	0
One	1
Two	2
Three	3
Four	4

Species Behavior

None	0
Migrating	1
Feeding/ Nursing	2
Unknown	3
Mating/ Calving/ Pupping	4

The numerical values assinged to each species factor is summed to give a T value.

The correction factor 18-T=T2 was used to invert the T value to give the sum of the species factors a proper ranking on an ascending order of 1-18. The resulting value is T2.

The summation of the T1 value and the T2 value yield a T3 value that indicates which species will be most affected by a specific activity in an area.

Table H-3. **Species/Impact Ranking by Area.**

	Impact Factor	Species Factor	SPC/IMP Rank
Lower Bay of Fundy			
Right Whale	21	30	51
Harbor Seal	24	35	59
Harbor Porpoise	23	40	63
Grey Seal	23	52	75
Humpback Whale	27	65	92
Fin Whale	28	65	93
Minke Whale	27	70	97
Atlantic White-sided Dolphin	28	70	98
Sei Whale	30	70	100
Gulf of Maine			
Harbor Seal	17	25	42
Harbor Porpoise	18	25	43
Atlantic White-sided Dolphin	25	25	50
Right Whale	26	40	66
Humpback Whale	26	40	66
Fin Whale	28	50	78
Grey Seal	26	60	86
Minke Whale	28	65	93
Sei Whale	28	70	98
Other Odontocetes	29	70	99
Blue Whale	28	90	118
Mass Offshore Banks			
Humpback Whale	15	25	40
Atlantic White-sided Dolphin	15	30	45
Fin Whale	20	35	55
Right Whale	22	50	72
Minke Whale	19	55	74
Harbor Porpoise	24	60	84
Other Odontocetes	29	70	99
Harbor Seal	30	75	105
Georges Bank			
Atlantic White-sided Dolphin	25	35	60
Other Odontocetes	27	35	62
Harbor Porpoise	25	45	70
Humpback Whale	27	50	77
Right Whale	27	55	82
Fin Whale	28	55	83
Sei Whale	30	70	100
Harbor Seal	30	85	115
Grey Seal	30	85	115

Table H-3. (cont.)

	Impact Factor	Species Factor	SPC/IMP Rank
Great South Channel			
Right Whale	21	25	46
Atlantic White-sided Dolphin	22	50	72
Humpback Whale	24	50	74
Fin Whale	24	60	84
Harbor Porpoise	23	65	88
Minke Whale	24	65	89
Other Odontocetes	28	65	93
Sperm Whale	30	80	110
Grey Seal	30	85	115
Sei Whale	30	85	115
Mid-Atlantic Shelf			
Other Odontocetes	20	35	55
Fin Whale	22	35	57
Humpback Whale	29	65	94
Harbor Porpoise	29	65	94
Minke Whale	29	65	94
Right Whale	25	70	95
Atlantic White-sided Dolphin	30	70	100
Sperm Whale	30	70	100
Offshore Shelf/Slope			
Other Odontocetes	17	20	37
Sperm Whale	21	35	56
Sei Whale	28	45	73
Fin Whale	25	65	90
Harbor Porpoise	26	70	96
Atlantic White-sided Dolphin	26	70	96
Blue Whale	30	70	100
Humpback Whale	29	75	104
Minke Whale	29	75	104
Right Whale	29	80	109
Grey Seal	30	85	115

Table H-4. **Information Needs Assessment.**

Information Quantity	
Unknown	0
Poor	1
Fair	2
Good	3

Information Quality	
Unknown	0
Poor	1
Fair	2
Good	3

This matrix contains 12 variables that were replicated for each species and area. Figure 2 shows the average values for each variable for the right whale in all areas as an example. This information is useful in determining the relative value of concentrating research on certain areas of a species life history.

These matrices are useful in developing recommendations to the Center on the direction of their marine mammal research efforts throughout the region. They can also be used to advise other Federal agencies on the type of research needed within a specific area to address the information needs required to asses the impacts of that agencies' specific activity. The matrices can also be used to develop and/or support; (1) decisions on certain marine mammal issues such as Recovery Plans, (2) in-house decisions such as budget documents and CYOPs, or (3) as in this case, develop research/management plans. For example, using the first matrix described above, Tracey McKenzie was able to draw up Figure 3 in a format that is similar to that prepared by Gordon Waring at the Center for his presentation at the meeting.

Activity

Area

Species	Impact Immediacy	+	Type of Impact	=	T_1	Species Factors							Correction Factor		
						# relative to population	+	Seasons in the area	+	Species Behavior	=	T	$18-T=T_2$	$T_1 + T_2 =$	T_3

Figure H-1. **Species Impact.**

AREA NORTHEAST REGION

SPECIES	INFORMATION/DATA	QUANTITY	QUANTITY AVG.	QUALITY	QUALITY AVG.	SUM TOTAL
RIGHT WHALE	DEMOGRAPHICS: NUMBER USING AREA	2.3	2.3	2.4	2.1	2.2
	% OF TOTAL N.A. POP. IN AREA	2.3		1.9		
	AGGREGATION TENDENCY	2.3		2.1		
	REPRODUCTIVE POTENTIAL (RATE)	1.3	1.5	1.0	1.3	1.4
	WHERE THEY REPRODUCE	1.7		1.6		
	PUPPING/CALVING (birth-weaning) (mortality factor, sucess factor)	1.3	1.4	1.0	1.1	1.3
	WHERE PUPPING/CALVING OCCURS	1.6		1.1		
	MOVEMENT/MIGRATION	1.4		1.1		1.3
	MORTALITY/SURVIVAL FACTOR (ADULTS)	1.7		1.6		1.6
	FEEDING (where, what species)	2.1		2.3		2.2
	AVOIDANCE FACTOR	1.0		1.4		1.2
	WEATHER/OCEANOGRAPHY FACTOR	2.6		1.4		2.0
		1.75		1.53		1.65

0 = Unknown 0 - 1 = Poor 1 - 2 = Fair 2 - 1 = Good

Figure H-2. **Species Activity.**

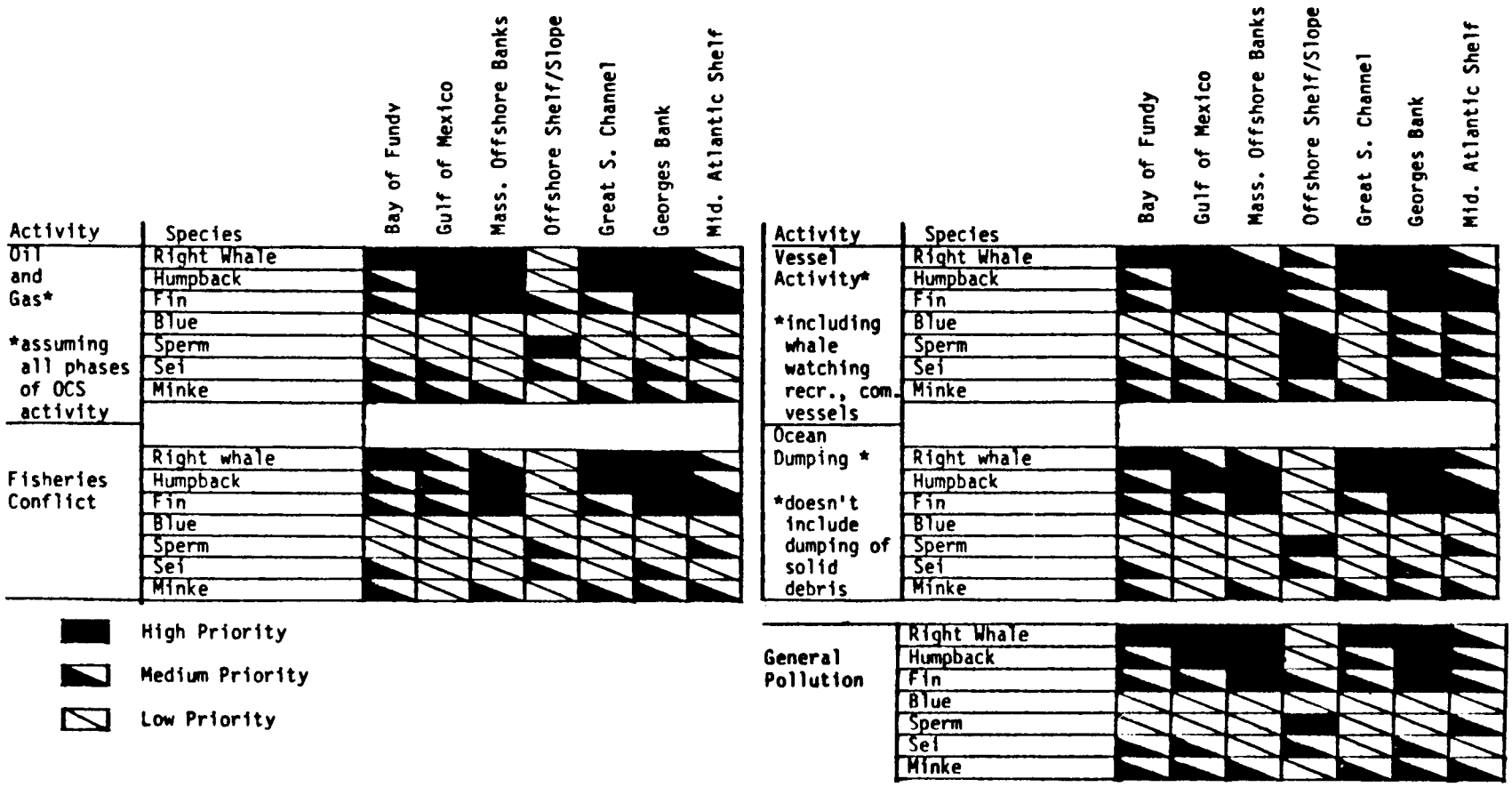

Figure H-3. Northeast Region management needs. Shows potential impacts to species by a specific activity in areas of importance to the species. Matrix is based on impact immediacy, impact type, and species factors (i.e., seasons spent in area, number relative to Northwest Atlantic population, and species behavior).

APPENDIX I

GENERIC STRATEGY FOR PROVIDING INFORMATION TO DECISION-MAKERS ON HABITAT CONSERVATION ISSUES*

Habitat Issue	Purpose (P)	Primary Activities (A)	Secondary Activities (S)	RAP Products (R)
(e.g., Urban and Port Development Non-point Source Pollution, Ocean Disposal, etc.)	P-1) Define habitat usage by living marine resources and people	A-1) Form Working Group I to accomplish P-1 & P-2 by doing S-1/S-4 & producing R-1/R-3	S-1) Assess problems	R-1) WMU characterization documents
			S-2) Review literature	R-2) Maps of habitat usage
	P-2) Define essential habitat areas, habitat requirements, & areas of particular concern	A-2) Form Working Group II to accomplish P-3 by doing S-5/S-8 & producing R-4/R-8	S-3) Summarize information	R-3) Issue papers on data gaps & research needs
			S-4) Combine information into a standard format	R-4) Syntheses of information
	P-3) Identify risks to living marine resources, habitats & people		S-5) Develop method for summarizing data of varied resolution	R-5) Site characterizations
				R-6) Conceptual models of anthropogenic effects
			S-6) Develop indices of habitat usage	R-7) Risk assessments & recommendations
			S-7) Develop architecture for condensed data file	R-8) Issue papers on data gaps, research needs, strategies & recommendations
			S-8) Evaluate problems, achievements, programs & activities	

*Note: This is a dynamic process involving many ongoing activities that could continue, be modified, or cease once the job is complete. Additional groups or individuals could be tasked to solve particular problems, do other activities, or produce other products

(continued from inside front cover)

25. ***Histological Techniques for Marine Bivalve Mollusks.*** By Dorothy W. Howard and Cecelia S. Smith. June 1983.

26. ***106-Mile Site Characterization Update.*** By John B. Pearce, Don C. Miller, and Carl Berman, eds. August 1983. xxxi + 483 p., 180 figs., 32 tables, 1 app. NTIS Access. No. PB84-118363.

27. ***Pelagic Distributions of Marine Birds Off the Northeastern United States.*** By Kevin D. Powers. November 1983. xvi + 201 p., 116 figs., 5 tables, 9 app. NTIS Access. No. PB84-187871.

28. ***Food of Seventeen Species of Northwest Atlantic Fish.*** By Ray E. Bowman and William L. Michaels. January 1984. xx + 183 p., 2 figs., 61 tables, 19 app. NTIS Access. No. PB84-219195.

29. ***Status of the Fishery Resources Off the Northeastern United States for 1983.*** By Resource Assessment Division, Northeast Fisheries Center; Emory D. Anderson, ed. July 1984. iii + 132 p., 44 figs., 48 tables. NTIS Access. No. PB85-106847.

30. ***Recent Estimates of Adult Spawning Stock Biomass Off the Northeastern United States from MARMAP Ichthyoplankton Surveys.*** By Peter Berrien, Wallace Morse, and Michael Pennington. July 1984. ix + 111 p., 25 figs., 25 tables. NTIS Access. No. PB85-108991.

31. ***Evidence of Nearshore Summer Upwelling Off Atlantic City, New Jersey.*** By Merton C. Ingham and James Eberwine. November 1984. iii + 10 p., 5 figs.

32. ***Secondary Production of Benthic Macrofauna at Three Stations of Delaware Bay and Coastal Delaware.*** By Stavros Howe and Wayne Leathem. November 1984. ix + 62 p., 6 figs., 19 tables. NTIS Access. No. PB85-145753/AS.

33. ***MARMAP Surveys of the Continental Shelf from Cape Hatteras, North Carolina, to Cape Sable, Nova Scotia (1977-1983). Atlas No. 1. Summary of Operations.*** By John D. Sibunka and Myron J. Silverman. November 1984. vii + 306 p., 52 figs., 2 tables. NTIS Access. No. PB85-150985/AS.

34. ***Oceanology: Biology of the Ocean. Volume 2. Biological Productivity of the Ocean.*** By M.E. Vinogradov, editor in chief. First printed by Nauka Press, Moscow, 1977. Translated from the Russian by Albert L. Peabody. January 1985. x + 518 p., 81 figs., 59 tables.

35. ***Annual NEMP Report on the Health of the Northeast Coastal Waters, 1982.*** By John B. Pearce, Carl R. Berman, and Marlene R. Rosen, eds., and Robert N. Reid (benthos), Catherine E. Warsh (water quality), and Edith Gould (biological effects), topic coords. January 1985. xi + 68 p., 29 figs., 5 tables.

36. ***Growth and Survival of Larval Fishes in Relation to the Trophodynamics of Georges Bank Cod and Haddock.*** By Geoffrey C. Laurence and R. Gregory Lough. January 1985. xvi + 150 p., 67 figs., 15 tables, 1 app.

Information Services Section
Northeast Fisheries Center
National Marine Fisheries Service, NOAA
Water St.
Woods Hole, MA 02543

U.S. MAIL

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

THIRD CLASS MAIL

NOAA SCIENTIFIC AND TECHNICAL PUBLICATIONS

The National Oceanic and Atmospheric Administration was established as part of the Department of Commerce on October 3, 1970. The mission responsibilities of NOAA are to assess the socioeconomic impact of natural and technological changes in the environment and to monitor and predict the state of the solid Earth, the oceans and their living resources, the atmosphere, and the space environment of the Earth.

The major components of NOAA regularly produce various types of scientific and technical information in the following kinds of publications:

PROFESSIONAL PAPERS—Important definitive research results, major techniques, and special investigations.

CONTRACT AND GRANT REPORTS—Reports prepared by contractors or grantees under NOAA sponsorship.

ATLAS—Presentation of analyzed data generally in the form of maps showing distribution of rainfall, chemical and physical conditions of oceans and atmosphere, distribution of fishes and marine mammals, ionospheric conditions, etc.

TECHNICAL SERVICE PUBLICATIONS—Reports containing data, observations, instructions, etc. A partial listing includes data serials; prediction and outlook periodicals; technical manuals, training papers, planning reports, and information serials; and miscellaneous technical publications.

TECHNICAL REPORTS—Journal quality with extensive details, mathematical developments, or data listings.

TECHNICAL MEMORANDUMS—Reports of preliminary, partial, or negative research or technology results, interim instructions, and the like.

Information on availability of NOAA publications can be obtained from:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161