# ANNUAL REPORT OF THE

# MARINE MAMMAL COMMISSION, CALENDAR YEAR 1987

A REPORT TO CONGRESS

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Marine Mammal Commission

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ANNUAL REPORT OF THE MARINE MAMMAL COMMISSION

CALENDAR YEAR 1987


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# CHAPTER I

# INTRODUCTION

## Background

This is the fifteenth Annual Report of the Marine Mammal Commission, covering the period from 1 January through 31 December 1987. It is being submitted to Congress pursuant to section 204 of the Marine Mammal Protection Act of 1972.

Established under Title II of the Act, the Marine Mammal Commission is an independent agency of the Executive Branch. It is charged with the responsibility for developing, reviewing, and making recommendations on actions and policies for all Federal agencies with respect to marine mammal protection and conservation and for carrying out a research program.

## Personnel

The Commission consists of three part-time Commissioners who are appointed by the President. The Marine Mammal Protection Act requires that the Commissioners be knowledgeable in marine ecology and resource management. At the beginning of 1987, the Commissioners were Robert Elsner, Ph.D. (Chairman), Fairbanks, Alaska, and Karen W. Pryor, North Bend, Washington. The third Commissioner's position was vacant. On 20 November 1987, the Senate confirmed the nominations of William W. Fox, Jr., Ph.D., Miami, Florida, to replace Ms. Pryor and Francis H. Fay, Ph.D., Fairbanks, Alaska, to fill the vacancy.

The Commission's full-time senior staff members are: John R. Twiss, Jr., Executive Director; Robert J. Hofman, Ph.D., Scientific Program Director; David W. Laist, Policy and Program Analyst; Sherburne B. Abbott, Assistant Scientific Program Director; Michael L. Gosliner, General Counsel; Marian Graham, Administrative Officer; Jeannie K. Drevenak, Staff Assistant in charge of permits; and Eileen C. Shoemaker, Staff Assistant in charge of publications. Effective 15 May 1987, the Commission accepted, with regret, the resignation of Donald C. Baur, former General Counsel, who left to enter private practice.

The Commission Chairman, with the concurrence of the other Commissioners, appoints the nine members of the Committee of Scientific Advisors on Marine Mammals, a committee of scientists statutorily mandated to be knowledgeable in marine ecology and marine mammal affairs. At the end of 1987, its members

were: Robert L. Brownell, Jr., Ph.D., U.S. Fish and Wildlife Service; Douglas G. Chapman, Ph.D., University of Washington; Joseph R. Geraci, V.M.D., Ph.D., University of Guelph; Daniel Goodman, Ph.D., Montana State University; Murray L. Johnson, M.D. (Chairman), University of Washington; Jack W. Lentfer, Alaska Environmental Consulting, Juneau, Alaska; George A. Llano, Ph.D., Naples, Florida; Jane M. Packard, Ph.D., Texas A&M University; and Forrest G. Wood, San Diego, California. On 12 April 1987, Dr. Chapman was appointed to the Committee to replace William W. Fox, Jr.

In recognition of the importance of marine mammals in the lives of many Eskimos, Indians, and Aleuts, the Commission, in 1986, asked Matthew Iya of Nome, Alaska, to serve as Special Advisor to the Marine Mammal Commission on Native Affairs. Mr. Iya continued to serve in that capacity throughout 1987.

## Funding

The Marine Mammal Commission started operations during the second half of Fiscal Year (FY) 1974 and was appropriated $412,000 for that period. Subsequent appropriations were:

| | |
|---|---|
| FY 75: | $750,000 |
| FY 76: | $900,000 |
| FY 77: | $1,000,000 |
| FY 78: | $900,000 |
| FY 79: | $702,000 |
| FY 80: | $940,000 |
| FY 81: | $734,000 |
| FY 82: | $672,000 |
| FY 83: | $822,000 |
| FY 84: | $929,000 |
| FY 85: | $929,000 |
| FY 86: | $861,000 |
| FY 87: | $900,000 |
| FY 88: | $953,000 |

## The Report

The Annual Report of the Marine Mammal Commission is a comprehensive review of domestic and international activities affecting marine mammals. Its purpose is to provide timely information to Congress, private citizens, public interest groups, government agencies, and the international community on events of the past year. To ensure factual accuracy, drafts of the report are circulated for review amongst agencies and others involved in each described activity.

Every year, the Marine Mammal Commission devotes special attention to certain species or populations that are of particular concern. Among the thirteen species addressed in Chapter II of this Report are the West Indian manatee, the Hawaiian monk seal, the right whale, the humpback whale, the North Pacific fur seal, and the California sea otter. All have been the subject of particularly intensive work by the Commission for a number of years.

The West Indian manatee population in the southeastern United States and the Hawaiian monk seal are found only within United States waters. One can say, therefore, that their survival is entirely in the hands of those in this country. Both populations are in jeopardy because of human encroachment into sensitive areas, habitat degradation and destruction, and a variety of other threats. It is not alarmist to foresee possible extinction. For these reasons, the Commission has devoted and continues to devote substantial effort to protecting and encouraging the recovery of these species. Efforts are described in Chapter II.

Like the manatee and monk seal, right and humpback whales are also endangered, and activities of the Commission and others to establish recovery teams, develop recovery plans, and start work to implement recovery plans are discussed in Chapter II. In many cases, action has come about because of the Commission's persistence in forcing issues. In some cases, like the North Pacific fur seal, species occur only partly or seasonally in U.S. waters and continuing efforts to develop and implement cooperative international conservation programs are still needed. Other species, like the river dolphins, Hector's dolphin, and the Gulf of California harbor porpoise, are not found in U.S. waters, but are discussed here because they have become the focus of much-needed international attention. As possible, the Commission is pleased to help support measures for the protection of such species.

The most perplexing problem encountered in 1987 was the continuing die-off of bottlenose dolphins along the Atlantic coast of the United States. By the end of the year, about 500 dead animals had been recovered and extensive examinations had been made of specimen material at laboratories throughout the United States and Canada. At year's end, there was no satisfactory explanation for the deaths. A summary of activities undertaken and underway at the end of 1987 is provided in Chapter III.

Conservation of marine mammals in Alaska has been a biologically and politically difficult matter for years. Many problems may have arisen because of an unhealthy focus on bureaucratic processes rather than on the welfare of the species or populations in question. To help provide a commonly agreed

basis from which groups of differing perspectives could constructively discuss Alaskan marine mammal issues, the Commission organized and supported the preparation of species reports with research and management recommendations for ten species. The reports, the cooperative effort of many informed contributors of widely varying interests, are discussed in Chapter IV, as are a variety of other issues affecting the Native community, government agencies, and marine mammals in Alaska.

The Marine Mammal Protection Act mandates the Marine Mammal Commission's substantive involvement in international activities affecting marine mammals and their habitats. Most species and populations with which the Commission is concerned are wide-ranging and their conservation requires cooperative international efforts. While some issues of international concern are discussed in Chapter II, "Species of Special Concern," those involving formal international agreements are reviewed in Chapter V.

One such issue is the Antarctic. Since its inception, the Marine Mammal Commission has been deeply involved in issues that could affect marine mammals in the Antarctic. It was instrumental in developing U.S. positions during negotiations of the Convention for the Conservation of Antarctic Marine Living Resources and continues to play a significant role with regard to the ongoing negotiation of a regime to govern mineral activities in the Antarctic. These actions are discussed in Chapter V.

Since the Marine Mammal Commission became operational in 1974, its representatives have participated in activities of the International Whaling Commission and its Scientific Committee. As discussed in Chapter V, activities of particular importance this past year were efforts to determine what should be included in the comprehensive assessment of whale stocks to be undertaken by 1990, and efforts by certain countries to conduct whaling for scientific purposes in an apparent attempt to circumvent the moratorium on commercial whaling which began in 1986. Also discussed in Chapter V are activities related to the Convention on International Trade in Endangered Species of Wild Fauna and Flora and the Cartagena Convention.

The Marine Mammal Commission called attention to entanglement of marine mammals in marine debris and plastic pollution as major environmental issues within the United States in the early 1980s. As part of its effort, the Commission recommended that an international workshop on the fate and impact of marine debris be held and provided the seed money and terms of reference for that workshop. Since that workshop in 1984, the Commission has continued to focus attention on this problem, both domestically and internationally. This past year was particularly important because of progress made by the National

Oceanographic and Atmospheric Administration to implement its marine debris program and because of the Coast Guard's achievements in bringing about ratification of Annex V of the International Convention for the Prevention of Pollution from Ships. In Chapter VI, the full range of domestic and international activities relating to debris and plastic pollution are discussed.

Marine mammal/fishery interactions concern fishermen, environmentalists, and the scientific community. When the Marine Mammal Protection Act was enacted in 1972, a major cause was the death of more than 350,000 porpoises in one year incidental to the commercial yellowfin tuna fishery (see Chapter VIII). As time has passed, some marine mammal populations have grown in response to the protection provided by the Act, and additional problems have become apparent. Chapter VII provides a brief historical overview and descriptions of marine mammal/fishery interactions in California and Alaska waters, and amendments to the Marine Mammal Protection Act proposed by fisheries groups to afford greater protection to fisheries. Chapter VIII describes actions regarding the incidental take of porpoise in the yellowfin tuna purse seine fishery, and the adverse impact of the Japanese high seas gill net fisheries upon marine mammals, particularly Dall's porpoise.

The Marine Mammal Commission is directed by statute to carry out a research program. That program is described in Chapter IX of this Report. Other research-related activities of the Commission, such as its annual survey of Federally-funded marine mammal research programs and the convening of a number of research program reviews and workshops are also discussed.

Since activities related to the exploration for and exploitation of offshore oil and gas resources can affect marine mammals and their habitats, the Commission has conducted a continuing review of proposed activities and has provided advice to the Minerals Management Service and other agencies on actions needed to ensure that such activities do not have significant adverse effects on marine mammals or the ecosystems of which they are a part. These efforts are described in Chapter X.

Chapters XI and XII describe issues related to the permit process and regulations to govern the care and maintenance of marine mammals in captivity. Both are of considerable importance and have been the subject of much attention by the Commission and its Committee of Scientific Advisors.

It is the Marine Mammal Commission's hope that this Report will serve as a useful and reliable reference document for interested individuals and groups in the United States and abroad.

# CHAPTER II

## SPECIES OF SPECIAL CONCERN

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, reviews the status of marine mammal populations and makes recommendations on necessary research and management actions as well as on designations with respect to the status of species or populations under the Marine Mammal Protection Act and the Endangered Species Act. During 1987, the Commission continued to concentrate on several species of marine mammals designated as endangered or threatened, including the West Indian manatee, the Hawaiian monk seal, the California sea otter population, the humpback whale, the right whale, and the bowhead whale. Given the serious condition of several other marine mammal species or populations, the Commission also focused on the North Pacific fur seal, the northern sea lion, harbor porpoise in California, the Gulf of California harbor porpoise, Hector's dolphin, the five species of river dolphins, and dugongs in Palau. A review of the Commission's activities regarding these species and populations follows.

### West Indian Manatee (*Trichechus manatus*)

The West Indian manatee is one of the most endangered species of marine mammal in the nearshore coastal waters of the United States. The largest concentration in this country, and perhaps the world, is the population in Florida. It is estimated to number more than 1,200 animals. Despite nearly a decade of concerted effort by Federal and State agencies and private organizations to protect manatees and their habitat in Florida, long-term survival of the population remains in doubt. This uncertainty is based, in large part, on the small size of the Florida manatee population, the increasing pace at which its habitat is being altered and destroyed due to coastal development, and the population's continued high mortality rate. Over the past four years, known manatee mortality in the United States has averaged 126 animals per year.

In the years 1977, 1981, 1984, and 1985, large numbers of manatees died as a result of thermal stress during periods of extreme cold. However, a more constant and growing threat to the survival of manatees in Florida is linked to the rapid growth of the State's human population, 90 percent of which live within 10 miles of the coast. With a population increasing at a rate of 800 residents a day, Florida recently became the fourth most populous state in the nation. By the year 2000, it is expected to rank third.

Manatee Mortality in the United States, 1977-1987*

| Year | In Florida | Outside Florida | Total | Boat/Barge Collisions |
|---|---|---|---|---|
| 1977 | 113 | 1 | 114 | -- |
| 1978 | 84 | 0 | 84 | -- |
| 1979 | 77 | 1 | 78 | 24 |
| 1980 | 63 | 4 | 67 | 16 |
| 1981 | 113 | 3 | 116 | 24 |
| 1982 | 117 | 6 | 123 | 21 |
| 1983 | 80 | 0 | 80 | 15 |
| 1984 | 128 | 3 | 131 | 35 |
| 1985 | 120 | 9 | 129 | 35 |
| 1986 | 122 | 3 | 125 | 33 |
| 1987 | 113 | 4 | 117 | 39 |

* Figures include the number of manatee carcasses recovered by year and the number of animals known to have died but which were not recovered.

Accompanying the population boom has been a corresponding increase in the number of registered boats in the State. While there were only 100,000 registered boats in Florida in the early 1960s, there are now more than 650,000 and an additional 300,000 transient boats enter each year from out of State. By the year 2000, these numbers are projected to double. As the above table shows, 1987 saw a record number of manatees killed as a result of collisions with boats and barges. This number can be expected to rise along with increased boat traffic unless additional steps are taken promptly to reduce the risk of boat strikes. Probably more serious in the long term are the habitat losses resulting from increased coastal development and environmental pollution that will further degrade critical manatee habitat.

If the survival and recovery of manatees are to become a reality, substantially increased effort must be devoted to protecting essential habitat and to reducing the number of collisions with boats.

## Manatee Program Review

As discussed in previous Annual Reports, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, undertook a thorough review of Federal and State manatee conservation programs in 1979-1980. In recognition of the importance of that review, Congress made a special Fiscal Year 1980 appropriation of $100,000 to the Commission for work on manatees. To determine how best

to use those funds, the Commission and its Committee of Scientific Advisors met with representatives of involved Federal agencies, State agencies, and private organizations in February 1980. Consensus was reached among the participants on the future direction of the manatee recovery program.

Based on those intensive planning efforts, the Commission allocated the special appropriation among such urgently needed projects as: the salary for a person (subsequently called the Manatee Recovery Activities Coordinator) to coordinate all efforts; development of a site-specific research and management plan for Crystal River manatees; support for a Manatee Technical Advisory Council to advise the Director of the Florida Department of Natural Resources on critical manatee issues; a study of food sources and feeding habits in Hobe Sound; a training program for Florida Marine Patrol officers and others on manatee biology and the enforcement of manatee protection laws; and increased information and education activities. While these activities were getting underway, the Fish and Wildlife Service completed its West Indian Manatee Recovery Plan in 1980 and its implementation plan (the Comprehensive Work Plan) in 1982.

Significant benefits resulted from the actions taken in the early 1980s. For instance, new information on manatee biology and ecology had been collected, a refined understanding of threats to manatee recovery had been developed, public awareness and concern for manatees had been increased, accumulating management experience was providing new insights into what could and should be done to assure the species' survival, and other agencies and organizations, particularly the Florida Department of Natural Resources, were assuming increasingly prominent roles in the manatee recovery program. At the same time, however, some of the most critical problems (e.g., record numbers of boat kills and increasing loss and degradation of essential habitat) had not been resolved and prospects were that these situations would worsen. Thus, despite the efforts of Federal, State, and private groups, the long-term survival of the West Indian manatee in the United States remained tenuous.

By late 1986, it was clear that the time had come for another comprehensive review of the entire situation. Therefore, the Commission decided to devote its 1987 Annual Meeting primarily to discussions of the West Indian manatee. The meeting was held in Florida on 10-12 December 1987. This was to provide representatives of the principal Federal and State agencies and private organizations cooperating in the manatee conservation program an opportunity to cooperatively review and re-examine priority needs and agree on future actions.

To prepare for the review, the Commission's Executive Director went to Florida earlier in the year to meet with involved Federal and State officials as well as representatives of the scientific community, industry, and environmental groups. During the course of the trip, additional information on research and management activities was collected, critical problems confronting the manatee program were reviewed, perceived needs of different groups were explored, and a general framework was developed for the December review of research and management needs.

Based on information collected during that visit and on what was already known about the situation, the Commission, in consultation with its Committee of Scientific Advisors, wrote to the Fish and Wildlife Service on 19 November 1987. In its letter, the Commission outlined its views of the critical management issues and the steps needed to strengthen the manatee recovery program. Specifically, it recommended that the Service, in cooperation with other involved parties, take prompt action to: (1) update the West Indian Manatee Recovery Plan and the accompanying Comprehensive Work Plan; (2) reconstitute and reconvene the West Indian Manatee Recovery Team; (3) complete land acquisition projects in the area of the Crystal and Homosassa Rivers on Florida's west coast; (4) improve the effectiveness of regulations and law enforcement pertaining to recreational boaters and divers in essential manatee habitat; (5) control the development of marinas and other boating facilities in essential manatee habitats; (6) identify and undertake priority manatee research; and (7) coordinate Federal/State/private public education and information programs. In addition, the Commission asked that representatives of the Service address the various recommendations during the December meeting so that all concerned could agree on appropriate approaches to critical issues.

Many Federal and State agencies and private organizations have important roles in the manatee recovery program. Among these are the Florida Department of Natural Resources, the Florida Game and Freshwater Fish Commission, the National Marine Fisheries Service, the Florida Power and Light Company, and the Save the Manatee Club. Accordingly, representatives of these groups and organizations were invited to participate in the program review during the Commission's meeting. The results of that review, including follow-up actions taken as of the end of 1987, are discussed below.

<u>The West Indian Manatee Recovery Plan and Comprehensive Work Plan</u> -- The Fish and Wildlife Service adopted the Recovery Plan for West Indian manatees in April 1980 and the Comprehensive Work Plan in February 1982. Unfortunately, neither the Recovery Plan nor the Work Plan has been updated since adoption, and they are badly out of date. As a result, program

budget needs beyond 1984 were never fully elaborated and changes to reflect progress on listed research and management tasks have not been incorporated since 1982.

Therefore, in its 19 November 1987 letter to the Service, the Commission recommended that the Recovery Plan and Comprehensive Work Plan be updated as soon as possible. The Service concurred and, during the December meeting, advised the Commission and other participants that it had begun efforts to revise and integrate the two Plans. The Service also presented a schedule for developing the new Plan with a projected approval date of spring 1989.

To help the Fish and Wildlife Service identify and evaluate critical issues and actions for inclusion in a revised Recovery Plan, the Commission contracted in 1986 for an analysis of the status of the Florida manatee recovery program with recommendations for its improvement. The Commission provided a draft report to the Service and the Florida Department of Natural Resources in July 1987. A review suggested that the report, while useful, needed further work, particularly in such areas as the analysis of research priorities. To supplement the draft, the Commission contracted with a scientist familiar with manatee research efforts in Florida and the recovery program to co-author the report. During the Commission's December 1987 meeting, a revised report outline was agreed upon, and a final report is expected in early 1988. The Commission will promptly provide the report to Federal and State agencies and other involved parties to provide help in planning future manatee research and management activities.

The West Indian Manatee Recovery Team -- The West Indian Manatee Recovery Team was established in the mid-1970s. Among other things, the Team helped the Fish and Wildlife Service identify research and management priorities and develop the Recovery Plan. Since 1980, however, the Team has not met. In view of the critical problems and the need for obtaining the best possible advice and assistance in identifying effective research and management solutions, updating the Recovery Plan, and undertaking appropriate recovery activities, the Commission recommended in its 19 November letter to the Service that the Recovery Team be re-activated. The Service concurred and, during the Commission's December meeting, announced that invitations to prospective Recovery Team members would be sent early in 1988. One of the Team's first tasks will be to review and comment on the draft Recovery Plan now being prepared by the Service.

In 1980, with financial assistance from the Commission, the Executive Director of the Florida Department of Natural Resources established a Manatee Technical Advisory Council to advise him on matters bearing on manatee conservation and

protection. The Council has met periodically since that time. In many respects, its meetings have partially fulfilled important functions previously addressed by the Recovery Team. For example, representatives of the Service and other interested parties participate regularly in Council meetings, affording all concerned a valuable opportunity to review and coordinate ongoing Federal, State, and private recovery activities.

By 1987, the importance of regular Council meetings had been well established. Unfortunately, the money provided by the Commission for its operation had been exhausted. Therefore, the Commission offered to continue to support the Council's operation. On 18 December 1987, the Commission's offer was accepted by the Director of the Department of Natural Resources, and the Commission will provide the Department with funds in early 1988.

Manatee-Related Land Acquisition -- To help encourage and guide efforts to protect manatee habitat in Florida, the Commission, in consultation with its Committee of Scientific Advisors, completed a report in 1984 entitled "Habitat Protection Needs for the Subpopulation of West Indian Manatees in the Crystal River Area of Northwest Florida." On 31 October 1984, the Commission transmitted its Report to the Fish and Wildlife Service and recommended that prompt action be taken to acquire certain wetlands and uplands along the Crystal and lower Suwannee Rivers. It also recommended that steps be taken to coordinate these efforts with regional land acquisition plans of State and private groups. In response, the Service convened a meeting with representatives of the State of Florida and the Commission in March 1985. During the meeting, land acquisition needs and plans related to Crystal River manatees were reviewed, and agreement was reached on the need to pursue several regional land acquisition projects important for protecting essential manatee habitat.

During the Commission's December meeting, activities of the State of Florida and the Fish and Wildlife Service in land acquisition in the Crystal River area were reviewed. It was apparent that substantial progress had been made. Among other things, the Commission learned that the State soon expects to complete acquisition projects involving 150 acres of land surrounding the warm-water spring at the head of the Homosassa River and some 2,000 acres of wetland and upland between the Crystal and Homosassa Rivers. In addition, the Service said that it had received a $650,000 appropriation for Fiscal Year 1988 to acquire a site on Kings Bay to serve as the headquarters and visitor center for the Crystal River National Wildlife Refuge. During the March 1985 meeting, such a site had been recognized as being urgently needed to improve visitor education and enforcement of manatee protection. Given the

pace of land development in Crystal River, both agencies committed themselves to pursue vigorously regional manatee habitat acquisition projects.

At the end of 1987, the Commission had made tentative plans to work with the Service and the State on intensified habitat protection efforts in 1988. In recognition of the importance of such activities for manatees elsewhere in Florida, the Commission had made known its interest in supporting a study, similar to the study on Crystal River manatees completed in 1984, on habitat protection needs for manatees along Florida's east coast.

Regulations and Law Enforcement Pertaining to Recreational Boaters and Divers -- Two activities that will affect recovery of manatees in Florida are boating and recreational diving. In addition to the prevalence of boat kills and injuries noted earlier, manatee harassment by divers at warm-water refuges during winter months could force animals to abandon the areas and thereby expose themselves to thermal stress and perhaps death. Both activities are increasing as human population grows.

To help protect manatees, 21 local boat speed regulatory zones have been established by the State, and similar areas have been established by the Fish and Wildlife Service in certain National Wildlife Refuges. Within these zones, boats must travel at slow or idle speeds to allow manatees time to avoid collisions. The Service has also established small manatee sanctuaries in Kings Bay into which entry of boats and divers is prohibited so that manatees can escape human disturbance. Enforcement in these and other areas is provided cooperatively by the Florida Marine Patrol, the Fish and Wildlife Service, the Florida Game and Freshwater Fish Commission, and the U.S. Coast Guard.

Despite these efforts, 1987 was a record year for boat-related manatee deaths, and virtually all manatees in Florida bear scars from non-lethal encounters with boat propellers. In addition, diver harassment increased as the number of people swimming with manatees in certain refuges grew. While the failure to satisfactorily address these problems is discouraging, it does not mean that the regulatory and enforcement efforts undertaken to date have been misdirected. Rather, it appears that the level of effort has been insufficient to keep pace with the increasing numbers of boaters and divers.

Therefore, in its 19 November letter to the Service, the Commission recommended that regulatory and enforcement approaches be re-evaluated to determine how existing efforts might be modified or expanded to make them more effective. One such approach suggested in the Commission's letter is

establishing "channel-exempt" boat speed restrictions in broad areas. This approach, which applies to waters outside designated channels, would afford greater protection adjacent to channels in the shallow areas often used by manatees for feeding and resting. Also, since shallow waters may prevent manatees from diving beneath oncoming boats, such an approach may decrease the number of collisions with boats. The Commission believes that the "channel-exempt" approach to boat speed regulation merits further examination. Therefore, it was pleased to learn at its December meeting that the Florida Department of Natural Resources was making such an effort along part of the Caloosahatchee River in southwest Florida and also was considering applying the approach elsewhere in the State.

Development of Marinas and Other Boating Facilities in Manatee Habitat -- Development of new marinas, boat ramps, docks, and other boating facilities in or adjacent to essential manatee habitats increases the likelihood of collisions between manatees and boats and could alter critical habitat components such as sea grass beds and water quality. The Fish and Wildlife Service and the Florida Department of Natural Resources review Federal and State applications for permits to build such facilities in navigable waters to ensure that adverse effects on manatees and manatee habitat are avoided. However, the number of permit applications exceeds the ability of agencies to review them.

During the Commission's December 1987 meeting, representatives of the Fish and Wildlife Service and the Florida Department of Natural Resources discussed two approaches being considered to improve the review process for permits for boating facilities in manatee habitat. First, under the Florida Growth Management Act of 1985, counties and municipalities in Florida are required to develop local growth management plans which incorporate measures to control new boating facilities and protect wildlife. The Florida Department of Natural Resources and the Fish and Wildlife Service are providing local governments with relevant information and advice on planning provisions for protecting manatees, including guidance on the development of new marinas. It is hoped that these planning requirements, when fully implemented, will reduce the number of boating facility proposals that pose threats to manatees and their habitat.

The second approach to strengthening the review of permit applications is development of a computer-based geographic information system. Such a system would facilitate review by integrating, mapping, and making readily available information on a local geographic area. Such a system might include data on: manatee distribution and habitat use patterns; the locations and numbers of boat-related manatee mortalities; vessel

densities and use patterns; the location of boat speed regulatory zones; existing boating facilities and trends in their development; zoning requirements; and the results of similar permit reviews in the same geographic area.

During the Commission's December meeting, information on both approaches was examined. There was general agreement that both approaches merit further work.

Manatee Research -- In recent years, the Florida Department of Natural Resources, the Army Corps of Engineers, the Florida Power and Light Company, the Save the Manatee Club, and others have assumed increasing roles in supporting and/or doing manatee research. However, the Fish and Wildlife Service, through the Sirenia Project of its National Ecology Research Center, has ultimate responsibility for ensuring that necessary information on the biology and ecology of manatees is available for making well-reasoned management decisions. In this regard, the Service's manatee research program has provided essential information for decisions on land acquisition, permits for boating facilities, boat speed regulatory zones, and other critical management actions.

During the Commission's December 1987 meeting, Service representatives described recent research activities, plans for the coming year, and funding projections for Fiscal Year 1988. It was clear that there is an urgent need to provide substantially increased support if an improved understanding of both manatee habitat use patterns and factors affecting essential habitat, including sea grass beds, is to be developed. This conclusion was reached after careful review of two multi-year research projects to: (1) continue and expand radio-tracking studies, including satellite-linked tracking, which had been pioneered by scientists in the Service's manatee research program; and (2) study factors affecting sea grass beds in Hobe Sound. In both cases, available support was inadequate.

In light of information provided at the meeting, the Commission wrote the Fish and Wildlife Service on 29 December 1987. In its letter, the Commission: described the urgent need for data on habitat use patterns for each of the more or less discrete manatee subpopulations in Florida; noted that data collection would require radio-tagging and tracking a representative age and sex sample of animals from each group for at least two to four years; stated that a modest, but critically needed program, would involve capturing, tagging, and tracking 20 to 25 manatees annually for five years; and recommended to the Service that it increase the Fiscal Year 1988 budget for the Sirenia Project by at least $120,000 and preferably $150,000. To carry these studies forward, the Commission recommended that the Sirenia Project budget be main-

tained at the recommended Fiscal Year 1988 level for five years thereafter. With respect to the Hobe Sound sea grass bed studies, the Commission recommended that at least $57,000 be made available by the Service in Fiscal Year 1988 and that $65,000 be provided in each of the succeeding four years to carry that project through to completion.

Information and Education Programs -- Because manatees interact extensively with boaters, divers, and other Florida residents and visitors, effective public awareness programs are essential. Among other things, this means developing messages that emphasize different points to different audiences (e.g., boaters, divers, school children, etc.). The manatee conservation program in Florida is exceedingly fortunate in that several cooperating agencies and private organizations have responded to this need with outstanding contributions and long-term commitments. Among the many groups deserving special recognition are the Fish and Wildlife Service, the Florida Department of Natural Resources, the Florida Power and Light Company, and the Save the Manatee Club. During the Commission's meeting, representatives of these groups provided information on relevant programs and the materials being prepared and distributed. As noted above, the Commission was advised, among other things, that the Service had received a special Fiscal Year 1988 appropriation of $650,000 for purchase of a headquarters and visitor center site on Kings Bay for the Crystal River National Wildlife Refuge.

In addition, representatives of the Florida Department of Natural Resources noted that, given the rapid growth of Florida's human population and its close association with manatees, it was essential that future generations of Floridians understand the critical issues involved in protecting manatees and the marine ecosystem as a whole. An identified approach for instilling a broader, more thorough awareness of these issues was through improved curricula for different elementary and secondary school levels. This point had been discussed earlier in the year with the Commission, and the Commission has responded by offering to provide funds to the Florida Department of Natural Resources to hire an education consultant. On 18 December 1987, the Director of the Department of Natural Resources accepted the offer. In early 1988, negotiations will be completed to transfer funds in support of developing curriculums for public schools on matters pertaining to the protection of West Indian manatees and coastal ecosystems in general.

Manatees of the Greater Caribbean and South America -- During its Annual Meeting, the Commission reviewed available information on the status of West Indian manatee populations in areas outside Florida. According to information provided by Fish and Wildlife Service representatives and others,

manatees appear to be declining throughout the species' range and are becoming increasingly scattered into small, isolated pockets of animals. While subsistence hunting has posed the greatest threat to these other populations in the past, it now appears that incidental take in gill net fisheries is the greatest threat outside Florida. Virtually all nations within the species' range now prohibit the taking of manatees, but enforcement is not adequate.

Service representatives noted that Sirenia Project staff are responding to increasing numbers of requests for information and technical assistance from nations throughout the Caribbean. In view of this growing interest in manatee protection, it was generally agreed that further effort should be devoted to developing an international conservation program for manatees through the Cartagena Convention (see Chapter V).

Habitat Protection

As indicated above, the long-term survival and recovery of manatees in Florida will depend on how successfully essential habitat is protected. Given increasing numbers of boating facilities and other types of shoreline development which render remaining habitat less suitable and less safe for manatees, the species probably cannot survive without a strategically integrated network of protected areas which contain all essential habitat components. Habitat protection and land acquisition are identified as being of the highest priority in the West Indian Manatee Recovery Plan, and if anything, these matters have assumed even greater importance in the intervening years. The Commission has worked closely with both the Florida Department of Natural Resources, the Fish and Wildlife Service, and other groups to encourage appropriate actions in these areas.

In 1979, the Florida Legislature created a State Conservation and Recreation Lands Program and Trust Fund to acquire lands that are environmentally sensitive or suitable for public recreation. The Program and Trust Fund are administered by the State Lands Selection Committee and the Florida Governor and Cabinet. Since the Program's inception, more than 100,000 acres of land have been acquired throughout the State, including certain areas along the Crystal River and elsewhere important to manatees.

In May 1987, the Commission learned that a group of local land owners in the Crystal River area was interested in selling about 13,000 acres of undeveloped wetland and upland between the Crystal and Homosassa Rivers at below-market value for purposes of wildlife protection. The area contains a significant portion of the habitat known to be important to the Crystal River manatee population. The Commission also learned that the land owners planned to request that the lands be added to

the list of recommended projects eligible for purchase under the State's Conservation and Recreation Lands Program.

Therefore, on 20 May 1987, the Commission, in consultation with its Committee of Scientific Advisors, wrote to the Directors of the Department of Natural Resources and the Florida Game and Freshwater Fish Commission, both of whom are members of the State Lands Selection Committee. In its letters, the Commission commended the State Committee for its accomplishments in pursuing an integrated regional network of State and Federal protected areas in northwest Florida and called attention to the importance of the proposal developed by the group of Crystal River residents for the regional manatee population. The Commission also noted that, if these lands could be incorporated into the evolving regional system of refuges and reserves, it would represent an important contribution to joint State and Federal efforts to ensure the long-term survival of this endangered species. Therefore, the Commission urged the Committee to act favorably on the proposal.

On 29 May 1987, the State Lands Selection Committee met to consider, among other things, the proposed land acquisition, which was named the St. Martins River Project. During its meeting, the Commission's letter and other letters of support, including one from the Manatee Technical Advisory Council, were reviewed. The Committee gave tentative approval for adding the proposed project to its recommended acquisition list. In so doing, the Committee asked that the Florida Division of State Lands prepare a detailed project design identifying boundaries, land ownership, property values, etc., for the St. Martins River acquisition project. Upon completion of the project design in early 1988, it will be reviewed by the Committee and a final listing decision made. At that time, assuming final approval is granted, the St. Martins River Project will be ranked against other listed projects to determine its priority on the recommended acquisition list.

## Conclusion

The population of West Indian manatees in Florida, which may be the largest concentration of animals anywhere in the species' range, is one of the most endangered marine mammals in nearshore waters of the United States. Continued survival of the population is in serious doubt, primarily because of the continuing loss of essential habitat, the increasing number of animals being killed and injured by collisions with boats, and other pressures related to the rapidly growing human population in Florida. The Fish and Wildlife Service, the Florida Department of Natural Resources, the Florida Power and Light Company, the Florida Game and Freshwater Fish Commission, and other cooperating agencies and private organizations have made great progress in their efforts to deal with these prob-

lems. Unfortunately, the pressures resulting from human population growth are such that more must be done if the species' continued existence and recovery are to be secured. During 1988, the Commission will continue to assist in the cooperative efforts to address the complex and difficult issues on which the welfare of this species rests.

## Palau Dugong (Dugong dugon)

The dugong, the single surviving species of the family Dugongidae, occurs throughout the shallow coastal waters of the Indo-Pacific region in scattered populations. Due to uncontrolled exploitation, the species has been severely depleted or extirpated in many parts of its former range. For example, local extinctions are documented around the Mascarene, Laccadive, and Maldive Islands. The Red Data Book, maintained by the International Union for the Conservation of Nature and Natural Resources, lists the species as vulnerable; it is designated as an endangered species under the U.S. Endangered Species Act.

An isolated dugong population still occurs in waters under U.S. jurisdiction around the Republic of Palau, about 850 km north of Papua New Guinea and 850 km east of the Philippines. The U.S. Fish and Wildlife Service conducted aerial surveys of the Belau population in 1977, 1978, and 1983. The general distribution of dugongs appeared to change little between these surveys. Maximum counts in 1978 and 1983 were 37 and 38 animals, respectively. However, the sensitivity of the surveys probably was not great enough to detect any changes in the size of the population.

Data gathered from local fishermen indicate that dugong are being taken illegally in greater numbers than the existing population can possibly sustain. In addition, the possible construction of U.S. military installations in the area could lead to loss of dugong habitat that would greatly decrease the population's chance for survival. Unless steps are taken to ensure protection of the animals and their habitat, this isolated population will likely become extinct in the near future.

The Marine Mammal Commission believes that steps must be taken immediately if this unique and highly vulnerable dugong population is to be preserved. Needed actions include long-term monitoring of both dugong habitat and population levels; implementation of a public education program; and reduction in the level of human exploitation. During 1988, the Commission intends to work with appropriate U.S., Palauan, and international agencies to take necessary steps to protect and preserve the threatened dugong population in Palauan waters.

## Hawaiian Monk Seal (Monachus schauinslandi)

The Hawaiian monk seal occurs on beaches and in waters surrounding the chain of small remote islands, atolls, and reefs that extend 1,500 miles northwest of the main Hawaiian Islands. Harassment and over-exploitation by sealers during the 19th century reduced the species to precariously low numbers close to extinction. The first systematic counts of animals were made in the 1950s and, although the population was thought to be increasing at that time, numbers in most areas have since declined. The number of animals counted in 1983 was roughly half the number counted in 1958. The size of the current population is estimated to be between 1,200 and 1,500 animals and the species is listed as endangered under the Endangered Species Act.

The National Marine Fisheries Service is responsible for protection of Hawaiian monk seals and their habitat under the Marine Mammal Protection Act and the Endangered Species Act. Because most of the species' terrestrial habitat is within the Hawaiian Islands National Wildlife Refuge, the Fish and Wildlife Service also has important responsibilities for protecting monk seals and their habitat. As discussed in previous Annual Reports, issues critical to the species' continued survival and recovery include: disturbance of seals on pupping and haul-out beaches; interactions between monk seals and commercial fisheries; entanglement in lost and discarded fishing gear and other marine debris; designation of critical habitat under the Endangered Species Act; management of the Hawaiian Islands National Wildlife Refuge; and identification of and continued support for priority research and management tasks.

Congressional concern for survival of the species has been expressed, in part, through special appropriations for monk seal-related activities. In Fiscal Year 1981, Congress provided the Commission $100,000 to develop and initiate an expanded research and management program for monk seals. The Commission's efforts to develop and begin implementing a directed research and management program are discussed in its previous Annual Reports. To carry that program forward, Congress directed that the National Marine Fisheries Service invest $400,000 in monk seal work in Fiscal Year 1982 and $150,000 in Fiscal Year 1983. Congress also provided $150,000 to the Commission for monk seal work in Fiscal Year 1983 and, after developing a detailed program plan for allocating those funds among priority research and management tasks, the entire $150,000 was transferred to the Service to carry out the specified activities. For Fiscal Years 1984 and 1985, Congress provided $300,000 and $350,000, respectively, to the Service to continue critically needed monk seal work. For Fiscal

Years 1986 through 1988, $325,000 a year has been appropriated.

As noted in previous Annual Reports, since the late 1970s, the Commission has made numerous recommendations to the National Marine Fisheries Service and the Fish and Wildlife Service to further the protection of Hawaiian monk seals and their habitat. Although some of those recommendations have been adopted, others have been addressed only partially or not at all. Therefore, as noted in its previous Annual Report, the Commission wrote to the National Marine Fisheries Service on 23 December 1986 recommending further steps to ensure the species' continued survival and recovery. Among other things, the Commission recommended that the Service: re-evaluate and extend designated critical habitat for monk seals from the 10-fathom to the 20-fathom isobath around certain Northwest Hawaiian Islands and Maro Reef; reconstitute the Hawaiian Monk Seal Recovery Team to update the Recovery Plan and help identify and address priority research and management needs; pursue efforts to eliminate the disturbance of seals by Coast Guard personnel stationed on Kure Atoll; in consultation with the Fish and Wildlife Service, ensure that the Hawaiian Islands National Wildlife Refuge Field Station on Tern Island remains open and occupied by personnel year-round to protect and monitor seals; undertake studies to better document interactions between monk seals and commercial fisheries; and ensure that adequate funds are sought and provided each year to carry forward urgent research and management needs.

By letter of 5 February 1987, the Service provided an initial response to the Commission's December 1986 letter. In its letter, the Service advised the Commission that: it planned to carry out further research to assess critical foraging habitat for monk seals and, based on the research results, further rulemaking would be considered for extending designated critical habitat around the Northwest Hawaiian Islands out to the 20-fathom isobath; ways to continue operation of the Tern Island field station were being explored with the Fish and Wildlife Service and, if temporary closure of the station became necessary, the possible effects of the decision on monk seals would be reviewed pursuant to section 7 of the Endangered Species Act; similar discussions were underway with the Coast Guard on ways to eliminate disturbance of seals by personnel located at the Kure Island LORAN station; and the Service had not allocated any funds for a study to better document interactions between monk seals and commercial fisheries in 1987.

Tern Island Field Station

As noted in its previous Annual Report, the Commission wrote to the Fish and Wildlife Service on 1 August and 22 December 1986 concerning potential removal of Service per-

sonnel from the Tern Island field station in the Hawaiian Islands National Wildlife Refuge. As many as 170 seals have been observed hauled out on that Island at one time and, as noted in the letters, the presence of Service personnel on the Island provides, among other things, an important deterrent against unauthorized landings by fishermen or other individuals who might disturb seals and cause them to abandon the area.

The Fish and Wildlife Service responded to the Commission's letters on 11 February 1987. It noted that it was continuing to explore options to maintain an operational station on Tern Island while reducing costs to meet budget constraints. Its preferred option was to establish a 10-month field camp on the Island and remove personnel during December and January. The Service noted that consultations with the National Marine Fisheries Service were underway to assess the possible effects of this option on monk seals. Congress subsequently provided a special appropriation to the Fish and Wildlife Service to maintain the Tern Island field station in 1987, thus avoiding the need to make a decision on closing or restricting operation of the facility. The issue could, however, be raised again in 1988.

Critical Habitat

As noted in the previous Annual Report, on 30 April 1986, the National Marine Fisheries Service designated all beaches, lagoons, and ocean waters out to a depth of 10 fathoms around most Northwest Hawaiian Islands as critical habitat for monk seals. The Service's action was not fully consistent with the advice of either the Commission or the Hawaiian Monk Seal Recovery Team, both of which had recommended that waters out to the 20-fathom isobath be designated critical habitat. Both the Commission and the Recovery Team had noted that waters beyond the 10-fathom isobath provided essential feeding habitat for monk seals. After reviewing the rationale for the Service's decision, the Commission wrote to the Service on 26 September 1986 recommending that the matter be re-opened for public comment to receive information on special management considerations that apparently had not been considered in reaching the decision, and that the Service extend the designated critical habitat out to 20 fathoms. As noted above, these recommendations were repeated in the Commission's 23 December 1986 letter.

On 15 July 1987, the National Marine Fisheries Service published a Federal Register notice requesting comments on whether the area between 10 and 20 fathoms around the Northwest Hawaiian Islands might require special management considerations or protection needs for monk seals which would justify its designation as critical habitat. By letter of 14 August 1987, the Commission, in consultation with its Committee of

Scientific Advisors, responded to the Service's request. Among other things, the Commission repeated its conclusion that available data clearly indicate that essential feeding activity occurs out to and beyond the 20-fathom isobath and that the waters between 10 and 20 fathoms, as well as waters less than 10 fathoms, should be considered critical for survival and recovery of the Hawaiian monk seal.

With respect to possible special management needs beyond the 10-fathom isobath, the Commission noted that: (a) waters beyond 10 fathoms are subject to commercial bottomfish and lobster fishing and interactions between these fisheries and monk seals are known to occur; (b) special efforts are needed within essential feeding areas, including waters between 10 and 20 fathoms, to avoid loss and encourage recovery of fishing gear and other debris that might entangle seals; (c) increasing ship traffic associated with expanding fisheries, potential offshore mining, and other activities poses risks of vessel groundings and spills of cargo and fuel; (d) proposals for deep seabed mining off the Northwest Hawaiian Islands could pose threats to seals by disrupting behavior patterns, altering habitat essential for prey species, or introducing contaminants that might affect seals or their prey; and (e) the 20-fathom isobath more clearly delineates the shelf break around the islands and therefore represents a more readily recognizable boundary that would facilitate compliance with existing and future conservation measures. The Commission repeated its recommendation that areas out to the 20-fathom contour around the Northwest Hawaiian islands and Maro Reef be designated as critical habitat for Hawaiian monk seals.

At the end of 1987, the Service was considering comments by the Commission and others on the matter, and it was the Commission's understanding that, early in 1988, the Service planned to formally propose extending designated critical habitat for monk seals out to the 20-fathom isobath and adding Maro Reef.

Scientific Research Permits

During 1987, the Commission reviewed and commented on two research permit applications involving work on Hawaiian monk seals. The first application requested authority to attach depth of dive recorders and radio transmitters on up to 80 seals at French Frigate Shoals to identify foraging areas and habitat use patterns. The second requested authority to mark and observe female seals and pups at the same atoll, for a period of three years, to improve information on nursing behavior and pup rearing strategies. During the review of both applications, questions were raised by the Commission and its Committee of Scientific Advisors as to whether the practical benefits of the proposed activities justified the

possible risk of disturbing, injuring, or otherwise affecting monk seals.

Additional information bearing on these questions was requested and received. Following further review of each application, the Commission wrote to the National Marine Fisheries Service on 30 March and 6 May 1987, respectively, recommending that the permits be approved subject to certain conditions. The recommended conditions were to minimize risks to the individuals and populations involved, and to ensure that potential unforeseen adverse impacts are detected and resolved as soon as possible. Both permits were subsequently approved by the Service, subject to the conditions recommended by the Commission.

Updating the Recovery Plan

The questions raised during the permit review process highlighted the urgent need for periodic, thorough reviews of all research and management activities proposed under the monk seal recovery program. In particular, reviews are needed to ensure that proposed activities address the most critical issues, that activities are well conceived, and that any potential risks to individuals and the population are clearly outweighed by the anticipated benefits.

Therefore, in the previously mentioned 26 December 1986 letter, the Commission recommended to the National Marine Fisheries Service that the Hawaiian Monk Seal Recovery Team, which had not met since 1984, be reconstituted and convened to help update the March 1983 Hawaiian Monk Seal Recovery Plan and provide expert advice on critical research and management needs. During 1987, the Service issued invitations to individuals, including representatives of the Marine Mammal Commission, to serve as members of the Hawaiian Monk Seal Recovery Team. The Service also established terms of reference which call upon the Team to assist the Service in identifying priority research and management actions, reviewing the status of the species and recovery actions, identifying necessary changes in the Recovery Plan, and providing technical assistance on matters such as scientific research and section 7 consultation. The first meeting of the Recovery Team was tentatively scheduled for 27-29 October 1987. However, it was subsequently cancelled due to funding constraints.

In view of the need to review and update the Recovery Plan, the Commission, in consultation with its Committee of Scientific Advisors, convened a Hawaiian monk seal program review during the course of its Annual Meeting in Miami on 10-12 December 1987. Representatives of the National Marine Fisheries Service as well as members of the Commission and its Committee of Scientific Advisors attended the review.

With respect to research, the participants reviewed and provided comments on plans to: monitor components of the monk seal population, particularly pups and females; conduct further depth-of-dive studies to better assess habitat use patterns; analyze data on trends in population parameters; use captive animals and field experiments to evaluate possible ways to reduce or control aberrant male reproductive behavior which has caused the death of several female seals at Laysan Island; and evaluate permit requirements for future research activities.

With respect to management, participants considered and provided comments on plans for: continuing the pup capture and release program to help rebuild the population at Kure Atoll; continuing the removal and rehabilitation of emaciated pups from French Frigate Shoals to increase their chances of survival; instituting a monk seal die-off response plan so as to be prepared to respond promptly in the event of a large scale die-off like that which occurred at Laysan Island in 1978; continuing to monitor and remove marine debris from beaches when it might entangle and kill monk seal pups; continuing consultations with the Coast Guard on ways to reduce disturbance of seals on Kure Atoll; consulting further with the Fish and Wildlife Service to ensure continued operation of the field station on Tern Island; designating critical habitat; convening the Hawaiian Monk Seal Recovery Team; and updating the Hawaiian Monk Seal Recovery Plan.

At the end of 1987, the Commission and its Committee of Scientific Advisors were considering the results of the program review to identify any additional measures that should be taken to ensure that planned research and management programs are properly oriented. In 1988, the Commission will continue to work with the National Marine Fisheries Service, the Fish and Wildlife Service, and such other organizations as may be appropriate to update and expedite implementation of the Hawaiian Monk Seal Recovery Plan.

## North Pacific Fur Seal (Callorhinus ursinus)

North Pacific fur seals occur seasonally in waters throughout the rim of the North Pacific Ocean. Most pupping and breeding occurs on Robben Island in the Okhotsk Sea, the Kuril Islands in the western North Pacific, the Commander Islands in the western Bering Sea, and the Pribilof Islands in the eastern Bering Sea. New pupping and breeding colonies established themselves on San Miguel Island off southern California in the late 1960s and early 1970s, and, more recently, on Bogoslof Island in the Aleutian chain.

Commercial exploitation of the North Pacific fur seal dates back to the 1700s when the species' pupping and breeding

sites were first discovered. Prior to the purchase of Alaska from Russia in 1867, the harvest of fur seals on the breeding islands was conducted and regulated by companies chartered by the Russian czar. Excessive harvesting prior to 1805 caused a substantial population decline and the harvest was halted in 1806-1807 to allow the population to rebuild. In subsequent years, quotas and other measures to protect the breeding stock were implemented. In 1847, the harvest of females was prohibited. This ban lasted until 1956 when an experimental harvest of female fur seals was begun on the Pribilof Islands.

In 1870, following its purchase of Alaska, the United States granted a U.S. company, the Alaska Commercial Company, exclusive sealing rights on the Pribilofs. About the same time, nationals from several countries began a pelagic harvest of fur seals on a commercial scale. Harvesting was carried out both on land and at sea until 1911, when pelagic harvesting was prohibited under terms of the Fur Seal Treaty. During the preceding four decades, the pelagic take, which included both sexes and all age classes, equaled or exceeded the on-land take and this resulted in a substantial population decline.

The prohibition on pelagic sealing instituted by the Fur Seal Treaty of 1911, combined with careful regulation of the on-land harvest, resulted in rapid growth and recovery of the North Pacific fur seal herd in the early 1900s. Japan believed that the increased fur seal herd was adversely affecting its fisheries and, in 1926 and again in 1936, it proposed modifying the 1911 Treaty to permit resumption of pelagic sealing. In 1940, Japan notified the other members that it was withdrawing from the Treaty and, in 1941, the Treaty expired.

From 1941 to 1957, fur seal harvests on the Pribilof Islands were governed by a provisional agreement between the United States and Canada. In 1957, the Governments of Canada, Japan, the Soviet Union, and the United States concluded an Interim Convention on Conservation of North Pacific Fur Seals. The purposes of the Convention were to determine and bring North Pacific fur seal herd to the level that would provide the greatest annual yield. The agreement prohibited pelagic sealing, established a Commission to formulate and coordinate research programs and other actions necessary to achieve Convention objectives, and provided that Canada and Japan would each receive 15 percent of the seal skins taken by the Soviet Union and the United States on islands under their jurisdiction.

The effective period of the Interim Convention was extended by a series of Protocols adopted in 1963, 1969, 1976, and 1981. In October 1984, representatives of the four countries signed a Protocol to extend the Convention through October 1988. The Governments of Canada, Japan, and the Soviet Union

subsequently ratified the Protocol; however, the United States did not and the Convention therefore expired. (Additional information on exploitation and efforts to conserve the North Pacific fur seal can be found in Scheffer, V.B., C.H. Fiscus, and E.I. Todd. 1967. History of Scientific Study and Management of the Alaskan Fur Seal (Callorhinus ursinus), 1786-1964; and in the Department of Commerce's Final Environmental Impact Statement on the Interim Convention on Conservation of North Pacific Fur Seals, February 1985.)

Population Status

Before commercial exploitation began in the 1700s, the Pribilof Islands fur seal population is estimated to have numbered between 2 and 2.5 million animals, of which 1.6-2.0 million animals (about 80 percent) were on St. Paul Island. By 1912, combined pelagic and on-land harvesting had reduced the Pribilof Islands population to about 300,000 animals. Under protection provided by the Fur Seal Treaty of 1911, the population recovered and, by the early 1950s, probably was at or near its pre-exploitation level. In the late 1950s, it was concluded, on theoretical grounds, that the population was too large to produce the maximum yield of skins. Therefore, from 1956 through 1962, a number of females, as well as males, were harvested to reduce the population and increase pupping rates. Between 1963 and 1968, an effort was made to stabilize the population by harvesting only females believed to be in excess of the number needed to maintain a stable population.

As a result of the female harvest, the St. Paul Island fur seal population decreased from about 1.8 million in the early 1950s to about 930,000 in 1970. The commercial harvest of females was halted in 1968 and by 1975 the St. Paul Island population had increased to about 1.1 million. However, the population subsequently declined and by 1979 numbered about 990,000 animals. The breeding colonies on St. George Island also declined during this period even though commercial harvesting there was stopped in 1973 in an experimental effort to assess the effects of harvesting on population growth and age/sex structure. The Pribilof population continued to decline through at least the mid-1980s and, at present, the combined St. Paul and St. George Islands populations are estimated at 800,000 animals.

The Pribilof Islands fur seal population is currently about 40 percent of the estimated population size prior to exploitation and after recovery in the early 1950s, and the decline may be continuing. Thus, in 1984, 1985, and 1986, the Marine Mammal Commission recommended that the National Marine Fisheries Service formally designate the Pribilof Islands stock of North Pacific fur seals as depleted under the Marine Mammal Protection Act (see the Commission's previous

reports for details of these recommendations). No action was taken on these recommendations until 30 December 1986 when the Service published and requested comments on a proposed rule designating the Pribilof Islands fur seal population as depleted under the Marine Mammal Protection Act. A public meeting was held in Anchorage, Alaska, on 21 January 1987 to obtain comments on the proposal. The comment period, initially scheduled to end on 6 February, was subsequently extended to 30 March 1987 to accommodate rural Alaskans.

The Commission reviewed and, by letter of 6 March 1987, provided comments on the proposed rulemaking to the National Marine Fisheries Service. The Commission concurred with the Service's determinations that: the population was below 50 percent of its observed level in the 1940s and early 1950s; there is no evidence suggesting that the North Pacific ecosystem cannot still support a fur seal population as high as that observed in the 1940s and 1950s; and the Pribilof Islands fur seal population consequently is below its maximum net productivity level, which is the lower limit of its optimum sustainable population range. In its comments, the Commission noted that, while the population had declined, the average body sizes of both male and female fur seals had increased and the length of time fur seals spend at sea feeding had decreased, suggesting that the population was not being limited by decreased food supplies.

On 4 August 1987, the Service requested comments from the Commission and others on a draft final rule designating the Pribilof Islands fur seal population as depleted under the Marine Mammal Protection Act. On 1 September 1987, the National Marine Fisheries Service received a petition from the St. Paul Aleut community and the Pribilof Aleut Sealing Commission requesting reconsideration of the proposed rulemaking. The Service determined that no useful purpose would be served by delaying the depletion designation and, on 28 September 1987, it denied the Aleuts' request.

During consideration of the draft final rule, the Service's Northwest and Alaska Fisheries Center questioned the Service's determination that the fur seal carrying capacity of the Bering Sea and North Pacific Ocean had not changed significantly since the peak in population size in the early 1950s. In response to the Center's questions, the Service, on 31 December 1987, suspended action on the proposed rulemaking and reopened the comment period on the proposed rule. In anticipation of this action, the Humane Society of the United States filed suit in the U.S. District Court for the District of Columbia on 17 December 1987, claiming that any further delay in designating the Pribilof Islands fur seal population as depleted was unjustified and contrary to provisions of the Marine Mammal Protection Act. At the end of 1987, the National Marine

Fisheries Service had not responded to the Humane Society's complaint.

Early in 1988, the Commission will review the questions raised by the Northwest and Alaska Fisheries Center and provide comments and recommendations as appropriate to the Assistant Administrator for Fisheries.

Development and Implementation of a Long-Range Conservation Plan

The cause or causes of the fur seal population decline since the mid-1970s has not been determined. Mortality due to entanglement in lost and discarded fishing gear is no doubt a contributing factor and may be the primary cause of the decline (see Chapter VI for a thorough discussion of issues regarding entanglement). Other possibilities include: incidental take during fishing operations; over-fishing of pollock or other species important in the fur seals' diet; past and ongoing fur seal harvest practices; disease; environmental pollution in one or more parts of the fur seals' range; predation; and natural variation or long-term changes in the marine ecosystem of which fur seals are a part.

Because of the continuing fur seal population decline and uncertainties concerning the cause or causes of that decline, the Commission recommended in November 1985 that the National Marine Fisheries Service: promptly convene a North Pacific Fur Seal Research Program review and schedule subsequent reviews annually until such time as the population decline has been reversed; constitute a group of experts to write and help implement a fur seal conservation plan similar in scope and format to an endangered species recovery plan; and seek the cooperation of other countries in efforts to implement the conservation plan. In December 1985, the Commission provided the Service a draft outline of a conservation plan for the Pribilof Islands fur seal population.

In its 21 February 1986 response to the Commission's recommendations, the National Marine Fisheries Service questioned the need to convene a fur seal research program review before February 1987 and noted that the need for a long-term research plan would be addressed at a meeting of the former parties to the Interim Fur Seal Convention, proposed to be held in Ottawa, Canada, in April 1986. The Service indicated that the draft outline of the Pribilof Islands Fur Seal Conservation Plan provided by the Commission would be used to form the basis of the U.S. contribution to plan development. The meeting in Ottawa was cancelled, but subsequently was rescheduled and held in Washington, D.C. in September 1987 (see discussion below).

A number of uncertainties concerning the National Marine Fisheries Service's North Pacific Fur Seal Research Program were raised during the review of permit applications submitted by the National Marine Mammal Laboratory in 1986. As noted in the Commission's previous Annual Report, a brief review of ongoing and planned activities related to the conservation of the Pribilof Islands fur seal population was held during the Commission's 28-30 October 1986 meeting in Anchorage, Alaska. In preparation for that review, the Service provided a draft research plan containing sections on research needs, priorities, and plans for studies that were to have been conducted in Fiscal Year 1986. It noted that the draft plan constituted a first draft of the Fur Seal Conservation Plan recommended by the Commission and that the National Marine Mammal Laboratory was planning to hold a fur seal research program review in February 1987.

Information provided by the Service during the Commission's October 1986 meeting in Anchorage did not resolve all of the Commission's concerns. The Commission was advised, for example, that the program review, initially scheduled to be held in February 1987, had been delayed until March 1987 and that the Service had not yet constituted a group of experts to facilitate development of a long-range conservation plan. The Commission therefore wrote to the Service on 23 December 1986, recommending (a) that the planned program review be held as soon as possible so that the results could be used in planning the 1987 research program and (b) that a working group be constituted and convened to prepare and oversee implementation of the long-range conservation plan as recommended by the Commission in 1985.

Commission representatives participated in the fur seal program review at the Northwest and Alaska Fisheries Center, Seattle, Washington, on 10-11 March 1987. During the review, participants were given copies of the Service's "Draft Fur Seal Research Plans: Needs, Alternatives and Priorities with a List of Proposed Studies for FY 1987." The Commission, in consultation with its Committee of Scientific Advisors, subsequently reviewed the draft research plan and other information presented during the program review and, on 27 April 1987, provided comments and recommendations to the Service.

In its letter, the Commission again called attention to the need for a long-range conservation plan and expressed its belief that highest priority should be devoted to assessing and monitoring population status and to identifying the cause or causes of the continuing fur seal population decline. With respect to population monitoring, the Commission recommended that efforts be continued or initiated to: (a) better estimate the number of pups born each year on the Pribilof Islands; (b) tag a large cohort of pups each year for the next three to five years to develop better data on age-specific

mortality and reproduction; (c) complete analysis of existing population data; and (d) develop a fur seal population model to assist in evaluating trend data and identifying critical information needs.

With respect to documenting the cause or causes of the population decline, the Commission recommended that the Service: (a) conduct a pilot study to evaluate possible methods for testing the hypothesis that fur seals, particularly pups and juveniles, are attracted to and become entangled in large fragments of net debris at sea; (b) contract with an appropriate individual or organization, or convene a workshop, to assess the technological and economic feasibility of using existing or developing new tagging and tracking technology to determine when, where, and how fur seals, particularly pups, die at sea; (c) expand observer and other monitoring programs to better determine the number of fur seals being taken incidentally in the North Pacific Ocean high sea squid fishery; and (d) review existing information and conduct additional studies as necessary to determine whether hook worm or emaciation syndrome may be causing or contributing to the population decline.

Following consideration of the Commission's comments and recommendations and those of a panel of experts constituted to facilitate the program review, the Service revised its 1987 research plans. In April 1987, the Service's National Marine Mammal Laboratory applied for a permit to conduct a broad range of fur seal research over the next five years. The Commission reviewed the application and, by letter of 18 June 1987, recommended authorizing tagging and observation studies to better document trends in population size and productivity. The Commission questioned the rationale of several proposed studies to assess the effects of entanglement in small net fragments and recommended that authorization for these studies be denied. The Commission further noted that the Laboratory was requesting authorization for a number of research activities not included in the accompanying project descriptions. It recommended that authorization of these activities, to be conducted in the latter four years of the permit period, be deferred pending development and review of a comprehensive fur seal conservation plan.

By letter of 22 June 1987, the Service advised the Commission that, in recognition of the Commission's position on evaluating the role of entanglement in the northern fur seal population decline, the Service had revised its approach and that $55,000 from the Service's Marine Entanglement Research Program (see Chapter VI) had been provided to the National Marine Mammal Laboratory to: (1) organize and hold a workshop to better determine and agree on research necessary to document the role of entanglement in the fur seal population decline; (2) develop and use a population model to assist in assessing

the effects of entanglement on northern fur seals; and (3) conduct a pilot study to evaluate the Service's capability for deploying, tracking, and recovering large fragments of trawl web as a means for assessing the nature and extent of fur seal entanglement in such debris. By letter of 1 July 1987, the Service further advised the Commission that it proposed to hold a workshop to assess entanglement-related research needs in 1987 and to defer the technology workshop recommended by the Commission until results of the fur seal entanglement workshop were available. In its letter, the Service also noted that it had been successful in arranging for cooperative squid drift net fishery research with Japan and the Republic of Korea, and that a preliminary draft conservation plan for fur seals was being developed and would be forwarded to the Commission for review and comment in the near future.

As noted in Chapter VI, commitment of funds from the Marine Entanglement Program requires Commission concurrence. By letter of 7 July 1987, the Commission advised the Service that it concurred conceptually with the proposed expenditure of $55,000 to support the workshop, modeling study, and pilot study described in the research plan forwarded with the Service's letter of 22 June 1987. The Commission recommended support of the workshop and modeling study with the understanding that: (1) a tentative workshop agenda, a list of prospective workshop participants, and a tentative list of documents to be distributed in advance of the workshop would be provided to the Commission for review and concurrence before funds were committed; and (2) the Commission would be given an opportunity to comment on a draft request for proposals for the modeling study and to review and comment on proposals submitted in response to the request. The Commission questioned the rationale for and the lack of detail in the plan for the proposed pilot study and recommended that funding of that project be deferred pending submission and approval of a proposal containing a detailed description of the proposed research protocol, the underlying rationale for it, and a detailed budget justification.

On 31 August 1987, the Service sent the Commission its Preliminary Draft Conservation Plan for Pribilof Islands Fur Seals for review and comment. This draft plan was used in developing U.S. positions and initiatives for discussion of fur seal research needs during informal consultations with the former parties to the Interim Fur Seal Convention, held on 22-23 September 1987 (see below). The draft plan was reviewed by the Commission, in consultation with its Committee of Scientific Advisors, during the Commission's Annual Meeting in Miami, Florida, on 10-12 December 1987. At the end of the year, the Service was revising the draft plan to take account of comments provided by scientists and program administrators

within the Service, and anticipated making a revised draft available for public review early in 1988.

The Entanglement Workshop

By letter of 16 October 1987, the National Marine Mammal Laboratory sent the Commission a draft agenda and related material for the Northern Fur Seal Entanglement Workshop, which was scheduled to be held at the Northwest and Alaska Fisheries Center on 17-19 November 1987. The letter advised the Commission that, because of timing problems, funds for the workshop had been committed without first obtaining Commission concurrence as specified in the Commission's letter of 7 July 1987. On 5 November 1987, the Commission received a formal announcement of the workshop from the organization contracted by the Service to make the workshop arrangements.

From the information provided, it was not clear that the workshop had been structured so as to most effectively identify and address key issues or that the persons able to attend the workshop on such short notice would have the range of expertise necessary to address the issues. Because of these uncertainties, the Commission, by letter of 9 November 1987, recommended that the workshop be postponed until the latter part of February 1988 so as to provide time for consultations with the Commission and others.

The Service concurred with the Commission's recommendation that the workshop be postponed and rescheduled it for 28-30 January 1988. By letter of 25 November 1987, the Service sent the Commission a revised workshop agenda and related materials for review and comment. The Commission, in consultation with its Committee of Scientific Advisors, reviewed these documents during its meeting in Miami, Florida, on 10-12 December 1987 and, by letter of 29 December 1987, forwarded its preliminary comments on the revised workshop plans.

The Commission will work with the Service in early 1988 to finalize plans for the workshop.

The 1987 Subsistence Harvest

As noted earlier, the Interim Convention on Conservation of North Pacific Fur Seals expired in October 1984. In the absence of an international agreement binding upon the United States, management authority for fur seals on the Pribilof Islands is derived exclusively from domestic laws, including the Marine Mammal Protection Act and the Fur Seal Act of 1966. Under these laws, the taking of fur seals for commercial purposes is prohibited. A take by Alaska Natives for subsistence purposes, however, is authorized under certain conditions. Under the authority of these two laws, the National Marine

Fisheries Service published emergency interim regulations on 8 July 1985 to govern the 1985 subsistence take of fur seals by Aleut residents of the Pribilof Islands.

Permanent subsistence harvest regulations were issued by the Service on 9 July 1986. The regulations set a subsistence harvest season from 30 June to 8 August of each year. The closing date was established to minimize the risk of taking females. After early August there is an influx of sub-adult female seals and a breakdown of the rookery structure. The regulations also provide for extension of the harvest period to as late as 30 September if the Service determines that subsistence needs have not been met by 8 August. If the harvest is extended, however, there are special provisions to limit the number of female seals that may accidentally be taken. In addition, the regulations require that the Service make a determination of the expected maximum and minimum number of seals needed for subsistence purposes on both St. Paul and St. George Islands prior to the start of the harvest each year. If the lower limit of the projected harvest range is reached during any year, the regulations require that the harvest be suspended pending a determination by the Service that additional seals are required to meet subsistence needs. The harvest may also be terminated before the lower estimate is reached if it is determined that the residents' subsistence needs have been met.

For 1987, the Service estimated that 1,600 to 3,000 fur seals were needed for subsistence on St. Paul and that 530 to 1,000 seals were required on St. George. These estimates were somewhat lower than those for 1986 and were based, in part, on the 1986 take. The harvest on St. Paul Island was suspended on 7 August 1987 after 1,600 seals (the lower bound of the estimated subsistence need) were taken. On 7 August, St. Paul residents, through their Native corporation, requested an extension of the harvest through 30 September to take an unspecified number of additional seals. A public meeting was held on 17 August to discuss the extension and subsequently the Natives agreed to limit their request to two additional harvest days and 300 additional seals. The Commission, by letter of 27 August 1987, supported the extension, but recommended that it be limited to 211 seals, the additional number needed to meet subsistence requirements as indicated by a survey of the Natives at the close of the season. Based on experience from the 1986 extension when 12 female seals were taken accidentally on one day, the Commission questioned the ability of anyone, including the Pribilof Natives, to distinguish between sub-adult male and female seals under harvest conditions. The Commission recommended that the harvest be monitored closely to ensure that the unauthorized take of females that occurred during the 1986 extended harvest was not repeated.

On 28 August, the Service determined that subsistence needs of the St. Paul Natives had not been satisfied and authorized a two-day extension of the harvest season to allow 211 seals to be taken. Seals were harvested on 2 September and only 110 additional seals were taken before the limit of five female seals was reached and the harvest was terminated. Because of the high female take during the 1986 and 1987 extensions of the harvest, the Service has indicated that it will review the advisability of allowing seals to be taken after the first week of August and will consider deleting the extension provisions from its regulations.

In 1986, a few St. Paul residents collected small numbers of seal pelts during the subsistence harvest and indicated that they intended to use them in the creation of Native handicrafts. In contrast, during 1987, the St. Paul Native corporation processed pelts from 1,600 of the 1,710 seals taken. The skins will be held pending resolution of the Natives' view that the Marine Mammal Protection Act should be amended to allow for the commercial sale of such subsistence by-products.

Seals were harvested on St. George Island on only two days during the 1987 season. A total of 92 seals were taken.

International Cooperation

North Pacific fur seals occur not only in U.S. waters but also seasonally in international waters and waters under the jurisdiction of other countries. Thus, conservation of the North Pacific fur seal and the ecosystem of which it is a part requires multinational cooperation.

As noted earlier, between 1957 and 1984, northern fur seals were managed according to the terms of the Interim Convention on Conservation of North Pacific Fur Seals. This expired at the end of 1984 when the United States failed to ratify the protocol to extend the Convention until 1988. As noted in the Commission's previous Annual Report, the Government of Canada subsequently cancelled a meeting of parties that was to have been held in Ottawa in April 1986 to discuss the future role of the Interim Convention and related issues.

Recognizing the importance of international cooperation to protect and permit recovery of the Pribilof Islands fur seal population, and the difficulty of securing that cooperation in the absence of an international agreement, the National Marine Fisheries Service and the Department of State invited representatives of the former parties to the Interim Convention to an informal meeting in Washington, D.C., to explore the possibility of a new agreement. The meeting, initially proposed

to be held in May 1987, was held in Washington, D.C., on 22-23 September 1987.

The National Marine Fisheries Service convened a meeting of State, Federal, Native, and public interest group representatives on 7 May 1987 to discuss what it hoped to accomplish at the meeting. Commission representatives attended the meeting and, on 22 May 1987, the Commission wrote to the Service, expressing its support for the proposed meeting even if only one or two of the other former parties to the Interim Convention agreed to participate. In its letter, the Commission noted that a conservation plan, as described earlier, would provide a structured, rational context within which to discuss cooperative international efforts to address fur seal conservation and management issues. It therefore recommended that a draft conservation plan be developed and distributed to all appropriate governmental and non-governmental groups for review and that it be used in developing U.S. positions for the forthcoming multilateral meetings. The Commission also pointed out that any international fur seal agreement involving the United States must be consistent with the purposes, policies, and requirements of the Marine Mammal Protection Act.

Several of the former Convention parties did not accept the U.S. invitation to meet in May 1987. However, all parties did accept a subsequent invitation to meet on 22-23 September. To facilitate preparations for the meeting, the National Marine Fisheries Service prepared and, by letter of 19 August 1987, sent the Commission a draft discussion paper outlining proposed U.S. positions on issues expected to be addressed at the meeting. The discussion paper subsequently was revised to take account of comments provided by the Commission and others and was provided to the representatives of the other parties during the September meeting.

The purposes of the September meeting were to re-establish the international dialogue on fur seal issues, explain why the United States did not ratify the 1984 protocol to extend the Interim Convention, and explore the possibility of a new agreement. During the meeting, the need for cooperative efforts to conserve North Pacific fur seals was generally recognized. However, there were differing views as to the need for a new agreement, what should be included in it, and what form it might take. The Canadian delegation indicated that Canada could support a new agreement if its provisions were substantially equivalent to those of the Interim Convention, including provision for a commercial harvest. The delegation noted that, if the primary objective was to coordinate fur seal research, a formal agreement may be unnecessary. The Canadian delegation questioned the quality of the data that had been used by the United States to conclude that the Pribilof Islands fur seal population was depleted under the Marine

Mammal Protection Act, particularly the accuracy of population estimates from the 1940s and 1950s.

The Japanese delegation expressed preference for continuing the Interim Convention concluded in 1957 and questioned the rationale for the United States' failure to ratify the 1984 Protocol to extend the Convention. The Japanese delegation noted that the United States was permitting a subsistence harvest by Alaska Natives even though the Pribilof Islands fur seal population was in the process of being declared depleted and that such a designation would prohibit the incidental take of fur seals in fisheries, which would have no more effect on the population than the Native subsistence take. The delegation also noted that analysis of pelagic survey data collected by Japanese scientists indicated that the Pribilof fur seal population was larger than U.S. scientists estimated.

The Soviet delegation supported negotiation of a new agreement and adoption of temporary management measures pending negotiation of the agreement. The delegation suggested formation of an ad hoc working group to expedite identification and implementation of needed research and conservation measures. The Soviet delegation also provided information indicating that the Robben Island fur seal population had declined substantially since 1984, due apparently to a substantial decline in recruitment to the breeding population, as appears to be happening in the Pribilofs.

Although there were differing views as to the type of agreement needed, the need for multinational efforts to protect and conserve North Pacific fur seals and their habitat was generally recognized. The United States therefore proposed to recommend initiation of formal talks to negotiate a new international agreement on fur seal research and conservation.

The Marine Mammal Commission supports the view that multinational efforts are necessary to effectively protect and conserve fur seals and the ecosystem of which they are a part. The Commission also believes, as noted earlier, that a comprehensive conservation plan should be developed by the National Marine Fisheries Service, and that the Plan should be used as the basis for determining provisions that should be included in a new international fur seal agreement. In 1988, the Commission will continue to work with the National Marine Fisheries Service, the Department of State, and others to identify and negotiate an appropriate agreement.

## Northern Sea Lion (Eumetopias jubatus)

Northern or Steller sea lions occur in coastal areas throughout the rim of the North Pacific Ocean from northern Hokkaido, Japan, through the Kuril Islands and Okhotsk Sea, the Aleutian Islands and central Bering Sea, the southern coast of Alaska, and the coasts of British Columbia, Washington, and Oregon, south to the California Channel Islands. Numbers are greatest and the largest pupping colonies occur in the Gulf of Alaska and the Aleutian Islands.

Available information indicates that northern sea lion populations have been declining since the late 1970s in the Kuril, Commander, Aleutian, and Pribilof Islands, in Bristol Bay and the central and western Gulf of Alaska, and in California. The cause or causes of the decline have not been documented. On 9-10 December 1986, the National Marine Mammal Laboratory convened a workshop to review available information and identify research necessary to determine the cause and to better document the nature and extent of the decline.

The workshop report, published in March 1987, indicates that the number of adult and juvenile northern sea lions on haul-out sites in the central Gulf of Alaska through the central Aleutian Islands declined 52 percent, from 140,000 animals in 1956-1960 to about 68,000 animals in 1985. The greatest declines have been in the eastern Aleutian Islands, where estimated numbers in 1985 were 79 percent less than in 1956-1960. The workshop concluded that the decline was continuing and likely was due to reduction in juvenile and adult female survival rates. The workshop also noted that declines in northern fur seals, harbor seals, and fish-eating birds apparently have occurred in the Gulf of Alaska and the Bering Sea in recent years as well.

Possible causes of the observed sea lion decline include: incidental take in fisheries; deliberate shooting by fishermen; reduction of important sea lion prey species due to fishery development; entanglement in lost and discarded fishing gear and other marine debris; disease; environmental pollution; and natural changes in the marine ecosystem of which northern sea lions are a part. The workshop concluded that available information was insufficient to assess reliably the likely significance of any of the possible causes and recommended that steps be taken to: obtain more reliable information on the numbers of sea lions, by age and sex, being killed incidentally and deliberately during domestic and foreign fishing operations offshore Alaska; complete the analysis of data from disease studies conducted in 1985-1986 and initiate additional studies as may be needed; salvage and do necropsies on animals found dead on beaches in selected rookery areas (e.g., Marmot Island, Alaska) to determine the nature, extent,

and causes of on-land mortality; assess possible methods for better determining and monitoring survival and pregnancy rates; and continue periodic surveys of selected rookeries to monitor distribution, abundance, and vital population parameters.

Given the workshop findings, the National Marine Fisheries Service announced in the Federal Register on 24 April 1987 that it was undertaking a status review to determine whether the northern sea lion should be designated as depleted under the Marine Mammal Protection Act and/or endangered or threatened under the Endangered Species Act. The results of the review, expected to be completed by 30 October 1987, were not available at the end of 1987.

Based on the information above, it seems likely that the status review will indicate that one or more local or regional populations of northern sea lions should be designated as depleted under the Marine Mammal Protection Act and possibly as threatened or endangered under the Endangered Species Act. The Commission, in consultation with its Committee of Scientific Advisors, will consider the status review when it is available and will provide comments and recommendations to the National Marine Fisheries Service as appropriate.

## The California Sea Otter Population (Enhydra lutris)

Commercial hunting of sea otters for fur began in the mid-1700s and continued intermittently until 1911 when the species was protected by the North Pacific Fur Seal Treaty, signed by the United States, Great Britain, Russia, and Japan. Prior to commercial exploitation, sea otters inhabited the coastal waters of the North Pacific Ocean, south along the west coast of North America to central Baja California and, in the eastern Pacific, as far south as the islands of northern Japan. By 1911, sea otters were extinct throughout most of their historic range.

Small groups of sea otters survived in remote areas in Russia, Alaska, and central California. The remnant population in California occupied a few miles of the rocky Point Sur coast and may have numbered fewer than 50 animals in 1911. Under the protection of the Fur Seal Treaty and subsequent State of California protection measures, the population grew slowly and, by the mid-1970s, occupied about 160 miles of habitat along the central California coast. The population was estimated at fewer than 1,800 animals. At the same time, the risk of oil spills in and near the California sea otter range was increasing as a result of increased tanker traffic, due primarily to transport of oil from the recently completed Alaska pipeline.

Because of its small size and limited distribution, and the increasing risk of oil spills and other catastrophic events, the California sea otter population was designated as threatened under the Endangered Species Act in January 1977. The most effective way to insure that the population is not threatened by oil spills is to establish one or more sea otter colonies outside the population's present range. However, such an action could adversely affect commercial and recreational fisheries for abalone, clams, and other invertebrates eaten by sea otters. It also could reduce populations of sea urchins and other species that consume kelp, and thus benefit the kelp industry and both recreational and commercial fisheries for finfish that inhabit kelp beds.

The Commission recognized the need to minimize possible adverse effects on commercial and recreational fisheries as well as to protect the California sea otter population. Accordingly, in December 1980, it recommended that the Fish and Wildlife Service adopt and implement a management strategy recognizing the ultimate need for "zonal" management of sea otters and the need to establish one or more sea otter colonies at a site or sites not likely to be affected by an oil spill in or near the population's current range. The Fish and Wildlife Service concurred with the Commission's recommendation and incorporated the zonal management concept into the Southern Sea Otter Recovery Plan, adopted in February 1982.

Past Commission efforts to help with development and implementation of an effective Southern Sea Otter Recovery Plan are described in previous Annual Reports. The Commission's activities in this regard in 1987 are summarized below.

Incidental Take

When the California sea otter population was listed as threatened in January 1977, it was assumed that the population was increasing and would continue to increase at about five percent per year for the foreseeable future. However, as noted in previous Commission reports, subsequent studies indicated that substantial numbers of sea otters were being caught and killed incidentally in coastal gill and trammel net fisheries and that this incidental take may have been sufficient to stop and reverse the population increase. From June 1982 to January 1985, 29 sea otters were observed drowned or were otherwise known to have drowned in commercial fishing nets. Only a small fraction of fishing nets set in or near the sea otter range were observed, and in a report issued in 1984, the California Department of Fish and Game estimated that an average of 105 otters were caught and killed in fishing nets each year between 1973 and 1983. Estimates of the fishing effort and sea otter mortality are shown in the following table, prepared by the California Department of Fish and Game.

Estimated Mortality of Sea Otters Taken Incidental to California Gill and Trammel Net Fisheries

| Year | Number of Landings | Estimated Mortality |
|---|---|---|
| 1973 | 457 | 49 |
| 1974 | 645 | 69 |
| 1975 | [no data] | 69 |
| 1976 | 980 | 105 |
| 1977 | 663 | 71 |
| 1978 | 874 | 93 |
| 1979 | 1,449 | 154 |
| 1980 | 1,407 | 150 |
| 1981 | 1,578 | 168 |
| 1982 | 1,057 | 113 |
| 1983 | 696 | 74 |

Thousands of sea birds and non-target fish species, as well as sea otters and other marine mammals, are caught in gill and trammel nets. The State of California recognized problems being caused by this indiscriminate bycatch and, in 1982, prohibited the use of gill and trammel nets in waters less than 10 fathoms deep in Monterey Bay to reduce the incidental take of sea birds. In the spring of 1984, the closure was extended to 15 fathoms. To protect sea otters, in 1984, the California Department of Fish and Game also imposed a temporary emergency closure, prohibiting the use of entangling fishing nets with mesh larger than three inches in waters less than 15 fathoms deep from Monterey south to the Santa Maria River mouth. This closure was made permanent in May 1985 and was modified to apply to nets with mesh size of 3.5 inches or larger.

The closures did not eliminate the incidental take of sea otters and, in the fall of 1985, the California Department of Fish and Game promulgated an emergency regulation prohibiting the use of entangling nets in waters less than 20 fathoms deep along 17 miles of coastline between Cape San Martin and Piedras Blancas. In September 1986, the State of California enacted legislation extending the earlier 15-fathom closure to 20 fathoms in two areas -- the first from Pico Creek in San Luis Obispo County to Cape San Martin in Monterey County and the second from Pfeiffer Point to Point Sur in Monterey County.

Prohibitions on the use of entangling nets in waters commonly inhabited by sea otters have no doubt substantially reduced the incidental take of sea otters. Although it is too early to be certain, the results of sea otter surveys, as shown in the following table, suggest that the population may be beginning to increase.

Sea Otter Population Counts
by the Fish and Wildlife Service and
the California Department of Fish and Game 1982-1987

| | | Independent Otters | Pups | Total |
|---|---|---|---|---|
| 1982 | Spring | 1124 | 222 | 1346 |
| | Fall | 1194 | 144 | 1338 |
| 1983 | Spring | 1131 | 120 | 1251 |
| | Fall | 1062 | 164 | 1226 |
| 1984 | Spring | 1181 | 123 | 1304 |
| 1985 | Spring | 1124 | 236 | 1360 * |
| | Fall | 1066 | 155 | 1221 * |
| 1986 | Spring | 1345 | 225 | 1570 * |
| | Fall | 1088 | 113 | 1201 * |
| 1987 | Spring | 1430 | 220 | 1650 * |
| | Fall | 1263 | 104 | 1367 * |

* Surveys conducted since implementation of State bans on use of entanglement nets beginning in January 1985.

## Sea Otter Amendment to the Endangered Species Act and the Translocation Decision Process

To promote protection and recovery of the California sea otter population while minimizing adverse effects on commercial and recreational fisheries, the Commission, as noted earlier, recommended in December 1980 that the Fish and Wildlife Service adopt and implement a management strategy recognizing the ultimate need for "zonal" management of sea otters and the need to establish one or more sea otter colonies at a site or sites not likely to be affected by an oil spill in or near the population's current range. The Service concurred with the Commission's recommendation and, as described in previous Commission Reports, initiated a study in 1981 to identify and evaluate possible translocation sites in California, Oregon, and Washington. The project was completed in May 1984. In June 1984, the Service announced its intention to prepare an environmental impact statement on a proposal to translocate a portion of the California sea otter population to a site within the species' historic range off the Pacific coast of the United States.

As part of the preparation process, the Service held public meetings on 23 and 24 July 1984 in Santa Barbara and Monterey,

California, to obtain the views of the public on issues that should be considered in the environmental impact statement. In addition, the Service established an Interagency Project Review Team, as recommended by the Council on Environmental Quality, to assist in the scoping process and the preparation of the environmental impact statement. The review team included representatives of the California Department of Fish and Game, the Fish and Wildlife Service, the Marine Mammal Commission, the Minerals Management Service, and other interested Federal and state agencies. Meetings of the Review Team were open to the public and were attended by representatives of environmental groups, the oil and gas industry, and sport and commercial fishing organizations.

To further facilitate public input and provide for the development of a thorough and balanced decision-making document, the Service issued two preliminary Draft Environmental Impact Statements to the Interagency Project Review Team and interested parties for review and comment. The first was issued early in 1985 and, based upon the comments received, a revision was prepared and issued in February 1986.

Questions concerning the legal authority for and other aspects of the Fish and Wildlife Service's translocation proposal were raised and considered during Congressional hearings on reauthorization of the Endangered Species Act in the spring of 1985. In response, specific sea otter translocation provisions were included in H.R. 1027, the House of Representatives proposed legislation to reauthorize the Endangered Species Act. Other issues concerning reauthorization of the Act, however, could not be resolved and H.R. 1027 was not passed. Instead, at the end of 1985, Congress enacted legislation to provide for continuing appropriations to the Department of the Interior and other agencies responsible for implementing the Act. As part of this legislation, Congress required that the Fish and Wildlife Service move forward with its decision-making on the proposed sea otter translocation, notwithstanding the fact that the Endangered Species Act had not been reauthorized.

Complying with the Congressional directive, the Fish and Wildlife Service issued a Draft Environmental Impact Statement on 31 July 1986. This document identified translocation of sea otters to San Nicolas Island in the California Channel Islands as the preferred action. On 15 August 1986, the Service published proposed experimental population regulations in the Federal Register.

Still seeing a need to clarify the authority for the translocation, in October 1986, the House Committee on Merchant Marine and Fisheries incorporated the sea otter translocation amendment from the unpassed Endangered Species Act reauthori-

zation bill (section 5 of H.R. 1027) into H.R. 4531, the legislation extending the Wetlands Loan Act. This bill was passed by the House on 14 October and by the Senate on 18 October and was signed into law (P.L. 99-625) by the President on 7 November 1986. The sea otter translocation amendment serves as a free-standing provision, independent of the Endangered Species Act. Thus, its requirements would continue to apply even if the sea otter were to be delisted under the Act. The purpose of the amendment was to encourage the development and implementation of a plan to establish at least one sea otter colony outside the present sea otter range in California. It required, among other things, that the translocation plan specify a translocation zone that would meet the habitat needs of the translocated animals and provide a buffer against possible adverse activities that may occur outside that zone. It also requires that the area surrounding the translocation zone be designated a management zone from which sea otters are to be excluded by non-lethal means. The amendment provides that actions necessary to affect the translocation and management of sea otters under the plan shall not be considered violations of either the Endangered Species Act or the Marine Mammal Protection Act. It authorizes (1) establishment of a sea otter colony outside the existing California sea otter range, and (2) use of non-lethal means to protect fishery resources by prohibiting expansion of the mainland sea otter population south of Point Concepcion.

The Fish and Wildlife Service's proposal to translocate up to 250 sea otters to San Nicolas Island was designed to fulfill research as well as management objectives and therefore required a scientific research permit as provided for in the Marine Mammal Protection Act. It also constituted a major Federal action under the Coastal Zone Managment Act and required a determination of consistency with the California Coastal Management Plan. In addition, to satisfy conditions related to the Endangered Species Act, it required the concurrence of the California Fish and Game Commission and consultations within the Fish and Wildlife Service, pursuant to section 7 of the Act. Formal consultation pursuant to section 7 was initiated in December 1985. On 6 March 1987, the Director of the Service's Region 1 Office in Portland, Oregon, issued a Biological Opinion which concluded that the proposed translocation of sea otters to San Nicolas Island was not likely to jeopardize the continued existence of the California sea otter population. The Biological Opinion also recommended steps that should be taken to minimize the possible adverse effects of the translocation on the affected otters and to facilitate evaluation of possible alternative means for regulating the San Nicolas colony when it reaches carrying capacity.

In accordance with the provisions of the Coastal Zone Management Act and related regulations, the Fish and Wildlife

Service prepared and, on 17 March 1987, submitted a Coastal Zone Consistency Determination on the proposed translocation to the California Coastal Commission for its review and concurrence. The Service also sought authorization of the proposed translocation by the California Fish and Game Commission, which is responsible for approving state permits for taking of wildlife from state lands and waters. The Service issued its Final Environmental Impact Statement for the proposed translocation in May 1987.

By separate letters of 15 May 1987, the Marine Mammal Commission wrote to the California Coastal Commission and the California Fish and Game Commission providing the rationale for its support of the translocation as proposed by the Fish and Wildlife Service. In its letters, the Commission expressed its belief that the proposed translocation of sea otters to San Nicolas Island in conjunction with the establishment of a "no-otter zone" south of Point Concepcion was in the best interest of both the sea otter and the long-term management of California's other valuable coastal resources. The Commission pointed out that, if the plan were approved and implemented and the translocation were successful, the following positive results would be realized:

- the significance of the possible impacts of an oil spill on the California sea otter population would be reduced;
- much of the information necessary to make judgments concerning the optimum sustainable level of the California sea otter population, as required by the Marine Mammal Protection Act, would be obtained;
- progress would be made toward recovering and delisting the population under the Endangered Species Act and reaching the optimum sustainable population level under the Marine Mammal Protection Act;
- zonal management would be implemented so as to limit sea otter distribution in southern California to the immediate vicinity of San Nicolas Island, thereby providing much better protection to both sea otters and fisheries within their respective zones; and
- the effectiveness of possible non-lethal methods for controlling sea otter distribution would be evaluated.

The California Fish and Game Commission considered the translocation proposal at a special public meeting held in Sacramento, California, on 24 June 1987. During the meeting, it was questioned whether the Fish and Game Commission had complied with a California Environmental Quality Act regulation requiring at least 45 days advance notice of the Commission's intent to base its decision on the Federal Environmental Impact Statement. The Commission therefore scheduled another hearing on the proposal for 7 August 1987 and, on 18 August

1987, concurred with the proposed translocation. The California Coastal Commission considered the Fish and Wildlife Service's Coastal Zone Consistency Determination at a public hearing on 7 July 1987 and, following the hearing, voted to concur with the Service's determination.

In accordance with the California Fish and Game Commission determination on 18 August, the California Department of Fish and Game and the Fish and Wildlife Service concluded a Memorandum of Understanding concerning their respective roles in implementing the translocation. Among other things, the Memorandum specified that:

- the Fish and Wildlife Service would be responsible for providing funds and personnel necessary to implement, enforce, and carry out the translocation program;
- if verified sightings of sea otters were made at any location within the designated management zone ("no-otter zone"), the Fish and Wildlife Service would undertake recapture efforts, as soon as weather and sea conditions permit, and return those otters either to the mainland sea otter range or to the translocation zone;
- the Fish and Wildlife Service, in cooperation with the California Department of Fish and Game, would evaluate the safety, effectiveness, and cost of possible alternative techniques for limiting population growth, including but not limited to reduction of fecundity and, as part of a long-term management plan, the appropriateness of selective culling, recognizing that studies involving taking or that would jeopardize the continued existence of the California sea otter population could not involve the use of California sea otters;
- the California Department of Fish and Game would be responsible for designing and carrying out a research program, using funds provided by the Fish and Wildlife Service, to evaluate the feasibility of humane, non-lethal methods to experimentally maintain the southern boundary of the mainland sea otter range in an area between Point Arguello and Point Concepcion; and
- the California Department of Fish and Game would initiate and/or support State legislation to implement appropriate restrictions on the use of gill and trammel nets in the translocation zone.

The Memorandum also stipulated that it would not take effect unless and until the Federal Wildlife Permit Office issued a research permit authorizing the studies needed to evaluate the feasibility of non-lethal methods for establishing and maintaining the southern boundary of the mainland California sea otter population at Point Concepcion.

With regard to the preceding point, the California Department of Fish and Game, in consultation with the Fish and Wildlife Service, had prepared and, on 11 June 1987, submitted an application to the Federal Wildlife Permit Office for a permit to conduct a series of studies over a three-year period beginning in January 1988 to assess the feasibility of several non-lethal methods to experimentally prevent the establishment of sea otters south of Point Arguello. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the permit application and, by letter of 28 July 1987 to the Fish and Wildlife Service, recommended that the application be approved, provided certain conditions were met. The Service concurred with the Commission's recommendation and the permit was issued on 12 August 1987.

As noted earlier, the proposed translocation was designed to accomplish both research and management objectives and required a scientific research permit under the Marine Mammal Protection Act. The permit application was forwarded to the Commission for review on 10 April 1987. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the application and, by letter of 18 May 1987 to the Fish and Wildlife Service, recommended that the proposed translocation be authorized provided certain conditions were met. Among other things, the Commission recommended that authorization to continue activities during the second and subsequent years of the permit be subject to review and approval by the Service, in consultation with the Commission, of a report on the previous year's activities, including information on the number of animals translocated, a review of any problems encountered, and the results of any postmortem examinations done on animals that died as a result of the research. The Service concurred with the Commission's recommendations and a permit authorizing proposed translocation-related research was issued on 12 August 1987.

Following or pending the aforementioned decisions by the California Coastal Commission, the California Fish and Game Commission, and the Federal Wildlife Permit Office, the Fish and Wildlife Service issued a final rule and record of decision on 11 August 1987 regarding the translocation of sea otters to San Nicolas Island and the establishment of a sea otter management zone outside the translocation zone, including all coastal areas south of Point Concepcion. As described in the next section, efforts to capture and translocate sea otters were initiated on 24 August 1987.

On 28 August 1987, a group representing several fishing interests filed suit in California State Court seeking a temporary restraining order to stop the translocation from proceeding. The plaintiffs alleged that several State laws had been violated in issuing the State permit to the Fish and

Wildlife Service. The California Superior Court denied the request for a temporary restraining order, concluding that the action against the Fish and Wildlife Service should have been brought in Federal court. On 11 September, plaintiffs filed an amended complaint in the Federal District Court adding allegations of violations of the National Environmental Policy Act and P.L. 99-625. The Court denied the plaintiff's motion for a preliminary injunction on 29 September, ruling that the plaintiff was unlikely to succeed on the merits of its claims. Both the Federal and State defendants filed dispositive motions on 28 December 1987. California moved to have the claims against it dismissed on the basis of the Eleventh Amendment, which gives States immunity from suits in Federal court. Federal defendants filed a motion for summary judgment, seeking to have the case decided on the merits. A hearing on the matter is expected in March 1988.

In accordance with the Memorandum of Understanding signed by the Fish and Wildlife Service and the California Department of Fish and Game in August 1987, the State of California on 18 September 1987 enacted legislation prohibiting the use of entangling fishing nets in all waters less than 20 fathoms deep around San Nicolas Island and banning the discharge of firearms within the designated translocation zone.

Summary of 1987 Translocation Activities

Capture of sea otters for translocation to San Nicolas Island was initiated on 24 August 1987 in the southern third of the mainland California sea otter range (Point Buchon north to Lopes Point) by teams of biologists from the Fish and Wildlife Service and the California Department of Fish and Game. From 24 August to 30 October 1987 when capture operations were concluded, 108 sea otters (48 males and 60 females) were captured. Sixty-four of these were transported to the Monterey Bay Aquarium for examination, tagging, and holding pending transfer to San Nicolas Island or return to the original capture site. Three otters died while at the Aquarium and one was returned to its capture site. Sixty otters were transported to the island (13 males and 47 females) in eight groups. Three otters are known to have died soon after release at San Nicolas Island. Two more were found dead on the mainland (on 11 and 22 October) and three live animals, plus a newborn pup, were sighted in a kelp bed near the Los Angeles/Ventura County line on 8 December 1987. In addition, there have been reports that three otters were caught and killed, two in lobster pots and one in a gill net, in the Management Zone.

## Containment

Between 1 September and 18 December 1987, there were 16 reports of sea otters in the designated Management Zone. Half of the reports provided sufficient information to conclude that sea otters, not harbor seals or objects mistaken for sea otters, had actually been sighted. Three of the reported sightings subsequently were verified. In the first case, a single otter was seen off Port Hueneme on 9 October 1987. From the color of its tag, it seems likely that the otter was from the mainland population, not San Nicolas Island. The animal could not be found after the initial observation and there have been no further reports of otters in this area.

A second verified report was by California Department of Fish and Game biologists who sighted two sea otters on 18 November 1987, just south of the northern limit of the Management Zone at Point Concepcion. Subsequently, one otter was seen north of Point Concepcion. Plans to capture the otter south of Point Concepcion were postponed due to bad weather, and subsequent searches failed to locate an otter in that part of the Management Zone.

The third verification occurred on 9 December 1987, following up on a report by a local fisherman of two otters in a kelp bed near the Los Angeles/Ventura County line. Responding to the report, Fish and Wildlife Service biologists found three adult sea otters with tags confirming that they were from San Nicolas Island, and one recently born pup. The female and pup were captured by Department of Fish and Game and Fish and Wildlife Service researchers and returned to the mainland location where the female had originally been captured. A winter storm precluded further capture efforts in 1987 and, at the end of the year, the remaining two animals had not been caught and removed from the Management Zone.

The containment program is operational and is expected to be successful in preventing the establishment of resident groups of sea otters in the Management Zone. There may be a need, however, to develop more efficient means for reporting and verifying sightings and to develop criteria to help determine when efforts should be initiated to capture and remove otters found in the Management Zone.

The Fish and Wildlife Service is evaluating the results of the 1987 translocation and containment program and, by mid-1988, should modify the approved translocation plan as necessary to facilitate establishment and containment of sea otters in the San Nicolas Island translocation zone. The Commission, in consultation with its Committee of Scientific Advisors, will review any proposed modifications and provide comments and recommendations to the Service as appropriate.

## Humpback Whale (Megaptera novaeangliae)

Humpback whales, which are found in most of the world's oceans, have been severely reduced in number as a result of commercial whaling. Commercial exploitation of the species has been banned by the International Whaling Commission since 1966 and, in 1970, the species was designated as endangered under the U.S. Endangered Species Act. However, as noted in Chapter V of this Report, a small number of humpback whales are still taken in St. Vincent and the Grenadines for subsistence purposes. In this and other areas, the species' recovery is threatened by human activities such as commercial vessel traffic, recreational boating, offshore oil and gas development, commercial fisheries, and coastal development.

As discussed in previous Annual Reports, the Commission believes that recovery plans, as required under the Endangered Species Act, should be prepared for humpback whales and other endangered whales in U.S. waters. The Commission recommended to the National Marine Fisheries Service in late 1984 that this step be taken and, in March 1985, the Service advised the Commission that it had decided to defer preparation of recovery plans for great whales due, in part, to its uncertainty as to whether or how recovery plans would enhance protection of the species. By letter of 23 December 1986, the Commission again raised the matter and recommended that recovery plans be developed and implemented for populations of right, humpback, and bowhead whales in U.S. waters. Late in 1986, the Service informally advised the Commission that in 1987 it planned to proceed with preparation of recovery plans and designation of recovery teams for both humpback whales and right whales. On 15 July 1987, the Service invited scientists and resource managers with broad knowledge of humpback whales and associated management problems to serve as members of the humpback whale recovery team. By letter of 23 September 1987, the Service provided team members with the terms of reference for team activities and a schedule for developing a humpback whale Recovery Plan.

Among other things, the Recovery Team will be responsible for providing the Service with recommendations on research, recovery activities, and other actions necessary to assist in the humpback whale recovery effort. The Team will also review the status of the species and recovery efforts and advise the Service on technical and scientific matters, such as scientific research permits and consultations under section 7 of the Endangered Species Act. Staff members of the National Marine Fisheries Service have been given the responsibility for preparing a draft Recovery Plan. During its Annual Meeting on 10-12 December 1987, the Marine Mammal Commission was advised that a draft Plan was nearing completion; that it would address populations of humpback whales off both the east and west

coasts of the United States; and that it would be provided to the Recovery Team early in 1988 for review and comment.

A matter of general concern regarding humpback whales and certain other endangered whales in U.S. waters (e.g., right and gray whales) is disturbance by whale-watching boats and other vessels. The problem has been a matter of particular concern in Hawaiian waters as well as waters off southeast Alaska, New England, and California. As illustrated below, past efforts to address these problems have been made on a regional or local basis. As similar problems requiring similar solutions have arisen in different geographic areas, however, the National Marine Fisheries Service has begun to examine possible advantages and disadvantages of promulgating general regulations that would provide a more consistent approach to establishing and applying whale-watching standards. At the Commission's Annual Meeting in Miami on 10-12 December 1987, the Service advised the Commission that, during 1988, it expects to consider such an approach within the context of efforts to prepare a Recovery Plan for humpback whales.

Humpback Whales in Hawaii

The importance of Hawaii's coastal waters to humpback whales for calving, nursing, and breeding is well documented. In order to protect whales from deliberate or inadvertent harassment, the National Marine Fisheries Service published a "Notice of Interpretation of Harassment of Humpback Whales in Hawaiian Waters" in 1979. This notice provided guidelines for approaching whales and advised boat and aircraft operators of proper conduct when in the vicinity of humpback whales. In recent years, there has been a substantial increase in boat and aircraft traffic in Hawaiian waters and a corresponding increase in the number of reported incidents of aircraft and vessel operators violating the guidelines outlined in the Service's Notice of Interpretation. However, because guidelines do not have the legal force of regulations, the Service has had difficulty in prosecuting violators. To overcome this problem, the Service, on 24 November 1986, proposed formal regulations to replace the 1979 Notice of Interpretation. The proposed regulations would apply within 200 nautical miles of the Hawaiian Islands and would prohibit, except under permit: (a) operating an aircraft at altitudes lower than 1,000 feet above a humpback whale; (b) approaching by boat or other means closer than 100 yards from a whale; (c) causing a vessel or other object to approach closer than 100 yards of a whale; or (4) disrupting the normal behavior or activity of a whale by any other act or omission.

As discussed in its previous Report, the Commission, in consultation with its Committee of Scientific Advisors, reviewed and, by letter of 23 December 1986, provided comments on the

proposed regulations. In its letter, the Commission pointed out, among other things, that the proposed regulations would eliminate the special protection that had been afforded cow/calf pairs in the 1979 Notice of Interpretation. The Commission recommended that traditional calving/breeding areas be identified and designated as areas where vessel approaches closer than 300 yards are prohibited.

On 23 November 1987, the National Marine Fisheries Service issued an interim rule aimed at reducing disturbance of humpback whales by vessel and aircraft operations. The interim rule took effect on 23 December 1987. It prohibits aircraft from approaching closer than 1,000 feet and vessels or swimmers from approaching closer than 100 yards of humpback whales. As recommended by the Marine Mammal Commission, additional protection is provided in certain cow/calf areas by prohibiting vessels and swimmers from approaching closer than 300 yards. Because the latter restriction was not included in the regulations as proposed in November 1986, the Service provided an additional 60-day comment period on this provision of the interim regulations. The comment period is scheduled to expire on 22 January 1988. At that time, it is expected that the Service will incorporate the provision providing additional protection in cow/calf areas into the interim regulations and adopt them as final regulations.

Humpback Whales in Alaska

Glacier Bay and surrounding waters in southeast Alaska provide summer habitat for a portion of the North Pacific population of humpback whales. In the late 1970s, it became apparent that fewer whales were using the Bay than had done so previously, and it was believed that increased vessel traffic in the area could have been a contributing cause. In response, in 1979, the National Park Service initiated steps to restrict vessel traffic in the Bay during the period when whales are present.

As discussed in previous Annual Reports, the Commission assisted in efforts to assess the situation and identify appropriate research and management actions by, among other things, convening research reviews and planning meetings in October 1979 and December 1981. Both meetings were organized and held in consultation with the National Park Service and the National Marine Fisheries Service. In addition, the National Park Service initiated consultations with the National Marine Fisheries Service pursuant to section 7 of the Endangered Species Act to ensure that permitted vessel access into the Bay would not adversely jeopardize the humpback whale or its critical habitat.

Based on the results of the meetings and consultations, the National Park Service initiated a multiyear research program in 1980 to assess factors possibly affecting the distribution of humpback whales in Glacier Bay and surrounding waters. It also promulgated temporary regulations which, among other things, limited the number of large commercial tour ships and smaller recreational vessels which could enter the Bay to 1976 levels (i.e., the level of use during the year before the marked decline in whale numbers was observed in the Bay). The temporary regulations also established a mechanism for designating temporary "whale waters" in which certain vessel operating restrictions were to apply. In subsequent years, these regulations were modified and reissued annually until 1985, when the National Park Service published permanent regulations for the protection of humpback whales in the Glacier Bay National Park and Preserve. These regulations establish a permit system for vessel entries, prohibit the harvest of certain humpback whale prey species in the Bay, and provide for designating "whale waters."

Since the early 1980s, the National Park Service has gradually allowed more vessels to enter the Bay during the summer whale season. Its decisions in this regard were based on results of relevant research, periodic consultations with the National Marine Fisheries Service, and other relevant information. During this period, the use of the Bay by humpback whales has increased and, between June and September 1987, 33 individual humpback whales were identified in Glacier Bay. This is the largest recorded number since systematic surveys of the area began in the early 1970s. On 4 September, the Service announced plans to further increase allowable vessel entries by an additional seven percent in 1988. This level would represent a 20 percent increase over 1976 levels. Following a 30-day comment period, the Service's plans for increasing permitted vessel entries in 1988 were finalized.

Humpback Whales in New England

In late November 1987, humpback whales began dying and washing up on beaches of Cape Cod Bay. By the end of the year, at least 13 humpback whales, two minke whales, and a fin whale had died in the area. These mortalities were particularly alarming due to the endangered status of humpback and fin whales and the continuing die-off of bottlenose dolphins along the U.S. east coast (see Chapter III of this report). An investigation of the humpback die-off was initiated by the National Marine Fisheries Service, in consultation with the Commission. It was directed by a member of the Commission's Committee of Scientific Advisors and involved researchers from the New England Aquarium, the Service's Gloucester Laboratory, Woods Hole Oceanographic Institution, and the Massachusetts Department of Public Health. Tests of Atlantic mackerel

collected from the stomach of one whale and from the area where the affected animals had been feeding revealed the presence of the toxins which cause paralytic shellfish poisoning (PSP). Subsequent tests confirmed the presence of PSP toxins in liver and other tissues from the dead whales, providing conclusive evidence that the die-off was caused by a "red tide" in the area.

Humpback Whales in the Caribbean

The North Atlantic population of humpback whales breeds and calves during the winter months in the area of Silver, Navidad, and Mouchoir Banks in the Caribbean. Of these whales, about 85 percent winter in the vicinity of Silver Bank, which is located primarily in waters of the Dominican Republic, about 80 miles north of the island.

In 1985, the Center for Environmental Education initiated a public education program in the Dominican Republic to promote efforts to protect the region's humpback whales. In addition, the Center provided support to the Center for Marine Biological Research at the Autonomous University of Santo Domingo for a biological inventory of marine resources in the Dominican Republic. A major goal of these efforts, which focused on the Silver Bank region, were to encourage the establishment of a protected area in Dominican waters for humpback whales and to help document the biological justification for doing so.

A report on the inventory was completed in October 1986 and, on 14 October 1986, the President of the Dominican Republic designated Silver Bank as a humpback whale sanctuary. The Presidential decree creating the sanctuary prohibits all hunting, capturing, or injuring of any marine mammal within the sanctuary boundaries. Also banned is the dumping of "contaminated, explosive or electrical materials" and the dredging, drilling, or alteration of the sea bottom. The Silver Bank sanctuary should contribute significantly to the protection and recovery of the northwest Atlantic humpback whale population and could serve as a model for creating sanctuaries elsewhere.

Right Whale (Eubalaena glacialis)

The right whale is the world's most endangered large whale. Remnant populations remain in the North Atlantic, North Pacific, South Atlantic, and South Pacific/Indian Oceans. Although available information is insufficient to make reliable estimates of pre-exploitation stock sizes, it is apparent that commercial whaling in the 19th and early 20th centuries resulted in the near-extinction of all right whale populations.

For example, the current population off the west coast of North America is thought to number a few tens of individuals and may be too small to recover. The population off the east coast of the United States and Canada may number no more than a few hundred animals. The largest populations are those in the South Atlantic Ocean off Argentina and South Africa, each of which is believed to include at least 400 to 600 animals. Although the species has been protected from commercial whaling since the 1930s, there is no evidence of substantial population increases in the Northern Hemisphere. The species occurs primarily in coastal waters exposing it to environmental pollution and human activities that may adversely affect both the whales and their habitat.

As noted in its previous Annual Reports, the Marine Mammal Commission has taken a number of steps to assess and improve prospects for the recovery of right whale populations worldwide. Among other things, the Commission: helped support a June 1983 workshop convened in response to a request by the International Whaling Commission to assess the extent to which protection from commercial whaling had resulted in recovery of right whales; funded two workshops in 1985 to develop a report on the status of the right whale population off the east coast of the United States and actions needed to protect and encourage its recovery; helped support a 1986 workshop to assess new information and potential protection needs related to the apparent occurrence of right whale calving areas off the southeastern U.S. coast during winter months; and provided the National Marine Fisheries Service with recommendations and advice for preparing a recovery plan and convening a recovery team for right whales in U.S. waters.

Congress also has recognized the need for further efforts to protect right whales in the northwest Atlantic Ocean. For Fiscal Years 1986 and 1987, Congress appropriated $500,000 and $250,000, respectively, to the National Marine Fisheries Service to support the first two years of a five-year right whale research program proposed by a consortium of non-governmental organizations concerned about recovery of the northwest Atlantic population. Due to the Deficit Reduction and Balanced Budget Act of 1985 and other factors, actual funds allocated by the Service for right whale research were somewhat lower than the appropriated amounts. For Fiscal Year 1988, Congress appropriated $250,000 for the third year of the program.

To help determine the best use of these funds, the Service established a Right Whale Scientific Advisory Group. This Group, which includes a Marine Mammal Commission representative, first met on 15 May 1986 in Woods Hole, Massachusetts, to identify and rank priority right whale research needs. Based on results of the meeting, a Cooperative Agreement was established in October 1986 with the consortium of whale research

organizations. Work to be carried out under the Agreement includes: conducting aerial surveys of right whales off the southeast U.S. coast and shipboard surveys in the Bay of Fundy and Cape Cod Bay; developing a computerized right whale sighting data base; assembling a photographic catalogue of individual right whales; developing a computer-based image analysis system to aid in identifying individual whales from photographs; developing a data management system; and recording and analyzing relevant data.

On 28-29 April 1987, a second meeting of the Scientific Advisory Group was held at Woods Hole to review the results and status of work under the Cooperative Agreement and to identify priority needs for future studies. With respect to future research priorities, the Group concluded that further work should be directed towards: identifying right whale habitat use patterns in the Great South Channel east of Cape Cod and on Brown's Bank off southern Nova Scotia; conducting preliminary surveys of other possible summering grounds; evaluating the capability of vessel surveys to collect information simultaneously for individual identification and abundance estimates; continuing development of the right whale photographic catalog and a computer-based image analysis system; developing analytical techniques to develop an index of population size using individual whale identification data; and adding historical sighting data to the right whale sighting data base.

As indicated above, the Commission has recommended on several occasions that the National Marine Fisheries Service develop a recovery plan and convene a recovery team for right whale populations in U.S. waters. In late 1986, the Commission was advised by the Director of the National Marine Fisheries Service that steps would be taken in 1987 to act on these recommendations. During 1987, steps were taken by the Service to address both needs. By letters of 15 July 1987, the Service invited scientists and resource managers with knowledge of issues and data regarding right whales, including a Marine Mammal Commission representative, to be members of the Right Whale Recovery Team. By letter of 23 September 1987, the Service provided Team members with terms of reference governing team activities and a schedule for developing a Right Whale Recovery Plan.

Among other things, the Recovery Team will be responsible for providing the Service with recommendations, advice, and assistance on: developing and implementing the Right Whale Recovery Plan; reviewing the status of the species and recovery efforts; and technical and scientific matters such as scientific research permits and section 7 consultations. Staff members of the National Marine Fisheries Service have been given the responsibility for preparing a draft Recovery Plan and, during

its Annual Meeting on 10-12 December 1987, the Commission was advised that a draft was nearing completion and would be provided to the Recovery Team early in 1988 for review and comment.

The Commission looks forward to working with the Service, the Recovery Team, and other concerned parties during 1988 to develop and improve the evolving right whale recovery program.

## Bowhead Whale (Balaena mysticetus)

Prior to commercial exploitation, bowhead whales were circumpolar in distribution and made up at least five or six separate populations. Over-exploitation by commercial whalers between 1600 and 1900 reduced all populations to extremely low levels, and one population, the Spitsbergen population north of Scandinavia, may be extinct. The largest surviving population is the Bering Sea (western Arctic) population. This population migrates seasonally between Bering Sea and the Chukchi and Beaufort Seas. The population is important to Alaska Eskimos who continue to hunt bowhead whales for subsistence and cultural purposes.

### Consideration by the International Whaling Commission

The International Whaling Commission (IWC) reviews information on the status of the Bering Sea stock of bowhead whales and establishes quotas for aboriginal subsistence whaling. Since 1977, a series of quotas have been adopted by the IWC to satisfy the needs of Alaska Eskimos while allowing the bowhead whale stock to recover. As noted in previous Annual Reports, the IWC Scientific Committee reviewed information on the status of bowhead whales during its meeting in 1985. Based on information available at that time, the Committee accepted an estimate of 4,417 animals (range, 2,613 to 6,221) as the best estimate of the current size of the Bering Sea stock of bowhead whales. Considering this estimate and the advice of the Committee, the IWC adopted a three-year block quota of 26 strikes per year for bowhead whales for the years 1985 through 1987. The quota provided that strikes not used in any one year could be used the following year so long as no more than 32 strikes were made in any single year.

As noted in Chapter V, the IWC again considered aboriginal subsistence needs for bowhead whales during its 1987 meeting. During the Scientific Committee deliberations prior to that meeting, results of further research on the Bering Sea stock of bowhead whales were considered. Based on that information, the Committee accepted a new population estimate of 7,200 animals (standard error, 2,400 animals) as the best estimate of stock size. In view of this estimate, the IWC modified

the 1987 quota adopted in 1985 to allow 32 rather than 26 strikes and established a 1988 quota of 35 strikes.

Eskimo Whaling

In 1981, the National Oceanic and Atmospheric Administration and the Alaska Eskimo Whaling Commission signed a cooperative agreement setting forth shared responsibilities for regulating, monitoring, and enforcing the Alaska Eskimo bowhead whale hunt. Under terms of the agreement, quotas are negotiated annually between the two parties. The Alaska Eskimo Whaling Commission then allocates the quota among Alaska whaling villages and monitors the hunt for compliance with the regulations. The quotas negotiated under the agreement have been consistent with those set by the IWC. The following table shows the quotas set by the IWC and the results of the Eskimo hunts since 1977.

Quotas and Catches of Bowhead Whales, 1977-1987

| | IWC Quotas* | | Catch by Alaska Eskimos | | |
|---|---|---|---|---|---|
| Year | Landings | Strikes | Actually Landed | Struck But Lost | Total Struck |
| 1977 | [No Quota] | | 26 | 82 | 108 |
| 1978 | 14 | 20 | 12 | 6 | 18 |
| 1979 | 18 | 27 | 12 | 15 | 27 |
| 1980 | 18 | 26 | 16 | 18 | 34 |
| 1981 | | | 17 | 11 | 28 |
| 1982 | 45** | 65** | 8 | 11 | 19 |
| 1983 | | | 9 | 9 | 18 |
| 1984 | | 43*** | 12 | 13 | 25 |
| 1985 | | 26+ | 11 | 6 | 17 |
| 1986 | | 26+ | 19 | 9 | 28 |
| 1987 | | 32++ | 22 | 9 | 31 |
| 1988 | | 35 | -- | -- | -- |

* In general, in establishing quotas on both the number of whales landed and the number of strikes, the IWC stipulated that whaling should cease whenever the number of whales landed or the number of strikes reached the specified number, whichever came first.

** In 1980, a block quota was set for the three years 1981 to 1983, with a further stipulation that in any one year, the number landed should not exceed 17 and the number of strikes should not exceed 27.

*** In 1983, a block quota was set on strikes alone for 1984 and 1985, with a further stipulation that the number of strikes in any one year should not exceed 27.

\+ In 1985, a block quota of 26 strikes per year was set for the three years 1985-1987, with the stipulation that strikes not used in any one year could be used the following year as long as no more than 32 strikes were taken in any single year.

++ In 1987, the IWC modified the quota for 1987 as adopted in 1985 to allow 32 strikes.

Seismic surveys and other activities associated with offshore oil and gas exploration and development may affect the movement and behavior of bowhead whales, thereby forcing Alaska Eskimo whalers to travel greater distances during the fall hunt. This in turn may increase the risk that those engaged in the hunt may be injured or killed or be unable to return portions of the catch to their villages. Therefore, in 1986, the Alaska Eskimo Whaling Commission and certain companies engaged in oil and gas activities on Alaska's North Slope entered into a cooperative agreement for the fall 1986 hunt whereby the industry participants agreed to: (1) attempt to tow caught whales to a suitable butchering site to prevent meat from spoiling (if an industry vessel was available near the kill site); (2) cache emergency supplies (gasoline, food, etc.) at selected sites for use by subsistence hunters; (3) provide emergency assistance to hunters during adverse weather conditions; and (4) assist in transporting whale meat and muktuk to prevent spoilage and maximize utilization of the catch.

The agreement was approved by the National Oceanic and Atmospheric Administration in 1986. On 24 August 1987, it was extended to cover the 1987 hunting seasons. In addition, the agreement was expanded to include an additional industry participant.

Research Planning and Coordination

In December 1977, the IWC lifted the total ban on subsistence taking of bowhead whales that had been adopted the preceding June. This action was taken, in part, on a pledge by the U.S. Commissioner to the IWC that the United States would undertake a comprehensive research program on the species. The National Marine Fisheries Service was responsible for planning and implementing this program. Relevant research also has been conducted or supported within the context of this program by the Alaska Eskimo Whaling Commission, the North Slope Borough, the Minerals Management Service, the oil and gas industry, and the State of Alaska. As discussed in its Annual Reports for 1977, 1978, and 1979, the Marine Mammal Commission played a major role in developing the research plan and initiating efforts to coordinate related bowhead whale research projects.

During 1987, representatives of the Commission participated in two meetings to review research results and plans related to bowhead whales. The first was the Fourth Conference on the Biology of Bowhead Whales, convened by the North Slope Borough on 4-6 March 1987 in Anchorage, Alaska. During the Conference, participants reviewed recent research results and future research strategies for censusing bowhead whales, assessing bowhead whale feeding habits and the importance of certain

feeding areas, and determining how bowhead behavior is affected by noise and disturbance associated with industrial activities. In addition, on 17-19 November 1987, a representative of the Commission participated in an Alaska OCS Information Transfer Meeting convened in Anchorage, Alaska, by the Minerals Management Service. The purpose of the meeting was to review results of recent research, including several studies of bowhead whales and other endangered whales supported by the Service's Alaska OCS Office Environmental Studies Program. During the meeting, additional research needs, including those concerning bowhead whales, were considered. Results of the meeting will be used by the Service to help identify and rank studies possibly meriting future support under its Environmental Studies Program.

### Harbor Porpoise (Phocoena phocoena) (Central California Population)

The harbor porpoise, one of the smallest cetaceans, is found in coastal areas throughout most of the Northern Hemisphere, including the waters off Europe, the Far East, and the east and west coasts of North America. The species' preference for inshore waters makes it particularly vulnerable to impacts from human activities, such as coastal set net fisheries and environmental pollution.

In the waters off north-central California, harbor porpoise and other marine species are killed incidentally in the set net fisheries for halibut and other finfish. Based on continuing fishery surveys carried out by the California Department of Fish and Game, it is estimated that approximately 200-300 harbor porpoise are taken annually in these fisheries. However, little is known about the number, size, and discreteness of harbor porpoise populations along the west coast, and it therefore is difficult to judge whether the level of take has caused or is causing one or more populations to be reduced below their maximum net productivity level.

As noted in the previous Annual Report, the best way to obtain information on harbor porpoise distribution and movement patterns, and thus on the relative discreteness of harbor porpoise populations in different geographic areas, may be by radio-tagging and tracking a representative sample of animals. In 1986, the Commission provided funds to the University of California at Santa Cruz for a pilot project to determine whether harbor porpoise could be safely and effectively caught, radio-tagged, and tracked in the Monterey Bay area. Results of the study indicated that harbor porpoise are able to detect and avoid live-capture weirs constructed with weighted polypropylene lines suspended at one-meter intervals and that such weirs would be of little or no use for capturing animals for tagging. However, further observation of harbor porpoise

responses to different types of net structure and lines may suggest ways for reducing incidental mortality of the species in set net fisheries. Therefore, in 1987, the Commission provided additional funds to the University of California to support experiments using net structures of different types to better determine possible variables affecting the ability of harbor porpoise to detect and avoid fishing nets. Field work is scheduled to be conducted during summer and fall of 1988.

It may also be possible to detect discrete populations by identifying differences in patterns of contaminant loads in animals from different regions. As discussed in previous Annual Reports, the National Marine Fisheries Service's Southwest Fisheries Center contracted in 1985 for an investigation to test for regional patterns in the concentration of contaminants and their ratios in harbor porpoise and to evaluate the feasibility of using contaminants to obtain information about the degree of intermixing of harbor porpoise along the west coast of North America. Results of that study were made available at the end of 1986. The study found strong regional patterns in both the concentrations of DDE (dichlorodiphenyldichloroethylene) and the ratios of various contaminants. Thus, the use of contaminant ratios to gain information on geographic interchange of harbor porpoise appears promising, especially in areas like California where the presence of pollutants in the marine environment varies widely from location to location.

As discussed elsewhere in this Chapter, the State of California enacted legislation in 1986 to reduce the incidental take of sea birds, marine mammals and non-target fish species in gill and trammel set net fisheries by means of selected fishing area closures. Also in 1986, in order to bring the fisheries into compliance with the Migratory Bird Treaty Act, the California Department of Fish and Game proposed to amend the State regulations by banning use of set nets inside 20 fathoms between Franklin Point, San Mateo County, to the Mendocino-Sonoma County line. On 3 December 1986, the National Marine Fisheries Service wrote to the California Department of Fish and Game, noting that the proposed modification, designed primarily to protect sea birds, would relocate the fishing effort into deeper waters and thus would likely increase the incidental kill of harbor porpoise. The Service recommended that the State amend its proposed prohibition on set nets to include a prohibition on use of trammel nets north of Point Reyes, where more than 60 percent of the harbor porpoise mortality occurred in 1984 and 1985.

Subsequently, representatives of the Service, the California Department of Fish and Game, the Marine Mammal Commission, environmental groups, and affected fisheries met and

reached agreement on modifications to the State regulations on gill and trammel nets. Among other things, the regulations impose a year-round prohibition on gill netting north of Point Reyes and in waters less than 40 fathoms deep in selected areas from Point Reyes south to Waddell Creek in San Mateo County.

At the end of 1986, the Commission was concerned that little apparent progress was being made toward determining and mitigating the impact of incidental take on the harbor porpoise. On 23 December 1986, the Commission wrote to the National Marine Fisheries Service, noting that, as of that date, the Service had not: (1) assessed the status of the affected population or populations of harbor porpoise; (2) determined if the incidental take had caused or may be causing any populations to be reduced or maintained below their level of maximum net productivity; or (3) issued a general permit authorizing any incidental take of the species. The Commission pointed out that, in addition to the biological impacts on the populations, the lack of a general permit made all taking of harbor porpoise along the U.S. west coast illegal.

In its 23 December letter, the Commission recommended that the Service: (a) ensure that the ongoing status of stock assessment for harbor porpoise be completed by January 1987; (b) depending on the result of that review and before coastal gill net fisheries began again in May, take the necessary steps either to authorize a specified level of incidental take or prohibit further taking; and (3) ensure that harbor porpoise take under a general permit be reported promptly, that data and samples necessary to assess the effects of the take be provided to the Service and/or the California Department of Fish and Game, and that monitoring efforts be sufficient to accurately determine the level, locations, and age/sex composition of any incidental take.

On 16 January 1987, the National Marine Fisheries Service convened a meeting to review a preliminary report on the status of the harbor porpoise in California. Representatives of the Commission participated in that meeting. The status report, published in final form in April 1987, concluded that, using the central estimate of abundance of 1,854 animals (April 1985) and assuming no net emigration of animals from the north, harbor porpoise abundance in central California is between 29 to 81 percent of that in 1969. If abundance were at carrying capacity in 1969, harbor porpoise in central California are currently near or below the level defined as depleted in the Marine Mammal Protection Act.

At the end of 1987, the National Marine Fisheries Service had not made a formal determination as to the status of the harbor porpoise population affected by coastal set net fisheries

in California. Consequently, the Service cannot authorize any incidental take and any fisherman who may take harbor porpoise incidentally during fishing operations in central California may be subject to prosecution under the Marine Mammal Protection Act. However, the legislation enacted by the State of California may be sufficient to avoid or substantially reduce incidental take in the future. The Commission looks forward in 1988 to further consultations with the National Marine Fisheries Service and the California Department of Fish and Game to determine if additional conservation measures may be required.

Gulf of California Harbor Porpoise (*Phocoena sinus*)

The Gulf of California harbor porpoise is one of the smallest and rarest cetacean species. There have been few confirmed sightings of live animals, and most of what is known about the species has been obtained from examination of carcasses washed up on beaches or taken incidentally in gill nets in the upper Gulf of California, Baja California, Mexico. Sighting and stranding data suggest that the species' range is limited to the northern third of the Gulf. Data are insufficient to estimate population size. However, given the few sightings, it seems unlikely that there are more than several hundred animals.

The major threat to the species appears to be incidental take in the gill net fishery for totoaba (*Cynoscion macdonaldi*). This fishery operated in the Gulf of California from the late 1940s to 1975 when it was closed due to depletion of the fish stocks. In 1985, experimental fishing was conducted to assess the status of the totoaba stocks and, during the fishing operation, at least 13 harbor porpoise were caught and killed. The fishery remains closed, but the closure is difficult to enforce and some illegal fishing and incidental take of harbor porpoise continue to occur.

Habitat degradation and destruction also may be affecting the Gulf of California harbor porpoise. Dams and water projects on the Colorado River in the southwestern United States have reduced its outflow into the Gulf of California. This may have reduced nutrient input and biological productivity in the Gulf, including reduction of species eaten by harbor porpoise. Also, exploratory drilling for oil and gas has begun in the northern Gulf, raising the possibility of future development, disturbance, oil spills, and other types of environmental contamination. In addition, run-off from farms and roads in the northern Gulf of California drainage system may be introducing significant quantities of pesticides and other contaminants.

Because of its limited distribution, small numbers, and vulnerability to gill net fisheries and other human activities, in January 1985, the National Marine Fisheries Service designated the Gulf of California harbor porpoise as endangered under the Endangered Species Act. As noted in previous Annual Reports and in Chapter IX of this Report, the Commission has provided funds to obtain carcasses of harbor porpoises taken incidentally in the totoaba fishery, to train students in methods of small cetacean identification, collection, and museum preparation, and to determine the types and levels of organic pollutants present in specimens.

During 1988, the Commission will work with the National Marine Fisheries Service, the Department of State, and other agencies and organizations to identify measures that might be undertaken to enhance the protection and recovery of this species and its habitat and to encourage their implementation.

## Hector's Dolphin (*Cephalorhynchus hectori*)

Hector's dolphin is one of four species of the genus Cephalorhynchus and is among the smallest of the cetaceans. Sexually mature adults are no more than 145 cm in length. Hector's dolphins are found only in the coastal waters of New Zealand and are most abundant along the east and west coasts of the South Island. Surveys carried out during 1984-1985 indicate a total population on the order of 3,000 to 4,000 animals.

All four Cephalorhynchus species are taken incidentally in commercial and recreational gill net fisheries, and two congeners, Commerson's dolphin (*C. commersonii*) and the black dolphin (*C. eutropia*), are also taken directly for bait. Although Hector's dolphin is not subject to a directed catch, its seasonal movements into inshore waters to calve coincide with periods of intense fishing. Thus, the incidental take in one area may be as high as 10 to 15 percent of the local population of that area.

The species' preference for close inshore habitat also makes Hector's dolphin vulnerable to pollutants such as heavy metals and pesticide residues. Although the biological effects of the pollutants are poorly known, contaminant levels in the limited number of dolphins examined may suggest some cause for concern.

Long-term studies of the species indicate that females become sexually mature at seven to nine years of age and produce, at most, one calf every two years. The actual recruitment rate of the population is under study in the Banks Peninsula area of the South Island. However, considering the extremely

low reproductive rate of Hector's dolphin, it seems unlikely that the small population will be able to sustain the continued take in gill nets in addition to natural mortality.

During 1988, the Marine Mammal Commission plans to contribute to the continued support of ongoing research and, as requested, otherwise cooperate in efforts to help determine steps that might be taken to ensure the protection of the Hector's dolphin population.

## River Dolphins (Superfamily Platanistoidea)

The Platanistoidea superfamily of toothed whales and porpoise comprises five species commonly known as river dolphins. It includes the only cetaceans whose natural habitat is limited to fresh-water environments. The species and their distribution are: *Platanista gangetica*, known as the Ganges or blind river dolphin, found in India, Bangladesh, and Nepal; *P. minor*, the Indus river dolphin, found in the Indus River system of Pakistan; *Inia geoffrensis*, the boto or Amazon river dolphin, found in the Amazon and Orinoco River basins in South America; *Lipotes vexillifer*, the baiji or Yangtze river dolphin, presently found along the middle and lower Yangtze River in China; and *Pontoporia blainvillei*, the franciscana, found in the South Atlantic coastal waters off Argentina, Uruguay, and Brazil. *Pontoporia* is the only member of the group that inhabits salt water.

Although there is little information available on the population status and ecology of river dolphins, there is reason to believe that all five species may be threatened to varying degrees with extinction due to subsistence hunting, incidental take by fisheries, and/or human-caused destruction and degradation of habitat. Construction of dams and other development in important river dolphin habitat pose potentially serious threats to the continued survival of several of the species. The baiji, Ganges river dolphin, and Indus river dolphin are listed on Appendix I of the Convention on International Trade in Endangered Species of Fauna and Flora, and the boto and franciscana are listed on Appendix II.

On 23 December 1986, the Commission wrote to the National Marine Fisheries Service recommending, among other things, that steps be taken to list the separate species of river dolphins as threatened or endangered under the U.S. Endangered Species Act. By Federal Register notice of 17 February 1987, the Service announced that it had reviewed a petition to designate the baiji as endangered and had determined that, based on available information, the proposed listing may be warranted. On 17 April 1987, the Service announced its intention to review the status of the other four river dolphins to determine whether

any of these species should be listed as endangered or threatened. In both instances, the Service asked for comments and information on the status of these species. At the end of 1987, no further action had been taken by the Service.

Also in 1986, the Commission provided funds to help convene an international Workshop on the Biology and Conservation of the Platanistoid Dolphins. The Workshop was held 26 October - 6 November 1986, in Wuhan, China. The final report of the Workshop was completed early in 1987 and is being published, along with contributed papers, by the Species Survival Commission of the International Union for the Conservation of Nature and Natural Resources.

One of the Workshop's recommendations was to initiate research to obtain information on numbers, movement patterns, reproductive biology, feeding habits, and social organization of the baiji. In response to the recommendation, in 1987, the Marine Mammal Commission contributed funds to send a U.S. scientist to the People's Republic of China to assist in developing a long-range conservation plan for the baiji (see also Chapter IX). In 1988, the contractor will report to the Commission on plans to protect and conserve the baiji, including any steps that possibly could be taken by the Commission or other U.S. agencies to encourage or facilitate needed research and management actions.

On 12 January 1987, the Commission was asked by the National Marine Fisheries Service to comment on a draft paper summarizing national laws and international agreements affecting river dolphins. By letter of 19 February, the Commission provided comments. In the letter, the Commission recommended that the paper be revised to expand the discussion of U.S. laws, such as the Marine Mammal Protection Act and the Endangered Species Act, that apply to activities in foreign countries. The Commission also suggested that it might be useful and reasonable to pursue multilateral agreements with the appropriate nations rather than attempting to use the Marine Mammal Protection Act and the Endangered Species Act as models to enact laws in the other countries.

In November 1987, the Commission received a pre-publication copy of the "Action Plan for the Conservation of Dolphins, Porpoises and Whales, 1988-1992," prepared by the Cetacean Specialist Group of the Species Survival Commission. The Plan focuses on problems of stock assessment and conservation of small cetaceans, especially the riverine and coastal species and populations most vulnerable to habitat destruction and degradation. The final draft Plan, including a list of 45 recommended actions and projects, will be presented to the next General Assembly of the International Union for the Conservation of Nature and Natural Resources in Costa Rica

early in 1988. Among the actions designated as having highest priority are several concerning river dolphins. These include: reversing the decline of the Indus river dolphin in Punjab; expanding research on the Indus river dolphin in Sind, Pakistan; reducing the kill of baiji in the Yangtze River; completing baseline studies of the baiji preserve in Shi Shou, China; continuing monitoring the baiji population; and determining movements and population structure of the baiji.

The survival of one or more of these species may well depend on actions taken in the near future to protect critical habitat. Therefore, the Commission looks forward in 1988 to working with the National Marine Fisheries Service, the Department of State, and private groups to determine and initiate measures needed to protect and conserve river dolphins and the ecosystems of which they are a part.

## CHAPTER III

## DIE-OFF OF BOTTLENOSE DOLPHINS (TURSIOPS TRUNCATUS)

The bottlenose dolphin is the cetacean species most commonly seen in the coastal waters of the eastern United States. Data compiled by the Smithsonian Institution indicate that, in an average year, about 12 dead bottlenose dolphins will be found washed up on beaches from New Jersey to Cape Hatteras. In June 1987, unprecedented numbers of animals began to wash up on New Jersey beaches. By the end of October 1987, at least 370 dolphins had washed ashore in New Jersey, Delaware, Maryland, and Virginia. By the end of the year, more than 100 additional animals had washed up on beaches in North Carolina, South Carolina, Georgia, and northern Florida.

The Marine Mammal Commission was advised of the die-off in late July 1987 when unusually high numbers of bottlenose dolphins began washing up on beaches in Virginia. The Commission immediately consulted the National Marine Fisheries Service and a number of persons expert in bottlenose dolphin biology and disease. The Commission asked Joseph R. Geraci, V.M.D., Ph.D., a member of its Committee of Scientific Advisors and a person expert in marine mammal husbandry and disease, to organize and lead an investigation to try to determine the cause or causes of the die-off.

To help in the investigation, the Commission asked the Department of Agriculture's Animal and Plant Health Inspection Service to conduct the range of bacterial and viral isolation studies and other analyses necessary to determine whether pathogenic organisms, environmental contaminants, or biological toxins were causing or possibly contributing to the die-off. The Commission also made arrangements with the Smithsonian Institution to continue collecting basic data from the stranded animals and with the U.S. Navy to provide facilities at the Little Creek Amphibious Base for detailed postmortem examinations of dolphins recovered in the Virginia Beach area. In consultation with the National Marine Fisheries Service, the Commission arranged for the Service's laboratory in Charleston, South Carolina, to perform toxicological analyses. In addition, the Commission sought the assistance of the Environmental Protection Agency in obtaining information on offshore dump sites, possible illegal dumping, phytoplankton blooms, water movement patterns, and other environmental factors that might provide a clue to the cause of the die-off.

The response team, with funding and administrative support provided by the National Marine Fisheries Service, began its investigations in the Virginia Beach area early in August.

From 9 August through 2 September, 83 bottlenose dolphin carcasses were recovered from beaches in the area. Gross necropsies were performed on most of the animals and tissue samples from the freshest animals were collected and sent to the National Veterinary Services Laboratory in Ames, Iowa, for isolation of bacteria, chlamydia, mycoplasma, fungi, and viruses and assessment of the presence and levels of a wide range of pollutants including heavy metals and organic compounds. Selected tissues were sent to the Diagnostic Virology Laboratory at the Eastern Virginia Medical School and to the National Cancer Institute, National Institutes of Health, to assist in identification of human viruses that might be present in the dolphins, to the Virginia Beach General Hospital to do basic blood analyses and type Vibrio organisms that might be isolated, and to the Charleston, South Carolina, laboratory of the National Marine Fisheries Service to conduct tests for three classes of biotoxins and several possible environmental contaminants.

No live animals were found on beaches in the Virginia Beach area. Therefore, to provide an opportunity to examine and obtain blood samples from live animals, the Commission made arrangements with Sea World Inc., Orlando, Florida, for a team of people experienced in the capture of bottlenose dolphins to assist in capturing live dolphins in the Virginia Beach area. The U.S. Navy transported a net and other equipment from Orlando to Norfolk and provided a boat and crew to assist in the capture operation. Four live dolphins were caught, examined, and released on 16 August. All four had skin lesions (see below) similar to those found on dead animals. Blood samples were taken from three of the animals and all had elevated white blood cell counts indicative of infection. The sample size was inadequate and an additional 19 animals were captured in the Virginia Beach area from 6-9 October 1987. Blood samples from these animals were analyzed for cell types and characteristics, and serum constituents including electrolytes, metabolites, enzymes, proteins, thyroid and adrenocortical hormones, and viral antibodies.

Data from population studies done in the late 1970s and early 1980s suggest that there could be two more or less discrete stocks of bottlenose dolphins along the U.S. east coast -- a nearshore stock that moves north to the New Jersey/New York Bight area in the spring and south to the Georgia/Florida area in the fall and an offshore stock that occurs primarily along the 100-fathom depth contour between Georges Bank in the north and Cape Hatteras in the south. These data were insufficient to judge when, where, and how many animals might be affected by the die-off. Therefore, in mid-August the National Marine Fisheries Service initiated a series of coastal and offshore aerial surveys to better determine the distribution, number, sizes, composition, and movements of dolphin pods

along the mid-Atlantic coast and to determine and monitor the number of dead animals floating at sea and washed up on beaches in selected index areas. Also, on 25-28 August and 30 August -3 September, members of the response team were placed aboard the Environmental Protection Agency's survey vessel, O.S.V. Anderson, to look for dead and dying dolphins as the ship conducted preplanned oceanographic surveys in and near the area where the die-off appeared to be centered. At the same time, the National Oceanic and Atmospheric Administration began synthesizing and comparing historic and recent data on weather conditions, sea surface temperatures, current patterns, and other variables to identify factors that could be correlated with and contributing to the die-off.

The number of dead animals on beaches in the New Jersey and Virginia Beach areas began declining in early and late August, respectively. At the same time, however, animals began to appear on beaches to the south. By late November 1987, dead animals had been found on beaches as far south as northern Florida, suggesting that whatever was killing the animals was spreading or, alternatively, that animals were continuing to die as they migrated south to their winter range.

The results of the continuing investigations were reviewed during the Commission's meeting in Miami, Florida, on 10-12 December 1987. During the review, it was reported that:

- in the early stages of the die-off, greater numbers of larger (i.e., older) animals may have been affected; in later stages, animals of all age and sex classes appear to have been affected, possibly in proportion to their abundance in the population;

- animals examined have had a range of internal and external lesions. Animals that came ashore in August and early September commonly had small blisters and craters on the skin -- suggestive of a pox-like viral disease -- particularly around the lips and snout. Many also had large areas of sloughing skin, fluid-filled body cavities, and other evidence of severe systemic bacterial infections;

- gross post-mortem examinations suggested that some animals died within a few hours after being invaded by bacteria, while others had protracted illnesses which ended in pneumonia, cerebral hemorrhage, vascular collapse, or shock;

- bacterial isolation studies done by the Department of Agriculture's National Veterinary Services Laboratory in Ames, Iowa, and by the Virginia Beach General Hospital have documented the presence of bacteria from a wide variety of genera including: Edwardsiella, Streptococcus,

Vibrio, Pseudomonas, Klebsiella, Acinetobactera, Bacillus, and Staphylococcus;

- viral isolation studies done by the Veterinary Services Laboratory and the Diagnostic Virology Laboratory of the Eastern Virginia Medical School have detected herpes-like particles and papova viruses in tissue cultures inoculated with extracts from lesions and internal organs;

- viral assessment studies done by the National Cancer Institute of the National Institutes of Health have shown no evidence of Human Immuno-Deficiency Viruses (HIV), which causes Autoimmune Deficiency Syndrome (AIDS) in humans;

- gas chromatograph analysis of liver and other tissue samples done by the National Veterinary Services Laboratory have revealed possible toxic levels of chlorinated hydrocarbons in some but not all animals sampled;

- there is no evidence of any unusual die-offs of any other species, suggesting that only bottlenose dolphins are vulnerable to whatever is causing the die-off;

- although bacterial infections have been the ultimate cause of death, it is questionable whether the animals would have been vulnerable to such infections unless they had been weakened by stress, disease, toxins, or other factors which weaken the immune system; and

- further studies are required to determine whether one or more viral agents, environmental pollutants, or natural environmental fluctuations have been the primary cause or a factor contributing to the continuing die-off.

Following the program review, the Commission consulted with the National Marine Fisheries Service and others to determine what more might be done to expedite the investigation. These discussions will be continued in early 1988 when the Commission, the National Marine Fisheries Service, and other agencies will meet to review progress, the direction of the investigation, and ways in which to meet the continuing need for financial support of the work.

## CHAPTER IV

## MARINE MAMMAL MANAGEMENT IN ALASKA

Since enactment of the Marine Mammal Protection Act in 1972, issues concerning marine mammals in Alaska have assumed greater significance and have been the focus of more attention than those in any other state. A number of states are confronted with important conservation problems that involve one or more species of marine mammals. Alaska, however, by virtue of the large number of marine mammal species found there, its extensive coastline, the use of marine mammals for subsistence purposes by Alaska Natives, interactions with commercial fisheries, and many other management issues concerning marine mammals, presents extraordinary conservation challenges. In recognition of this fact, the Commission has made marine mammal issues in Alaska a matter of high priority.

### Marine Mammal Working Groups and Species Reports

The Marine Mammal Protection Act makes provision for management of marine mammals by the Federal Government and, under certain conditions described in the next section, by states. It has been the Commission's view that, whether management authority resides with the State, the Federal Government, or a cooperating group of interests, such authority must rest upon a foundation of carefully described and generally accepted research and management programs. To develop such programs, the Commission established, in 1984, Alaska Marine Mammal Working Groups to oversee development of species reports for ten species of marine mammals in Alaska: walrus (*Odobenus rosmarus*), polar bear (*Ursus maritimus*), ringed seal (*Phoca hispida*), bearded seal (*Erignathus barbatus*), ribbon seal (*Phoca fasciata*), spotted seal (*Phoca largha*), harbor seal (*Phoca vitulina*), northern sea lion (*Eumetopias jubatus*), beluga whale (*Delphinapterus leucas*), and sea otter (*Enhydra lutris*).

The Commission adopted the working group approach as a way of further focusing attention on the species in question, not upon bureaucratic processes, and in the belief that: (a) research and management plans should be developed in a non-political environment with benefit of carefully developed and generally agreed-upon species accounts and problem descriptions as base documents; (b) research upon which to base an effective marine mammal conservation program must be derived from, among other things, careful consideration of both research and management issues; and (c) to be useful, species reports should be cooperatively developed by groups of people with

broadly representative marine mammal interests and experience.

The ten Working Groups involved biologists, biometricians, Native subsistence users, conservationists, and State and Federal wildlife resource managers. The Groups were asked: (1) to prepare comprehensive summaries of available information on biological, ecological, and other factors affecting conservation; (2) to describe the research and management activities which they believed should be undertaken; and (3) to provide estimates of costs and priorities for the identified research and management tasks.

Recognizing the need to coordinate the Working Groups' efforts, the Marine Mammal Commission asked Jack W. Lentfer, a marine mammal and resource management specialist in Alaska, to oversee the effort. Since drafting the species accounts required considerable effort, the Commission contracted with a number of people to act as lead authors. Completed drafts of each paper were circulated among members of the appropriate Working Group for review and comment. The consultative process among lead author, Working Group members, other interested persons, and the Commission continued until there was general agreement on each paper's content. The papers' strengths come, in no small measure, from the fact that they represent a broadly agreed-upon body of factual information and recommendations.

The Marine Mammal Commission believes that these ten species reports, to be published in early 1988, will help to provide the needed basis for developing and implementing marine mammal conservation plans in Alaska. The documents should be of equal value whether management authority ultimately rests with the Federal Government, with the State of Alaska, or with a cooperating group of interests.

## Background Information on Transfer of Management

The Marine Mammal Protection Act sets forth certain procedures whereby the Secretaries of Commerce and/or the Interior may, in response to a properly submitted request, transfer authority for marine mammal management from the Federal Government to a State Government. In order to transfer Federal management authority, the Secretary with jurisdiction over the species in question must determine, after notice and opportunity for public comment, that the state has developed and will implement a program that satisfies the requirements of section 109 of the Act for the conservation of the affected species. In making this determination, the Secretary must issue a finding that the state has, among other things, established a process to determine the optimum sustainable population

of each affected species and the maximum number of animals that may be taken without reducing the species below that level.

Certain additional points are germane to requests for transfer of management to the State of Alaska. For example, in the case of depleted species, the State of Alaska's conservation and management program must include mechanisms to determine the maximum numbers of animals that can be taken by subsistence users while still allowing the species to increase towards its optimum sustainable population. Furthermore, Alaska's program must include a State statute and regulations requiring that subsistence takings not be wasteful and that priority use be given to subsistence rather than other consumptive uses of the species.

As discussed in previous Annual Reports, in 1976 the State of Alaska sought and received authority to manage walruses and, in 1979, the State relinquished that authority to the Fish and Wildlife Service. In 1982, the State of Alaska again took preliminary steps to request a transfer of management for ten species of marine mammals -- the same species, listed above, for which species reports have been prepared. Early in 1984, the State solicited public comments to help it make a final decision on whether to proceed with such a request. As a part of this process, the Alaska Department of Fish and Game conducted 49 public meetings to provide information on the transfer process requirements, to explain the likely consequences of a State management program, and to solicit comments from coastal residents and other affected parties. The meetings were completed early in 1985.

On 22 February 1985, however, the Alaska Supreme Court, in Madison v. Alaska Department of Fish and Game, invalidated a Board of Fisheries regulation designed to identify eligibility for subsistence fishing in the Cook Inlet region. The decision called into question the consistency of the State's subsistence requirements with provisions of the Marine Mammal Protection Act, thereby complicating the State's decision to request return of management authority for marine mammals.

On 30 May 1986, the State amended its subsistence law to remove the discrepancies between State and Federal subsistence requirements. By letter of 18 November 1986, the Department of the Interior's Assistant Secretary for Fish and Wildlife and Parks informed the State that the amendment brought State law into compliance with the subsistence requirements of the Alaska National Interest Lands Conservation Act. Those requirements are virtually identical to the subsistence provisions of section 109(f)(1) of the Marine Mammal Protection Act. Thus, it appears that the impediment to transfer of management imposed by the Madison decision has been removed.

On 21 December 1987, the Alaska Department of Fish and Game wrote to the Commission advising it that another series of 17 public meetings had been completed on polar bear, walrus, and sea otter, three species being considered as the possible focus of a more limited request for management authority. Twelve other meetings with various agencies, organizations, and interest groups were also held to discuss what was under consideration, to identify major concerns about management of marine mammals in Alaska, and to exchange views with Alaskans interested in the issue. At year's end, the State was compiling and evaluating the information obtained through this process and, in early 1988, the Department will make a recommendation to the Governor of Alaska as to whether an application for return of management should be submitted.

## Report of the Special Advisor on Native Affairs

The Marine Mammal Protection Act recognizes that marine mammals play an important role in the cultural and subsistence needs of Alaska Natives. Further, it calls on the Marine Mammal Commission to take such steps "as it deems necessary or desirable to further the policies of this Act, including provisions for the protection of the Indians, Eskimos, and Aleuts whose livelihood may be adversely affected by actions taken pursuant to this Act."

Following a series of meetings with interested persons in Anchorage, Fairbanks, and Nome, the Commission, on 30 September 1987, asked Mr. Matthew Iya, Special Advisor to the Marine Mammal Commission on Native Affairs, to prepare a report describing: the number of Alaska Natives and Native communities that are to some extent dependent on marine mammals to meet subsistence needs; the numbers of marine mammals needed to meet the subsistence needs of Natives; traditional subsistence uses of marine mammals by Alaska Natives in terms of type and quantity; factors that may prevent Natives from taking the species and numbers of marine mammals that they consider necessary to meet their subsistence and related needs (e.g., regulations, offshore oil and gas development, coastal development); terms for either cooperative programs or changes in State or Federal laws or regulations that would better ensure that Native subsistence and related needs are met, while safeguarding the well-being of affected marine mammal populations; and such legislative language and supporting rationale as the Native communities consider appropriate for amendments, if any, to the Marine Mammal Protection Act.

Recognizing that the consultations necessary to do such a report would require extensive travel, the Commission also made money available to support the travel of the Special Advisor to meet with informed persons throughout the State.

A draft of the report was presented at the Commission's Annual Meeting in December 1987, and the final report is expected in March 1988.

## Pacific Walrus, Memorandum of Agreement

On 21 May 1987, the Eskimo Walrus Commission, the Fish and Wildlife Service, and the Alaska Department of Fish and Game entered into an agreement to improve coordination and cooperation amongst themselves with other nations. Under the Agreement's terms, they are to cooperate on a variety of research and management activities in ways that are consistent with the Marine Mammal Protection Act. For example, the agreement addresses: development of conservation and management plans; retaining the Alaska Native exemption in the Act and implementing regulations; cooperative research on population dynamics, the presence and effects of pollutants, habitat protection, the impacts of harassment and other activities, and methods of reducing the loss rate in taking; the value of input from the Eskimo community in decision-making; the use of Native monitors in management activities; public education on walrus programs; agreements with other nations on walrus conservation; compliance with applicable laws and regulations; and the value of traditional Native knowledge in biological and other studies.

## Meeting of the Alaska Federation of Natives

In October 1987, the Alaska Federation of Natives, the Eskimo Walrus Commission, and the Rural Alaska Resources Association held a one-day workshop on marine mammals in Anchorage. The Marine Mammal Commission was one of several organizations asked to present a paper at the meeting. The Commission's paper touched briefly on: return of management to states; previous amendments to the Act designed to facilitate return of management; statutory and regulatory requirements which must be met if management is to be returned; subsistence provisions under State and Federal management; possible points to be discussed in reauthorization of the Marine Mammal Protection Act; and the species reports being prepared by the Commission-sponsored Working Groups.

As a result of marine mammal discussions at the workshop and further deliberations at the Alaska Federation of Natives Convention the following day, a number of resolutions pertaining to marine mammals and the pending reauthorization of the Marine Mammal Protection Act were passed. Among other things, the resolutions endorsed actions to: protect "the Native subsistence hunting exemption in the Marine Mammal Protection Act as an AFN priority"; amend the Act to allow commercial use of by-products of North Pacific fur seals and other marine mammals,

except sea otters, taken for subsistence purposes; oppose proposed regulatory authority of the Fish and Wildlife Service over Native take of marine mammals; amend the Act to allow Native people to alter the skins and other parts of traditionally harvested marine mammals for uses "which more nearly represent the best and most economical use of such mammals" nowadays; oppose the current definition of "depleted species" and instead develop a more comprehensive data base using biological and user-group knowledge to determine when a species is depleted; and support village regulation of sea otter taking until such time as a sea otter commission is established. At year's end, leaders of the Native community were considering these resolutions and other information as they prepared to develop, in early 1988, positions on reauthorization of the Marine Mammal Protection Act.

## Federal Marking and Tagging Regulations

In 1981, the Marine Mammal Protection Act was amended to provide the Fish and Wildlife Service with authority to promulgate regulations requiring the marking, tagging, and reporting of marine mammals taken by Alaska Natives. The purpose of the amendment was to make it possible to obtain better information on the numbers of marine mammals taken for subsistence and handicraft purposes. On 3 December 1985, the Fish and Wildlife Service published proposed marking and tagging regulations to implement the new statutory requirement. During the comment period, 32 public meetings were held throughout Alaska to discuss the proposed regulations and to solicit comments from affected individuals and interested parties.

By letter of 3 March 1986, the Commission, in consultation with its Committee of Scientific Advisors, recommended that the regulations be adopted, subject to certain modifications. Among other changes, the Commission recommended that: (a) the data obtained as a result of the regulations should be summarized each year in the annual report which the Fish and Wildlife Service submits to Congress under the Marine Mammal Protection Act; (b) the penalty provisions of the regulations should apply to the transport and export of unregistered marine mammal parts; and (c) a cost-effective, administratively flexible approach should be established for designating the villages where authorized Service representatives would be stationed for marking, tagging, and reporting purposes.

While final regulations had not been published by the end of 1987, the Fish and Wildlife Service had made known on various occasions during the year its intention to publish final regulations in 1988.

## Litigation

In a lawsuit filed in 1985 (Katelnikoff v. U.S. Department of the Interior), an Alaska Native challenged the validity of the Fish and Wildlife Service's regulatory definition of "authentic Native articles of handicraft and clothing." That definition requires that, in order to qualify for the Marine Mammal Protection Act's Native-take exemption, handicraft articles fashioned from marine mammal parts and products must have been "commonly produced on or before December 21, 1972." The plaintiff's complaint alleged that the cutoff date has no basis in the Marine Mammal Protection Act.

The litigation arose as a result of a seizure by Fish and Wildlife Service and National Marine Fisheries Service enforcement agents of several articles of handicraft made by the plaintiff out of sea otter skins. The items -- which included teddy bears, hats and mittens, fur flowers, and pillows -- were confiscated because there is no record indicating that such articles were commonly produced by Alaska Natives before the regulatory cutoff date. The plaintiff claimed that, by seizing these items, the Federal Government deprived her of the right to take marine mammals for handicraft purposes. A second plaintiff, whose sea otter handicrafts had also been seized by Fish and Wildlife Service agents, intervened in the proceeding, adopting the legal arguments of the original plaintiff.

On 21 July 1986, the U.S. District Court for the District of Alaska issued a decision in favor of the Fish and Wildlife Service. Relying on both the express provisions and the legislative history of the Marine Mammal Protection Act, the Court held that it was a reasonable exercise of the Service's authority to establish a 1972 cutoff date as part of its regulations. The question of whether the seized handicrafts of the original plaintiff were commonly produced by Alaska Natives prior to the regulatory cutoff date is expected to be reviewed in an administrative proceeding.

The intervenor, on 13 October 1987, raised a new challenge to the validity of the regulatory definition of "authentic Native articles of handicrafts and clothing," claiming that the regulation is unconstitutionally vague because it is unclear what handicrafts were produced prior to 21 December 1972. At the end of 1987, the court had not ruled on whether it would hear the new argument.

# CHAPTER V

## INTERNATIONAL ASPECTS OF MARINE MAMMAL PROTECTION AND CONSERVATION

Section 108 of the Marine Mammal Protection Act directs that the Departments of Commerce, the Interior, and State, in consultation with the Commission, seek to further the protection and conservation of marine mammals under existing international agreements and take such initiatives as necessary to negotiate additional agreements required to achieve the purposes of the Act. In addition, section 202 of the Marine Mammal Protection Act directs that the Marine Mammal Commission recommend to the Secretary of State and other Federal officials appropriate policies regarding existing international arrangements for the protection and conservation of marine mammals.

The Commission's activities in 1987 with respect to conservation and protection of marine mammals in the Southern Ocean, the International Whaling Commission, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region are discussed below.

### Conservation and Protection of Marine Mammals in the Southern Ocean

At least thirteen species of seals and whales inhabit or are present seasonally in the Southern Ocean, the seas surrounding Antarctica. Two of the seal species, the Antarctic fur seal and the southern elephant seal were driven to near-extinction by unregulated hunting in the late 18th and early 19th centuries. Most of the populations of large whales, including Antarctic populations of humpback, blue, fin, sei, and sperm whales, have been severely depleted by poorly regulated commercial whaling, which began in the Antarctic in the early 1900s.

In 1972, the Antarctic Treaty Consultative Parties concluded the Convention for the Conservation of Antarctic Seals to regulate commercial sealing, should it ever begin again in the Antarctic. In 1982, the International Whaling Commission agreed to a moratorium on commercial whaling, which took effect in 1986 (see the following section of this Chapter). Thus, commercial sealing and whaling presently do not pose threats to Southern Ocean populations of seals and whales. However, both commercial sealing and commercial whaling could be resumed in the future. In addition, developing fisheries, particularly

the fishery for Antarctic krill (Euphausia superba), and growing interest in possible mineral exploration and development pose threats to seals, whales, and other components of the Antarctic marine ecosystem.

Antarctic krill is a keystone of the Southern Ocean food web. It is one of the dominant herbivores and the principal component in the diets of numerous species including fin, blue, humpback, and minke whales; crabeater and Antarctic fur seals; Adelie, chinstrap, macaroni, and rockhopper penguins; several other species of sea birds; and several species of fish and squid. Some of these species are eaten in turn by sperm whales, killer whales, leopard seals, and other higher-order predators.

Because of the possible direct and indirect effects of fisheries, mineral development, and related activities on marine mammals, the Marine Mammal Commission has, since 1974, undertaken a continuing review of matters that might affect marine mammals, krill, or other components of the Southern Ocean ecosystem upon which marine mammals may depend. It has made recommendations to the National Science Foundation, the Department of State, the National Oceanic and Atmospheric Administration, and the National Marine Fisheries Service on the need for basic and directed research and monitoring programs and for international agreements to effectively regulate sealing, whaling, fisheries, mineral exploration and development, and related activities in the Southern Ocean. In addition, since the mid-1970s, Commission representatives have served as scientific advisors on most U.S. delegations to regular Antarctic Treaty Consultative Meetings, special consultative meetings held to negotiate the marine living resources and minerals regimes, and the Annual Meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources.

Background information and a description of 1987 activities are provided in the following sections.

## The 14th Antarctic Treaty Consultative Meeting

The Antarctic Treaty was signed in 1959 and entered into force in 1961. The purpose of the Treaty is to insure that the Antarctic does not become the scene or object of international discord. Among other things, the Treaty: prohibits military activity, nuclear testing, and disposal of nuclear waste in the Treaty Area (lands and ice shelves south of 60 degrees south latitude); provides for on-site inspection of all stations and field camps to insure compliance with Treaty provisions; and promotes cooperative scientific investigations and free exchange of scientific information. The Antarctic Treaty Consultative Parties -- the 12 countries that partici-

pated in the 1957-1958 International Geophysical Year (IGY) research program in the Antarctic and the subsequent negotiation of the Antarctic Treaty, and countries that since established and maintained research programs in the Antarctic -- meet periodically to review and facilitate operation of the Treaty. Since the 12th Consultative Meeting held in Canberra, Australia, in September 1983, contracting parties which do not carry out research programs necessary to achieve consultative status have been invited to attend the regular Consultative Meetings and the special meeting (see below) charged with developing a regime to govern possible mineral exploration and development in the Antarctic.

The 14th Antarctic Treaty Consultative Meeting was held in Rio de Janeiro, Brazil, from 5-16 October 1987. Representatives of the 20 Consultative Parties[1] and most of the 17 non-Consultative Parties[2] attended the meeting. In addition, representatives of several international organizations -- the Scientific Committee on Antarctic Research, the Commission on the Conservation of Antarctic Marine Living Resources, the World Meteorological Organization, and the International Union for the Conservation of Nature and Natural Resources -- were invited and attended the meeting. Environmental issues considered by the 14th Consultative Meeting included environmental impact assessment procedures, waste disposal, protected areas, data management, and safeguards for scientific drilling.

Environmental Impact Assessment: Scientific research and related logistic support activities, like fisheries and mineral exploration and development, can have adverse effects on the Antarctic environment. In recognition of this fact, the 12th Consultative Meeting, 13-27 September 1983, adopted general guidelines and requested that the Scientific Committee on Antarctic Research (SCAR), described below, provide advice on procedures that should be used to evaluate the possible environmental impacts of scientific and logistic support activities in Antarctica. The subsequent SCAR report -- "Man's

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[1] As of 31 December 1987, the Consultative Parties were: Argentina, Australia, Belgium, Brazil, Chile, the People's Republic of China, France, the German Democratic Republic, the Federal Republic of Germany, India, Italy, Japan, New Zealand, Norway, Poland, South Africa, the Union of Soviet Socialist Republics, the United Kingdom, the United States, and Uruguay.

[2] As of 31 December 1987, the non-Consultative Parties were: Austria, Bulgaria, Cuba, Czechoslovakia, Denmark, Ecuador, Finland, Greece, Hungary, the Democratic People's Republic of Korea, the Republic of Korea, The Netherlands, Papua New Guinea, Peru, Romania, Spain, and Sweden.

Impact on the Antarctic Environment: A Procedure for Evaluating Impacts from Scientific and Logistic Activities" -- was considered by the 13th Consultative Meeting in Brussels, Belgium, in 1985. The meeting was unable to reach agreement on adoption of standard guidelines or procedures for environmental impact assessment, but did agree that the matter should be considered further at the 14th Consultative Meeting.

At the 14th Consultative Meeting, it was agreed that, in the process of planning Antarctic scientific and logistic support activities, the national organizations responsible for planning should evaluate the possible impacts of the activities using guidelines set forth in the agreed recommendation. The guidelines are an amalgamation of those proposed in the previously mentioned SCAR report and in the "Goals and Principles on Environmental Impact Assessment" adopted by the Governing Council of the United Nations Environmental Program in June 1987. They are also consistent with the environmental impact assessment procedures established by the U.S. Council on Environmental Quality to help implement the U.S. National Environmental Policy Act. If applied as recommended, the guidelines will help to minimize the impact of human activities on the Antarctic environment.

Waste management: The 8th Antarctic Treaty Consultative Meeting, held in 1975, developed and recommended adoption of a Code of Conduct for Antarctic Expedition and Station Activities, including recommended procedures for waste disposal. In 1985, the 13th Antarctic Treaty Consultative Meeting requested that SCAR undertake a comprehensive review of waste disposal practices and provide advice on standards that would be desirable to achieve at coastal and inland stations and field camps and ways that the standards can be met. SCAR was unable to complete its review before the 14th Consultative Meeting, due in part to incomplete responses from national program operators to requests for information concerning waste disposal practices at existing Antarctic stations and field camps. Recognizing the importance of identifying and using the best available technology and practices, the 14th Consultative Meeting urged national operating agencies to respond promptly and fully to the request for information concerning national practices. Pending receipt of SCAR's advice on the matter, the Meeting urged all parties to consider: (1) the clean-up of existing waste disposal sites; (2) minimizing the amount of waste generated; (3) reuse or recycling of waste materials; and (4) removal of all waste from the Treaty area that cannot otherwise be disposed of in an environmentally sound manner.

The United States should lead the way in developing and implementing environmentally sound waste disposal practices in the Antarctic and, in 1988, the Commission will work with the National Science Foundation, the National Marine Fisheries

Service, and the Department of State to identify and evaluate ways in which waste disposal practices at U.S. stations and field camps in Antarctica can and should be improved.

Protected Areas: Recommendations adopted by the 7th and 8th Antarctic Treaty Consultative Meetings (1972 and 1975) established procedures for designating Sites of Special Scientific Interest and Specially Protected Areas. Since then, 28 Sites of Special Scientific Interest and 17 Specially Protected Areas have been so designated. The types and sizes of areas protected have been limited and the 13th Consultative Meeting adopted a recommendation requesting that SCAR review and provide advice on the adequacy of the existing system of protected areas, including the possible need for an additional category under a different form of protection. SCAR's response to this request, provided in a report entitled "The Protected Areas System in the Antarctic," pointed out a number of deficiencies in and questions concerning the existing system. It recommended that: (1) existing Specially Protected Areas, Sites of Special Scientific Interest, and historic monuments be visited periodically to determine whether the objectives for which they were designated are being met; (2) the results of site visits carried out during the next two years be made available for consideration during the preparatory meeting for the 15th Consultative Meeting in 1989; (3) management plans be developed for Specially Protected Areas, as well as Sites of Special Scientific Interest; (4) measures be taken to encourage submission of proposals for additional protected areas to provide protection for geographically distributed, representative examples of all Antarctic terrestrial, inland water, and marine ecosystems; and (5) an additional multipurpose category of protected area be added to the existing system.

In response to the first two recommendations, the 14th Consultative Meeting urged that Parties undertake visits to as many Specially Protected Areas, Sites of Special Scientific Interest, and historic monuments as possible during the next two years and that reports of these visits be provided for consideration at the preparatory meeting for the 15th Consultative Meeting. With regard to the third recommendation, the meeting acknowledged the desirability of management plans for Specially Protected Areas as well as for Sites of Special Scientific Interest. There were differing views, however, as to whether management plans could be required without amending the Agreed Measures for the Conservation of Antarctic Flora and Fauna, adopted at the 8th Consultative Meeting in 1975. It was agreed that examples of management plans for Specially Protected Areas should be developed and the matter should be considered further at the 15th Consultative Meeting. With regard to the recommendation that steps be taken to expand the number and types of areas protected under the existing

system, the meeting urged parties to conduct surveys and take other feasible steps to identify possible candidate areas and, when deemed appropriate, to draft and submit proposals for additional Sites of Special Scientific Interest and Specially Protected Areas.

The fifth SCAR recommendation -- that a new multi-purpose category of protected area be established -- was the subject of much debate. The utility of zoning and other multiple-use management practices was generally recognized. However, most delegations, including the U.S. delegation, believed that further study and experience are required to determine how best to implement such practices. To facilitate further consideration by the 15th Consultative Meeting, it was suggested that Parties identify and prepare draft management plans for areas that might be considered for designation under the proposed, multiple-use category of protected area.

During the discussions, there were differing views as to whether Specially Protected Areas could be designated to provide protection to areas for other than biological purposes. To overcome the problem, the United States proposed establishing a new category of protected area, tentatively called "Special Reserves," to provide unambiguous authority for protecting areas of outstanding geological, recreational, scenic, or wilderness value. Time was insufficient to act on this proposal, and it will be taken up again at the 15th Consultative Meeting.

The area around the U.S. Palmer Station on Anvers Island is one of the areas that might benefit by establishment of a zoning plan envisioned as part of the new multiple-use category of protected area. Tourism, as well as a variety of scientific studies, occur in the area and create substantial potential for interference and environmental damage. Therefore, the Commission will work with the National Science Foundation and the Department of State in 1988 and 1989 to prepare a draft management plan for possible consideration at the 15th Consultative Meeting. The Commission also will assist, as appropriate, in developing and seeking agreement on a proposal to establish a new single-use category of protected area to protect areas of outstanding geological, recreational, scenic, and wilderness value.

Data Management: Much of the data being compiled by national Antarctic programs may be useful for assessing the possible environmental effects of scientific research programs, fisheries, mineral exploration and development, and related logistic support activities in the Antarctic. The utility of the data will depend, in part, upon their accessibility and comparability. Therefore, in response to a U.S. initiative, the 13th Antarctic Consultative Meeting requested that SCAR

provide advice on the comparability and accessibility of Antarctic scientific data to facilitate planning and management of activities in Antarctica. Because of the complexity of the task, SCAR will be unable to respond to the request until after its meeting in September 1988. Recognizing the importance of the task, the 14th Consultative Meeting called upon national contact points to assist in gathering needed information. It noted that two important beginning steps are to: (1) identify the specific types of data likely to be most useful for planning, managing, and evaluating activities in Antarctica, and (2) develop a directory which lists where and in what format such data exist and how they can be accessed.

SCAR has constituted an ad hoc group on Environmental Data Management to respond to the Consultative Parties' request for advice on this matter. The chairman of this group has requested that the Marine Mammal Commission and other U.S. agencies assist in identifying and cataloging relevant data. The Commission has provided the requested assistance and will continue to do so in 1988.

Safeguards for Scientific Drilling: In some areas of Antarctica, drilling into the earth's crust could strike oil or gas deposits and result in oil leaks that would damage the Antarctic environment. In response to a National Science Foundation initiative, the 14th Antarctic Treaty Consultative Meeting adopted "Guidelines for Scientific Drilling in the Antarctic Treaty Area." The Guidelines recommend that, before conducting scientific drilling in areas where hydrocarbons might be encountered, a geophysical survey of the proposed drill site be conducted to identify potential hazards, the survey data be provided to appropriate experts to evaluate and determine how to avoid potential environmental impacts, drilling be done off potential hydrocarbon-bearing structures to reduce the possibility of encountering hydrocarbons, contingency plans be developed to deal with any problems that may develop during drilling, and drilling operations be continuously monitored to detect and promptly respond to any problems that might arise.

If applied properly by the national operating agencies, the guidelines should substantially eliminate the possibility of environmental damage from scientific drilling.

## Activities Related to Antarctic Seals

In 1964, a private Norwegian expedition conducted exploratory sealing in the western Atlantic section of the Southern Ocean to determine whether crabeater seals could be profitably exploited. At about the same time, Canadian scientists recommended that the Canadian and Norwegian long-distance sealing fleets be diverted to the Antarctic to reduce exploitation

pressure on depleted harp seal stocks in the western North Atlantic. Recognizing the need to provide a mechanism for regulating a commercial sealing industry, should it develop, the Antarctic Treaty Consultative Parties developed and, in 1972, concluded the Convention for the Conservation of Antarctic Seals. The Convention entered into force in March 1978 and, to date, has been ratified by Argentina, Australia, Belgium, Brazil, Chile, the Federal Republic of Germany, France, Japan, Norway, Poland, South Africa, the Union of Soviet Socialist Republics, the United Kingdom, and the United States. The Convention prohibits commercial harvesting of fur seals, elephant seals, and Ross seals. Permissible catch levels, sealing areas, and sealing seasons for crabeater, leopard, and Weddell seals are specified in an Annex. The Convention provides for the establishment of a regulatory body and scientific advisory committee, when and if commercial sealing is resumed, and requires that Convention Parties annually provide information on seals taken for either scientific or commercial purposes to the other parties and to the Scientific Committee on Antarctic Research. It also provides that the Scientific Committee on Antarctic Research and the other contracting parties must be notified at least 30 days in advance of departure from their home ports of proposed sealing expeditions and that the parties shall meet at least every five years to review the operation of the Convention.

Since the Convention was concluded in 1972, several hundred seals have been killed each year for research purposes. The Scientific Committee on Antarctic Research has established a Group of Specialists on Seals to facilitate and coordinate Antarctic seal research. This group has been charged with compiling information and advising SCAR on measures needed to improve information exchange and to facilitate stock assessment and scientific research. Several parties to the Convention have not met the reporting requirements and, at its meeting in San Diego in June 1986, SCAR urged all of its national committees to insure that data on seals killed or captured in the Antarctic are submitted in the appropriate form and in a timely fashion to the convener of the Group of Specialists to enable SCAR to meet its commitments under the Seals Convention. This problem was called to the attention of the Antarctic Treaty Consultative Parties during their meeting in Rio de Janeiro in October 1987.

As noted in the Commission's previous Report, the Union of Soviet Socialist Republics advised the United States and other parties to the Seals Convention in October 1986 that it was sending two sealing vessels to the Antarctic on 10 November 1986 to conduct experimental sealing. In a diplomatic note dated 4 November 1987, the Soviet Union advised the United States and other Convention parties that the two sealing vessels had conducted experimental sealing in the Balleny Island area

from 9 December 1986 to 2 February 1987 and that, during this period, they had taken 4,014 crabeater seals, 649 leopard seals, 107 Weddell seals, 30 Ross seals, and 2 elephant seals.

In 1988, the Seals Convention will have been in effect for ten years and, pursuant to the previously mentioned review provision, the United Kingdom, as depository government, will convene a review conference in London. During the conference, to be held 12-16 September 1988, the Parties to the Convention will consider ways to improve operation of the Convention, including the possible need to constitute a regulatory body and scientific advisory body. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, will work with the Department of State and other involved U.S. agencies to develop U.S. positions on matters to be considered at this review conference.

Activities Related to Other Living Resources

Experimental harvesting of Antarctic krill was begun by the Soviet Union and Japan in the early 1960s. Commercial harvesting of finfish was begun by the Soviet Union in the late 1960s. As noted in previous Commission Reports, concern that the developing fisheries, particularly the krill fishery, could adversely affect dependent and associated species, as well as the species being exploited, led the Scientific Committee on Antarctic Research to plan and coordinate an international research program entitled "Biological Investigations of Marine Antarctic Systems and Stocks." Recognition of the need for a legal framework to regulate fisheries led the Antarctic Treaty Consultative Parties to develop and adopt the Convention for the Conservation of Antarctic Marine Living Resources.

The Convention, which was concluded in May 1980 and came into force in April 1982, established the Commission and the Scientific Committee for the Conservation of Antarctic Marine Living Resources. The first meetings of the Commission and Scientific Committee were held in 1982. The Marine Mammal Commission's activities regarding negotiation of the Convention and the first five meetings of the Commission and Scientific Committee established by the Convention are described in previous Annual Reports.

The 1987 meetings of the Commission and Scientific Committee: The 1987 meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources were held in Hobart, Australia, on 26 October - 6 November 1987. To help prepare for these meetings and to review plans for the Antarctic Marine Living Resources Research Program being developed by the National Marine Fisheries Service (see below), the Service, in consultation with the Marine

Mammal Commission, the Department of State, and the National Science Foundation, convened an ad hoc group of U.S. scientists and representatives of interested industry and environmental groups in Washington, D.C., on 15-16 April 1987. At that meeting, information and views were exchanged on scientific and technical issues on the agenda for the 1987 meetings of the Living Resources Commission and Scientific Committee and on research and monitoring which the United States should carry out to implement the Living Resources Convention. Marine Mammal Commission representatives participated in the preparatory meeting and in subsequent efforts to develop agreed positions on issues scheduled for consideration during the 26 October - 6 November 1987 meetings of the Living Resources Commission and Scientific Committee.

During their 1987 meetings, the Living Resources Commission and Scientific Committee considered a broad range of issues, including finfish conservation measures, krill research and monitoring, observation and inspection, incidental mortality and marine debris, ecosystem monitoring, and development of a long-term conservation strategy.

Finfish Conservation Measures: Vessels from six Contracting Parties (Chile, the German Democratic Republic, France, Japan, Poland, and the Union of Soviet Socialist Republics) fished in the Convention Area during the 1986/1987 season.[3] The total fish catch was 98,029 metric tons, up substantially from the catch of 58,228 metric tons in 1985/1986. Most of the catch (74,142 metric tons) was *Champsocephalus gunnari* and was taken from the area around South Georgia Island.

The 1986/1987 catch of *C. gunnari* (primarily by Soviet fishing vessels) was more than five times the 1985/1986 catch, despite the fact that the fishing nations had indicated their intent at the 1986 Commission meeting to maintain the catch of this species at about the 1985/1986 level. The increase was because the fishing fleets found larger than expected quantities of the species, not because of increased fishing effort.

Recognizing the desirability of limiting fishing mortality and the possibility that a considerable quantity of *C. gunnari* might already have been taken from the South Georgia area

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[3] As of 31 December 1987, there were 20 members of the Living Resources Commission and Scientific Committee: Argentina, Australia, Belgium, Brazil, Chile, the European Economic Community, France, the German Democratic Republic, the Federal Republic of Germany, India, Japan, the Republic of Korea, New Zealand, Norway, Poland, South Africa, Spain, the Union of Soviet Socialist Republics, the United Kingdom, and the United States.

since the 1987/1988 fishing season began in August-September, the Commission imposed several conservation measures. It established a 1987/1988 Total Allowable Catch of 35,000 metric tons for C. gunnari in the South Georgia area, retroactive to 1 July 1987; it required that catches of C. gunnari be reported to the Secretariat at ten-day intervals beginning no later than 1 December 1987; and it prohibited fishing for other species in the South Georgia area, except for scientific purposes, after the Total Allowable Catch of 35,000 metric tons of C. gunnari is reached. The Commission also closed the C. gunnari fishery in the South Georgia area from 1 April to 1 October 1988 and requested that the Scientific Committee provide advice for C. gunnari and other species on: (i) the appropriate mesh size to protect young fish; (ii) closed areas and/or seasons to protect young fish and reduce by-catch; (iii) estimates of total allowable catch that would achieve an appropriately low value of fishing mortality; and (iv) an evaluation of the total finfish replacement yield on an area basis.

Krill Research and Monitoring: The total catch of krill in the Convention Area in 1986/1987 was 376,527 metric tons, down substantially from the 1985/1986 catch of 445,673 metric tons. It is unlikely that this level of catch has had any adverse effects on either krill stocks or krill predators, except possibly in local areas. However, the need to assess and monitor krill stocks and to determine how best to predict and detect the effects of fishing has been recognized by both the Living Resources Commission and the Scientific Committee. The Committee, with Commission concurrence, has initiated or recommended a range of theoretical studies, field experiments, and monitoring programs to determine how best to assess and monitor krill stocks and to detect the possible effects of fishing on both krill stocks and krill predators.[4] At its 1987 meeting, the Scientific Committee established an ad hoc working group to review and evaluate past and planned krill research and to advise it on the potential application of such research to stock assessment and ecosystem monitoring.

Observation and Inspection: Article XXIV of the Living Resources Convention provides for establishment of a system of observation and inspection to insure compliance with provisions of the Convention. During the 1987 meeting of the Commission, it was agreed that: each member of the Commission may designate inspectors and observers who shall be entitled

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[4] Actions taken by the Commission and the Scientific Committee for the Conservation of Antarctic Marine Living Resources are described in their annual meeting reports. These and related reports can be obtained from: The Executive Secretary, Commission for the Conservation of Antarctic Marine Living Resources, 25 Old Wharf, Hobart, Tasmania 7000, Australia.

to carry out inspection and observation activities on board vessels engaged in scientific research or harvesting of marine living resources in the Convention area; the Commission shall maintain a register of certified inspectors and observers designated by members; reports of observers and inspectors shall be provided to the designating member, which in turn shall report to the Commission; and, if there is evidence of violations of the provisions of the Convention or measures adopted thereunder, the flag state shall take steps to prosecute and, if necessary, impose sanctions. The Commission also established a Standing Committee to provide advice on such matters as boarding and inspection procedures, reporting formats, inspection and observation priorities, and steps taken by members to enforce compliance with measures adopted under the Convention. There was preliminary discussion of possible means for financing the system of observation and inspection. The discussion will be continued during the 1988 meeting of the Standing Committee on Observation and Inspection.

Incidental Mortality and Marine Debris: Seals, whales, birds, and other non-target species may be caught and killed incidentally during fishing operations, be caught and killed in lost and discarded fishing gear, or die as a result of ingesting plastic bags and other debris discarded in the Convention Area (see also Chapter VI of this Report). The Living Resources Commission has recognized this and has adopted a number of measures to try to insure that accidental and incidental mortality of marine living resources does not become a serious problem in the Convention Area.

At the 1987 meeting, Commission members reported sightings of debris, including fishing buoys, gas bottles, plastic containers, trawl net fragments, and plastic packing bands, in the Convention Area. In addition, they reported sightings of two fur seals entangled in fragments of fishing nets and a third entangled in the dropper of a long line. To call attention to the problem and steps that should be taken to prevent it from developing in the Convention Area, the Commission directed the Executive Secretary to publish and distribute (1) an information brochure advising fishermen, researchers, and others working in the Convention Area of the sources, fates, and effects of potentially hazardous marine debris, and (2) a placard, describing the "do's" and "don't's" with respect to handling, storing, and discarding different types of refuse, that can be displayed in appropriate places aboard ships in the Convention Area. Members were urged to provide the brochure to scientists and others working in Antarctica and to ensure that all vessel operators were provided with the placard.

It was agreed that Members would continue to report and to take all feasible steps to prevent the discard of potentially hazardous debris in the Convention Area and that the

subject of incidental mortality should be kept under continuing review.

Ecosystem Monitoring: The Scientific Committee for the Conservation of Antarctic Marine Living Resources established a Working Group in 1984 to formulate and coordinate implementation of a multi-national research program to assess and monitor key components of the Antarctic marine ecosystem. This Working Group has met three times and developed a long-range program plan with three major elements: (1) monitoring of representative krill predators (e.g., crabeater and Antarctic fur seals and Adelie, chinstrap, and macaroni penguins) at a network of sites throughout Antarctica; (2) comprehensive studies of krill, krill predators, and related environmental variables in three "integrated study areas" (Prydz Bay, the Bransfield Strait, and the area around South Georgia Island); and (3) basic studies of the demography and dynamics of crabeater seals in one or more pack ice areas.

At its 10-16 June 1987 meeting in Dammarie-les-Lys, France, the Working Group began developing standard protocols for collecting and reporting various types of data. It recommended steps that should be taken to initiate monitoring of key krill predators, particularly fur seals and penguins, in and near the three integrated study areas. The Working Group's recommendations were endorsed by the full Scientific Committee and by the Commission during their 26 October - 6 November 1987 meetings.

Development of a Conservation Strategy: There is no established precedent to the ecosystem-oriented conservation standard set forth in Article II of the Convention on the Conservation of Antarctic Marine Living Resources. Therefore, at its 1986 meeting, the Living Resources Commission established a Working Group to assist in determining how best to give effect to Article II. This Working Group met during the 1987 meetings of the Commission and Scientific Committee and agreed to focus initially on development of performance criteria for assessing the effectiveness of different conservation approaches with respect to attaining the objectives set forth in Article II of the Convention. It was agreed that Australia, as convenor of the Working Group, would prepare and distribute a discussion paper early in 1988 to serve as the basis for further consideration of the subject during the next meeting of the Commission, scheduled for on 24 October - 4 November 1988 in Hobart.

The Marine Mammal Commission believes that development and implementation of an effective ecosystem monitoring program and a long-range conservation strategy, combined with timely and accurate reporting of catch, effort and related biological information, and development of an effective system of observation and inspection, are the keys to successful implementation

MARINE MAMMAL COMMISSION
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WASHINGTON, DC 20006

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Dear Jack:

I enclose a copy of our Annual Report for Calendar Year 1987.

Sincerely,

John R. Twiss, Jr.
Executive Director

Enclosure

of the Convention on the Conservation of Antarctic Marine Living Resources. In 1988, the Commission will consider and provide advice, as appropriate, to the Department of State, the National Marine Fisheries Service, and the National Science Foundation on steps needed to facilitate development and implementation of an effective monitoring program and conservation strategy for the Antarctic marine ecosystem.

The U.S. Antarctic Marine Living Resources Research Program

The Antarctic Marine Living Resources Convention Act of 1984 establishes the domestic authority necessary for the United States to implement the Convention for the Conservation of Antarctic Marine Living Resources. Among other things, the Act directs that the National Science Foundation continue support of basic marine research in the Antarctic and that the Secretary of Commerce, in consultation with the Secretary of State, the Director of the National Science Foundation, and appropriate officials of other Federal agencies, such as the Marine Mammal Commission, prepare, implement, and annually update a plan for directed research necessary to effectively implement the Convention.

In response to the Act's directive, the National Marine Fisheries Service has prepared, adopted, and begun to implement a plan for directed marine living resource research in the Southern Ocean. The plan was developed in consultation with the National Science Foundation, the Marine Mammal Commission, other Federal agencies, knowledgeable scientists in the United States and abroad, and representatives of the U.S. fishing industry and public interest groups.[5] The Service received a $2 million supplement to its Fiscal Year 1987 budget appropriation to begin implementing the program. Ship support is a critical limiting factor and, to make the best possible use of the available funding, the Service arranged to carry out three research cruises in 1986-1987 on a cost-sharing basis aboard a Polish research vessel, the Profesor Siedlecki.

The preliminary results of the three research cruises and an update of the National Marine Fisheries Service's Program Development Plan were reviewed during the previously mentioned meeting of the ad hoc U.S. Scientific Working Group on the

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[5] Details of the National Marine Fisheries Service's Antarctic Marine Living Resources Research Program can be obtained from Michael F. Tillman, Ph.D., AMLR Program Manager, National Marine Fisheries Service, 1825 Connecticut Avenue, N.W., Washington, D.C. 20235; or Kenneth Sherman, Ph.D., Director, Narragansett Laboratory, Northeast Fisheries Center, National Marine Fisheries Service, South Ferry Road, Narragansett, Rhode Island 02882-1199.

Antarctic, convened by the National Marine Fisheries Service on 15-16 April 1987. Subsequently, a series of papers describing the basic results of the research cruises and other studies done as part of the directed research program were prepared and provided to the Scientific Committee for the Conservation of Antarctic Marine Living Resources for consideration during its 1987 meeting described earlier. One paper described the results of a fish stock assessment done in November-December 1986. It provided convincing evidence that the stock of Notothenia rossii in the South Georgia region has been seriously overfished and played a key role in calling attention to the continuing need for stringent conservation measures.

Again in Fiscal Year 1988, the Service received a $2 million supplement to its budget appropriation to continue implementation of the directed research program mandated by the Antarctic Marine Living Resources Convention Act of 1984. (This amount may be reduced due to reprogramming of funds or subsequent Fiscal 1988 budget reductions.) Required ship support continues to be a major limiting factor and, to make the best possible use of available funding, the Service again made arrangements to cooperatively carry out two research cruises in 1987-88 on a cost-sharing basis aboard the Profesor Siedlecki. The Service also made arrangements to conduct land-based studies of seals and birds at Seal Island in the South Shetland Islands and at Palmer Station on Anvers Island.

Plans for the FY 1988 research program were reviewed during a meeting convened by the Service on 21 October 1987. Representatives of the Commission, the National Science Foundation, the State Department, and the Service's four research centers participated in the meeting. Meeting participants noted a number of ways to improve planning and exchange of information between the National Science Foundation and the National Marine Fisheries Service.

The Commission believes that both basic and directed research are essential to effective operation of the Antarctic Treaty system. Therefore, in 1988, the Commission will continue to work with the Department of State, the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, the National Science Foundation, and private organizations to facilitate development of both basic and directed marine research programs in the Antarctic.

Activities Related to Non-living Resources

There is growing interest, as noted earlier, in potential non-living resources in Antarctica, particularly offshore oil and gas. Disturbance, noise, oil spills, and other environmental pollutants resulting from exploration, development, and transport of oil, gas, or other non-living resources could

have direct and indirect effects on whales, seals, krill, and other components of the Antarctic marine ecosystem. The Antarctic Treaty Consultative Parties have recognized this possibility and, at the 11th Antarctic Treaty Consultative Meeting (Buenos Aires, Argentina, 23 June - 7 July 1981), agreed that a regime should be elaborated to provide means for: (1) assessing the possible impact of mineral resource activities on the Antarctic environment in order to provide for informed decision-making; (2) determining the acceptability of possible mineral resource activity; and (3) governing those activities determined to be acceptable.

Negotiation of the regime began in New Zealand in June 1982 as the first session of the 4th Special Antarctic Treaty Consultative Meeting. The negotiations continued at formal and informal sessions in New Zealand (January 1983), the Federal Republic of Germany (July 1983), Washington, D.C. (January 1984), Japan (May 1984), Brazil (February 1985), France (September 1985), Australia (April 1986), Japan (October/November 1986), and Uruguay (May 1987). The next round of negotiations will be held in New Zealand in January 1988. If these are successful, it is expected that a meeting to conclude the regime will be held in New Zealand in May 1988.

The Marine Mammal Commission believes that an effective regime for regulating and monitoring possible mineral resource activities in the Antarctic offers great potential for ensuring that any such activities are not to the disadvantage of whales, seals, and other components of the Antarctic marine ecosystem. The Commission, therefore, has provided and will continue to provide advice and assistance to the Department of State to insure, insofar as possible, that the regime is ecologically sound and provides adequate and effective means for protecting marine mammals and their habitat in the Southern Ocean.

The Scientific Committee on Antarctic Research (SCAR)

The Scientific Committee on Antarctic Research was established in 1958 to foster international cooperation on scientific research programs in the Antarctic. It is one of the Scientific Committees under the International Council of Scientific Unions, a body to which the National Academy of Sciences is the U.S. adhering organization. The Academy's Polar Research Board functions as the U.S. National Committee for SCAR. SCAR serves as an unofficial scientific advisory body to the Antarctic Treaty Consultative Parties, who have increasingly called upon it for scientific and technical advice concerning conservation and other issues. As noted earlier, for example, the Antarctic Treaty Consultative Parties have, since 1983, requested that SCAR provide advice on: procedures to evaluate the possible environmental impacts of scientific research programs and related logistic support activities in the Ant-

arctic; standards and technology for waste disposal; the adequacy of the existing system of protected areas and the possible need for an additional category of protected area; and measures that possibly could be taken to improve the comparability and accessibility of environmental and other data being collected by national programs.

SCAR and many of its subsidiary bodies are scheduled to meet in Hobart, Australia, in September 1988. Conservation-related issues to be considered at these meetings include: SCAR's response to the previously mentioned requests from the Antarctic Treaty Consultative Parties for advice on waste disposal and possible means for improving the comparability and accessibility of scientific data on Antarctica; preparation of a statement elaborating SCAR principles regarding protection of the Antarctic environment; a proposal to establish a Group of Specialists on Antarctic Environmental Affairs and Conservation; the future of Antarctic science; and continued development of cooperative programs and working relationships with the Scientific Committee for the Conservation of Antarctic Marine Living Resources. In addition, a symposium (the Fifth Symposium on Antarctic Biology) will be held immediately before the SCAR meetings to review and consider information concerning ecological change and the conservation of Antarctic ecosystems.

The Marine Mammal Commission believes that SCAR plays a critical role in planning and coordinating research programs in the Antarctic and is essential to the effective operation of the Antarctic Treaty system. Through the Polar Research Board, the Commission will continue to provide whatever assistance possible to facilitate SCAR's work.

New International Interest in Antarctica

There is growing international interest in Antarctica. Since the Treaty entered into force in 1961, 25 additional nations have acceded to it, bringing the total number of parties to 37. As noted earlier, eight of the acceding states have achieved consultative status by establishing and maintaining research programs in the Antarctic, making a total of 20 parties eligible to participate in making decisions under the Antarctic Treaty.

The growing international interest in Antarctica reflects, in part, recognition of the value of scientific research which remains the primary human activity in Antarctica. It also results from speculation about potential resources, particularly non-renewable mineral and hydrocarbon resources, in Antarctica. In addition, there is growing interest in tourism, raising concerns about tourist safety, impacts of tourism on the Antarctic environment, and impacts of tourism on Antarctic reseach.

As noted in previous Commission Reports, speculation about possible mineral resources appears to have been a major factor stimulating an initiative by Malaysia in 1983 and later to involve the United Nations in Antarctic matters. The "Question of Antarctica" was raised again during the 42nd session of the United Nations General Assembly in December 1987. Two resolutions were adopted by vote. The first resolution calls upon the Antarctic Treaty Consultative Parties to invite the United Nations Secretary General to all meetings of the Consultative Parties, including the special meeting negotiating the minerals regime, and repeats the 1986 call for a moratorium on the minerals negotiations until such time as all members of the international community are able to participate. The second resolution repeats an earlier appeal to the Antarctic Treaty Parties to exclude the apartheid regime of South Africa from participation in Consultative Party meetings. As in 1986, the majority of the Antarctic Treaty Parties did not participate in the vote on the first resolution. A number of Parties did, however, participate in the vote on the resolution regarding South Africa.

The Marine Mammal Commission believes that the Antarctic Treaty and the related agreements that form the Antarctic Treaty system provide the basis for effectively protecting and conserving marine mammals and their habitat in the Southern Ocean. In 1988, the Commission will continue its efforts to help implement the Antarctic Treaty, the Convention for the Conservation of Antarctic Seals, and the Convention on the Conservation of Antarctic Marine Living Resources, and to complete negotiation of an ecologically sound minerals regime.

## The International Whaling Commission (IWC)

During 1987, representatives of the Marine Mammal Commission consulted with the U.S. Commissioner to the IWC and others in preparation for the Thirty-ninth Annual Meeting of the IWC and attended meetings of the IWC Scientific Committee. In addition, the Commission consulted with the National Oceanic and Atmospheric Administration, the State Department, and others on other matters related to participation of the United States in the IWC. A summary of the activities undertaken during 1987 follows.

### The June 1987 Meeting of the IWC

Membership and participation -- Representatives of 33 of the IWC's 41 member nations participated in the IWC's Thirty-ninth Annual Meeting, held in Bournemouth, England, on 22-26 June 1987.

Moratorium on Commercial Whaling -- In 1982, the IWC adopted a new provision, paragraph 10 (e), to its Schedule of regulations. The provision established catch limits for all commercial whaling at zero, beginning with the 1985/1986 pelagic and 1986 coastal whaling seasons, and provided that, by 1990 at the latest, the IWC would undertake a comprehensive assessment of the effect of this decision on whale stocks and consider modifying the provision and establishing catch limits other than zero. No action was taken during the 1987 meeting to change this provision and, therefore, catch limits for commercial whaling remained at zero for all stocks of whales during the 1987-1988 whaling seasons. Catch limits for commercial whaling will continue to be set at zero unless and until a three-quarters majority of the IWC's membership votes to modify Schedule paragraph 10 (e).

Three nations (Japan, Norway, and the Soviet Union) maintain objections to Schedule paragraph 10 (e). Under the International Convention for the Regulation of Whaling of 1946, this action removes the obligation of their respective governments to comply with the requirements of this provision. During 1987, all three nations exercised their rights under the Convention to allow whales to be taken commercially by their nationals.

Notwithstanding any take of whales during permitted scientific research (see below), all three nations have expressed plans to suspend commercial whaling activity before the end of 1988. At the 1985 IWC meeting, the Soviet Union announced its intention to suspend commercial whaling after the 1986-1987 Antarctic minke whaling season for technical reasons. As of the end of 1987, no Soviet ships were engaged in commercial whaling. As noted in the previous Annual Report, pursuant to a 1984 agreement between the United States and Japan, the Government of Japan submitted a prospective withdrawal of its objection to paragraph 10 (e) in July 1986. The withdrawal is to take effect on or before 1 April 1988, after which time Japan will be obligated to comply with the moratorium provision. The Government of Norway has expressed its intent to suspend commercial whaling after the 1987 whaling season, but it has not indicated whether it will withdraw its objection to the IWC moratorium provision and, if so, when.

Comprehensive Assessment -- During a meeting of the IWC Scientific Committee in April 1986, a work plan and timetable were developed for conducting the comprehensive assessment required under Schedule paragraph 10 (e). They were approved by the IWC at its meeting in 1986 and, according to its provisions, two workshops and three contract reviews were carried out or initiated between the 1986 and 1987 IWC meetings. The workshops were held in Reykjavik, Iceland, in March 1987 and addressed (a) the utility of using data on catch per unit of

effort as an index of whale abundance and (b) alternative management procedures for establishing catch limits. The three contract studies addressed the suitability of biochemical genetic research techniques for identifying stock discreteness, alternative whale censusing techniques, and mark-recapture techniques for estimating stock abundance.

A Joint Working Group of the Scientific and Technical Committees met shortly before the 1987 IWC meeting to consider progress and further work related to the comprehensive assessment. Based on the Joint Working Group's recommendations, the IWC approved the following further work: (1) use of the Secretariat's computer facilities for testing management procedures; (2) carrying forward studies on new biochemical genetic research techniques to distinguish between whale stocks; (3) continuing stock monitoring studies; (4) contracting for an analysis of Southern Hemisphere minke whale marking data; (5) convening a workshop to assess the utility of using natural markings to estimate whale population parameters; and (6) compiling information on the methods and hunting strategies from whalers involved in the past exploitation of minke whales in the North Atlantic. The IWC also agreed that priority attention for the comprehensive assessment should be on those stocks that were the object of substantial whaling activity before the moratorium.

Aboriginal/Subsistence Whaling -- At its 1985 meeting, the IWC adopted a three-year block quota for the Bering Sea stock of bowhead whales allowing 26 strikes per year for the years 1985 through 1987. The quota permitted strikes not used in any one year to be carried forward to the next year provided that no more than 32 whales are struck in any one year. At its 1987 meeting, the IWC modified the last year of its previous block quota by establishing a new catch limit of 32 strikes for 1987. In addition, a quota of 35 strikes was set for 1988.

Aboriginal catch limits for other stocks of whales were set as follows for the 1988 aboriginal whaling seasons: 179 whales from the eastern North Pacific gray whale stock; 110 whales from the West Greenland minke whale stock; 10 whales from the West Greenland fin whale stock; and 12 whales from the central Atlantic minke whale stock. A quota of three humpback whales per year was established for aboriginal whalers in St. Vincent and the Grenadines for the 1987-1988, 1988-1989, and 1989-1990 whaling seasons.

Special Permits for Scientific Research -- Article VIII of the 1946 Whaling Convention provides that any member nation may grant a special permit to its citizens to take whales for purposes of scientific research and that any whales taken may be processed and sold according to that contracting government's

directions. In addition, the IWC's conservation program provides that contracting governments must afford the IWC and its Scientific Committee an opportunity to review the proposed permits, which must include certain information on the proposed research activities.

In view of the provisions of Schedule paragraph 10 (e) calling for a moratorium on commercial whaling and a comprehensive assessment of whale stocks, the IWC and its Scientific Committee have devoted particular attention during recent meetings to matters pertaining to the issuance of special permits. In 1985, the Scientific Committee developed a series of guidelines for reviewing proposed permits. At its 1986 meeting, the IWC adopted a Resolution providing advice to contracting governments on criteria to be considered in issuing special permits and authorizing disposition of whale meat and other products derived from any whales taken.

To further clarify the type of research conducted under special permits that is consistent with the IWC conservation program, the United States developed and put forward a proposed resolution on scientific research programs during the 1987 IWC meeting. The proposed resolution identified four additional criteria by which to assess existing and proposed research involving the killing of whales. The criteria call upon contracting governments to ensure that permitted research:

(1) addresses a question or questions that should be answered in order to conduct the comprehensive assessment or to meet other critically important research needs;

(2) can be conducted without adversely affecting the overall status and trends of the stock in question or the success of the comprehensive assessment of such stock;

(3) addresses a question or questions that cannot be answered by analysis of existing data and/or use of non-lethal research techniques; and

(4) is likely to yield results leading to reliable answers to the question or questions being addressed.

The proposed resolution also: (a) requested that the Scientific Committee provide the IWC with its views as to whether the research satisfies those and other relevant criteria; (b) sought agreement that, beginning with its Thirty-ninth meeting, the IWC would annually review the report of the Scientific Committee regarding its views on special permits for the killing of whales; (c) sought agreement that the IWC would notify contracting governments if, in its view, ongoing or proposed research did not satisfy the above criteria or criteria in its 1986 Resolution on Special Permits; and

(d) recommended that, in exercising their sovereign rights, contracting governments refrain from issuing or revoke permits that the IWC considers inconsistent with the identified criteria. The IWC adopted the proposed Resolution by a vote of 19 in favor, 6 against, and 7 abstentions.

During the 1987 meeting, two nations (Japan and the Republic of Korea) submitted proposals to grant special permits involving the killing of whales and one nation (Iceland) provided information on an ongoing research program under an existing special permit. The research programs were reviewed by the Scientific Committee, which identified a number of uncertainties regarding the various research protocols. Consistent with the Resolution adopted at its meeting, the IWC considered the relevant comments on the proposed and ongoing research programs in the Scientific Committee's report and, based on its review, passed three Resolutions recommending that Iceland, Japan, and the Republic of Korea revoke or refrain from issuing their respective special permits until uncertainties identified by the Scientific Committee are resolved to its satisfaction.

Related Activities

As discussed in previous Annual Reports, nations which permit whaling or other activities to be carried out in a manner inconsistent with the Schedule of regulations or conservation program of the IWC may trigger certain actions under two U.S. laws -- the Pelly Amendment to the Fishermen's Protective Act and the Packwood-Magnuson Amendment to the Magnuson Fishery Conservation and Management Act. The Packwood-Magnuson Amendment mandates a reduction by at least 50 percent in the allocation of fish that may be caught within the U.S. Exclusive Economic Zone by any nation whose citizens are certified by the Secretary of Commerce for directly or indirectly engaging in fishing operations, trade, or taking, which diminishes the effectiveness of the International Whaling Convention or its conservation program. Under the Pelly Amendment, the United States may embargo imports of fish products by any nation so certified. As noted in the previous Annual Report, the Secretary of Commerce certified Norway and the Soviet Union in 1986 for permitting their nationals to continue commercial whaling contrary to the provisions of Schedule paragraph 10 (e). During 1987, both certification findings remained in place. Also during 1987, certification and the exercise of sanctions under these laws were considered with respect to Iceland and Japan.

Iceland -- At the IWC's 1985 meeting, Iceland submitted a proposal for a four-year special permit (1986-1989) to take 80 fin whales, 40 sei whales, and 80 minke whales per year for research purposes. This was about half its 1985 commercial

take. Because of concerns expressed by the IWC Scientific Committee and a number of contracting governments about the design of the research program and the appearance of continuing commercial whaling under the name of research, Iceland refrained from issuing its special permit and the matter was again considered at the 1986 IWC meeting. During that meeting, similar concerns were again raised by some members of the Scientific Committee and the IWC. In response, the IWC adopted a resolution calling upon contracting governments to utilize whale meat taken during research activities "primarily" for local consumption.

Despite these concerns, Iceland, having met the IWC's minimal informational and procedural requirements, issued a special permit for the research program and whaling began after the 1986 IWC meeting. The United States subsequently advised Iceland that it would consider actions to certify Iceland under the above mentioned U.S. laws if it failed to abide by provisions in the resolution adopted by the IWC at the 1986 meeting. There was no evidence that whale meat taken during the course of Iceland's research program was utilized "primarily" (more than 50 percent) for other than local purposes and no action was taken by the United States to certify Iceland in 1986.

As noted above, the IWC again reviewed the Icelandic research program during its 1987 meeting. Consistent with the Resolution on Scientific Research adopted at the meeting, the IWC adopted a separate resolution on Iceland's research program, requesting that Iceland revoke its special permit until uncertainties identified in the report of the 1987 Scientific Committee meeting had been resolved to the satisfaction of the Committee. Under IWC rules of procedure, advice adopted by the IWC in the form of resolutions are non-binding upon members and, following the meeting, Iceland did not revoke its special permit and Icelandic whalers resumed research whaling.

In view of actions by Iceland and its whalers after the 1987 IWC meeting, discussions were initiated between officials of the United States and Iceland in July 1987 on Iceland's research program and the possible imposition of sanctions against Iceland under U.S. law. During the discussions, there was a pause in the taking of whales by Icelandic whalers and U.S. participants tried to secure Iceland's acceptance of advice in the IWC's resolutions.

To provide advice on developing an appropriate U.S. position with respect to Iceland's research whaling, the Marine Mammal Commission wrote to the Acting Secretary of Commerce on 14 August 1987. In its letter, the Commission expressed the view that, although IWC resolutions are

non-binding upon its members, they do reflect the sense of the IWC regarding appropriate conservation actions. Thus, if a nation fails to follow a recommendation adopted in an IWC resolution, that provides a reasonable basis for the Secretary of Commerce to certify, pursuant to the Pelly and Packwood-Magnuson Amendments, that the nation's actions are diminishing the effectiveness of the IWC's conservation program. In the view of the Marine Mammal Commission, while Iceland's actions supported a certification action by the Secretary, it was appropriate to enter into negotiations with Iceland to attempt to secure their acceptance of the IWC resolutions. Therefore, the Commission recommended that Iceland be advised that certification under the Pelly Amendment would take place if any more whales were taken or if Iceland did not make clear its intention to fully comply with all IWC resolutions within 90 days.

Discussions between representatives of the United States and Iceland concluded on 9 September 1987 with a meeting in Ottawa, Canada. Based on discussions during the meeting, it was agreed that: (1) beginning in 1988, Iceland would submit its research program for review by the IWC Scientific Committee and would carry out the scientific recommendations of that Committee; (2) the United States would not certify Iceland for taking 80 fin whales and 20 sei whales in 1987, nor for whales taken in 1988 and thereafter, as long as Iceland complies with the provision of point 1; and (3) the Governments of the United States and Iceland would cooperate with other IWC parties to make recommendations regarding the structure of the IWC Scientific Committee's process for reviewing special permits for scientific research. The agreement was executed through an exchange of letters between the Secretary of Commerce and the Charge d'Affaires of the Embassy of Iceland in Washington, D.C., on 15-16 September 1987. By the end of 1987, Iceland had taken 80 fin whales and 20 sei whales. No action was taken by the United States to certify Iceland under the Pelly or Packwood-Magnuson Amendments.

Japan -- As noted above, Japan submitted a proposed special permit for scientific research for review by the IWC and its Scientific Committee during the IWC's 1987 meeting. The Japanese research proposal involved taking 825 minke whales and 50 sperm whales from the Southern Ocean during the first year of a multi-year research program scheduled to begin in late 1987. In reviewing Japan's proposal, some members of the Scientific Committee identified a number of uncertainties about whether the proposed research could contribute reliable results for the comprehensive assessment or other critically important research needs. These uncertainties were discussed in the report of the Committee's meeting and considered by the IWC. Based on its review, the IWC adopted a resolution at its 1987 meeting expressing the view that the proposed

research did not appear to satisfy the criteria set out in its 1986 Resolution on Special Permits or to be structured in a way to provide information essential for stock management. The resolution therefore recommended that Japan refrain from issuing special permits for the proposed research until such time as the Scientific Committee resolves its uncertainties concerning Japan's research proposal.

In view of the comments and actions taken at the June 1987 meeting of the IWC, Japan developed a revised research proposal following the meeting. A copy of the revised proposal was provided for information and review purposes to the National Oceanic and Atmospheric Administration on 15 October 1987 by the Director of the Japanese Fisheries Agency. Among other things, it proposed delaying research under the original proposal pending results of a preliminary study to test certain research approaches contained in the original proposal. The proposed preliminary study involved a reduced take of 300 Antarctic minke whales during the initial year of research and omitted research on sperm whales.

To help review Japan's revised research proposal, the National Oceanic and Atmospheric Administration provided a copy to the Marine Mammal Commission with a request for comments. By letter of 12 November 1987, the Commission advised the Assistant Administrator for Fisheries that, in its view, the revised proposal did not address the concerns raised by the IWC Scientific Committee during review of the original proposal. For example, the proposal did not elaborate on the anticipated contribution to the comprehensive assessment and it did not provide a clear indication of precisely what data would be collected.

Shortly after providing the revised proposal to the United States in October, Japan submitted it to the IWC Scientific Committee. Japan was anxious to start its research program during the 1987-1988 field season, and it requested that the Committee review the proposal before the end of 1987. The request was granted and, on 15-17 December 1987, a special meeting of the Committee was convened in Cambridge, England, for that purpose. Representatives for the United States, including the Marine Mammal Commission, participated in the meeting. Among other things, the revised proposal was considered in light of the criteria in the Resolutions adopted by the IWC for special permits at its 1986 and 1987 meetings. Participants in the meeting were of differing views concerning whether the proposed research program satisfied those criteria; however, representatives of most the nations participating in the meeting shared the view that it did not. A report of the meeting was prepared and submitted to the IWC.

Under IWC rules of procedure, any Commissioner may request a postal vote on a proposed action by the IWC between its annual meetings. In view of the results of the Scientific Committee's review, the Commissioner for the United Kingdom submitted to the IWC Secretariat a proposed resolution recommending that the Government of Japan refrain from issuing a special permit for the revised research proposal until identified concerns of the Committee have been addressed to its satisfaction. The proposed resolution was subsequently circulated to the IWC with a request that votes on the matter be returned by 14 February 1988.

At the end of 1987, the Committee's report and the resolution proposed by the United Kingdom were being reviewed by members of the International Whaling Commission, including the U.S. IWC Commissioner. In addition, the Japanese whaling fleet's factory ship left port in late December and catcher boats were expected to follow shortly for the purpose of carrying out the planned research. Therefore, the Department of Commerce, the Marine Mammal Commission, and other involved Federal agencies were monitoring developments closely at the end of the year. In the event that Japan permits whales to be taken in early 1988 under the revised whale research program, the Secretary of Commerce will make a decision as to whether Japan should be certified under the Pelly and Packwood-Magnuson Amendments as having allowed whaling which diminishes the effectiveness of the IWC's conservation program.

Litigation -- As noted in previous Annual Reports, a number of environmental groups filed suit in late 1984 seeking to prevent the Secretaries of Commerce and State from entering into an agreement negotiated with the Government of Japan on commercial whaling. Under terms of the agreement, which had been negotiated in November 1984, the United States agreed not to certify Japan under the Pelly and Packwood-Magnuson Amendments in return for a commitment that Japan would phase out all commercial whaling by 1988 and adhere to the moratorium provision adopted by the IWC. The Supreme Court issued a final ruling in favor the Secretaries on 30 June 1986.

In response to recent actions to authorize the Japanese whale research program mentioned above, environmental groups involved in the earlier litigation sought to have the 1986 Supreme Court ruling reconsidered. In its motion, which was filed on 23 September 1987, the environmental groups claimed that the defendants had misrepresented the agreement to discontinue commercial whaling by not disclosing that the Japanese would continue to take whales for scientific research. They claimed that this prevented them from fully and fairly presenting their case and had misled the Supreme Court. They also alleged that newly discovered information supported their motion for relief. On 18 November 1987, the District Court

ruled in favor of the Secretaries' finding that there was no misrepresentation made to the Supreme Court and that the plaintiffs had failed to present any newly discovered evidence to support their motion. The motion was therefore denied and no appeal of the ruling had been filed as of the end of the year.

At the end of 1987, the environmental groups were contemplating further litigation concerning Japanese research whaling and the application of certification provisions under the Pelly and Packwood-Magnuson Amendments.

## Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora regulates trade among signatory nations in animals and plants that are or may become threatened with extinction. The extent of trade control depends upon the extent to which a species is endangered which, in turn, is reflected by its inclusion on one of three Appendices to the Convention. Species included under Appendix I are those considered to be threatened with extinction; they also are or may be affected by trade. Species on Appendix II are not necessarily threatened with extinction, but may become so unless trade in them is strictly controlled. Appendix III includes species that any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation and for which the Party needs the cooperation of other Parties to control trade. There are 96 Parties to the Convention, including the United States.

Additions or deletions of species listed on Appendices I and II can be made by agreement of the Parties and, in the case of Appendix III, by individual Parties. Parties to the Convention meet biennially to consider, among other things, changes to the lists of species in the Appendices. The Sixth Conference of Parties to the Convention was held on 12-24 July 1987 in Ottawa, Canada. The Fish and Wildlife Service, on behalf of the State Department, acts as the lead agency on U.S. delegations to such meetings.

As noted in the previous Annual Report, on 4 December 1986, the National Marine Fisheries Service suggested to the Fish and Wildlife Service that the United States submit a proposal to the Sixth Conference to delete northern elephant seals (*Mirounga angustirostris*) from Appendix II. This proposal was not put forward by the U.S. delegation, nor was it raised by other delegations during the Sixth Session. At the end of 1987, however, it was the Commission's understanding that the

Fish and Wildlife Service would consider submitting such a proposal to the Seventh Conference of Parties, scheduled to be held in Indonesia in 1989.

With respect to other species of marine mammals, a proposal was put forward by the Government of The Netherlands to list both the Atlantic and Pacific walrus (Odobenus rosmarus) on Appendix II. To assist the Service in developing a U.S. position on this proposal, the Commission, in consultation with its Committee of Scientific Advisors, reviewed the proposal and available information on walrus populations in the Atlantic and Pacific Oceans. Based on its review, the Commission concluded that neither Pacific nor Atlantic populations of walrus were in danger of becoming threatened with extinction. In addition, existing and planned management programs in the United States and other countries in which the species occurs appeared to address adequately the concerns regarding native taking and illegal trade. Therefore, on 28 April 1987, the Commission wrote to the Service recommending that the U.S. delegation oppose the proposal put forward by The Netherlands. The Service concurred with the Commission's assessment and a U.S. position opposing its listing on Appendix II was adopted.

Of the nations that are Party to the Convention, five have walrus populations and are known, in Convention parlance, as walrus range states. During the Sixth Conference of Convention Parties, representatives of these countries (Denmark, Canada, Norway, the Soviet Union, and the United States) held two informal meetings with proponents of the proposal to review recent information on the status of the species and applicable management measures. Representatives of the Eskimo Walrus Commission, the State of Alaska, and the Alaska Outdoor Council participated in the meetings. Based on the information presented and commitments made by the five range states to carry forward certain research and management actions, The Netherlands withdrew its proposal to add walrus to Appendix II. The Canadian population, however, remains on Appendix III. In further response to points raised during the various meetings on walrus, representatives of the range states met in Ottawa immediately after the Conference to discuss and outline a procedure whereby current information on walrus research and management might be exchanged regularly. The Fish and Wildlife Service is responsible for coordinating U.S. response to the agreed exchanges of information.

The only other suggested change in the Appendices involving marine mammals was a proposal submitted by the Government of Switzerland concerning the West African manatee (Trichechus senegalensis). This species is listed on Appendix II and, as part of a ten-year review of the status of species listed on the Appendices, consideration was given to removing the species from Appendix II or transferring it to Appendix I. The United

States opposed both proposals. Based on information provided by participants at the Sixth Conference of Parties, the proposals were withdrawn, and the West African manatee was retained on Appendix II. As a related matter, however, the Chairman of the ten-year review Committee proposed that the newly established Animals Committee investigate and report on trade problems as may exist for any of the four species of Sirenia. The proposal was referred to the Committee for consideration, and it is expected that the matter will be reviewed at the next Conference of Parties in 1989.

## The Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)

The Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, more commonly known as the Cartegena Convention, is a part of the Caribbean Environment Program, one of 12 Regional Seas Programs developed and sponsored by the United Nations Environment Program. Regional Seas Programs are intended to protect marine resources and habitat in selected areas vulnerable to pollution by encouraging nations bordering the areas to commit financial and human resources to cooperative research and management programs. Each Regional Seas Program includes an Action Plan outlining needed environmental projects (e.g., watershed management, oil spill contingency planning, public awareness campaigns, environmental impact assessment, and protection and recovery of endangered species) and a Convention to provide a framework for agreement among Contracting Parties to cooperate in protecting and managing the regional marine environment.

The Action Plan for the Caribbean Environment Program was developed and approved in 1981. The Cartegena Convention, which provides a complementry legal framework for the Action Plan, was concluded in 1983 and entered into force in 1986. Thirteen nations have ratified the Convention.[6] At the end of 1987, 33 states and territories were participating in the Convention.

The Convention calls for: cooperation in controlling marine pollution from ships, land-based and atmospheric sources, man-made structures at sea, and exploration and exploitation of the seabed; protecting and preserving rare or fragile

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[6] At the end of 1987, parties that had ratified the Cartagena Convention were: Antigua and Barbuda; Barbados; France; Grenada; Jamaica; Mexico; The Netherlands; Panama; St. Lucia; Trinidad and Tobago; the United Kingdom; the United States; and Venezuela.

ecosystems and the habitat of depleted, threatened, and endangered species; responding to emergencies caused by pollution; assessing the potential impacts on the environment from proposed activities and notifying any nation that could be affected by such impacts; and cooperating in scientific and technical matters, especially in the exchange of data that may be pertinent to the objectives of the Convention. The Convention also provides for concluding detailed agreements, or protocols, as needs arise, to implement or augment the Convention. To date, only one protocol has been adopted. It provides for cooperation among Contracting Parties in responding to oil spill emergencies.

Article 10 of the Convention calls upon Contracting Parties to "take all appropriate measures to protect and preserve rare or fragile ecosystems, as well as the habitat of depleted, threatened, or endangered species" by establishing protected areas. When the Convention was concluded in March 1983, a resolution was adopted calling upon the parties to develop a protocol to provide protection for special areas and wildlife in the wider Caribbean region. The resolution encouraged "competent governmental and non-governmental organizations to prepare proposals for submission to the first meeting of the Contracting Parties after entry into force of the Convention."

The First Meeting of the Contracting Parties was held jointly with the Fourth Intergovernmental Meeting of the Action Plan for the Caribbean Environment Program in Guadeloupe on 26-28 October 1987. Prior to the meeting, a coalition of non-governmental organizations, including Monitor International, the Center for Environmental Education, Fund for Animals, Friends of the United Nations Environment Program, and Widecast - Antigua and Barbuda, prepared and transmitted a draft Protocol on Specially Protected Areas and Wildlife to the Contracting Parties for consideration in accordance with the Resolution mentioned above.

At the meeting in Guadeloupe, the Contracting Parties noted the draft prepared by non-governmental organizations and agreed that it would be desirable to develop a protocol on specially protected areas and wildlife. They also agreed that it would be desirable to develop a protocol on land-based sources of pollution. In addition, the U.S. delegation noted the need to heighten awareness of the problem of ship-generated marine debris in the wider Caribbean region and the need to formally adopt amendments to extend the existing Protocol on oil spill emergencies to other hazardous substances.

The United States indicated a willingness to host a meeting of experts in the U.S. Virgin Islands or Puerto Rico in 1988 to prepare a draft protocol on specially protected

areas and wildlife for consideration at the Second Meeting of Contracting Parties, to be held in Mexico City in 1989.

The area covered by the Convention includes habitat for the endangered West Indian manatee, the endangered humpback whale, and the Caribbean monk seal, which is widely believed to be extinct. The Marine Mammal Commission believes that identification and protection of important habitats are essential to the protection and recovery of these and other endangered or threatened marine mammal species. In 1988, the Commission will continue to work with the Department of State, the National Oceanic and Atmospheric Administration, other Federal agencies, and public interest groups to further develop and implement strategies for protecting marine mammals and their habitat in the wider Caribbean region.

# CHAPTER VI

## IMPACTS OF MARINE DEBRIS

The tendency of marine mammals, sea birds, turtles, fish, and invertebrates to become entangled in net fragments, packing bands, and other synthetic materials lost and discarded at sea has been recognized for many years. More recently, problems caused by ingestion of plastic bags and other plastic materials by marine life and the fouling of beaches and shorelines by all types of flotsam also have become increasingly apparent. Plastic debris represents a worldwide pollution problem that may be particularly acute in certain ocean areas. For example, in the North Pacific Ocean, debris-related injuries and mortality may be contributing to declines in populations of North Pacific fur seals, Hawaiian monk seals, Steller sea lions, harbor seals, and a number of other marine species.

Since the early 1980s, the Marine Mammal Commission has played a major role in focusing domestic and international attention on ways to better assess and reduce the extent of the problem for marine mammals and other species. The Commission's past efforts have been discussed in its previous Annual Reports. This chapter provides an overview of the problem and related activities undertaken by the Commission and others during 1987.

### Background

Since the early 1950s, the use of plastics and other synthetic materials has developed at a rapid pace. As these materials have been used for more and more purposes, there has been a corresponding increase in the amount of plastic debris entering the marine environment. Many of these products degrade very slowly. Those that float remain suspended at the sea surface for extended periods of time and those that sink may remain on the sea floor for years or even decades. As the amount of such debris increases, so too does its threat to marine mammals, sea birds, turtles, fish, and crustaceans. These organisms become entangled in loops and openings of floating and submerged debris and they ingest items, such as plastic bags and small plastic objects, because they may resemble natural prey. Animals that become entangled may drown, lose their ability to catch food or avoid predators, or incur wounds and infections from the abrasion of attached debris. Ingested plastics may block digestive tracts, damage stomach linings, or reduce feeding drives.

Until recently, the magnitude of these threats was masked by the size of the ocean, the deceptively simple nature of the

threat, the perception that chance encounters between marine animals and debris would be unlikely, and an absence of large numbers of marine animals being found on beaches or at sea strangled, drowned, starved, or choked by marine debris. It is becoming apparent, however, that plastic debris may be concentrated through disposal patterns, winds, and ocean currents in coastal areas where marine mammals and other species are most likely to occur. In addition, many species actively seek out marine debris because of the associated prey species attracted by the cover it provides, because it represents an object of play, or because the debris itself may resemble natural prey. Thus, encounters between certain marine species and marine debris may be relatively common. At the same time, however, evidence of such encounters may not be readily apparent because animals affected at sea may be consumed by predators, sink, or be widely scattered.

The potential magnitude of these effects became apparent as a result of an International Workshop on the Fate and Impact of Marine Debris held on 27-29 November 1984 in Honolulu, Hawaii. As noted in previous Annual Reports, this Workshop was convened under the direction of National Marine Fisheries Service at the recommendation of the Marine Mammal Commission. To help organize the Workshop, the Commission also provided the Service with terms of reference and seed money for its organization and planning. The results of the Workshop, which the Service published in a Proceedings volume, identified an urgent need for: educating vessel operators and others about the marine debris problem; regulating the deliberate disposal of synthetic materials; and developing better quantitative data to assess related impacts on living marine resources.

In response to concerns identified during the Workshop, Congress appropriated funds to the Service in Fiscal Year 1985 to initiate a responsive research and management program. Congressional support for this Program has been carried forward since then. In addition, other Federal agencies have become increasingly involved in addressing related aspects of the problem. For example, the Coast Guard and the State Department have pursued efforts to ratify and implement Annex V of the 1978 Protocol Relating to the Convention for the Prevention of Pollution from Ships, which, among other things, would prohibit the disposal of plastics from ships at sea; the Environmental Protection Agency has supported a study to assess the nature and extent of problems created by plastic pollution in the marine environment; and the National Marine Pollution Program Office has factored the problem of plastic pollution into its Federal Plan for Ocean Pollution Research, Development, and Monitoring.

The Commission has assisted these efforts while also taking steps to support related research and increase international

awareness and involvement. Among other efforts, the Commission has: supported an analysis of domestic and international authorities related to the problem of marine debris; funded studies to document and clean up debris on beaches; provided relevant background information for a global study of the problem by the United Nations Food and Agricultural Organization; brought the problem of marine debris to the attention of parties to the Convention on Conservation of Antarctic Marine Living Resources for responsive action (see also Chapter V); encouraged the Intergovernmental Oceanographic Commission to develop a manual on procedures for monitoring marine debris; and provided information on the issue to scientists and government officials in New Zealand and Australia.

## Domestic Activities in 1987

During 1987, the Commission continued to work closely with other Federal agencies to strengthen the effectiveness of domestic programs in addressing problems created by marine debris. Particular attention was devoted towards implementing the Marine Entanglement Research Program of the National Marine Fisheries Service, assisting the National Marine Pollution Program Office in updating the Federal Ocean Pollution Research, Development, and Monitoring Plan; and working with the White House Domestic Policy Council in efforts to assess and strengthen the response of Federal agencies to the marine debris problem.

### The U.S. Marine Entanglement Research Program

For Fiscal Years 1985 and 1986, Congress appropriated $1,000,000 and $750,000, respectively, to the National Marine Fisheries Service to develop and undertake a Marine Entanglement Research Program to improve understanding of and resolve problems created by marine debris. In appropriating those funds, Congress also directed that the Service consult with the Commission on efforts to develop a plan for allocating monies among priority research and management needs. The steps taken by the Service and the Commission to develop this program are described in the Commission's previous Annual Reports. For each of Fiscal Years 1987 and 1988, Congress appropriated $750,000 in additional funding to the Service to carry the program forward and it again directed that allocation of these funds be made in consultation with, and with the concurrence of, the Marine Mammal Commission.

As noted in the previous Annual Report, the Commission participated in a planning meeting held by the Service on 24-25 September 1986 in Seattle, Washington, to begin identifying tasks to be undertaken as part of its Fiscal Year 1987 Entanglement Research Program. Based on results of that meeting, the

National Marine Fisheries Service developed a recommended Program Plan, which it transmitted to the Commission on 12 January 1987. The recommended Plan proposed allocating $719,100 among 23 priority research and management tasks, many of which were continuations of projects begun in previous years.

Twenty-two proposed tasks were grouped into three categories with the remaining task addressing program administration. The first category, education and public awareness, included six recommended tasks: continuing and expanding education programs for three regions, the North Pacific, Gulf of Mexico, and Northwest Atlantic; evaluating the effectiveness of past education efforts in the North Pacific area; developing a teaching unit on the marine debris problem for elementary and secondary grade levels; and developing a procedures manual for monitoring marine debris on beaches and at sea. The second category, technology development and mitigation, included three tasks: evaluating the feasibility of plastic recycling systems; assessing potential onboard trash incineration systems; and convening a marine debris research steering group meeting.

The third grouping of tasks included 13 impact assessment tasks: monitoring debris and incidental take associated with high seas squid drift net fisheries in the North Pacific Ocean; continuing to collect and catalogue marine debris hazardous to Hawaiian monk seals and other species in the Northwest Hawaiian Islands; continuing studies of debris accumulation rates on Alaska beaches; monitoring rates of juvenile fur seal entanglement on the Pribilof Islands; assessing the incidence of entanglement in fur seal pups and juvenile female fur seals on these Islands; comparing the behavior of entangled and unentangled juvenile fur seals; continuing experiments to track and monitor the movement of drift nets in the North Pacific Ocean; monitoring stranded sea turtles along the southeast and east coasts of the United States for evidence of debris-related mortality; continuing efforts to monitor entanglement of seals on the California Channel Islands; analyzing stomach contents of sea turtles collected in the past along the United States' east coast for occurrence of persistent debris; attempting to determine decomposition rates of derelict trawl netting on Alaska beaches; assessing the extent to which debris accumulates and affects marine life along lines of ocean currents; and assessing the occurrence of plastics in stomachs of sea birds caught incidentally in high seas drift nets.

On 9 March 1987, the Commission, in consultation with its Committee of Scientific Advisors, wrote to the Service providing comments and recommendations on the Service's Proposed Program Plan. The Commission's letter noted that the program plan was generally well done and that it identified many important tasks needed to better define and resolve specific problems caused

by marine debris. With respect to five of the proposed tasks, however, the Commission expressed the view that further consideration was warranted prior to making final funding decisions. The exceptions included the proposed task to evaluate onboard trash incineration systems, the proposed study concerning the occurrence of plastics in stomachs of sea birds, and the three proposed tasks concerning entanglement of North Pacific fur seals. Therefore, the Commission's letter recommended that the Service proceed with implementing portions of the proposed program plan but that further analysis and consultation be undertaken with respect to the five noted tasks.

After further consideration, the Service and the Commission agreed that, in lieu of support for the five proposed projects, funds should be used to assess the distribution and amount of floating plastic debris in the North Pacific Ocean, to complete a cooperative study with the Fish and Wildlife Service on the effects of plastic ingestion on Hawaiian sea birds, and to undertake three alternative research projects on the entanglement of North Pacific fur seals in marine debris. The latter three projects are discussed in greater detail in the North Pacific fur seal section of Chapter II of the Report.

As noted above, Congress appropriated $750,000 to the National Marine Fisheries Service for its Entanglement Program in Fiscal Year 1988. To begin developing plans for allocating these funds, the Service convened a meeting in Seattle, Washington, on 30 June-1 July 1987 to review the status and results of tasks undertaken up to that point under the Entanglement Program and to identify priority tasks for future funding. Representatives of the Commission participated in that meeting and, based on its results, the Service developed a proposed Program Plan for Fiscal Year 1988. The recommended Program Plan was transmitted to the Commission by letter of 4 December 1987 and, to assist the Commission's review, the Service's Entanglement Program Manager reviewed the proposed Plan during the course of the Commission's Annual Meeting in Miami on 10 December 1987.

The Service's proposed Fiscal Year 1988 Program budget was developed at a level of $685,000 because of mandatory budget reductions. The Service recommended allocating funds among 19 tasks, 11 of which would continue projects begun in previous years. Those to be carried forward include: the education and public awareness programs for the North Pacific, Gulf of Mexico, and Northwest Atlantic areas; monitoring the high seas squid drift net fishery in the North Pacific Ocean; collecting and cataloguing marine debris hazardous to Hawaiian monk seals and other marine life in the Northwest Hawaiian Islands; monitoring pinniped entanglement rates at the California Channel Islands; assessing the accumulation and disappearance rates of marine debris at selected Alaska beaches;

determining the extent to which marine debris accumulates and affects marine life along the margins of ocean currents and frontal zones; intensifying the collection and analysis of stranded sea turtles along the Gulf of Mexico and Hawaii coasts to assess entanglement-related injury and mortality rates; and overall program management and administration.

In addition, support for the following eight new projects was proposed: planning and organization for a second international workshop on the fate and impact of marine debris to be held before March 1989; an assessment of the feasibility of manufacturing certain plastic items using technology for controlled-lifetime plastics; assisting a remote fishing port (Unalaska) in the Aleutian Islands with efforts to plan for and develop systems to receive waste fishing gear and other ship-generated garbage returned to port by regional fishermen; two projects to assess the impact of entanglement on North Pacific fur seals; an assessment of the effects of pollutants along drift lines (i.e., lines of floating material concentrated by winds, tides, or ocean currents) on sea turtles; and a cooperative study with the National Park Service to assess and monitor debris accumulation rates at national seashores.

At the end of the year, the Commission and its Committee of Scientific Advisors were completing their review of the Service's recommended Program Plan. Based on a preliminary assessment, the Commission again found the Program Plan to be well conceived and anticipated advising the Service, early in 1988, of its concurrence with all but the proposed fur seal studies. As noted in the North Pacific fur seal section in Chapter II, the latter studies will be considered at a January 1988 workshop scheduled by the Service to identify priority research needs related to assessing fur seal entanglement rates. Thus, the Commission expects to ask the Service to provide it with final proposals for these studies immediately after that Workshop. Among other things, the Commission also expects to recommend that: the project plan for port reception facilities at Unalaska be expanded to consider similar needs at other regional ports (e.g., in the Pribilof Islands and Port Mollar on the Aleutian peninsula); and that the cooperative study with the National Park Service to monitor marine debris at national seashores be expanded to include other protected areas such as coastal national wildlife refuges and national marine sanctuaries.

National Marine Pollution Program Plan

Pursuant to the National Ocean Pollution Planning Act of 1978 as amended, the National Marine Pollution Program Office of the National Oceanic and Atmospheric Administration is responsible for preparing a five-year Federal plan for ocean pollution research, development, and monitoring. The plan,

which is updated every three years, includes an inventory of existing Federal programs, an analysis of the extent to which priority pollution problems are being addressed, and recommendations for improving the overall effectiveness of Federal efforts to study and monitor marine pollution issues. The most recent Plan was completed in September 1985 and, as noted in previous Annual Reports, the Commission participated in a 1984 workshop convened by the Office to identify priority marine pollution issues to be addressed in that Plan. During the workshop, the Commission representatives raised the problem of marine debris as a significant marine pollutant and the matter was subsequently addressed in the 1985 Plan.

A revised Federal Pollution Plan is scheduled for completion in September 1988. To help update it, the National Marine Pollution Program Office convened a Workshop on National Marine Pollution Problems and Needs on 10-11 June 1987. Representatives of agencies and organizations from both governmental and non-governmental sectors were invited to participate. Five Working Groups were established, including one on Persistent Marine Debris, to identify priority information needs and suggest appropriate changes in related Federal research and monitoring efforts. A representative of the Commission participated in the Workshop's Working Group on Persistent Marine Debris. During the Working Group meeting, the participants listed 14 types of persistent debris of particular concern (e.g., fishing nets, fishing traps, plastic pellets, strapping bands, etc.) and identified and ranked 31 important research needs. The results of all five Working Groups will be incorporated into a final Workshop report, which will be considered by the Office in developing the next five-year plan. During 1988, the Commission looks forward to working with the Office to ensure that the problems of marine debris and plastic pollution are addressed in an appropriate manner in the forthcoming plan.

Domestic Policy Council Task Force on Marine Debris

On 2 April 1987, a letter signed by 30 Members of the U.S. Senate was sent to the President. In their letter, the Senators expressed their concern about the increasing amounts and effects of plastic debris accumulating in ocean and coastal waters of the United States. Citing the broad range of sources contributing to the problem (e.g., commercial and recreational fishermen, recreational boaters, merchant and military ships, sewage and storm water discharges, etc.) and the related responsibilities of many Federal agencies (including those in the Departments of Commerce, Interior, Transportation, and Defense and the Environmental Protection Agency), it was suggested that a high-level, interagency task force be established to assess the problem and potential solutions.

The matter was referred to the President's Domestic Policy Council which, in response to the letter, asked the National Oceanic and Atmospheric Administration to establish and chair an Interagency Marine Debris Task Force composed of the principal agencies involved in addressing aspects of the marine debris problem. Representatives of the Coast Guard, the Council on Environmental Quality, the Department of Agriculture, the Department of the Interior, the Department of State, the Environmental Protection Agency, the Office of Management and Budget, the White House Office of Domestic Policy, the U.S. Navy, and the Marine Mammal Commission were asked to participate. The Task Force's charge was to prepare a report for the Council by April 1988 which would assess the problem and the need for research, identify potential reduction measures, and consider alternative actions to address the problem of plastic marine pollution.

A representative from the National Oceanic and Atmospheric Administration was designated as Task Force Director and a representative of the Environmental Protection Agency was designated as Deputy Director. The Task Force met several times during the latter half of 1987 to develop a work plan for its activities, to consider priority research and management needs, and to carry out other related responsibilities. At the end of 1987, the Commission looked forward to continuing participation on the Task Force and to assisting as possible with preparation of its report to the Domestic Policy Council.

U.S. Efforts To Ratify MARPOL Annex V

Annex V of the 1978 Protocol Relating to the International Convention for the Prevention of Pollution from Ships of 1973 (MARPOL 73/78) would provide an international regulatory framework for controlling the disposal of garbage from ships. Among other things, it would prohibit, with certain exceptions, "...the disposal of all plastics, including but not limited to synthetic ropes, synthetic fishing nets, and plastic garbage bags..." into the sea from ships. This provision would be a significant contribution to efforts to reduce the marine debris problem; however, criteria established for its entry into force (see below) had not been met as of the end of 1986, nor had the necessary steps been taken to ratify the Annex in the United States.

As noted in its Annual Reports for 1985 and 1986, the importance of Annex V provisions prompted the Marine Mammal Commission to recommend that steps be taken by the U.S. Coast Guard and the State Department to have it ratified by the U.S. Government. Both agencies shared the Commission's appreciation of the need for action and, as of the end of 1986, the State Department and the Coast Guard were completing the necessary documentation for review by the President and tran-

smittal to the Senate for its advice and consent. By letter of 21 January 1987, the Secretary of State advised the President that Annex V had the support of the Coast Guard, the Marine Mammal Commission, the National Oceanic and Atmospheric Administration, other involved Federal agencies, the environmental community, and the maritime industry. He recommended that the Annex be transmitted to the Senate for its early advice and consent. The President concurred with the recommendation and, on 9 February 1987, transmitted the Annex to the Senate. In so doing, the President noted that its entry into force was an important step for controlling and preventing pollution from disposal of ship-generated garbage at sea.

On 5 November 1987, the Senate voted unanimously to adopt a resolution that it provide its advice and consent to ratify Annex V. In taking this action, the Senate recognized that Annex V provided for the designation of "Special Areas" in which dumping of all garbage is prohibited, except for food wastes beyond 12 nautical miles from the nearest land. In this regard, the Senate called attention to the large amount of ship- and platform-generated debris washing up on U.S. beaches along the Gulf of Mexico, particularly on the Texas shoreline, and the large numbers of endangered sea turtles that inhabit the Gulf and are susceptible to adverse interactions with debris. In view of this provision and the noted problems, the Senate included an understanding in its resolution that the U.S. Government would make every reasonable effort to designate the Gulf of Mexico as a Special Area under this Annex.

The final step in the ratification process is depositing the instrument of ratification with the Convention's Secretariat (the International Maritime Organization), thereby providing official notice that the United States accepts the obligations associated with implementing requirements set forth in the Annex. On 2 December 1987, the President signed the instrument of ratification. However, it is U.S. policy not to deposit such an instrument unless domestic legislation is in place to authorize all actions required to carry out an agreement's provisions. At the time the Senate provided its advice and consent on Annex V, U.S. law did not provide authority for regulating garbage disposal from ships in U.S. waters as set forth in the Annex.

Therefore, the step of depositing the instrument of ratification was not taken until Congress had passed, and the President had signed, the implementing legislation necessary to carry out the requirements of Annex V. Final Congressional action on the matter was taken on 18 and 19 December 1987 when the House of Representatives and the Senate, respectively, passed H.R. 3674. Title II of the bill, entitled the "Marine Plastic Pollution Research and Control Act of 1987," provides

the authority necessary to implement requirements of Annex V by amending the Act to Prevent Pollution from Ships. The bill was then sent to the President, who signed it into law on 29 December 1987. With final action on the implementing legislation completed, the President transmitted the instrument of ratification to the Secretary of the International Maritime Organization on 30 December 1987 and the United States thereby became the 31st nation to ratify MARPOL Annex V. The international implications of this are discussed below.

In order to carry out the requirements of the new domestic implementing legislation for Annex V, the Coast Guard will be preparing regulations under its authority during 1988. At the end of 1987, the Commission looked forward to assisting the Coast Guard with this effort.

## International Activities

Plastic debris enters the world's oceans from ships and coastlines of all coastal nations. Many of the most harmful plastic materials may drift on ocean currents hundreds or thousands of miles from their points of origin. Therefore, successful resolution of the marine debris problem requires cooperative action at the international level. To facilitate responsive international actions, the Commission, in cooperation with other agencies and organizations, undertook the following actions in 1987.

### North Pacific Rim Fishermen's Conference

Lost and discarded fishing gear is among the types of marine debris that pose the greatest risk of entangling marine mammals and other marine life. As noted above, problems may be particularly significant in the North Pacific Ocean and Bering Sea because of the extensive commercial fisheries in those waters. As concern about the effects of fishing debris in these areas has increased, regional fishing industry organizations have responded with constructive actions to help address the problem. One particularly noteworthy effort was the North Pacific Rim Fishermen's Conference on Marine Debris on 13-16 October 1987 in Kailua-Kona, Hawaii. The Conference was sponsored by a consortium of fishing industry organizations from Canada, Japan, the Republic of China, the Republic of Korea, and the United States.

The purpose of the Conference was to review information on the nature of the problems, legal requirements, responsive actions taken by fishing organizations, and possible technical solutions to the problem. The meeting was well attended by representatives of more than 20 commercial fishing organizations from the five North Pacific fishing nations, the scientific

community, and involved government agencies, including the Marine Mammal Commission.

Among other things, the Conference highlighted needs for: (a) continuing educational efforts, such as those being supported as part of the Marine Entanglement Research Program, to advise fishermen of the nature of the problem, applicable legal requirements, and appropriate procedures to reduce the problem; (b) developing and maintaining a research program to monitor the amounts, quantities, distribution, and effects of debris so as to assess progress in cleaning up and reducing the problem; and (c) improving shore-based trash reception facilities. Fishing industry representatives at the meeting also adopted a resolution committing their respective organizations to support efforts to eliminate the disposal of plastic materials at sea, minimize the use of supplies packaged in synthetic material, promote local education programs on the problem, secure early adoption and enforcement of Annex V of the International Convention for the Prevention of Pollution from Ships, and cooperate with local port authorities in developing effective shore-based garbage reception facilities.

Planning for a Second International Workshop on the Fate and Impact of Marine Debris

In November 1984, the National Marine Fisheries Service, at the recommendation of and with the financial support of the Marine Mammal Commission, took the lead in supporting and convening a Workshop on the Fate and Impact of Marine Debris in Honolulu, Hawaii. The Workshop, based on terms of reference developed and presented internationally by the Commission, marked a turning point in perceptions of persistent marine debris as a major ocean pollutant. The Proceedings of the Workshop provided what continues to be perhaps the best single source of information on the issue. Since that Workshop, much has been done both in the United States and abroad to further define elements of the problem and to describe mitigating measures. Recognizing the need to review the results of these efforts so as to provide a basis for improving assessments of the problem and redirecting future research and management measures, the Commission wrote to the National Marine Fisheries Service on 26 December 1986 recommending, among other things, that a Second International Workshop on the Fate and Impact of Marine Debris be convened in 1988. As indicated above, the Service agreed with the Commission's recommendation and programmed funds as part of its Fiscal Year 1988 Marine Entanglement Research Program to begin planning and organizing for such a Workshop in late 1988 or early 1989.

During 1987, the Commission started informal discussions about the Workshop with people in the United States and abroad. An overwhelming majority of those contacted expressed the

view that: the Service deserved much credit for its efforts to convene the 1984 Workshop; substantial new data on the marine debris problem had been developed since 1984; considerable progress had been made internationally by organizations including the International Maritime Organization, the Food and Agricultural Organization, the Intergovernmental Oceanographic Commission, and others to recognize and address the issue of marine debris; and a comprehensive international review of the entire matter would be timely and provide substantive guidance to the many research and management actions underway or contemplated.

Therefore, the Commission, in consultation with its Committee of Scientific Advisors, wrote to the Service on 29 December 1987 to provide further recommendations regarding the Workshop. In its letter, the Commission noted that, if possible, it might be preferable to hold the Workshop in late 1988 rather than in 1989. By doing so, the Workshop would coincide with critical planning periods associated with domestic efforts to assess recommendations contained in the Marine Debris Task Force Report to the Domestic Policy Council (see above) and international actions to develop programs to implement requirements of Annex V of the International Convention for the Prevention of Pollution from Ships (see below). In addition, because of the outstanding work done on the 1984 Workshop by the Service's Honolulu Laboratory, the Hawaii Sea Grant Program Office, and the Steering Group organized by the Director of the Honolulu Laboratory, the Commission recommended that responsibility for planning and organizing the forthcoming Workshop again be vested with either or both the Laboratory and the Sea Grant Program Office, and that a Steering Group for the Workshop again be established. With respect to the Steering Group, the Commission also recommended that representatives from Australia, Canada, England, France, Japan, New Zealand, and the Soviet Union, as well as the United States, be invited to participate so as to ensure a broad international focus.

MARPOL Annex V

As noted above, Annex V of the 1978 Protocol Relating to the Convention for the Prevention of Pollution from Ships would provide an international framework for controlling the disposal of ship-generated garbage at sea. A summary of discharge limitations under the Annex is provided in the table on the following page. The discharge limitations and other provisions of Annex V, which also include measures for providing port reception facilities to off-load and properly dispose of ship-generated garbage, offer an important opportunity for reducing quantities of potentially harmful marine debris entering the marine environment. Therefore, the Commission and other Federal agencies have worked hard in the

SUMMARY OF GARBAGE DISCHARGE LIMITATONS UNDER
THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (1973/1978)

| Garbage Type | All Vessels | | Offshore Platforms and Associated Vessels*** |
|---|---|---|---|
| | Outside Special Areas | Inside Special Areas** | |
| Plastics, includes synthetic ropes and fishing nets and garbage bags | Dumping Prohibited | Dumping Prohibited | Dumping Prohibited |
| Floating dunnage, lining, and packing materials | >25 miles offshore | Dumping Prohibited | Dumping Prohibited |
| Paper, rags, glass, metal bottles, crockery, and similar items | >12 miles | Dumping Prohibited | Dumping Prohibited |
| Paper, rags, glass, etc., comminuted or ground* | >3 miles | Dumping Prohibited | Dumping Prohibited |
| Food waste not comminuted or ground | >12 miles | >12 miles | Dumping Prohibited |
| Food waste comminuted or ground* | >3 miles | >12 miles | >12 miles |
| Mixed refuse types | More stringent requirements apply | More stringent requirements apply | More stringent requirements apply |

* Comminuted or ground garbage must be able to pass through a screen with mesh size no larger than 25 mm.
** Special areas are the Mediterranean, Baltic, Red, and Black Seas areas and the Gulf area.
*** Offshore platforms and associated vessels include all fixed or floating platforms engaged in exploration or exploitation of seabed mineral resources and all vessels alongside or within 500 m of such platforms.

United States and abroad to encourage ratification of the Annex and preparation for its entry into force.

Entry into Force: Under terms of the Convention, Annex V will enter into force 12 months after ratification by at least 15 nations, collectively representing at least 50 percent of the world's registered commercial shipping tonnage. The purpose of the 12-month waiting period is to allow nations time to put in place the domestic programs necessary to implement the Annex.

As of early December 1987, 30 nations representing 45.2 percent of the world's registered commercial shipping tonnage had ratified the Convention. Five percent of the world's commercial ship tonnage is registered with the United States. Therefore, when the United States deposited its instrument of ratification on 30 December 1987, the percentage of registered commercial ship tonnage represented by ratifying nations passed the 50 percent level, thereby satisfying the remaining requirement for entry into force. As a result, all nations which have ratified Annex V will be obligated to begin implementing the provisions of Annex V beginning 31 December 1988.

23rd Session of the Marine Environment Protection Committee, 7-11 July 1986: To facilitate entry into force of the Annex, the U.S. Government also assumed a leadership role on the matter within the International Maritime Organization's Marine Environment Protection Committee. The Organization serves as the Secretariat for the Convention for the Prevention of Pollution from Ships and the Committee has been assigned responsibility for overseeing efforts to implement it. The U.S. Coast Guard acts on behalf of the State Department as the agency heading delegations representing the United States at meetings of the Committee, which are held in London, England. The Marine Mammal Commission and the National Oceanic and Atmospheric Administration have assisted the Coast Guard in this work.

As described in its previous Annual Report, during 1986, the Commission, in consultation with the National Oceanic and Atmospheric Administration, drafted an information paper on the nature of the problem created by marine debris and the importance of Annex V as a responsive action. The Coast Guard submitted the paper to the 23rd Session of the Committee in July 1986. The paper was well received and, in response, the U.S. delegation agreed to provide a paper for the 24th Session of the Committee in February 1987, describing actions appropriate to take to implement Annex V.

24th Session of the Marine Environment Protection Committee, 16-20 February 1987: To assist the U.S. delegation in meeting its commitment, the Marine Mammal Commission, in

consultation with its Committee of Scientific Advisors, the National Oceanic and Atmospheric Administration, and the Coast Guard, took the lead in drafting a paper which was submitted to the Committee by the Coast Guard in late 1986. Among other things, the paper proposed terms of reference for future work on the Annex as might appropriately be undertaken by the Committee's Working Group on Optional Annexes, and it also proposed that the Committee develop recommended guidelines on actions to implement Annex V.

A representative of the Commission participated as an observer on the U.S. delegation to the Committee's 24th Session. During the meeting, the aforementioned U.S. paper and its proposed actions on Annex V was referred to the Committee's Working Group on Optional Annexes. Based on the proposal in the U.S. paper, the Working Group recommended adopting the terms of reference for future work on Annex V. These call upon the Group to: (a) review information on the nature and magnitude of problems caused by ship-generated garbage; (b) review information on the effectiveness of actions to implement Annex V; (c) identify and recommend actions to reduce and monitor adverse effects of ship-generated garbage; (d) identify and recommend actions to facilitate development of adequate port reception facilities; and (e) provide advice and recommendation on interpreting or amending the provision of Annex V.

The Working Group also concurred with the recommendation in the U.S. paper to develop guidelines on implementing and enforcing Annex V. To help prepare those guidelines, the Working Group developed an annotated outline, with the following major headings: training, education and information; minimizing the amount of potential garbage; shipboard storage and handling procedures for garbage; shipboard equipment and processing of garbage; port facilities to receive garbage; and ensuring compliance with Annex V.

The Working Group's recommendations for terms of reference and developing guidelines on Annex V were adopted by the Committee in Plenary Session and, to facilitate further work on the matter, the U.S. delegation agreed to prepare a draft set of recommended guidelines for consideration at the 25th Session of the Committee, subsequently held in December 1987.

<u>25th Session of the Marine Environment Protection Committee, 30 November-3 December 1987:</u> To help prepare for the 25th Session of the Committee, the National Oceanic and Atmospheric Administration, in consultation with the Coast Guard and the Marine Mammal Commission, took the lead in preparing an initial draft set of guidelines on implementing Annex V. By letter of 17 August 1987, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, provided comments to the Administration on an initial draft. The

initial draft guidelines developed by the Administration were responsive to the advice provided by the Working Group on Optional Annexes at the 24th Session of the Committee and followed its recommended annotated outline. They provided practical advice for ship operators, crew members, and Party Governments on ways to ensure that requirements in the Annex are met and they also included definitions of terms used in the guidelines.

Among other things, however, the Commission noted in its comment letter that the draft guidelines could be improved by reorganizing and restructuring parts of the recommended guidelines and it suggested that the chapter on handling and storage procedures for ship-generated garbage be expanded and rewritten to present clearer advice on the matters of collecting, processing, storing, and disposing of garbage generated aboard ship. In this regard, the Commission provided a suggested alternative draft text for this chapter.

The draft guidelines were subsequently revised by the U.S. Coast Guard, taking into account relevant information provided to the United States through the Secretariat of the International Maritime Organization by other contracting parties. Most of the Commission's comments, including the suggested alternative text for the chapter on shipboard garbage handling and storage, were accepted and included in the final draft guidelines, which the Coast Guard submitted to the Committee in October 1987.

During the 25th Session of the Committee, the U.S. paper containing the draft guidelines was referred to the Working Group on Optional Annexes with a request that the Group finalize the guidelines and pay particular attention to the definitions contained therein. The Working Group reviewed the draft guidelines and related papers presented by other nations. The draft guidelines were very well received and, with the exception of certain definitions and some further editorial work, they were accepted in principle by the Working Group. With respect to the definitions, the Working Group noted that the inclusion of certain "oily rags" and "cargo associated wastes" as garbage may create special disposal hazards which port reception facilities for garbage are ill-equipped to handle. Although the Working Group was unable to completely resolve when such wastes would be inappropriate for disposal with other garbage at port reception facilities, it revised these definitions to better address the identified concerns and noted that a partial solution to the problem might be addressed through development of a new Annex (Annex VI) dealing with the disposal of cargo residues arising from the transportation of bulk solid cargoes.

Therefore, the Working Group recommended that the Committee instruct the Secretariat to distribute the draft guidelines as modified by the Working Group to the full Committee in order that they may be modified as necessary and adopted by the 26th Session of the Committee. It was also recommended that the Committee members' views be sought on the development and scope of a new Annex VI to address disposal of cargo residues. There was unanimous Committee agreement on the scope and content of the guidelines drafted by the United States and the Committee adopted the recommendations made by its Working Group.

At the end of 1987, it was apparent that the U.S. Coast Guard had effectively precipitated constructive action, both domestically and internationally, on the marine debris issue, and that much of the credit for U.S. ratification and entry into force of Annex V was attributable to its efforts. It was, therefore, the Commission's intention to write the Chief of the Coast Guard's Office of Safety, Security, and Environmental Protection, who also serves as head of the U.S. delegation to the Marine Environment Protection Committee, in early 1988 to commend him and his staff. The Commission looks forward to helping the Coast Guard in 1988 as it prepares for the 26th Session of the Committee in September 1988.

## CHAPTER VII

## MARINE MAMMAL/FISHERY INTERACTIONS

Many marine mammal species may affect and be affected by fisheries. For example, marine mammals may be disturbed, harassed, injured, or killed, either incidentally or deliberately, during fishing operations; they may take or damage bait and fish caught on lines, in traps, and in nets; they may damage or destroy fishing gear while trying to remove bait or caught fish or when they accidentally become entangled in fishing gear; and they may compete with commercial and recreational fisherman for the same fish and shellfish resources.

The Marine Mammal Protection Act recognizes that such interactions can have significant adverse effects on marine mammals, fish and shellfish stocks, fisheries, and the ecosystems of which they are a part. The Act mandates that the primary objective of marine mammal management should be to maintain the health and stability of the marine ecosystem. To reduce the possible impacts of marine mammal/fishery interactions on fisheries, the Act provides that marine mammals may be taken incidentally in the course of commercial fishing operations and that permits authorizing such take may be issued to fishermen subject to regulations prescribed by the Secretaries of Commerce and the Interior. Regulations promulgated by the National Marine Fisheries Service authorize permit holders to take whatever steps may be necessary, up to and including killing marine mammals, to protect their gear and catch. The Act also specifies procedures for waiving the moratorium on taking marine mammals to give consideration to, among other things, the conservation, development, and utilization of fishery resources.

To insure that marine mammal populations are not adversely affected by interactions with fisheries, the Act: prohibits the taking of depleted species and populations (i.e., those that are below their level of maximum net productivity); requires that all feasible efforts be made to reduce to insignificant levels the incidental killing and injury of marine mammals during commercial fishing operations; and, requires that, before waiving the moratorium on taking or issuing permits authorizing the take of marine mammals during commercial fishing operations, the Secretary of Commerce or the Interior must determine that the affected population is at or above its maximum net productivity level and will not be adversely affected by the authorized taking. In addition, the Act requires that, in cases where waivers are requested to permit population reduction, the Secretary shall determine whether

it would be preferable to capture and transport the excess animals to another location within the species' historic range rather than killing them.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has devoted considerable attention and funding to efforts to identify, assess, and resolve problems caused by marine mammal/fishery interactions. Activities prior to 1987 have been reported in previous Annual Reports. A brief summary of these earlier efforts and a description of activities in 1987 follow.

## Background

Before passage of the Marine Mammal Protection Act in 1972, regulated and unregulated hunting, bounty programs, and various forms of harassment were used in a number of areas to eliminate or reduce marine mammal populations and thus eliminate or reduce damage and loss of gear and catch being caused, or thought to be caused, by marine mammals. Consequently, marine mammal populations were reduced to and held at very low levels in some areas. The Act imposed a moratorium on such taking and, in the ensuing years, marine mammals have become more abundant in some areas and/or less likely to avoid fishing boats and gear.

By the mid-1970s, there were reports of increasing interactions between marine mammals and fisheries, particularly in the Pacific Northwest. In response to these reports, the Commission, in December 1977, convened a workshop to gather and review available information on the nature, extent, and impact of interactions between fisheries and marine mammal populations in Oregon, Washington, California, Alaska, and Hawaii. The workshop concluded that the most acute problems seemed to involve seals, sea lions, and the salmon gill net fisheries in the Copper River Delta area of Alaska and the Columbia River in Washington and Oregon (for more information, see Mate, 1980, Appendix B). In response to the workshop findings, the Commission, among other things, provided funds to initiate assessment of the interactions problem in the Copper River Delta (see Matkin and Fay, 1980, Appendix B) and to begin development of a plan to assess and determine how to resolve the interactions problems in the Columbia River and adjacent areas.

As noted in previous Commission reports, additional studies subsequently were initiated by the National Marine Fisheries Service, the North Pacific Fishery Management Council, and the States of Alaska, Washington, Oregon, and California. These studies were intended to better determine the nature and extent of certain interactions in the Bering Sea, in waters

off the U.S. west coast from Washington to California, and off New England. The Commission, concerned that these studies might not be providing either comparable data or the types and quality of data needed for decision-making, convened a second workshop in October 1981 to review and determine what steps should be taken to improve and coordinate ongoing and planned studies.

Participants in the 1981 workshop concluded that: (1) it is not possible to make broad generalizations about marine mammal/fishery interactions in different areas and each situation must therefore be considered individually; (2) because of the potentially complex nature of indirect (trophic) interactions among marine mammals, fisheries, and fish and shellfish resources, there is a substantial risk of making bad management decisions; (3) to minimize this risk, marine mammals and fisheries should be managed cooperatively in areas where they may be competing for, or otherwise affecting, the same fish or shellfish stocks; (4) because funding is limited and direct interactions are less complex and therefore easier to assess and deal with, high priority initially should be afforded to research on direct rather than indirect interactions; (5) ongoing efforts to determine and document the nature and extent of impacts on both the involved fisheries and marine mammal populations should be expanded to identify and evaluate the relative cost and benefits of possible mitigation measures; and (6) when remedial measures are determined to be necessary, non-lethal measures should be considered before lethal measures.

These workshop findings have guided subsequent Commission efforts as described below.

## Interactions in California Coastal Waters

Investigations to determine the nature and extent of marine mammal/fishery interactions in California coastal waters have been underway since 1979 as a cooperative project of the National Marine Fisheries Service and the California Department of Fish and Game. As noted in previous Annual Reports, these investigations indicate that marine mammals are affecting a number of California fisheries including the commercial salmon troll fishery, the commercial passenger fishing vessel fishery, the Pacific herring seine fishery, the market squid dip net fishery, the drift net fishery for sharks, and set net fisheries for halibut, croaker, and rockfish. They also indicate that substantial numbers of sea otters, harbor porpoise, sea lions, harbor seals, and other non-target species are being caught and killed, particularly in the drift net and set net fisheries.

As noted in Chapter II of this Report and in previous Annual Reports, the California Department of Fish and Game and the California state legislature have taken steps to prohibit the use of drift nets and set nets at certain times and in certain areas to prevent or reduce the incidental take of sea birds, sea otters, harbor porpoise, gray whales, and other marine mammals. In 1987, the California legislature enacted additional legislation extending the prohibition on the use of drift nets and set nets and requiring the modification of certain types of set nets to reduce the possibility of entangling and killing gray whales. Also, as noted in previous Reports, the National Marine Fisheries Service has modified its regulations governing incidental take to allow owners and operators of commercial passenger fishing vessels to use seal bombs, cracker shells, and acoustic harassment devices to prevent California sea lions from taking fish caught by passengers.

Although substantial effort has been devoted to determining the nature and extent of marine mammal/fishery interactions, relatively little has been done to identify and evaluate the relative cost and benefits of measures that possibly could be taken to avoid or reduce the adverse effects of interactions. This fact was noted during the Commission's meeting in San Diego, California, in October 1985. Following that meeting, the Commission and the California Department of Fish and Game agreed to cooperatively sponsor a workshop to determine and describe such additional measures as may be necessary to assess, avoid, and reduce impacts on both the involved fisheries and marine mammal populations.

As noted in the Commission's previous Annual Report, the Workshop was held in San Francisco, California, on 26-28 March 1986. It was planned and supported cooperatively by the Commission, the California Department of Fish and Game, the California Sea Grant Program, the National Marine Fisheries Service, and the Fish and Wildlife Service. Participants included representatives of these agencies and representatives of commercial fisheries, the academic community, and public interest groups. The Workshop concluded that several fisheries and marine mammal populations in California are being affected so severely that measures may be necessary to reduce or mitigate interactions. For example, the commercial passenger fishing vessel fishery, the commercial salmon troll fishery, and coastal set net fisheries are being affected substantially by California sea lions and other marine mammals that take or damage caught fish. Likewise, the incidental take of sea otters, harbor porpoise, harbor seals, and some other marine mammal species may have caused, or be causing or contributing to, population declines.

Workshop participants recognized that the prohibitions on the use of drift nets and set nets in certain areas were having an adverse economic impact on some fishermen. They recommended that a feasibility study and, if appropriate, an engineering/assistance program be carried out to assess the potential utility of converting small gill net vessels to alternative types of gear (e.g., Danish seines) to permit resumption of halibut and other fisheries in areas where set net fisheries have been prohibited to protect sea birds, sea otters, harbor porpoise, and gray whales. Participants also noted that studies should be done to identify factors (e.g., the length of time that nets are left in the water) that may be causing or contributing to the incidental take of harbor porpoise, harbor seals, and other marine mammals.

Because of uncertainties concerning the effects of certain fisheries on marine mammals, Workshop participants concluded that survey, reporting, and observer programs should be continued and, in some cases, expanded to provide more reliable information on the species, numbers, ages, and sex of marine mammals being taken, both deliberately and incidentally, in set net, drift net, troll, and other fisheries in California. Participants noted that depredation by California sea lions and harbor seals of fish caught in the party boat, gill net, and salmon troll fisheries could be caused by a small number of "nuisance" animals who have learned that food is easy to find in the vicinity of fishing gear and vessels or by a general cross-section of animals present in fishing areas. Participants pointed out that it might be possible to use non-lethal aversive stimuli to frighten and keep seals and sea lions away from fishing gear and fishing areas. They concluded that additional studies should be done to evaluate this potential. Finally, the participants noted that long-term monitoring of both the affected fisheries and marine mammal populations is necessary to evaluate the relative advantages and disadvantages of measures taken to avoid or reduce interactions.

## Interactions in Areas off Alaska

The southeastern Bering Sea and other areas off Alaska include some of the world's richest fishing grounds and support a diverse assemblage of marine mammals. The expansion of both domestic and foreign fisheries in these areas beginning in the mid-1960s has increased the potential for marine mammal/fishery interactions and has focused attention on possible competition between marine mammals and fishermen for the same fish and shellfish resources. Because of the potential interactions, the Marine Mammal Commission and the North Pacific Fishery Management Council initiated cooperative efforts in 1980 to develop and implement an ecosystem approach to the management of marine mammals and fishery resources in areas

under the Council's jurisdiction. As part of this effort, the Commission and the Council jointly supported a workshop in October 1983 to review available information concerning biological interactions among marine mammals and commercial fisheries in the southeastern Bering Sea. Papers presented during the Workshop indicated significant potential for interactions between the following marine mammals and fisheries:

| | |
|---|---|
| North Pacific fur seal | groundfish, capelin, squid, herring |
| Northern sea lion | groundfish, herring, capelin, salmon |
| Harbor seal | groundfish, herring, capelin, salmon |
| Spotted seal | groundfish, herring, capelin |
| Beluga whale | salmon, herring, capelin |
| Harbor porpoise | groundfish, herring, capelin |
| Dall's porpoise | salmon |
| Killer whale | salmon |
| Gray whale | salmon |
| Fin whale | herring |
| Minke whale | herring |

Workshop participants concluded that available information was generally insufficient to estimate accurately the impacts of the interactions on the affected fisheries, fish stocks, or marine mammals. They identified the types of research and monitoring programs that would be necessary to determine the nature, magnitude, and impacts of the interactions.

Northern Sea Lion/Fishery Interactions

As noted in Chapter II of this Report, comparison of data from northern sea lion surveys conducted in the 1960s, 1970s, and 1980s indicate that there have been substantial declines in northern sea lion numbers in several areas, particularly in the eastern Aleutian Islands and the western Gulf of Alaska. The magnitude and cause of these declines have not been documented and, in 1983, the Commission provided funds to the North Pacific Fishery Management Council to help support a survey of Steller sea lion colonies affected by the winter pollock fishery in the Shelikof Strait (for details, see the Annual Reports for 1983 and 1984).

The results of these surveys and other information concerning the demography and dynamics of northern sea lion populations were reviewed during the Workshop convened by the National Marine Mammal Laboratory on 9-10 December 1986 to assess the status of northern sea lion populations in Alaska and the possible cause or causes of the observed decline. As noted in Chapter II of this Report, the Workshop concluded that the decline was continuing and probably was due to reduc-

tions in juvenile and adult female survival rates, the cause of which could not be determined.

Given the Workshop findings, the National Marine Fisheries Service announced on 24 April 1987 that it was undertaking a status review to determine whether the northern sea lion should be designated as depleted under the Marine Mammal Protection Act and/or endangered or threatened under the Endangered Species Act. As noted in Chapter II, this review was expected to be completed by 30 October 1987, but was not yet available at the end of 1987. When the status review is made available, the Commission, in consultation with its Committee of Scientific Advisors, will review it and provide comments and recommendations to the National Marine Fisheries Service as appropriate.

Killer Whale/Black Cod Fishery Interactions

In 1986, the Commission learned of a problem involving interactions between killer whales and a developing black cod (sablefish) long-line fishery in Prince William Sound, Alaska. As noted in its previous Report, the Commission wrote to the National Marine Fisheries Service on 5 March 1986 requesting information on what was being done to investigate and resolve the problem. By letter of 13 May 1986, the Service advised the Commission that: (1) it had been aware of the problem since the fall of 1985; (2) the Service's Alaska Regional Office had let a contract to survey black cod fishermen in Prince William Sound to determine the quantity of caught fish being taken by killer whales; (3) the report from the contract study indicated that approximately 25 percent of the fall 1986 black cod catch in Prince William Sound had been lost to killer whales, that a single killer whale pod appeared to be responsible for the depredation, and that the responsible killer whale pod had a mortality rate twice that of all other pods in the area, probably due to shooting by fishermen; (4) the Service had advised fishermen of steps that they were authorized to take to protect their gear and catch; (5) the Service was considering modifying the General Permit issued to the North Pacific Fishing Vessels Owners Association to allow long-line and pot fishermen to take killer whales only by non-lethal means; (6) a meeting had been held at the National Marine Mammal Laboratory on 21 February 1986 to identify steps that possibly could be taken to prevent or reduce interactions; and (7) no potentially effective and acceptable solutions were identified at that meeting, and funding constraints prevented the Service from undertaking any major new research at that time.

On 6 June 1986, the Commission advised the Service that it concurred with the determination that it would be desirable and appropriate to modify the general permit issued to the North Pacific Fishing Vessel Owners Association to allow long-

line and pot fishermen to take killer whales only by non-lethal means. Recognizing that funding constraints limited the Service's ability to undertake a major research program, the Commission recommended that the Service: (1) consult bio-acousticians, killer whale and other cetacean biologists, behavioral experts, fishery gear experts, and the affected fishermen to identify possible mitigation measures that would be effective, but not kill or injure the affected whales; (2) based on these consultations, design and seek the assistance of the affected fishermen in carrying out field trials to assess the likely cost and benefits of the possible solutions judged most promising; and (3) continue to survey fishermen, researchers, and others working in Prince William Sound and other areas of killer whale/fisheries interactions to better assess and monitor levels of fish loss and killer whale mortality and injury. The Service subsequently modified the general permit to allow fishermen to use only non-lethal means to keep killer whales from taking caught fish. It also continued survey efforts as recommended by the Commission, but was unable to initiate efforts to identify and assess possible mitigation measures.

The State of Alaska made funds available in 1986 to evaluate possible mitigation measures. As noted in the Commission's previous Annual Report, the extension agent of the Alaska Sea Grant Marine Advisory Program in Cordova, Alaska, had a telephone conference on 19 June 1986 with representatives of the Commission, the National Marine Fisheries Service, and several other organizations to seek advice on how best to use the State funds. During this telephone conference, Commission representatives pointed out that: there are no obvious solutions to the problem other than prohibiting long-line fisheries at times and in places that killer whales are present; trial and error experimentation with explosives or other possible deterrents could result in habituation and positive rather than negative reinforcement, making the problem more difficult to overcome; better understanding of acoustic or other cues attracting killer whales to vessels retrieving long-line gear might suggest ways for avoiding or reducing interactions; and a workshop involving the affected fishermen, cetacean biologists, acousticians, and other relevant experts likely would be the most effective way to determine how best to identify and evaluate possible ways to prevent or reduce interactions.

During the summer and fall of 1986, researchers from the Alaska Sea Grant Program conducted additional studies to assess and monitor the killer whales affecting and being affected by the sablefish fishery in Prince William Sound and to determine whether entangling caught fish or other non-injurious means might be useful for preventing or reducing killer whale depredation of caught sablefish. In addition, the National Marine Fisheries Service extracted and analyzed data from existing observer reports and asked observers placed aboard Japanese

long-line vessels operating in the eastern Bering Sea to record and report any interactions with killer whales. The results of these and prior studies were reviewed and discussed during the Commission's meeting in Anchorage, Alaska, on 28-30 October 1986. During the meeting there also was discussion of the possible desirability of holding a workshop, as described earlier, to identify research that would help to identify and evaluate the likely cost and benefits of possible means for avoiding or reducing interactions.

Subsequent discussions with personnel from the University of Alaska Marine Advisory Program indicated that U.S. participation in the black cod long-line fishery in the Bering Sea was expanding, and that foreign fisheries for black cod in the U.S. Fishery Conservation Zone were being phased out. This shift could result in increased conflicts between killer whales and the U.S. long-line fleet. Therefore, on 13 March 1987, the Commission wrote to the National Marine Fisheries Service to find out whether the Service or the State of Alaska would be able to place observers aboard U.S. fishing vessels, as it had on foreign fishing vessels, and, if not, what steps would be taken to assess and monitor the impacts of the interactions on the involved killer whales, fisheries, and fish stocks. The Service responded to the Commission's inquiry on 3 April 1987. In its response, the Service described steps that it had taken to assess and resolve the problem, including ongoing efforts to work cooperatively with the Alaska Fishing Vessel Owners Association to obtain reliable information on the incidence and impact of interactions in the southern Bering Sea during the 1987 fishing season. The Service also noted that it had not been possible to place observers aboard long-line fishing vessels during the 1987 season, but the option was available and every effort would be made to work with individual fishermen in 1988 as needed. The Service also noted that its Northwest and Alaska Fisheries Center would provide a full report of research activities as soon as data from the 1987 fishing season were provided by the Alaska Fishing Vessel Owners Association.

In 1988, the Commission will continue to work with the National Marine Fisheries Service, the Alaska Sea Grant Program, the Alaska Department of Fish and Game, and other interested parties to identify and implement necessary and appropriate measures to prevent or reduce interactions between killer whales and long-line fisheries in both Prince William Sound and the Bering Sea.

## Proposed Fishery-Related Amendments to the Marine Mammal Protection Act

At its 1986 annual meeting, the Pacific Marine Fisheries Commission constituted an ad hoc Technical Committee on Marine Mammals to identify possible amendments to the Marine Mammal Protection Act. The Committee's draft report and comments thereon were considered by the Pacific Marine Fisheries Commission at its annual meeting on 27-28 October 1987, a meeting to which the Marine Mammal Commission was invited and did send a representative.

On 1 December 1987, the Pacific Marine Fisheries Commission distributed the final report of its ad hoc Technical Committee on Marine Mammals. The report proposed amendment of the Marine Mammal Protection Act to: (1) "provide appropriate government entities with the authority to lethally remove nuisance marine mammals in limited situations where the conservation and protection of other significant resources is at risk" (without having to seek a waiver of the Act's moratorium on taking); (2) "provide marine mammals with the same system of protection as provided other wildlife populations under the ESA" (Endangered Species Act); (3) "provide the option for the development of cooperative marine mammal management programs by state and federal resource agencies"; and (4) "provide funding for state agencies to participate in cooperative state/federal programs."

In 1988, the Marine Mammal Commission will continue to work with the National Marine Fisheries Service, state agencies, fisheries and public interest groups, and the academic community to better define and seek solutions to problems being caused by interactions between marine mammals and fisheries.

# CHAPTER VIII

## INCIDENTAL TAKE OF MARINE MAMMALS IN THE COURSE OF COMMERCIAL FISHING OPERATIONS

The Marine Mammal Protection Act directs the Secretaries of Commerce and the Interior, in consultation with the Commission, to develop regulations governing the incidental taking of marine mammals by persons subject to the jurisdiction of the United States. It also calls upon the Secretaries, again in consultation with the Commission, to develop effective international arrangements, through the Secretary of State, for the purpose of reducing the incidental taking of marine mammals to insignificant levels approaching a zero mortality and serious injury rate.

Although the incidental taking of marine mammals occurs in the course of several fisheries and involves several different species of marine mammals, the "tuna-porpoise" issue involving the incidental mortality and serious injury of porpoises entrapped in purse seine nets used by commercial yellowfin tuna fishermen has, over the past decade, been the subject of the most intense concern, attention, and controversy. More recently, there has been concern over the incidental taking of Dall's porpoises and other marine mammals in the course of the Japanese salmon gill net fishery in the North Pacific Ocean, a portion of which occurs within the United States' 200-mile Fishery Conservation Zone, and the incidental take of southern sea otters and other marine mammals in gill and trammel nets in California coastal waters. The Commission's activities during 1987 related to the tuna-porpoise and Dall's porpoise issues are discussed below. A discussion on the incidental take of southern sea otters is included in Chapter II of this Report. Interactions between fisheries and other marine mammals are discussed in Chapter VII.

### The Tuna-Porpoise Issue

Discussions of the Commission's past activities and a historical summary of the efforts to resolve this problem are presented in the Commission's previous Annual Reports. As discussed below, the Commission, the National Marine Fisheries Service, the U.S. tuna industry, and others continued to devote substantial attention to the issue in 1987. In 1986, the U.S. tuna fleet reached the incidental kill quota of 20,500 porpoises in mid-October. As a result, the U.S. tuna purse seine fleet was prohibited from fishing for tuna by setting on marine mammals for the remainder of the year. The level of marine mammal mortality observed in 1987 was con-

siderably lower than that for 1986 and there was no need to prohibit setting on porpoise as was required in 1986. The mortality of eastern spinner dolphins, however, was unusually high and necessitated close monitoring to ensure that the allowable level of take of 2,750 would not be exceeded.

The 1987 Fishing Season

The National Marine Fisheries Service issued final regulations on 31 October 1980 establishing an annual allowable take (quota) of 20,500 animals for each of the five years, 1981-1985. On 7 December 1980, a general permit to take porpoise in compliance with the final regulations and the quota was issued to the American Tunaboat Association. By means of the 1984 amendments to the Marine Mammal Protection Act, Congress extended indefinitely the annual quota, as well as the regulations and the general permit, and added quotas for eastern spinner and coastal spotted dolphins. Estimates of the annual incidental take of porpoise by the U.S. tuna purse seine fleet since passage of the Marine Mammal Protection Act are listed in the following table.

Estimated Incidental Take of Porpoise in the U.S. Tuna Purse Seine Fishery In the Eastern Tropical Pacific Ocean

| Year | Estimated Kill and Serious Injury |
|---|---|
| 1972 | 368,600 |
| 1973 | 206,697 |
| 1974 | 147,437 |
| 1975 | 166,645 |
| 1976 | 108,740 |
| 1977 | 25,452 |
| 1978 | 19,366 |
| 1979 | 17,938 |
| 1980 | 15,305 |
| 1981 | 18,780 |
| 1982 | 22,736 |
| 1983 | 9,589 |
| 1984 | 17,732 |
| 1985 | 19,205 |
| 1986 | 20,696 |
| 1987 | 13,992* |

*Preliminary estimate

As noted above, in 1986, the U.S. tuna fleet reached the allowable take level of 20,500 and was required to cease

setting for tuna on schools of porpoise. There are several possible reasons why the quota was reached. One is that the tuna fleet experienced an increased number of problem sets which resulted in abnormally high levels of take. Another, perhaps more important, reason is that tuna fishermen made more sets on porpoise schools during 1986 than in 1985. This was because tuna found with porpoise tend to be large and large tuna brought a better price than smaller ones during the generally depressed 1986 tuna market. Another possible explanation for the high level of porpoise mortality in 1986 was the record high tuna catch rate of approximately 25 tons of tuna per set. Large schools of tuna may be associated with large schools of porpoise and, therefore, more porpoise than usual may have been encircled per set. The large number of tuna in the net may also have contributed to the high mortality by making it more difficult to release porpoise during the backdown procedure.

The preliminary estimate of porpoise mortality in the tuna fishery during 1987 was significantly less than the 1986 estimate with a total of 13,992 porpoise killed or seriously injured. In 1987, the catch rate of tuna was somewhat below 20 tons of tuna per set, well below the record level of 1986, suggesting that a lower incidental mortality of porpoise may be correlated with a lower catch per unit effort of tuna.

Despite the relatively low overall mortality observed in 1987, an unusually large number of eastern spinner dolphins were taken. The 1984 amendments to the Marine Mammal Protection Act established a quota of 2,750 for the eastern spinner stock and, as this quota was approached, mortality was estimated by the Service on a weekly basis rather than the customary biweekly basis. At the close of the season, it was estimated that 2,688 eastern spinner dolphins had been killed or seriously injured. In comparison, during 1986, when the overall quota of 20,500 porpoise was reached, the estimated mortality of eastern spinners was only 1,608. One possible explanation for the high eastern spinner mortality is that tuna, and, hence, fishing effort, were concentrated in the area of the eastern tropical Pacific Ocean where eastern spinner dolphins are more abundant.

Questions concerning the methodology that should be used to estimate porpoise mortality were raised by the Commission and others in 1986. As a result of deliberations among the National Marine Fisheries Service, the Commission, and other interested parties, it was determined that the same methodology that had been used previously would be used in 1987, but that further review of alternative approaches would take place. In addition, the Service decided to provide 100 percent observer coverage for the first trip of the U.S. tuna fleet in 1987. In response to comments from the tuna industry that the metho-

dology being used to estimate porpoise mortality tended to overestimate the true level of kill and that the 1986 season was closed prematurely, the Service initiated a study of the issue and set a target of 100 percent observer coverage throughout the 1987 season. Preliminary assessments by the Service indicate that approximately 95 percent of all U.S. sets in 1987 were observed. The Service, in cooperation with the Commission, is reviewing the data from the 1987 season to better determine the optimal level of observer coverage and will prepare a report of its findings in 1988. The Service has set a target of 50 percent observer coverage for 1988.

As noted previously, the Service published emergency interim regulations in 1986 that imposed a ban on catching, possessing, or landing yellowfin or bigeye tuna from the eastern tropical Pacific Ocean once the porpoise quota had been reached. An exception to the ban was established for vessels that voluntarily carried a National Marine Fisheries Service observer to verify compliance with the prohibition on fishing on porpoise. By letter of 3 October 1986, the Commission supported the adoption of the regulations and recommended that permanent regulations including similar requirements be established for future fishing seasons. The emergency regulations went into effect on 21 October 1986, and no additional takes of porpoise were reported for that year. On 23 December 1986, the Commission again recommended that the Service adopt permanent regulations to enforce the quota. At the close of 1987, no such regulations had been proposed by the Service.

At the end of 1986, the Service took the first step toward establishing regulations that would govern the performance of individual vessels and/or captains in the U.S. tuna fleet by issuing a discussion paper on alternative approaches. These performance standards, which would have been set forth as regulations, were intended to address the problem that arose in 1986 when certain vessels and/or captains experienced exceptionally high kill rates. The standards would have been implemented along with increased observer coverage to provide a more effective method for monitoring the operations of the U.S. fleet, reducing kill rates, and imposing appropriate sanctions, such as the revocation of certificates of inclusion, on captains and/or vessels with poor performance records.

Early in 1987, the Service circulated a draft proposed rule that would have established performance standards for operators of U.S. tuna vessels. A report prepared for the Service by Living Marine Resources, Inc., summarizing the U.S. tuna fleet's performance for 1981-1986 and used in preparing the draft proposed rule, was also circulated. The American Tunaboat Association, on 6 February 1987, voiced strong opposition to implementation of the regulations, stating that "there is no significant, widespread skipper performance problem in the

U.S. fleet that supports the complicated and financially burdensome regulatory process instituted by the draft proposed rules." The tuna industry representative presented an alternative to the regulation of operator performance, proposing that the existing Expert Skippers Panel be used to address the problems of disaster sets and under-performing skippers. The Service asked the American Tunaboat Association to prepare a more detailed proposal for distribution to interested parties.

The Commission, by letter of 8 April 1987, expressed its desire to work with the Service, the environmental community, and the tuna industry, in developing an effective performance review program. In that letter, the Commission took issue with the finding of the Living Marine Resources report and the statement made by the American Tunaboat Association in its 6 February letter that "problem performance...cannot be predicted with any degree of certainty." The Commission recommended that additional data be analyzed and noted that, "[a]lthough additional review is necessary, it appears to us ... that there is a pattern of predictability between problem sets and skipper performance."

Also on 8 April, the American Tunaboat Association submitted its proposal, setting forth the criteria and procedures that it believes should be used to evaluate the porpoise mortality performance of vessel operators. Under the proposal, the Expert Skippers Panel would review the circumstances surrounding the trip in which a disaster set occurred, would consider other relevant factors such as the operator's experience, and would work with the operator to improve performance. If performance problems recur, the Service could sanction the operator by suspending his Certificate of Inclusion. The Service, by letter of 20 May, indicated that the proposal was a good beginning toward resolving how it might use the recommendations of the American Tunaboat Association and the Expert Skippers Panel in addressing problem performance. In its letter, the Service posed several questions to the American Tunaboat Association in an effort to clarify various aspects of the proposal. No further action had been taken by the end of 1987.

Foreign Nation Compliance Programs

During the 1984 reauthorization hearings on the Marine Mammal Protection Act, concern was expressed by the Commission, the National Marine Fisheries Service, the tuna industry, and the environmental community that progress realized by the U.S. fleet in reducing incidental porpoise mortality was being offset by the high kill rates of foreign fleets. It was believed that, if further progress were to be made in achieving the Act's goal of reducing incidental mortality to insignificant levels approaching zero, foreign fleets would

have to comply with porpoise saving regulations similar to those applicable to the U.S. fleet. As a result, Congress amended the Act to require that each nation exporting tuna to this country provide documentary evidence that it has adopted a program to regulate the incidental take of marine mammals that is comparable to that of the U.S. and that the average rate of incidental take by its fleet is comparable to that of the U.S. fleet. Failure to meet these requirements may result in a ban on the import of tuna and tuna products from the nation involved.

On 21 July 1984, the Commission wrote to the Service urging that it promulgate regulations to implement the foreign nation certification requirements of the amendments. The Commission noted that prompt action was needed because the Service's existing foreign nation reporting and certification standards were not as stringent as those required by the 1984 amendments. Concerned about the lack of progress, the Commission wrote to the Service again on 22 May 1986, pointing out the need for immediate action. The Service responded by letter of 30 June 1986, stating that it was in the process of developing the proposed regulations. The Commission wrote to the Service again on 24 July 1986, asking when the proposed regulations would be published and requesting that a pre-publication version of the proposed regulations be provided to the Commission for review.

While the Service was preparing its proposed regulations, it received a request from Mexico that the Marine Mammal Protection Act embargo imposed on the importation of its tuna products in 1981 be rescinded. On 21 May 1986, the Service published a Federal Register notice that a determination had been made that Mexico was in substantial conformity with the U.S. regulations governing the incidental take of marine mammals and that the importation prohibition had been rescinded for that country. The decision was made under the Service's existing foreign nation certification regulations, which did not conform with the requirements of the 1984 amendments.

By letter of 25 June 1986, the Commission advised the Service that, in its opinion, it was inappropriate to render this decision under regulatory standards that were less stringent than those established by Congress in 1984. It also pointed out that the Service had not consulted with the Commission on the Mexican request and that it was not clear how the certification decision had been reached. In order to clarify the record, the Commission sought answers to a series of questions on the nature and scope of the Mexican tuna-porpoise program. The Service responded by letter of 4 September 1986, noting that, among other things: Mexico does not have an incidental take quota; a Mexican observer program was established in January 1986; and Mexican vessels are required

to use some, but not all, of the porpoise-saving devices and techniques used by the U.S. fleet. No further action was taken in 1986 or 1987 with respect to the certification of Mexico.

On 13 August 1986 the Service published in the Federal Register proposed regulations to implement the foreign nation reporting and certification requirements of the 1984 amendments. The proposed regulations call for a performance-based approach that requires a showing that the foreign nation's regulatory program is comparable to that of the U.S. and that reliable data indicate that the level of take in the foreign fleet is comparable to that of the U.S. fleet. The proposed regulations state that a comparable level of take would be one that is not more than 50 percent higher than the U.S. level. For each nation that is certified as satisfying U.S. standards, an annual review would be conducted to assess whether the program remains in compliance.

By letter of 14 November 1986, the Commission advised the Service that it supported the adoption of the proposed regulations, subject to certain modifications. In its letter, the Commission recommended that the regulations specify that the only method of monitoring take levels that would be in compliance with U.S. standards is one that is based on observer data. The Commission also expressed its view that a level of take that is 50 percent higher than that of the U.S. is unacceptably high and does not satisfy the requirements of the 1984 amendments that the level of take be comparable to that of the U.S. fleet. Final regulations were expected to be published early in 1987.

Because of comments received on the proposed rule, however, several modifications and clarifications were being incorporated before issuance of the final regulations. Publication of the final rule was further delayed to accommodate consultations between the National Marine Fisheries Service and the Inter-American Tropical Tuna Commission seeking to devise a system that would provide reliable data upon which to make comparisons between the U.S. and foreign fleets. The Commission worked closely with the Service during 1987 on various drafts of the final regulations and, by letter of 29 December 1987, recommended to the Service that the regulations, with certain modifications, be promptly adopted. Among the modifications recommended by the Commission were that: (a) the comparability of foreign and domestic kill rates reflect the variability found in the U.S. kill rate and the number of vessels in the foreign fleet; (b) the Service fully explain why the standards it eventually adopts for foreign nations are considered to be comparable; (c) the comparison of porpoise kill rates between U.S. and foreign fleets begin in 1988 and that full comparability be required in 1989; (d) mortality data be provided by

foreign governments on a stock-by-stock basis; and (e) a showing be made that tuna were caught when a positive finding of comparability was in effect for the exporting nation before tuna may be imported into the United States from that nation. Publication of an interim final rule is expected in early 1988.

Research Activities and Planning

The 1984 amendments to the Marine Mammal Protection Act directed the National Marine Fisheries Service to undertake a scientific research program, beginning on 1 January 1985 and continuing for at least five years, to monitor indices of abundance and trends in the porpoise populations affected by the yellowfin tuna purse seine fishery in the eastern tropical Pacific Ocean. In response to this directive, the Service, in consultation with the Commission, the U.S. tuna industry, and the Inter-American Tropical Tuna Commission, convened a series of meetings in 1984 to plan the monitoring program. However, as noted in the Commission's previous Report, funding and logistics constraints prevented initiation of the program in 1985.

With one exception, the planned program was initiated in July 1986 in accordance with the plan developed in 1984. The exception was that the Service was unable to deploy a helicopter to assist in detecting, counting, and determining whether porpoise are attracted to or attempt to avoid survey vessels. The Service was able to deploy a helicopter as well as two research vessels, the *David Starr Jordan* and the *McArthur*, to conduct porpoise surveys and related oceanographic studies in 1987. The surveys, which began in July and ended in early December 1987, covered an approximately five million square mile area in the eastern tropical Pacific and provided aerial photographic data necessary to calibrate shipboard estimates of porpoise school size and calculate age composition of schools.

The Commission was advised at its meeting on 10-12 December 1987 that the Service expects to be able to complete the remainder of the five-year monitoring program as planned. In 1988, the Commission will review the results of the 1986 and 1987 surveys and, as appropriate, suggest changes to improve the program plan.

## The Dall's Porpoise Issue

Dall's porpoise (*Phocoenoides dalli*) become entangled and die in gill nets used by Japanese salmon fishermen in the North Pacific Ocean. Pursuant to the International Convention for the High Seas Fisheries of the North Pacific, the Japanese are permitted to fish for salmon inside the U.S. 200-mile

Fishery Conservation Zone. The fishery is subject to the Convention, a Memorandum of Understanding between the United States and Japan on coordinated research efforts, the Marine Mammal Protection Act, the North Pacific Fisheries Act, and general permit requirements.

The Dall's Porpoise Permit, 1981-1986

A general permit authorizing the Federation of Japan Salmon Fisheries Cooperative Association to incidentally take up to 5,500 Dall's porpoise, 450 northern fur seals, and 25 northern sea lions per year was issued by the National Marine Fisheries Service in 1981 for the 1981-1983 fishing seasons. Through the 1982 amendments to the North Pacific Fisheries Act, which implements the High Seas Fisheries Convention in the United States, the general permit was extended until 9 June 1987. The amendments required the Japanese to introduce new fishing gear and techniques to reduce the incidental take of porpoise. In addition, the National Marine Fisheries Service was required annually to prepare a report on the operations of the Federation during the preceding fishing season and issue a detailed action plan concerning monitoring, research, development, and other necessary actions for the forthcoming season.

Under section 14(a)(2) of the North Pacific Fisheries Act, Japan was required to have introduced new gear or fishing techniques into its entire salmon drift gill net fleet by the 1987 fishing season. The National Marine Fisheries Service has authority under the Act to determine what types of fishing gear or techniques offer the most practical and effective opportunity for reducing porpoise mortality and to specify which of those must be adopted by the Japanese fleet. In 1987, two types of nets were used. Twenty-one percent of the fleet used nets with three strands of multi-filament material along the midline of the net. The remainder of the fleet used nets with three strands of hollow tube material along the midline. It was hoped that these gear modifications would make it easier for porpoise to detect and avoid gill nets through echolocation. Preliminary reports suggest that there was no significant difference in take rates between the two net types. Additional research is needed to determine whether these modifications can effectively reduce Dall's porpoise mortality.

Estimates based on U.S. observer coverage of the Japanese fishing operations indicate that except through the reduction of fishing effort, there had been no progress in reducing the total level of Dall's porpoise mortality since the permit was issued. Making note of this trend, the Administrative Law Judge presiding over proceedings for the 1987 permit application concluded that the Federation has been without success in

reducing incidental take. Estimates for incidental take in each fishing season under the permit are as follows:

Estimated Incidental Take of Dall's Porpoise
by the Japanese Salmon Drift Net Fishery
in the North Pacific Ocean

| Year | Estimated Take |
|---|---|
| 1981 | 1,850 |
| 1982 | 4,187 |
| 1983 | 2,906 |
| 1984 | 2,443 |
| 1985 | 2,760 |
| 1981 | 1,456 |
| 1987 | 741 |

The low level of take in 1987 reflects, in large part, a further reduction in fishing effort. The estimated take rate in the U.S. Fishery Conservation Zone before the 1987 season has been estimated at 0.47 porpoise per gill net operation. The mean observed take rate for the 1987 season was 0.26 porpoise per set.

The 1987 Permit

The extension of the 1981 general permit under the North Pacific Fisheries Act expired on 9 June 1987. In order to fish for salmon with gill nets in the U.S. Fishery Conservation Zone beyond that date, the Federation was required to have its permit renewed, pursuant to the Marine Mammal Protection Act.

On 21 July 1986, the Federation applied to the National Marine Fisheries Service for a five-year general permit to incidentally take 5,500 Dall's porpoise, 450 northern fur seals, and 25 northern sea lions. By Federal Register notice of 20 August 1986, the Service announced receipt of the application and published proposed regulations to implement the permit. A Draft Environmental Impact Statement on the permit request was issued on 29 August 1986.

Pursuant to section 103 of the Marine Mammal Protection Act, a formal rulemaking procedure was initiated on the application. The parties to the proceeding were: the permit applicant, the Federation of Japan Cooperative Fisheries Association; several environmental organizations; the Kokechik and Qaluyaat Fishermen's Associations, representing Alaska Eskimos; the Marine Mammal Commission; and the National Marine Fisheries Service.

The formal hearing took place in Seattle from 1-7 December 1986. Testimony was presented by expert witnesses for all of the parties. Initial briefs on the permit application were filed with the Administrative Law Judge on 29 December 1986. In its brief, the Commission recommended that the permit to take Dall's porpoise be issued for two years, subject to research and monitoring conditions. Due to the lack of reliable data on the status of the affected stocks, the Commission recommended that the permit not be issued for northern fur seals and northern sea lions. It also recommended establishment of an ecosystem protection zone around the Aleutian Islands which would be closed to gill net fishing by the Federation. The environmental organizations and the Kokechik and Qaluyaat Fishermen's Associations opposed issuance of the permit. The National Marine Fisheries Service supported the issuance of a five-year permit to take annually up to 4,200 Dall's porpoise and 450 fur seals from the Commander Islands stock.

Reply briefs were filed by all parties on 9 January 1987. In its brief, the Commission reaffirmed its earlier positions and emphasized that quota reductions should be applied if the term of the permit was extended. On 23 January 1987, the Service published a Federal Register notice setting forth required statements on the status of the Commander Islands fur seal stock. This action was necessary because, during the rulemaking process, the Federation explained that it was requesting permission to take fur seals only from the Commander Islands stock, not the Pribilof Islands population which the parties considered to be depleted.

The Administrative Law Judge issued his Recommended Decision on 6 March 1987. He recommended that a five-year permit be issued allowing the Federation to incidentally take 1,750 Dall's porpoise and 45 northern fur seals during 1987, and that, for each of four subsequent years, the quota be reduced by five percent from the previous year. He recommended denial of the request to take sea lions. The Administrative Law Judge also made findings and recommendations concerning permit terms and conditions and further research needs, most of which were consistent with the Commission's recommendations.

All parties filed exceptions to Administrative Law Judge's Recommended Decision. In its 2 April 1987 brief, the Commission urged that a permit be issued for a shorter period of time, that fur seals be excluded from the permit, and that the Aleutian Islands ecosystem protection zone be established. It also requested that additional emphasis be placed on developing improved fishing gear and techniques to reduce incidental take. The Federation filed numerous exceptions, including objections to the Dall's porpoise quota and the mandatory annual quota reduction. The Eskimo fishermen's groups and

the environmental organizations filed objections and argued that the permit could not lawfully be issued because, among other problems, it was certain that animals from species and stocks not covered by the permit would be taken incidental to the Federation's operations.

The final decision of the Under Secretary of Commerce and the general permit were issued on 22 May 1987. The final decision was published in the Federal Register on 28 May 1987. The permit was issued for three years and established an aggregate three-year quota of no more than 789 Dall's porpoise from the Bering Sea stock and no more than 5,250 porpoise from the North Pacific Ocean stock. During any calendar year, no more than 448 animals could be taken in the Bering Sea and no more than 2,494 from the North Pacific Ocean. The request to take fur seals and sea lions was denied on the grounds that the Federation had failed to meet its burden of proof to demonstrate that the affected stocks were within their optimum sustainable population levels and that the projected levels of take would not be to the disadvantage of those stocks. The permit was subject to numerous conditions, including requirements for observer coverage and gear modifications. Under the permit, the Federation began fishing within the U.S. Fishery Conservation Zone on 12 June 1987.

Litigation

Shortly after the final decision, lawsuits were filed in the U.S. District Court for the District of Columbia by the Kokechik Fishermen's Association, representing Alaska subsistence fishermen; the Center for Environmental Education, representing numerous environmental organizations; and the Federation. Kokechik and the Center alleged that the permit violated the Marine Mammal Protection Act because it covered only Dall's porpoise when it is certain that other marine mammals would be taken incidentally. They also alleged violations of the Act on other grounds, as well as violations of the National Environmental Policy Act and the Administrative Procedure Act. The Federation claimed that the denial of its request to take fur seals was improper, that it was unlawful to require the placement of U.S. observers on Japanese vessels outside U.S. waters, and that the quota levels were improper. Subsequently, the Federation voluntarily dismissed its causes of action on the observer coverage and the quota.

On 15 June 1987, the U.S. District Court ruled in favor of Kokechik and the Center. The Court preliminarily enjoined the permit and held that Kokechik and the Center had demonstrated a substantial likelihood of success on the merits of their claim that the permit unlawfully allowed the taking of one species of marine mammals, Dall's porpoise, even though it was known that other species would be taken by the same

fishing operations. The Court denied the request of the National Marine Fisheries Service and the Federation for a stay pending appeal. However, the injunction was withheld for 20 days to allow the parties time to request a stay from the Court of Appeals.

On 10 July 1987, the Federation requested a stay of the injunction from the U.S. Court of Appeals for the District of Columbia Circuit. The National Marine Fisheries Service moved for expedited review and a stay on 13 July 1987, the same day that the District Court's preliminary injunction took effect. Both motions were denied on 16 July 1987. The Federation terminated its operations within the U.S. Fishery Conservation Zone on 12 July 1987.

Oral argument was held on the Federation's and the Service's appeals of the District Court injunction on 2 November 1987. Those appeals are limited to one of the issues raised in the three lawsuits -- whether a permit may be issued for one species when it is known that other species also will be taken. The other issues raised in the District Court litigation (inadequacy of the Environmental Impact Statement, insufficient scientific evidence to support the decision, ex parte communications, failure to establish an ecosystem protection zone, insufficient observer coverage, and failure to include fur seals in the permit) were being briefed at the end of 1987. If the litigation is not resolved in its favor before the 1988 fishing season begins, the Federation will be barred from conducting operations within the U.S. Fishery Conservation Zone.

Administrative Review and Research

In its 9 January 1987 reply brief to the Administrative Law Judge, the Commission made numerous recommendations concerning the research and monitoring conditions that should be included in the permit. Most of these recommendations were adopted by the Administrative Law Judge in his recommended decision, accepted by the Under Secretary in his final decision, and incorporated into the permit. The conditions included in the permit are as follows: the costs of U.S. observers must be borne by the Federation or the Government of Japan; U.S. observers must be accommodated by the Japanese land-based salmon and high seas squid gill net fleets; a report must be furnished before 9 June 1988 as to the extent of the Japanese high seas salmon gill net fishery before 1952; the quotas must be reduced in proportion to decreases in Japan's salmon quota set by the Soviet Union; randomness of observer placement must be ensured; fur seals taken should be identified by stock; observers should report lost and discarded nets and plastic debris; research should be conducted on stock discreteness; population assessment techniques must be refined; reliable

estimates should be made of Dall's porpoise biological parameters, including gross annual reproductive rate and natural mortality rate; and expanded research must be conducted by the Federation on gear modifications, including studies of the behavioral patterns of Dall's porpoise, mesh sizes, auditory stimuli, sound generators, net setting and retrieval techniques, and metal or metal particle filled filament.

In recognition of the importance of this research, on 20 November 1987, the Commission recommended to the Service that the annual report/action plan requirements of the North Pacific Fisheries Act, which expired on 9 June 1987, be formally extended for every year the Federation conducts activities in U.S. waters. If this is done in accordance with the public review requirements of the North Pacific Fisheries Act, it should be possible for the Service, the Commission, and other interested parties to monitor the progress being made in fulfilling the Federation's research and monitoring permit conditions.

In the 20 November 1987 letter, the Commission also requested that the Service comply with the North Pacific Fisheries Act by preparing a report on the results of the Federation's fishing activities for 1986 and publishing a notice of availability of that report in the Federal Register. Finally, the Commission requested information on the enforcement actions taken by the Service with respect to unauthorized incidental takes of marine mammals other than Dall's porpoise during 1987 fishing operations. At the end of 1987, the Service had not responded to this letter. The Commission intends to pay particularly close attention to the implementation of the Federation's permit conditions during 1988.

# CHAPTER IX

## RESEARCH AND STUDIES PROGRAM

The Marine Mammal Protection Act requires that the Commission: maintain a continuing review of research programs conducted or proposed to be conducted under the authority of the Act; undertake or cause to be undertaken such other studies as it deems necessary or desirable in connection with marine mammal conservation and protection; and take every step feasible to prevent wasteful duplication of research. To accomplish these tasks, the Commission: conducts an annual survey of Federally-funded marine mammal research; reviews and recommends steps that should be taken to prevent duplication and improve the quality of marine mammal research programs conducted or supported by the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the Minerals Management Service, and other Federal agencies; convenes meetings and workshops to review, plan, and coordinate marine mammal research; and contracts for studies to help define and develop solutions to domestic and international problems affecting marine mammals and their habitats so as to facilitate and complement other agencies' activities.

### Survey of Federally-Funded Marine Mammal Research

Research directly or indirectly relevant to the conservation and protection of marine mammals and their habitat is conducted or supported by many Federal departments and agencies. To determine the precise nature of this research, to examine ways in which it can best be used to facilitate marine mammal conservation and protection, and to prevent wasteful duplication, the Commission annually requests and reviews information on the marine mammal research programs being conducted, supported, or planned elsewhere in the Federal Government.

In 1987, the Commission requested information from 22 Federal agencies and departments, at least 16 of which had in the past conducted or supported research relevant to the conservation and protection of marine mammals. Those departments, agencies, and offices were the Department of the Air Force, the Department of Energy, the Department of State, the Minerals Management Service, the National Aeronautics and Space Administration, the National Institutes of Health, the National Marine Fisheries Service, the National Park Service, the National Sea Grant College Program, the National Science Foundation, the Naval Ocean Systems Center, the Office of Naval Research, the Office of Ocean and Coastal Resources Management, the Office of Oceanography and Marine Assessment, the Smith-

sonian Institution, and the U.S. Fish and Wildlife Service. The Minerals Management Service, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service have had the largest and most diverse marine mammal research programs.

Responses to the 1987 survey are due early in 1988. After the information provided has been compiled and verified, the Commission, in consultation with its Committee of Scientific Advisors, will evaluate the information and make such recommendations as may be appropriate to better develop, focus, and coordinate agency programs.

## Research Program Reviews, Workshops, and Planning Meetings

In 1987, the Commission, in consultation with its Committee of Scientific Advisors, reviewed, commented on, and/or made recommendations concerning: the harbor porpoise, Hawaiian monk seal, North Pacific fur seal, Steller sea lion, entanglement of marine mammals in debris at sea and on beaches, and Antarctic marine living resources research and management programs being planned, conducted, or supported by the National Marine Fisheries Service; the research on southern sea otters, bowhead whales, gray whales, and other marine mammals being planned and supported by the Minerals Management Service; and the manatee, California sea otter, and Pacific walrus research programs being conducted by the Fish and Wildlife Service. Representatives of the Commission also convened, co-sponsored, or participated in meetings and workshops to: (1) better define and decide how best to meet essential information and management requirements relating to: North Pacific fur seals; right whales; gray whales; bowhead whales; bottlenose dolphins; Alaska sea otters; marine mammal strandings; conservation and research recommendations of the International Whaling Commission; the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); river dolphins; Steller sea lions; entanglement; impacts of offshore oil and gas exploration and development on marine mammals; and conservation of seals and whales in the seas surrounding Antarctica; (2) determine the cause or causes of the bottlenose dolphin die-off along the mid-Atlantic coast; (3) identify, evaluate, and recommend safe and effective systems for radio-tagging and tracking large cetaceans; (4) describe research, education, and other programs necessary to protect the West Indian manatee in southern Florida; and (5) review and evaluate the effectiveness of the National Marine Fisheries Service's Hawaiian monk seal program in promoting the recovery of the species.

## Commission-Sponsored Research and Study Projects

The Departments of Commerce and the Interior have primary responsibility under the Marine Mammal Protection Act for acquiring the biological and ecological data needed to protect and conserve marine mammals and the ecosystems of which they are a part. This responsibility has been delegated to the National Marine Fisheries Service and the Fish and Wildlife Service, respectively.

As noted earlier, the Commission convenes workshops and contracts for research and studies to identify and evaluate threats to marine mammal populations. It also supports other research necessary to further the purposes and policies of the Act. Since it was established, the Commission has contracted for more than 600 projects, ranging in amounts from several hundred dollars to $150,000. The average contract amount has been about $6,800. The total amounts of contracts awarded have been: $258,787 in FY 1974; $446,628 in FY 75; $497,449 in FY 76; $132,068 in the FY 76-77 three-month transition period; $523,504 in FY 77; $407,678 in FY 78; $219,897 in FY 79; $396,640 in FY 80; $173,652 in FY 81; $107,117 in FY 82; $211,982 in FY 83; $327,854 in FY 84; $226,160 in FY 85; $132,611 in FY 86; and $134,975 in FY 87.

From time to time, the Commission's investment in research activities is in the form of transfers of funds to other Federal agencies, particularly the National Marine Fisheries Service and the Fish and Wildlife Service. When such funds are transferred, the Commission provides detailed scopes of work which describe precisely what the agency is to do or to have done and the requirements for reporting on progress to the Commission. In many instances, this approach has made it possible for agencies to start needed research sooner than might otherwise have been possible and then to subsequently support the projects on their own for as long as necessary. The Commission believes that it is valuable to maintain agency involvement to the greatest extent possible and that such transfers provide a useful means of doing so.

Projects undertaken by the Marine Mammal Commission in 1987 are summarized below. In those cases in which the Commission has jointly supported the work with other agencies, it is so noted in the project summary.

Final reports from Commission-sponsored studies completed in 1987 and earlier are available from the National Technical Information Service; they are listed in Appendix B of this Report. Papers resulting from Commission-sponsored activities and published elsewhere are listed in Appendix C.

Survey of Federally-Funded Marine Mammal Research
(G. H. Waring, Ph.D., Southern Illinois University)

Each year the Commission identifies and publishes a report on the marine mammal research conducted or supported by Federal agencies in the preceding Fiscal Year and that which is expected to be conducted or supported by those agencies in the current Fiscal Year. At the end of 1987, the agencies were responding to the Commission's request for information on their Fiscal 1987 and Fiscal 1988 marine mammal research programs. In early 1988, the Contractor will prepare a report summarizing information being provided by the agencies. A proof copy of this report will be sent to the agencies to verify the accuracy of reported data. After verification, the Commission, in consultation with its Committee of Scientific Advisors, will review the report and, as appropriate, recommend actions to agencies for better developing, focusing, and coordinating their research programs. Copies of the final report will be provided to agencies conducting or supporting marine mammal research and will be available to other interested persons and organizations through the National Technical Information Service.

Mid-Atlantic Die-Off of Bottlenose Dolphins
(Smithsonian Institution, Washington, D.C.; J. E. White, Virginia Beach, Virginia; and W. T. Wilkins, Eastville, Virginia)

As noted in Chapter III, the Commission learned in late July 1987 that unprecedented numbers of bottlenose dolphins (*Tursiops truncatus*) had been washing up on Atlantic coast beaches from New Jersey to Virginia. The Commission subsequently coordinated and supported efforts to organize an Emergency Response Team in Virginia Beach, Virginia, to determine the nature, extent, and cause of the die-off. As part of this effort, the Commission provided funds to the Smithsonian Institution to help cover the cost of recovering carcasses and determining the age, sex, reproductive status, and other characteristics of the dolphins found dead in the Virginia Beach area. The Commission also paid for two small boat charters for a live capture operation during which three live animals, all showing symptoms of the secondary bacterial infection thought to be killing the dolphins, were captured, examined, and released. As described in Chapter III, the investigation is continuing with funding provided by several Federal, state and private organizations.

Survey of Marine Debris on the Coasts of Argentina
(R.N.P. Goodall, Tierra del Fuego, Argentina)

As described in Chapter VI, the Commission has played a major role since the early 1980s in focusing domestic and international efforts on assessing the extent and impact of entanglement in marine debris, especially discarded fishing gear, on marine mammals and to identify ways to reduce or eliminate the problem. Little is known about the incidence of marine debris in the Southern Hemisphere and no directed effort has been undertaken along the Argentine or other coasts of South America. The contractor is surveying selected beaches in Argentina to determine the types and quantities of debris present and to establish a baseline for detecting increases that may result from developing fisheries. Information provided by the surveys should provide insight into the nature and extent of the debris problem in Argentina and South America in general. The contract report, expected in December 1988, will be reviewed by the Commission, in consultation with its Committee of Scientific Advisors, to determine any need for further investigation or mitigation measures.

Overview of Federal and State Efforts to Protect Manatees and Their Habitat in Florida
(J. E. Reynolds, III, Ph.D., Eckerd College, St. Petersburg, Florida)

In 1986, the Commission provided funds for a review and evaluation of actions taken since 1979 by the Federal Government, the State of Florida, involved public interest groups, and others to protect manatees and essential manatee habitats in Florida. During review of the contract report, it became evident that additional information and evaluation of ongoing and planned research programs were needed. The contractor is updating the previous contract report to include the additional information and analysis. To assist in determining topics that should be included in the revised report, representatives of the Commission, the Fish and Wildlife Service, the State of Florida, and the Florida Power and Light Company met with the contractor on 9 December 1987 and developed and agreed on a report outline. The report, which is expected in draft form in February 1988, will be used by the Commission, in consultation with its Committee of Scientific Advisors, to assist in determining additional research and management actions necessary to help ensure the continued existence of manatee populations in Florida.

Development of a Long-Term Conservation Plan for the Chinese River Dolphin
(B. Wuersig, Ph.D., Moss Landing Marine Laboratories, Moss Landing, California)

As noted in Chapter II, the Chinese river dolphin (*Lipotes vexillifer*), or baiji, is one of only five species of river dolphins. Survival of the species is believed to be at risk because of human activities. However, little is known about the natural history and habitat requirements of the species, knowledge of which is essential for development of sound conservation measures. The contractor is conducting a site visit to assist researchers from several Chinese universities in developing and implementing a research program to assess the movements and social structure of the baiji in the lower Yangtze River. The contract report, expected in spring 1988, will describe the results of the site visit, discuss critical research and management needs, and identify any steps that possibly could be taken by the Commission or other U.S. agencies to encourage or facilitate actions necessary to protect the endangered baiji.

Seminar on Frontiers of Marine Ecosystem Research
(American Association for the Advancement of Science, Washington, D.C.)

The American Association for the Advancement of Science, in collaboration with the National Oceanic and Atmospheric Administration/National Marine Fisheries Service's Northeast Fisheries Center and the Marine Biological Laboratory at Woods Hole, Massachusetts, is organizing a Seminar on Frontiers of Marine Ecosystem Research, to be held in Boston, Massachusetts, on 11-14 February 1988 as part of the Association's annual meeting. The seminar is being co-sponsored by the Association, the Center for Ocean Management Studies at the University of Rhode Island, the National Science Foundation, the Marine Mammal Commission, and the National Oceanic and Atmospheric Administration/National Marine Fisheries Service. The purpose of the seminar is to review existing theory and information concerning the structure and dynamics of marine ecosystems and to call attention to the importance of collecting long time series of fisheries, environmental, and other data using the best available technology. The future of all marine mammals will depend, in part, on identifying and protecting key elements (*e.g.*, feeding and breeding areas) of the marine ecosystems of which they are a part. Thus, the seminar results will assist in determining and designing programs necessary to understand and protect marine ecosystems and their component elements, including marine mammals.

Workshop to Assess Possible Systems for Tracking Large Cetaceans
(A. Bruce, Point Reyes Bird Observatory, Stinson Beach, California; Ebasco Services, Inc., Bellevue, Washington; and S. Montgomery, Woodstock, Virginia)

Reliable information on daily and seasonal movement patterns is necessary to identify breeding, feeding, and other areas that may be critical to the survival of endangered cetaceans. Radio-tagging and tracking would be the most cost-effective means for obtaining such information. To date, however, efforts to develop safe and effective systems for radio-tagging and tracking large cetaceans have had limited success. The purposes of this Workshop, sponsored by the Minerals Management Service and organized by the Marine Mammal Commission at the request of the Service, were to: (a) determine what if any problems must be overcome to develop a safe and effective system for long-term tracking and/or relocating large cetaceans; (2) determine how, if possible, to best overcome identified problems; and (3) estimate the time, money, special equipment, and logistic support that would be required to accomplish the identified tasks. The contractors assisted in identifying potential workshop sites, provided logistic support, and prepared the Workshop report. The Workshop was held at the Northwest and Alaska Fisheries Center, Seattle, Washington, on 24-26 February 1987. The Workshop concluded that: (a) tracking radio-tagged whales from satellites offered the best potential for obtaining needed movement and related data; (b) the technology is available to tag and track large cetaceans using existing satellites; (c) problems with attachment and retention of tags pose the greatest obstacles; and (d) several possible alternatives to satellite tracking may be useful in some circumstances and thus merit further investigation and development. The Workshop report, which described research necessary to determine whether and how the tag attachment problems might be overcome, was provided to the Minerals Management Service and is being used to determine how best to facilitate further development and use of technology.

Ability of Harbor Porpoise to Detect and Avoid Live-Capture Weirs
(K.S. Norris, Ph.D., G.K. Silber, and R.S. Wells, Ph.D., University of California, Santa Cruz, California)

It is not known whether the harbor porpoise being caught and killed in coastal gill net fisheries in central California are part of a small local population or part of a larger population that ranges north into northern California, Oregon, and Washington. Since radio-tagging and tracking may be the most cost-effective means for obtaining movement data necessary to make this determination, the Commission contracted in 1986 for an evaluation of possible methods of capturing, radio-

tagging, and tracking harbor porpoise in central California. The results to date of that study indicate that harbor porpoise are able to detect and avoid live-capture weirs. This contract provides for further study of harbor porpoise responses to different types of net structure and lines to determine if the responses suggest ways to alter fishing gear or practices to reduce incidental mortality in set net fisheries. The report, to be submitted by 30 September 1988, will be reviewed by the Commission, in consultation with its Committee of Scientific Advisors, to determine how the results might be applied to reduce incidental mortality in set net fisheries in California and elsewhere.

Isolation and Analysis of Mitochondrial DNA from Tissues Collected from Stranded Pilot Whales
(R.L. Honeycutt, Ph.D., Harvard University, Cambridge, Massachusetts)

Effective conservation often requires knowledge of whether animals from different geographic areas are from the same or different breeding populations. Work at the University of Michigan, supported by the Commission in the past, indicates that analysis of mitochondrial DNA may be useful for identifying discrete populations of bottlenose dolphins. To determine if the technique may also be useful with other species, the Commission in 1987 provided funds to assist the contractor in isolating and analyzing mitochondrial DNA from tissues collected from pilot whales stranded along the east coast of the United States from 1981 through 1986. If this preliminary study suggests that mitochondrial DNA might be useful in differentiating pods and stocks of pilot whales, the Commission, in consultation with its Committee of Scientific Advisors, will recommend that the National Marine Fisheries Service provide support to analyze samples from past and future stranding events to help determine the most reasonable pilot whale management units.

Radio-tagging and Release of Rehabilitated Pilot Whales Stranded on Cape Cod, Massachusetts, in December 1986
(New England Aquarium, Boston, Massachusetts; B.R. Mate, Ph.D., Oregon State University, Newport, Oregon)

In December 1986, three young pilot whales from a mass stranding of pilot whales on Cape Cod, Massachusetts, were brought to the New England Aquarium in Boston, Massachusetts, for rehabilitation. By June 1987, the animals were judged healthy and suitable for reintroduction to the wild. Although substantial effort has been devoted in the United States, Australia, and elsewhere to rescuing, rehabilitating and/or returning live-stranded pilot whales to the sea, it is not

known whether these animals survive and are able to locate and be accepted by other members of the species. To help resolve these uncertainties, standard radio-tags were attached to two of the whales and a satellite-linked radio-tag was attached to the third before they were released east of Nantucket, Massachusetts, on 29 June 1987. The Commission provided funds to help support aerial and ship surveys to locate possible optimal release sites (i.e., nearshore areas inhabited by pilot whales) prior to the release and to attempt to relocate and verify the health of the whales before expiration of the 70- to 90-day life expectancy of the batteries in the satellite-linked radio. The transmitter functioned for at least 91 days during which 3,000 transmissions were received and 453 locations were determined. Efforts to visually confirm the condition of the whale before expiration of transmitter batteries were unsuccessful due to poor weather conditions during the search period. The fact that transmissions were received during the full life expectancy of the transmitter indicates that at least one of the whales was alive and presumably healthy at least 91 days after release. It also demonstrates the value of satellite-linked radio tags.

Analysis of Blubber Samples Obtained from Gulf of California Harbor Porpoises to Determine the Presence and Levels of Environmental Contaminants
(J.A. Calambokidis, Cascadia Research, Olympia, Washington)

As noted in Chapter II, the Gulf of California harbor porpoise is one of the smallest and rarest cetaceans. It was listed as endangered under the Endangered Species Act in 1985 because of its limited numbers and the substantial incidental take in totoaba gill net fisheries in the Gulf of California. In addition, nutrient depletion and environmental contamination may be affecting the harbor porpoise and its habitat. At least 13 animals were caught and killed accidentally in the spring of 1985 during experimental gill net fishing operations for totoaba near El Golfo, Santa Clara, Sonora, Mexico. The contractor is analyzing blubber samples from 8-10 of these animals to determine the types and levels of environmental contaminants present in the blubber. The results should provide insight into the nature and significance of possible threats to the species from environmental pollution.

Harbor Seal Trend Counts in Selected Areas of Alaska
(Alaska Department of Fish and Game, Anchorage, Alaska)

From 1983 through 1986, the Alaska Department of Fish and Game conducted aerial surveys of harbor seals hauled out at selected sites in the Ketchikan and Sitka area of southeastern Alaska, in Prince William Sound, in the Kodiak Island

area, and along the Bering Sea coast of the Alaska peninsula. Comparison of data from these surveys and surveys done in the 1960s and 1970s indicate that harbor seal numbers have declined and may be continuing to decline in several areas. Follow-up surveys of selected index areas should be conducted at regular intervals to determine whether the population continues to decline, stabilizes, or begins to increase. The National Marine Fisheries Service was unable to provide funding to continue trend surveys in 1987-1988 and the Commission provided funds to the Alaska Department of Fish and Game to help defray the survey costs.

Review of Final Draft Report on the Sea Otter in Alaska
(K. W. Pitcher, Alaska Department of Fish and Game, Anchorage, Alaska; L.M. Rotterman, and D.B. Siniff, Ph.D., University of Minnesota)

As noted in Chapter IV, the Commission initiated efforts in 1984 to develop species reports, with research and management recommendations, for sea otters and nine other species of marine mammals commonly found in Alaska coastal waters. Reviewers' comments on the draft sea otter report reflected substantially differing views on priority research and management issues. The Commission therefore organized and held a meeting of the ad hoc sea otter working group on 24-25 September 1987 to better identify and resolve the differing views. Following the meeting, another draft was prepared, circulated, and approved after further revision. As noted in Chapter IV, the species reports are expected to be published early in 1988 and to provide the bases for developing agreed research and management programs for these ten species.

Review of Alaska Species Accounts with Research and Management Recommendations
(J.W. Lentfer, Juneau, Alaska)

As described in the Commission's 1985 and 1986 Annual Reports and in Chapter IV of this Report, the Commission organized and provided funding for groups of experts to prepare reports describing the research and management programs necessary to protect and conserve ten species of marine mammals that commonly occur in Alaska coastal waters. The contractor coordinated and participated in working group activities under contract with the Commission from 1984 to 1986. In 1987, the contractor reviewed and edited the working group reports and compiled a single document suitable for publication. As noted in the preceding project description, the report is expected to be published early in 1988.

Analysis of Elephant Seal Tag-Resighting Data from the Farallon Islands
(H.R. Huber, Visiting Scientist, National Marine Mammal Laboratory, Seattle, Washington)

Tagging and observation studies of elephant seals on the Farallon Islands off central California have been conducted since 1974. The tag-resighting data have not been fully analyzed and, in 1986, the Commission provided funds for analysis to determine if there were any apparent changes in the juvenile survival rates between 1974 and 1986. If the survival rates varied or declined substantially, they may indicate an inverse correlation with increasing population size (a density-dependent response) and/or correlation with environmental variables (a density-independent response). In 1987, the Commission provided funds for additional analysis, including assessment of the possible effect of the El Nino event in 1982-1983 on the survival and emigration of immature elephant seals. The contract report will be reviewed by the Commission, in consultation with its Committee of Scientific Advisors, to determine whether additional analysis, monitoring, or management actions may be necessary to ascertain and maintain the optimum sustainable northern elephant seal population.

Assessment of Information and Programs Concerning the Incidental Take of Sea Otters, Harbor Porpoise, and Other Marine Mammals in California Coastal Waters
(B. Heneman, Bolinas, California)

The coastal waters of California are inhabited by at least 34 species of marine mammals, several of which have been or are being affected by fisheries and other human activities. In 1984, the Commission provided funds to review and evaluate research and management programs bearing on these species conducted by the Fish and Wildlife Service, the National Marine Fisheries Service, and others. In 1987, the Commission provided additional funds to: review and advise the Commission on actions that have been taken or are being considered by the California Department of Fish and Game, the California State Legislature, the National Marine Fisheries Service, and other organizations to ban or limit the use of set nets in California waters; assess what effect these actions may have on fisheries development and on marine mammals including sea otters, harbor porpoise, gray whales, and harbor seals; describe steps that could or should be taken by the Commission to assure that actions being taken or contemplated by other Federal agencies or State agencies do not adversely affect marine mammals and identify steps that could or should be taken by the Commission to facilitate adoption and implementation of the Sea Otter Translocation Plan. Information and recommendations provided by the contractor have been used by the Commission, in consul-

tation with its Committee of Scientific Advisors, to advise Federal and State agencies as to steps that should be taken to better protect and conserve marine mammals and their habitat in the coastal waters of California.

Publication of Contract Reports
(National Technical Information Service)

Many of the Commission's contract reports are of interest to organizations and individuals outside the Commission and may be of value for many years to come. To assure that such reports are readily available, the Commission contracts with the National Technical Information Service, part of the Department of Commerce, to publish and archive selected reports. Commission reports available from the Service are listed in Appendix B of this Report.

## Special Research Concerns for FY 1988

As noted in this and previous Annual Reports, a substantial amount of additional research is needed to more effectively assess and determine how to deal with problems affecting the conservation of marine mammals and their habitats worldwide. As examples, additional research is needed to:

-- identify and determine how best to protect critical marine mammal habitats (e.g., breeding and feeding areas of manatees and dugongs, Hawaiian and Mediterranean monk seals, river dolphins, and humpback and right whales) that are being destroyed or damaged by human activities;

-- determine the cause(s) and how to stop and reverse the continuing decline of North Pacific fur seal, northern sea lion, and harbor porpoise populations in the North Pacific and Bering Sea and the continued die-off of bottlenose dolphins along the U.S. mid-Atlantic coast;

-- identify and evaluate the relative costs and benefits of possible alternative means for preventing or reducing the at-sea loss and discard of fishing gear and other persistent debris that pose hazards to marine mammals, sea birds, turtles, fish, and mariners;

-- identify and evaluate the relative costs and benefits of possible means for avoiding or minimizing the effects of marine mammal/fishery interactions on the affected marine mammals, fisheries, and fish stocks;

-- better assess and detect the effects of pollution and activities such as offshore oil and gas exploration and development on marine mammals and their habitat; and

-- develop better methods for assessing and monitoring the status of marine mammal populations, determining habitat requirements and essential habitats, and assessing and detecting the effects of human activities on marine mammals and their habitat.

As noted earlier in this Chapter, agencies such as the National Marine Fisheries Service, the Fish and Wildlife Service, and the Minerals Management Service have primary responsibility for ensuring that needed research and studies are done. The Commission is responsible for assessing the adequacy of the agency programs and for seeing that any additional work is done which it deems necessary or desirable for meeting the objectives of the Marine Mammal Protection Act. To meet its responsibilities, the Commission, in Fiscal Year 1988, will continue to hold workshops, convene plenary meetings, and contract for studies to help identify potential solutions to critical problems. In particular, the Commission expects to organize, convene, or help support workshops, program reviews, and planning meetings to: (1) facilitate development of a long-range conservation plan for the North Pacific fur seal; (2) expedite investigations of the continuing die-off of bottlenose dolphins along the U.S. Atlantic coast; (3) determine further actions that usefully can be taken to prevent or mitigate problems being caused by lost and discarded fishing gear and other hazardous marine debris; (4) identify and determine how to avoid or minimize marine mammal conservation problems being caused by fishery development, potential mineral development, and other activities in the seas surrounding Antarctica; (5) develop recovery plans for endangered cetaceans; (6) assess possible amendments to strengthen and improve the effectiveness of the Marine Mammal Protection Act; and (7) improve planning and coordination of marine mammal research and management programs being conducted or supported by Federal, state, and private organizations.

# CHAPTER X

## COASTAL AND OFFSHORE OIL AND GAS DEVELOPMENT

Activities and oil spills associated with exploration and development of coastal and offshore oil and gas resources may adversely affect marine mammals and the ecosystems of which they are a part. Under the Outer Continental Shelf (OCS) Lands Act, the Department of the Interior's Minerals Management Service is responsible for predicting, detecting, and mitigating the adverse effects of OCS exploration and development. The National Marine Fisheries Service and the Fish and Wildlife Service are responsible, under the Marine Mammal Protection Act and the Endangered Species Act, for reviewing proposed actions and advising the Minerals Management Service of measures that may be needed to assure that those actions will not have adverse effects on marine mammals or species listed as endangered or threatened. The Commission reviews relevant policies and activities of these agencies and recommends actions that appear necessary to protect marine mammals and their habitats. The Commission's activities in this regard in 1987 are discussed below.

### Proposed OCS Lease Sale #97
### Beaufort Sea

Lease Sale #97, tentatively scheduled for January 1988, involves leasing up to 3,930 blocks (approximately 8.6 million acres) of submerged lands in the Beaufort and Chukchi Seas off the North Slope of Alaska for the purpose of oil and gas development. Eight species of marine mammals occur in the area, including endangered bowhead and gray whales. The Minerals Management Service's Draft Environmental Impact Statement (DEIS) on the proposed action, which was distributed in November 1986, concludes that possible effects on endangered and non-endangered marine mammals are likely to be minor. The Draft Statement further concludes that the cumulative effects of offshore oil and gas development activities on endangered whales in the area are likely to be moderate.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the Draft Statement and, by letter of 6 January 1987, provided comments to the Minerals Management Service. In its letter, the Commission noted that, although the Draft Statement considered many of the possible impacts of the proposed action, there were a number of uncertainties concerning the likelihood and extent of some potential effects that were not fully understood. For example, the Draft Statement did not always recognize that the effects of an oil

spill are independent of the probability that a spill will occur, and that it therefore is inappropriate to conclude that the effects will be negligible or minor because the probability of occurrence is negligible or minor. The Commission also noted that some potential impacts are difficult or impossible to identify or assess from available information.

Therefore, in its letter, the Commission recommended that the Minerals Management Service modify the Statement to acknowledge uncertainties concerning the likely effects of the proposed action and that the Final Environmental Impact Statement consider: (a) the possible effects on polar bears of garbage disposal from drilling platforms; (b) the possibility that oil spills, disturbances, etc., will cause walrus, polar bears, ice seals, and other species to move to adjacent areas already occupied, thereby increasing animal densities in those areas to levels that will damage or deplete food supplies; and (c) the possible cumulative effects of subsistence harvesting and other activities, as well as oil and gas exploration and development, on bowhead and beluga whales, polar bears, walrus, and seals. The Commission also recommended that the Minerals Management Service consider developing and implementing monitoring programs aimed at detecting unforeseen impacts before those impacts can reach unacceptable levels.

## Proposed OCS Lease Sale #109
## Chukchi Sea

Lease Sale #109 is tentatively scheduled for May 1988. It involves up to 5,448 blocks (approximately 29.5 million acres) of submerged OCS lands in the Chukchi Sea off northwest Alaska. Ten species of marine mammals, including four endangered whales species (bowhead, gray, fin, and humpback whales) are found in the sale area. The Minerals Management Service prepared a Draft Environmental Impact Statement on the proposed action, which was distributed to the Commission and others for review and comment on 6 March 1987. The Draft Statement concluded that possible effects of the proposed activities on all species of non-endangered marine mammals and on the endangered bowhead and gray whales are likely to be minor, and that possible impacts on the endangered fin and humpback whales are likely to be negligible.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the Draft Statement and provided comments to the Minerals Management Service on 5 May 1987. The Commission noted that the Statement provides a concise and useful review of information on the abundance, distribution, trophic relationships, and subsistence take of both non-endangered marine mammals and endangered bowhead whales, and that it also provides a reasonably thorough review of the

types and possible effects of oil spills and activities expected as a result of the proposed and alternative actions. The Commission also noted that some of the conclusions concerning possible adverse effects on marine mammals appear to be speculative and based on unstated assumptions.

With respect to potential impacts on both endangered and non-endangered marine mammals, the Commission recommended that the Draft Statement be modified to: (a) emphasize the importance of post-sale monitoring efforts; (b) consider that, as a result of the proposed action, animals may move into adjacent and already occupied areas, thereby increasing animal densities in those areas to levels which could damage or deplete food supplies; (c) consider the cumulative impacts of oil spills and disturbances on affected animals throughout their ranges rather than just within and near the proposed sale area; and (d) consider the possible cumulative effects of subsistence harvesting and other activities, as well as oil and gas activities, on both endangered and non-endangered marine mammals.

In its letter, the Commission further noted that the Statement identified a number of potential mitigating measures that could help reduce potential impacts on marine mammals and other marine species. It recommended that these measures be included as part of the proposed action.

## Potential OCS Lease Sale #95
## Offshore Southern California

During 1987, the Minerals Management Service began the planning process for proposed Lease Sale #95 in the Southern California OCS Planning Area. The Sale is tentatively scheduled for September 1989. The area under consideration involves approximately 1,373 whole or partial blocks covering some seven million acres, located from 3 to approximately 130 miles from shore. In its 9 July 1987 Call for Information and Nominations, the Service asked the Commission and others to identify any issues and areas of concern related to offshore oil and gas exploration and development in the proposed sale area.

By letter of 24 August 1987, the Commission, in consultation with its Committee of Scientific Advisors, provided the Service its comments and an outline indicating how offshore oil and gas development could affect marine mammals. It its letter, the Commission noted that noise and other disturbance from seismic exploration, platform construction and drilling, and routine operations may cause some species of marine mammals to abandon or avoid important breeding, feeding, and haul-out areas and migration routes. The potential effects of such disturbances could equal or exceed those that might result from catastrophic oil spills. Thus, the Commission stressed

the need to identify and characterize areas in and near the proposed lease sale area that may be critically important to the survival and welfare of marine mammals in the area.

The Commission further noted that, in addition to the threatened sea otter, at least 30 other species of marine mammals occur in or near the proposed lease sale area. Several of these species are listed as threatened or endangered under the Endangered Species Act. Other populations of marine mammals, such as the Pribilof Islands population of northern fur seals and the harbor porpoise population in central California, are either declining and/or near or below the lower limit of their optimum sustainable population range. Thus, the Commission suggested that, if it had not already done so, the Minerals Management Service consult with the National Marine Fisheries Service to determine whether the proposed action could jeopardize fur seal or harbor porpoise populations, and, if so, to identify steps that could be taken to avoid or minimize possible adverse effects.

In its August 24 letter, the Commission pointed out that several species of marine mammals in the sale area are affected by interactions with commercial fisheries, whale watching operations, and other human activities. It noted that the Service should factor the possible effects of these activities, as well as oil and gas exploration and development activities in other areas, into the assessment of the possible adverse effects of the proposed action. The Commission again noted that the risk of possible adverse effects might be minimized by selecting and monitoring key "indicator" species and parameters as a means of verifying predictions and detecting possible unforeseen effects in time to mitigate them. The Commission suggested that, if the Service decided to proceed with the proposed lease sale, the Environmental Impact Statement should include a comprehensive description of monitoring studies which would be carried out to increase protection of marine mammals and important marine mammal habitats in and near the proposed lease sale area.

## Proposed Opening of the Coastal Plain of the Arctic National Wildlife Refuge to Oil and Gas Development

The Alaska National Interest Lands Conservation Act of 1980 set aside more than 100 million acres of land in Alaska as national parks, preserves, wildlife refuges, and wilderness areas. The Act recognized that significant oil and gas resources could be present in the 1.5 million acres of the coastal plain of the National Arctic Wildlife Refuge and directed the Department of the Interior to conduct geological and biological surveys of the area and to provide a recommendation as to whether the coastal plain should be opened for

oil and gas exploration and development. The Department undertook the studies as directed and, in November 1986, published a draft report and legislative environmental impact statement in which it recommended that the coastal plain of the Arctic National Wildlife Refuge be opened for oil and gas exploration and development. Among other things, the report indicated that:

- fourteen species of marine mammals, including walrus, beluga whales, polar bears, and the endangered bowhead whale occur in or near the proposed lease area and could be affected by oil and gas exploration and development in the area;

- many of the potentially affected marine mammal and other wildlife species are hunted by Alaska Natives for subsistence purposes and the availability of these animals could be affected by the proposed action;

- activities associated with exploration and development could cause female polar bears to avoid or abandon important denning areas, and/or attract polar bears and increase the probability of both bears and oil field workers being killed or injured due to interactions;

- it is not known how many polar bears den in or near the coastal plain of the Arctic Wildlife Refuge or how disturbance and habitat alteration in the area, combined with subsistence hunting, disturbance, and habitat alteration in the Canadian Arctic and other parts of Alaska might affect the size, age/sex structure, and productivity of the Beaufort Sea polar bear population;

- an annual sea lift would be the most economical means of transporting supplies, production/support modules, and other cargo in and out of the Refuge, and it therefore would be necessary to construct one or more port facilities for this purpose;

- development of port and other support facilities likely would encourage other activities and additional exploration and development activities in adjacent offshore and onshore areas;

- it is not known whether frequent or continuous vessel operations would cause bowhead whales or other marine mammals to abandon important habitat areas; and

- because the resource potential of the area has not been verified, it is impossible to determine where or how

much development is likely to occur, and what or where port facilities would be required.

Because of uncertainties concerning the nature and extent of exploration, development, and related support activities, and their effects on polar bears and other marine mammals, the Commission advised the Department of the Interior, on 6 February 1987, that additional studies and assessments should be conducted before the Refuge coastal plain is made available for oil and gas exploration and development. In particular, the Commission advised that further studies are necessary to: determine the numbers of polar bears, bowhead whales, and other marine mammal species that could be affected by exploration, development, and related activities; identify the nature of the potential effects, including possible effects on subsistence uses of the affected marine mammal populations by Alaska Natives; establish protective restrictions and mitigating actions (if exploration and development is to occur); and develop monitoring programs to detect possible unforeseen effects before they reach unacceptable levels.

## The Minerals Management Service's Environmental Studies Program

As noted above, the Minerals Management Service is responsible for assessing and mitigating possible adverse effects of offshore oil and gas exploration and development. To help meet this responsibility, the Service has established an Environmental Studies Program, which is administered regionally by its OCS offices in New Orleans, Louisiana; Los Angeles, California; Anchorage, Alaska; and Vienna, Virginia. The Service also has contracted with the National Oceanic and Atmospheric Administration's Office of Oceanography and Marine Assessment to plan and administer the Alaska Outer Continental Shelf Environmental Assessment Program (OCSEAP).

To help the Service meet its responsibilities with regard to the conservation and protection of marine mammals, the Commission, in consultation with its Committee of Scientific Advisors: reviews and provides comments on regional studies plans, environmental impact statements, and requests for proposals related to marine mammal research developed by the Service; participates, as requested, in meetings of Technical Proposal Evaluation Committees convened by the Service to review research proposals; and helps plan and participates in meetings and workshops to review and coordinate relevant research programs being conducted or planned by the Minerals Management Service, the National Marine Fisheries Service, the Fish and Wildlife Service, and other Federal, state, and private agencies and organizations.

## Workshop To Assess Possible Systems for Tracking Large Cetaceans

Radio-tagging and tracking appears to offer the only cost-effective way to obtain movement and related information necessary to adequately assess the possible effects of offshore oil and gas development and other human activities on endangered cetaceans. The Minerals Management Service, the National Marine Fisheries Service, and other organizations have devoted substantial effort to developing and testing technology and techniques for radio-tagging and using satellites to relay location and other data from tagged whales. These efforts, although partially successful, have not demonstrated that a safe and effective system has been developed. Thus, in late 1986, the Minerals Management Service requested that the Commission convene a workshop to: (1) determine what, if any, problems must be overcome to develop a safe and effective system for long-term tracking and/or relocation of large cetaceans; (2) determine whether and, if so, how the identified problems might best be overcome; and (3) estimate the time, money, special equipment, and logistic support that would be required to accomplish the identified tasks.

The Workshop, funded by the Minerals Management Service, was held at the Northwest and Alaska Fisheries Center, Seattle, Washington, on 24-26 February 1987. Participants included researchers who have been involved in radio-tagging cetaceans and other mammals; representatives of organizations involved in developing and manufacturing tracking equipment; and representatives of the Minerals Management Service, the Marine Mammal Commission, the National Marine Fisheries Service, the Fish and Wildlife Service, the U.S. Navy, the British Sea Mammal Research Unit, the Canadian Department of Fisheries and Oceans, and several state agencies. Participants concluded, among other things, that:

- there are at least two radio-tag types that may be safe and effective for long-term satellite-linked monitoring of whale movement patterns and related behavioral characteristics. The first is a dart-type projectile tag, which is shot from a bow or gun and is imbedded in the whale with only the antenna protruding through the skin. The second is a barnacle-type tag which is attached, either remotely or directly, with only the attachment mechanism penetrating the skin of the whale;

- a high-frequency, high-power-output transmitter certified for use with the Argos satellite detection-relay system has not been and possibly cannot be configured to fit into a projectile tag of the size range currently being used for conventional VHF radio tags. Although Argos-certified transmitters have been configured to

work in the barnacle tag, a cheap and effective system for deploying barnacle tags at distances beyond five meters has not been and possibly cannot be developed. Also, it has not been shown that either the projectile or the barnacle tag will remain attached and function properly for the periods of time (e.g., one and a half to eighteen months) necessary to obtain reliable movement and related data or that radio tags will have no long-term effects on the behavior or survival of the tagged whales;

- to resolve the uncertainties concerning the safety and effectiveness of possible systems for long-term satellite-linked tracking of large whales, studies should be done to: (1) determine whether an Argos-certifiable transmitter can be configured to fit into an existing or slightly larger projectile housing and, if so, whether the tag can be implanted without seriously injuring the target animal or damaging the transmitter; (2) develop and test systems for attaching barnacle-type tags to free-swimming whales at distances beyond five meters; and (3) determine how long both projectile and barnacle tags will remain attached to various species of large whales and whether the tags have any long-term effects on behavior or survival; and

- field trials to determine retention times and possible effects on long-term behavior or survival should be carried out on cetacean species that can be individually recognized from natural marks and in areas where relatively large numbers of individually recognizable whales are likely to be present and which can be easily surveyed.

The report from the workshop (see Montgomery 1987, Appendix B) was published and provided to the Minerals Management Service in April 1987. The Service is considering the workshop recommendations and, in early 1988, is expected to issue a request for proposals to undertake the studies described in the workshop report.

Program Review by the National Academy of Sciences

When it was initiated in 1973, the Environmental Studies Program focused on obtaining descriptive, baseline information necessary to characterize outer continental shelf areas being considered for leasing of tracts for oil and gas exploration and development. The data from these studies contributed relatively little to the decision-making process and, in 1976, the Bureau of Land Management (now the Minerals Management Service) requested that the National Academy of Sciences review and provide recommendations for improving the Environmental Studies Program. The review was carried out by a

Committee appointed by the Academy's Environmental Studies Board. The Committee's report, published in 1978, recommended that:

> "The Program should (a) reallocate funds for greater emphasis on study of onshore and nearshore impacts; (b) formulate a program based on an adequate problem analysis and relevance to policy decisions; (c) change research management and procurement practices to assure scientifically sound and useful results; and (d) adjust responsibilities for environmental studies within the Department of the Interior to facilitate effective use of Program results."

The Bureau reviewed the Committee's report and modified its Environmental Studies Program accordingly. Among other things, the Bureau, in 1978, drafted study plans for each of the five OCS regions and distributed these draft plans to the Commission and others for review and comment (see the Commission's Report for 1978).

The changes made in 1978 helped to define and accelerate acquisition of information needed to make and assess the possible environmental consequences of basic leasing decisions. A number of lease sales subsequently were held and, in some areas, both exploration and development activities have since been authorized and undertaken.

As activities move from leasing to exploration and development, data needs may change. To verify assumptions or hypotheses concerning predicted effects and to detect possible unforeseen effects, it might be more cost effective, for example, to select and monitor a few "index" species and areas, rather than attempt to monitor each and every species and area that could be affected directly or indirectly by offshore exploration, development, or related activities. Recognizing uncertainties concerning the continuing focus and effectiveness of its Environmental Studies Program, the Minerals Management Service contracted with the National Academy of Sciences again in 1986 to further evaluate the program. The Academy has constituted a committee to review the program and expects to complete its review and make recommendations to the Service within two years.

The Commission believes that the program review is timely and of great importance. It therefore will provide whatever assistance possible to both the Minerals Management Service and the National Academy of Sciences to insure that the study properly reflects issues bearing upon the conservation and protection of marine mammals and their habitat.

## CHAPTER XI

## MARINE MAMMALS IN CAPTIVITY

On 20 September 1979, the Department of Agriculture's Standards and Regulations for the Humane Handling, Care, Treatment, and Transportation of Marine Mammals went into effect. These Standards were promulgated by the Department of Agriculture under the Animal Welfare Act in response to the Commission's recommendations of 20 October 1974. As discussed in the Commission's past Annual Reports, they were the subject of lengthy and extensive correspondence, consultation, and rulemaking.

The Standards require dealers, exhibitors, operators of auction sales, carriers, and intermediate handlers to comply with minimum standards relating to maintenance and transportation of marine mammals in captivity. These Standards apply to research facilities as well. All persons or facilities maintaining marine mammals in captivity in the United States, be it for purposes of public display or scientific research, must obtain a license from the Department of Agriculture's Animal and Plant Health Inspection Service and must maintain those marine mammals in compliance with the Standards unless a variance has been obtained to allow a limited time for modification of existing facilities, construction of new facilities, or other actions necessary to achieve full compliance.

During succeeding years, representatives of the Animal and Plant Health Inspection Service consulted with representatives of the Commission, the National Marine Fisheries Service, the Fish and Wildlife Service, the American Association of Zoological Parks and Aquaria, and others concerning the practical effects of applying the Standards and needed changes.

On 28 June 1984, the Animal and Plant Health Inspection Service published amendments to the Standards in the Federal Register. Significant areas covered by the amendments included space requirements for primary enclosures for certain marine mammals, new procedures for the granting of variances, construction requirements for housing marine mammals, requirements for accompanying pinnipeds during transport, and specifications for holding areas for marine mammals maintained in transportation facilities.

The Commission works on an ongoing basis with the Animal and Plant Health Inspection Service, the Fish and Wildlife Service, and the National Marine Fisheries Service to assist in implementing the care and maintenance standards. In 1985,

for example, the four agencies sponsored a three-day training seminar for Animal and Plant Health Inspection Service inspectors to advise them of their duties and responsibilities with regard to marine mammals and how best to meet them.

The Commission also occasionally becomes involved in on-site inspections of marine mammal facilities. On 4 October 1985, representatives of the Commission's Committee of Scientific Advisors and the National Marine Fisheries Service assisted the Animal and Plant Health Inspection Service in an on-site review of a public display facility with a history of problems in complying with the Standards for the Humane Handling, Care, Treatment and Transportation of Marine Mammals. The interagency team's findings were transmitted to the Department of Agriculture's Office of General Counsel, for action. On 7 July 1986, the Department of Agriculture filed a complaint against the facility seeking a cease and desist order for violations of the Standards, civil penalties, and suspension or revocation of the facility's license. The facility answered the complaint on 24 July 1986, denying the actionable allegations. A consent order in this matter was issued on 24 July 1987. Under the terms of that order, the facility was assessed a $5,000 civil penalty and was required to make certain improvements in its structures and practices. Additionally, the facility's operating license was suspended for 60 days and thereafter until it demonstrated compliance with the Animal Welfare Act and the applicable regulations and standards.

The Commission has convened a Working Group to address the biological, behavioral, legal, and administrative problems associated with captive reproduction, birth rate control in captive populations, introduction of beached/stranded animals into captive populations, and the release of captive-born animals to the wild. The Working Group was directed to collect relevant data and information, identify and address behavioral and biological issues, analyze related legal questions, and suggest needed research, as well as desirable statutory, regulatory, and administrative changes. Participants in the Working Group include members of the Commission's staff and the Committee of Scientific Advisors on Marine Mammals. When completed, a draft report based on the data collected will be provided to other government agencies and interested parties for review.

In 1987, the Commission staff's, utilizing data obtained from the National Marine Fisheries Service, completed an analysis of survival patterns of three species of cetaceans in captivity (bottlenose dolphins, white or beluga whales, and killer whales). The purpose of the study was to estimate the average annual survival rate for each species to determine whether survival rates are significantly different in different institutions and to compare findings with the literature on

the survival of captive and free-ranging cetaceans. The results of study show, among other things, that: an annual survival rate in captivity of 0.93 for bottlenose dolphins and killer whales and 0.94 for white whales; differences in survival rates between institutions are significant for bottlenose dolphins only; calf survival for bottlenose dolphins is lower than non-calf survival; and survival of male killer whales is significantly less than that of female killer whales. At this time, it is not possible to compare the survivability of animals in captivity with that of animals in the wild.

On 4 December 1985, the Fish and Wildlife Service published in the Federal Register proposed regulations governing the humane and healthful transport of wild animals and birds. These regulations are intended to satisfy the requirements of the 1981 amendments to the Lacey Act, which governs the importation and shipment of wild animals and birds in interstate commerce. The 1981 amendments required, among other things, the implementation of transportation standards for all wild animals and birds. Separate regulatory requirements have been proposed for the transport of marine mammals. The Commission commented on the proposed regulations by letter of 4 February 1986. Several proposed changes to the standards involving marine mammals were set forth in the Commission's letter, including the recommendation that the standards be at least as stringent as the corresponding provisions of the Standards for the Humane Handling, Care, Treatment, and Transportation of Marine Mammals promulgated under the Animal Welfare Act. Final regulations were published by the Service on 10 November 1987. With the exception of the Commission's recommendation that marine mammals not be delivered to a carrier more than four hours prior to the scheduled departure, all of the Commission's recommendations were adopted in the final rule.

## Animal Welfare Act Amendments

The Food Security Act of 1985 (P.L. 99-188), enacted on 23 December 1985, included amendments to the Animal Welfare Act. The main thrust of these amendments was to enhance the humane treatment of animals used in research by minimizing pain and distress. Congress directed that the Secretary of Agriculture promulgate standards with respect to animals in research facilities requiring that: (a) animal pain and distress be minimized; (b) principal investigators consider possible alternatives to any procedure likely to produce pain or distress; (c) veterinarians be consulted in planning potentially painful procedures; (d) appropriate pain-killers be used, and (e) except when scientifically necessary, no animal be used in more than one experiment involving major surgery. The amendments also call for the establishment of Institutional

Animal Committees at research facilities to inspect periodically all animal study areas and to review research practices and the condition of research animals.

On 21 March 1987, the Department of Agriculture's Animal and Plant Health Inspection Service published proposed regulations to implement the 1985 amendments and to update the existing Animal Welfare Act regulations. On 10 August 1987, the Commission, in consultation with its Committee of Scientific Advisors, provided detailed comments to the Service on the proposed regulations. Among its primary concerns, the Commission noted that the definition of "research facility" contained in the statute and the proposed regulations created some ambiguity with respect to what facilities and what activities come within the scope of the regulations. The Commission recommended that the Service clarify the definition and suggested that the substantive requirements of the regulations should apply to all "federally funded research on marine mammals and other animals or any research which involves the purchase or transport of live animals in commerce." The Commission further recommended that field research, not of a biomedical nature and involving little or no pain and distress in the subject animals, should be exempted from the regulatory provisions. At the close of 1987, final regulations had not been issued.

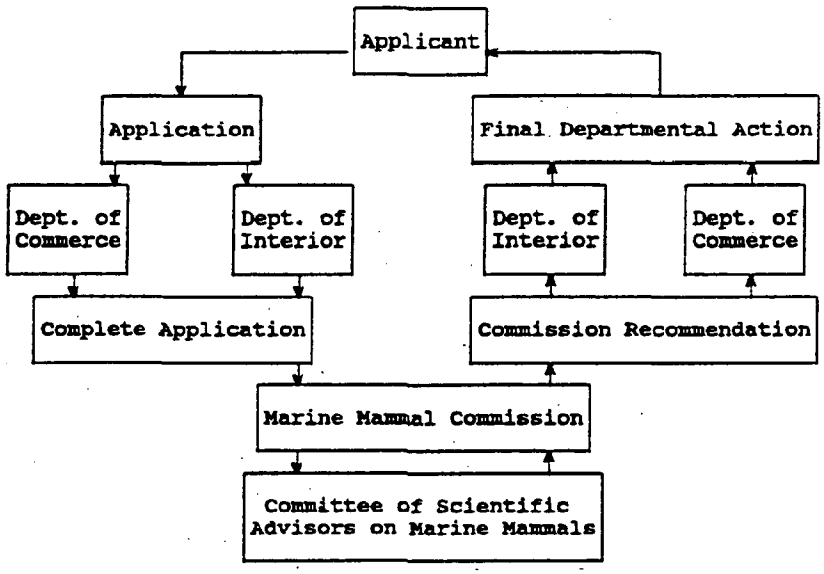
## CHAPTER XII

## PERMIT PROCESS

The Marine Mammal Protection Act placed a moratorium, with certain exceptions, on the taking and importing of marine mammals and marine mammal products. One exception is the provision for the issuance of permits by either the Secretary of Commerce or the Secretary of the Interior, depending upon the species of animal involved, for the taking of marine mammals for purposes of scientific research or public display. Before acting on a permit application, the responsible regulatory agency is required to have the application reviewed by the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals.

### Application Review

The permit application and review process involves three stages: (1) receipt and initial review of the application at the Department of Commerce or the Interior, publication of a notice of receipt of the application in the Federal Register, and transmittal to the Commission; (2) review of the application by the Commission, in consultation with its Committee of Scientific Advisors, and transmittal of its recommendation to the Department; and (3) final processing by the Department, including consideration of all comments and recommendations of the Commission and the public, resulting in the approval or denial of the application. The following is a schematic representation of this process.



The total review time (initial receipt of application until final Departmental action) depends on many factors, including: the sufficiency of the information provided by the applicant; special requirements, such as inspection of an applicant's marine mammal holding facilities, that may be warranted before a decision can be reached; and the efficiency and thoroughness of those responsible for the agency review.

During 1987, the Commission made recommendations on 37 applications submitted to the Department of Commerce, including eight applications that were received in 1986 but which did not receive final action until 1987, and 13 applications submitted to the Department of the Interior. The Commission's average review time for complete applications was 46 days (median, 37 days). Not included in the preceding statistics are recommendations on eight applications that were awaiting final action by the Department of Commerce and one application awaiting final action by the Department of the Interior at year's end and three applications that were under Commission review at year's end. Also not included are two applications from the Department of Commerce and two applications from the Department of the Interior on which review was suspended at year's end pending receipt of additional information. The Commission, in consultation with its Committee of Scientific Advisors, also made recommendations on 26 requests to modify permits and other related permit actions during 1987. The average time required for Commission review of these matters was 25 days.

For the 37 applications processed by the Department of Commerce during 1987, it took an average of 139 days (median, 112 days) from the date the application was received by the Department until final action was taken. The 13 permit applications submitted to the Department of the Interior were processed in an average of 107 days (median, 85 days). If calculated from the date of receipt of a complete application by the Departments, the average processing times for the Departments of Commerce and the Interior were 112 and 72 days, respectively, compared to 92 and 65 days, respectively, in 1986.

## Working Group on the Permit System

In July 1985, the Commission established a Working Group composed of members of the Commission staff and the Committee of Scientific Advisors on Marine Mammals for purposes of preparing a report on how the Marine Mammal Protection Act permit system could be improved. The Working Group was asked to identify problems that have arisen with regard to the review of applications and the issuance, modification, and enforcement of marine mammal permits, and to recommend such

statutory, regulatory, and administrative changes as might be appropriate to address the problems.

A draft of the Working Group's report was reviewed by the Committee of Scientific Advisors and considered during the October 1985 meeting of the Commission and Committee in San Diego. Informal comments on the draft report were received from the Animal and Plant Health Inspection Service, the National Marine Fisheries Service, the Fish and Wildlife Service, and several non-governmental parties.

Based on those comments, the draft report was revised during 1986 and issued for formal review by interested parties. Comments received during the formal review have been addressed and incorporated into a revised draft which is undergoing final review by the Commission. The report is expected to be issued early in 1988.

## Conflicts Between Public Display and Research Takings

In certain geographic areas there is growing demand for permits to take animals from a single stock. This is the case, for example, with respect to bottlenose dolphins off the southwest coast of Florida where public display collectors and researchers conduct activities in the same area. In the past, the Commission has recommended that the cumulative effects of these takes be monitored so as to ensure that the affected stocks would not be adversely impacted. During 1986, it became apparent that this competing demand also was creating the potential for jeopardizing ongoing research activities as a result of research animals possibly being taken in the course of public display collections.

In an effort to resolve this potential problem, the Commission wrote to the National Marine Fisheries Service on 8 October 1986 and recommended that procedures be established as a part of permit application review to identify these potential conflicts and develop acceptable resolutions. A follow-up meeting between Commission and Service representatives was held on 24 October and the matter was discussed at the Commission's 1986 Annual Meeting. In both meetings, the Service indicated that it was giving the Commission's recommendations further consideration. By letter of 23 December 1986, the Commission reiterated its concern about this matter.

At the close of 1987, the Service had yet to take any specific action in response to the Commission's recommendation. It did, however, continue to include a special condition in permits issued to authorize the capture of bottlenose dolphins for public display. Under the provision, the Service's Regional Director specifies the date and location of capture opera-

tions. Although this condition does not ensure that all conflicts between research and collection activities will be resolved, it does provide a possible mechanism for avoiding potential conflicts.

## Issues Concerning Lethal Take for Public Display

During 1987, the Fish and Wildlife Service requested Commission comments on a permit application seeking authority to kill a walrus for purposes of museum display. By letter of 28 October 1987, the Commission advised the Service that, in its view, lethal taking of marine mammals from the wild for this use is not warranted if satisfactory specimens can be obtained from alternative sources, such as an animal that dies in captivity, is killed intentionally or unintentionally during scientific research, or is taken incidental to commercial fishing. In this regard, the Commission noted that, if a specimen is not immediately available, one is likely to become available within a reasonable time and it therefore recommended that the applicant be required to explore alternative sources of animals.

To address similar requests that might arise in the future, the Commission wrote a second letter to the Fish and Wildlife Service on 28 October. In this letter, the Commission recommended that the Service prepare and provide to the Commission and the National Marine Fisheries Service a draft of a general policy statement requiring that, for purposes of displaying stuffed animals, specimens be obtained from sources that do not require a directed lethal take of animals from the wild. On 24 November 1987, the Service replied to the Commission's letter, noting that it agreed that lethal take for public display is inappropriate if specimens are available from other sources and that it intended to adopt a formal policy on the matter. For this purpose, the Service enclosed a draft policy statement with its letter and requested Commission comments. At the end of 1987, the Commission was preparing its response to the Service and it looked forward to working with both Services on the matter during 1988.

## Permit-Related Litigation

On 21 October 1986, Greenpeace filed a lawsuit challenging Permit No. 563 issued by the National Marine Fisheries Service authorizing the take, by harassment, of up to 86 killer whales (*Orcinus orca*) in Puget Sound, Washington, for purposes of scientific research. The research called for obtaining skin biopsies from up to 45 killer whales. The permit was issued on 22 August 1986 and had been approved, subject to recommended conditions, by the Commission.

In the lawsuit, Greenpeace alleged that the Service violated the National Environmental Policy Act by failing to: (a) prepare either an environmental assessment or an environmental impact statement on the permit application; (b) develop alternatives to the proposed taking that would involve less impact on the affected animals; and (c) provide a reasoned explanation for the decision not to prepare an environmental impact statement or environmental assessment. The plaintiff also alleged that the Service violated the Marine Mammal Protection Act by failing to obtain sufficient evidence to make findings on whether the permit would be consistent with the purposes and policies of the Act and that it would advance a bona fide scientific purpose.

The National Marine Fisheries Service contended that scientific research permits, in general, do not have a significant effect on the human environment and argued that the agency had properly excluded the issuance of such permits from the requirement to prepare an environmental impact statement or an environmental assessment. Although there are certain exceptions to the "categorical exclusion" for scientific permits, the Service argued that none were applicable in this instance.

The U.S. District Court held a hearing on this matter on 5 June 1987 and issued a preliminary injunction invalidating the permit. On 17 June, the court filed its order in the case, ruling in favor of the plaintiff. While acknowledging the existence of the general exclusion for scientific research permits from the requirement to prepare an environmental document, the Court found that Greenpeace had raised substantial questions about whether the research may have significant environmental effects and that the Service had not adequately explained why the exceptions to its categorical exclusions were not applicable.

## APPENDIX A

### COMMISSION RECOMMENDATIONS: CALENDAR YEAR 1987

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| 5 January | Commerce, scientific research permit application, Nelio B. Barros and Daniel K. Odell. |
| 6 January | Interior, commenting to the Minerals Management Service on the "Beaufort Sea Sale 97 Draft Environmental Impact Statement," noting that the Statement provides a reasonably thorough review and analysis of available information on the possible impacts of the proposed action on marine mammals in the sale area, and recommending, among other things, that the Statement be modified to consider: (a) the possible effects of garbage disposal practices on polar bears; (b) the possibility that oils spills, disturbances, etc., will cause polar bears and other marine mammal species to move to areas already occupied and thus increase animal densities in those areas to levels that could damage or deplete food supplies; and (c) the possible cumulative effects of subsistence harvesting and other activities, as well as oil and gas exploration and development, on bowhead and beluga whales, polar bears, walrus, and seals; and also recommending that the Service consider developing and implementing monitoring programs to detect possible unforeseen impacts on the species. |
| 7 January | Commerce, public display permit application, Dolphin Research Center. |
| 9 January | Commerce, scientific research permit application, Oceanic Research and Communication Alliance. |
| 16 January | Commerce, commenting to the National Marine Fisheries Service on draft porpoise mortality performance standards for tuna vessels and vessel operators and noting, among other things, that: (1) the most effective system for applying performance standards would involve 100% observer coverage of all vessel trips; (2) if this is not possible, a dual system of vessel and operator standards would be most useful; (3) formal rulemaking is required to implement a performance system; and (4) the Service should continue to |

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| | discuss its proposals with the Commission, the environmental community, and the industry. |
| 28 January | Commerce, scientific research permit application, Oceanic Research and Communication Alliance. |
| 6 February | Interior, commenting to the Fish and Wildlife Service on the Arctic National Wildlife Refuge Coastal Plain Resource Assessment; noting, among other things, that: marine mammals, including the endangered bowhead whale, in or near the Refuge are hunted by Alaska Natives for subsistence purposes, and availability of these animals to Natives could be affected by the proposed action; and recommending that, considering the many uncertainties about the nature, extent, and effects of exploration and development activities in the area, additional studies and assessments be carried out before the area is made available for oil and gas recovery and utilization. |
| 17 February | Commerce, scientific research permit application, Northwest and Alaska Fisheries Center. |
| 19 February | Commerce, commenting to the National Marine Fisheries Service on a draft paper entitled "Summary of National Laws and International Agreements Affecting River Dolphins" and recommending that discussion of U.S. laws applicable to activities in foreign countries be expanded. |
| 6 March | Commerce, commenting to the National Marine Fisheries Service on the proposed rulemaking, "North Pacific Fur Seal -- Pribilof Islands Population; Designation as Depleted," and recommending that the proposed designation be implemented, with minor modification. |
| 9 March | Commerce, scientific research permit application, The Whale Center. |
| 9 March | Commerce, commenting to the National Marine Fisheries Service on the Fiscal Year 1987 Entanglement Research Program, noting that, for the most part, the Program provides a sound basis for making decisions regarding project funding, and recommending that the Service: (a) begin implementing portions of the Plan; (b) give additional consideration to certain tasks involving North Pacific fur seals and sea birds; and (c) consult with the |

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| | Commission before committing funds for these identified tasks. |
| 13 March | Commerce, modification of scientific research permit, Center for Coastal Marine Studies. |
| 13 March | Commerce, modification of scientific research permit, Oregon Department of Fish and Wildlife. |
| 18 March | Commerce, public display permit application, Theater of the Sea. |
| 19 March | Commerce, commenting to the National Oceanic and Atmospheric Administration on the forthcoming meeting of the International Whaling Commission and its Scientific Committee and nominating participants to be included on the U.S. delegation to its meetings. |
| 25 March | Commerce, scientific research permit application, Northwest and Alaska Fisheries Center. |
| 30 March | Commerce, scientific research permit application, National Zoological Park. |
| 3 April | Interior, public display permit application, Columbus Zoo. |
| 3 April | Interior, public display permit application, Kobe Municipal Suma Aquarium. |
| 3 April | Interior, public display permit application, Adventure World. |
| 3 April | Commerce, scientific research permit application, Steven L. Swartz. |
| 3 April | Commerce, scientific research permit application, Steven L. Swartz and Randall S. Wells. |
| 3 April | Commerce, public display permit application, Knie's Kinderzoo. |
| 3 April | Commerce, modifiction of scientific permit, D.P. Costa, B.J. LeBoeuf, and C. Leo Ortiz. |
| 8 April | Interior, modification of scientific research permit, Donald B. Siniff. |
| 8 April | Commerce, recommending to the National Marine Fisheries Service that it communicate, in writing, to the Federation of Japan Salmon |

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| | Fisheries Cooperative Association rescinding the Service's 5 March 1987 determination regarding the required level of observer coverage on Japanese catcherboats. |
| 13 April | Commerce, public display permit application, Sea World, Inc. |
| 13 April | Commerce, modification of scientific research permit, Gerald L. Kooyman. |
| 13 April | Commerce, scientific research permit application, S. Jonathan Stern. |
| 13 April | Commerce, public display permit application, Mystic Marinelife Aquarium. |
| 21 April | Commerce, modification of scientific research permit, Center for Coastal Marine Studies. |
| 21 April | Interior, scientific research permit application, Charles Monnett. |
| 21 April | Commerce, public display permit application, Gulf Exhibition Corp. |
| 21 April | Interior, scientific research permit application, Sea World Research Institute/Hubbs Research Center. |
| 21 April | Interior, scientific research permit application, The Cousteau Society. |
| 27 April | Commerce, commenting to the National Marine Fisheries Service on the "Draft Fur Seal Research Plans: Needs, Alternatives and Priorities with a List of Proposed Studies for FY 1987"; noting, among other things, that the draft document does not provide a priority ranking for proposed research projects and does not identify all necessary research tasks; stating the Commission's opinion that highest priority should be placed on assessing and monitoring the fur seal population and identifying the cause or causes of its continuing population decline; and recommending several specific research efforts to accomplish these tasks; and also recommending that the long-range fur seal conservation plan now being developed by the Service be completed as soon as possible and that it be made available to the Commission and other relevant U.S. agencies and organiza- |

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| | tions for comment prior to discussions with Canada, Japan, and the Soviet Union on multilateral fur seal research and management. |
| 28 April | Interior, commenting to the Fish and Wildlife Service on a draft proposal from the Government of the Netherlands to list the Atlantic and Pacific walrus on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora and recommending that the United States oppose the proposal. |
| 30 April | Commerce, public display permit application, Marine Animal Productions. |
| 1 May | Commerce, public display permit application, Walt Disney Company. |
| 1 May | Commerce, public display permit application, Jolly Roger Amusement Park. |
| 1 May | Commerce, scientific research permit application, The Cousteau Society. |
| 1 May | Commerce, public display permit application, Baltimore Aquarium. |
| 4 May | Commerce, commenting to the National Marine Fisheries Service on the draft update for the "Antarctic Marine Living Resources Program Development Plan, 1988-1990" and suggesting that future draft updates be expanded to provide detailed information on alternative programs and funding levels. |
| 5 May | Interior, commenting to the Minerals Management Service on the "Chukchi Sea Sale 109 Draft Environmental Impact Statement"; noting that the Statement provides a concise and useful review of relevant information on marine mammal species and a reasonably thorough review of the types and possible effects of oil spills and activities that could result from the proposed action; suggesting that the Statement be modified to: (a) emphasize the importance of post-sale monitoring efforts; (b) consider the possibility that activities resulting from the Sale could cause marine mammals to move into already occupied areas, thus increasing animal densities in those areas to level which will damage or deplete food supplies; (c) consider cumulative impacts on marine mammals |

throughout their range; and (d) consider possible cumulative effects of subsistence harvesting and other activities, as well as oil and gas exploration, on marine mammals; and recommending that several potential mitigating measures to reduce potential impacts on marine mammals and other marine species be included as part of the Proposed and Alternative Actions.

6 May — Commerce, scientific research permit application, Southwest Fisheries Center.

8 May — Interior, modification of scientific research permit, Donald B. Siniff.

14 May — Interior, modification of scientific research permit, Charles Monnett.

15 May — State of California, commenting to the California Department of Fish and Game and the California Coastal Commission on the background and rationale for translocating 250 sea otters from their existing range to San Nicolas Island; expressing the Commission's strong support for the proposed action; and urging the two State agencies to act favorably on the proposal in their decision-making process.

18 May — Commerce, modification of scientific research permit, James L. Hickman and Virginia Coyle.

18 May — Commerce, scientific research permit application, Southwest Fisheries Center.

18 May — Commerce, scientific research permit application, Kenneth S. Norris, Randall S. Wells, Jan S. Ostman, and William T. Doyle.

18 May — Interior, scientific research permit application, Fish and Wildlife Service.

19 May — Commerce, commenting to the National Marine Fisheries Service, on plans for the Fiscal Year 1987 Marine Entanglement Research Program; restating the conclusion in its 9 March letter that certain of the Service's proposed tasks will not address critical information needs concerning entanglement of fur seals in marine debris; recommending again that funds not be used to support these tasks but be redirected toward alternative research tasks; concurring with other alternatives put forth by the Service

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| | in response to Commission recommendations; protesting the Service's proposal to reprogram $50,200 of the entanglement appropriation to cover unrelated budget shortfalls; and recommending that the funds be used to support specific alternative tasks recommended as part of the entanglement research program. |
| 19 May | Federal Trade Commission, commenting to the Office of the U.S. Trade Representative on a request from the Government of Canada to lift the ban on importing marine mammals or parts thereof into the United States; noting that the National Oceanic and Atmospheric Administration opposes removal of the ban on the grounds that the ban is a conservation rather than a trade measure; and expressing the Commission's concurrence with this position. |
| 20 May | State of Florida, commenting to the Florida Department of Natural Resources and the Florida Game & Freshwater Fish Commission in support of a request to add some 13,000 acres in the Crystal River area to the list of recommended projects eligible for funding under the State Conservation and Recreation Lands Program. |
| 21 May | Commerce, commenting to the National Marine Fisheries Service on reported problems related to a public display permit issued to Jolly Roger Amusement Park and recommending that the Service re-examine the permit. |
| 28 May | Interior, scientific research permit application, Natural History Museum of Los Angeles County. |
| 29 May | Commerce, public display permit application, New York Aquarium. |
| 3 June | Commerce, modification of scientific research permit, West Coast Whale Research Foundation. |
| 3 June | Commerce, scientific research permit application, Glacier Bay National Park and Preserve. |
| 3 June | Commerce, scientific research permit application, Cascadia Research Collective. |
| 4 June | Commerce, public display permit application, Baltimore Aquarium. |

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| 11 June | Commerce, modification of scientific research permit, Charles Monnett. |
| 18 June | Commerce, modification of scientific research permit, Kenneth S. Norris, Randall S. Wells, Jan S. Ostman and William T. Doyle. |
| 18 June | Interior, modification of scientific research permit, Anthony R. DeGange. |
| 18 June | Commerce, scientific research permit application, Gerald L. Kooyman. |
| 18 June | Commerce, scientific research permit application, Northwest and Alaska Fisheries Center. |
| 25 June | Interior, modification of scientific research permit, Mote Marine Laboratory. |
| 25 June | Commerce, scientific research permit application, Naval Facilities Engineering Command. |
| 25 June | Commerce, modification of public display permit, Sea World, Inc. |
| 2 July | Commerce, commenting to the National Marine Fisheries Service on human/dolphin swim programs and recommending that: (1) all facilities conducting human-dolphin swim programs be required to inform participants of the potential hazards; (2) complete records be maintained on any unfavorable interactions and facilities forward copies of the records to the Service; (3) any animal displaying unacceptable behavior be prevented from participating in such activities; (4) the Service require facilities conducting such programs to adhere strictly to all applicable Federal laws, regulations, etc., and (5) the Service, in consultation with the Animal and Plant Health Inspection Service, promptly evaluate the suitability of closed water systems for these programs. |
| 7 July | Commerce, commenting to the National Marine Mammal Laboratory on the Service's proposed fur seal entanglement workshop, the planned fur seal modelling study, and planned pilot deployment of large net fragments and suggesting, among other things, that constitution of a steering committee would be useful for all three projects. |

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| 7 July | Commerce, commenting to the National Marine Fisheries Service on proposed tasks related to entanglement of fur seals in marine debris and expressing its support for the Service's plan to fund the fur seal entanglement workshop and the modelling study provided that: (1) a workshop agenda, list of participants and list of documents to be distributed be provided to the Commission for review and concurrence; and (2) a representative of the Commission be consulted on the drafting of the request for proposals for the fur seal modelling study; and recommending deferral of support for the task involving deployment of large net fragments, pending submission and approval of a proposal containing the proposed research protocol, the underlying rationale, and a detailed budget justification. |
| 17 July | Commerce, modification of scientific research permit, Loro Parque. |
| 17 July | Commerce, scientific research permit application, Naval Surface Weapons Systems. |
| 20 July | Commerce, scientific research permit application, Sealand of Cape Cod. |
| 22 July | Interior, public display permit application, Adventure World. |
| 22 July | Interior, public display permit application, Marine Palace Aquarium, Oita Ecological Aquarium. |
| 22 July | Interior, public display permit application, Hiroo Aquarium. |
| 22 July | Commerce, scientific research permit application, Steven L. Swartz and Randall S. Wells. |
| 24 July | Commerce, scientific research permit application, Gregory K. Silber. |
| 24 July | Commerce, public display permit application, John G. Shedd Aquarium. |
| 28 July | Interior, scientific research permit application, California Department of Fish and Game. |
| 28 July | Commerce, scientific research permit application, Dan R. Salden. |

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| 28 July | Interior, public display permit application, The Cousteau Society. |
| 29 July | Interior, modification of public display permits, Adventure World, Hiroo Aquarium. |
| 5 August | Commerce, scientific research permit application, Southwest Fisheries Center. |
| 5 August | Commerce, public display permit application, John G. Shedd Aquarium. |
| 6 August | Commerce, public display permit application, Alberta Forestry, Lands and Wildlife. |
| 7 August | Commerce, scientific research permit application, Naval Ocean Systems Center. |
| 7 August | Commerce, scientific research permit application, Southwest Fisheries Center. |
| 7 August | Commerce, public display permit application, Aquarium of Niagara Falls. |
| 7 August | Interior, scientific research permit application, National Park Service. |
| 10 August | Agriculture, commenting to the Animal and Plant Health Inspection Service on the Proposed Rule to amend the Animal Welfare Act regulations; suggesting, among other things, that certain types of research, such as field research not of a biomedical nature, be categorically excluded from the provisions of these regulations; and recommending certain modifications to clarify the proposed rule. |
| 14 August | Commerce, commenting to the National Oceanic and Atmospheric Administration on a research program proposed by Iceland and its relationship to resolutions adopted by the International Whaling Commission in 1987; stating its concurrence with the Department's decision to negotiate with Iceland on its whaling activities; and recommending: (a) the immediate certification of Iceland under the Pelly Amendment if its nationals take a single sei whale and (2) the Government of Iceland be advised that, within 90 days, it must announce its full acceptance of the IWC regulations or be certified under the Pelly Amendment. |

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| 14 August | Commerce, commenting to the National Marine Fisheries Service on critical habitat designation for the Hawaiian monk seal; noting that the Service's re-examination of critical habitat for the species is appropriate; restating the Commission's previous recommendations that areas out to the 20-fathom contour around the Northwest Hawaiian Islands and Maro Reef be designated critical habitat for Hawaiian monk seals. |
| 17 August | Commerce, commenting to the National Oceanic and Atmospheric Administration on "Draft Guidelines on the Prevention of Pollution by Garbage from Ships," noting that draft is responsive to advice provided by the Marine Environment Protection Committee; suggesting ways in which the draft might improved; and recommending alternative text for the chapter on handling and storing garbage aboard ship. |
| 19 August | Commerce, scientific research permit application, Suzanne Macy-Marcy and J. Ward Testa. |
| 24 August | Interior, commenting to the Minerals Management Service on the request for information and nominations to begin the planning process for offshore oil and gas Lease Sale 95; noting that at least 30 species of marine mammals occur in or near the proposed sale area and that noise and other disturbance from seismic exploration, platform construction and drilling, and routine operations may cause some species of marine mammals to abandon or avoid important breeding, feeding, and haul-out areas and migration routes; pointing out the need to identify and characterize areas in and near the proposed lease sale area that may be critically important to the survival and welfare of marine mammals in the area; and suggesting that, if it had not already done so, the Service consult with the National Marine Fisheries Service to determine whether the proposed action could jeopardize the Pribilof or San Miguel Islands fur seal populations or the harbor porpoise population and, if so, identify steps that could be taken to avoid or minimize possible adverse effects. |
| 25 August | Commerce, scientific research permit application, Richard H. Lambertsen. |

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| 27 August | Commerce, commenting to the National Marine Fisheries Service on its proposal to extend the subsistence harvest of North Pacific fur seals on St. Paul Island; supporting the Service's proposal to set a strict quota on the number of seals that may be harvested during the extension; and recommending that the harvest be limited to the subsistence level indicated by a Native survey of the island, that is, 211 seals. |
| 28 August | Commerce, scientific research permit application, All Union Scientific Research Institute of Fisheries and Oceanography, U.S.S.R. |
| 4 September | Interior, scientific research permit application, The Cousteau Society. |
| 11 September | Commerce, public display permit application, Dolfinarium Brugge. |
| 16 September | Commerce, commenting to the National Marine Fisheries Service's Marine Entanglement Research Program on a proposed study entitled "Evaluating Controlled-Lifetime Plastics," concurring with the Service's plan to support the study, on the condition that the project address potential effects of degradation products. |
| 14 September | Commerce, modification of public display permit, Jolly Roger Amusement Park. |
| 18 September | Commerce, modification of scientific research permit, Washington Department of Game. |
| 22 September | Commerce, scientific research permit application, Bernie Tershy. |
| 24 September | Commerce, scientific research permit application, North Gulf Oceanic Society. |
| 13 October | Interior, modification of scientific research permit, Southwest Fisheries Center. |
| 13 October | Commerce, public display permit application, Ocean Reef Club. |
| 16 October | Commerce, scientific research permit application, Northwest and Alaska Fisheries Center. |
| 16 October | Commerce, public display permit application, Sea World, Inc. |

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| 20 October | Commerce, modification of scientific research permit, Southwest Fisheries Center. |
| 20 October | Commerce, scientific research permit application, Donald B. Siniff. |
| 23 October | Interior, modification of scientific research permit, Fish and Wildlife Service. |
| 28 October | Interior, recommending to the Fish and Wildlife Service that it develop a policy statement requiring that applicants requesting a public display permit under the Marine Mammal Protection Act for purposes of taxidermy obtain the specimen by means other than a directed lethal take from the wild. |
| 28 October | Interior, public display permit application, Paul Jensen Arctic Museum. |
| 29 October | Commerce, scientific research permit application, R. H. DeFran. |
| 6 November | Commerce, modification of scientific research permit, Gerald G. Joyce. |
| 9 November | Commerce, commenting to the National Marine Mammal Laboratory on the draft agenda for the Service's planned Fur Seal Entanglement Research Workshop; noting, among other things, that the Commission had not been provided the opportunity to review the tentative agenda, list of participants, and list of pertinent documents; further noting that the planned workshop may not be structured so as to most effectively identify and address key issues; and recommending that the workshop be postponed until the latter part of February 1988 in order to provide time for consultations. |
| 12 November | Commerce, commenting to the National Oceanic and Atmospheric Administration on "The Research Plan for the Feasibility Study on 'The Program for Research on the Southern Hemisphere Minke Whale and for the Preliminary Research on the Marine Ecosystem in the Antarctic,'" submitted to the International Whaling Commission by the Government of Japan and noting, among other things, that the revised proposal does not address the concerns raised by the International Whaling Commission's Scientific Committee |

during its review of the original Japanese proposal.

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| 13 November | Commerce, public display permit application, Sea World, Inc. |
| 17 November | Commerce, scientific research permit application, Marine Animal Productions. |
| 18 November | Commerce, modification of scientific research permit, Janice M. Straley. |
| 19 November | Interior, commenting to the Fish and Wildlife Service on the West Indian manatee recovery program; noting that a number of changes have occurred since the program was initiated in 1980; and recommending that the Service, in cooperation with appropriate State agencies in Florida, the Commission, and other involved parties, undertake a thorough review of critical issues confronting the manatee recovery program, including: updating the West Indian Manatee Recovery Plan and the Comprehensive Work Plan; reconstituting and reconvening the West Indian Manatee Recovery Team; completing land acquisition projects in the Crystal River and Homosassa River areas; improving the effectiveness of regulations and law enforcement pertaining to recreational boaters and divers in essential manatee habitat; controlling development of marinas and other boating facilities in essential manatee habitats; identifying and undertaking priority manatee research needs; and coordinating Federal-State-private public education and information programs. |
| 20 November | Commerce, commenting to the National Marine Fisheries Service on the permit issued to the Federation of Japan Salmon Fisheries Cooperative Association to take marine mammals incidental to commercial fishing operations in the U.S. Exclusive Economic Zone; recommending that the Service: (1) make available, through publication in the Federal Register, information summarizing the results of the Federation's fishing activities in 1986, and (2) continue to fulfill the requirements of the North Pacific Fisheries Act to prepare an annual report/action plan for every year that the Federation conducts fishery operations within the United States Exclusive Economic Zone, including 1987; and requesting, with respect to enforcement, that |

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| | the Service provide the Commission with certain information on unauthorized incidental take of marine mammals other than Dall's porpoise by the Federation during 1987. |
| 24 November | Commerce, request to transfer dolphin for public display. |
| 30 November | Commerce, public display permit application, Miami Seaquarium. |
| 30 November | Commerce, public display permit application, Sea-Arama, Inc. |
| 30 November | Commerce, commenting to the National Marine Fisheries Service on a request to permit Marine Animal Productions to temporarily maintain two sea lions and two beluga whales at the Baltimore Aquarium; noting that it appears that the recent problem with blastomycosis among Marine Animal Productions' sea lions has been resolved; and urging the Service to make every effort to eliminate the possibility that affected animals might transmit the disease to animals at the Baltimore facility. |
| 17 December | Commerce, forwarding to the Interagency Marine Debris Task Force information on the Commission's involvement in matters pertaining to marine debris and a list of recommended actions to address priority research and management needs. |
| 21 December | Commerce, public display permit application, Knie's Kinderzoo. |
| 29 December | Commerce, recommending to the National Marine Fisheries Service that: the Service organize and convene a Second International Workshop on the Fate and Impact of Marine Debris in late 1988 or early 1989; responsibility for organizing the Workshop be vested with the Service's Honolulu Laboratory, the Hawaii Sea Grant Program Office, or both; and a Workshop Steering Group be convened including representatives from the United States and certain other nations. |
| 29 December | Commerce, commenting to the National Marine Fisheries Service on the draft final rule pertaining to importation of yellowfin tuna and supporting the prompt adoption of the regulations, subject to modification. |

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| 29 December | Interior, commenting to the Fish and Wildlife Service on funding for the Service's West Indian manatee research program; and recommending that the Service: (a) increase the $237,000 Fiscal Year 1988 budget for the Sirenia Project by $120,000 to $150,000 for continuing and expanding manatee tracking studies; (b) maintain the Sirenia Project budget at the increased funding level for the next five years; (c) ensure that at least $57,000 is made available in Fiscal Year 1988 for cooperative studies of grass beds in Hobe Sound; and (d) continue support for the Hobe Sound grass bed studies for the next four years at a level of $65,000 a year. |

# APPENDIX B

## REPORTS OF COMMISSION-SPONSORED ACTIVITIES AVAILABLE FROM THE NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)[1]


Ainley, D.G., H.R. Huber, R.P. Henderson, and T.J. Lewis. 1977. Studies of marine mammals at the Farallon Islands, California, 1970-1975. Final report for MMC contract MM4AC002. NTIS PB-274 046. 42 pp. (A03)

Ainley, D.G., H.R. Huber, R.P. Henderson, T.J. Lewis, and S.H. Morrell. 1977. Studies of marine mammals at the Farallon Islands, California, 1975-1976. Final report for MMC contract MM5AC020. NTIS PB-266 249. 32 pp. (A03)

Ainley, D.G., H.R. Huber, S.H. Morrell, and R.R. LeValley. 1978. Studies of marine mammals at the Farallon Islands, California, 1976-1977. Final report for MMC contract MM6AC027. NTIS PB-286 603. 44 pp. (A03)

Allen, S.G., D.G. Ainley, and G.W. Page. 1980. Haul out patterns of harbor seals in Bolinas Lagoon, California. Final report for MMC contract MM8AC012. NTIS PB80-176 910. 31 pp. (A03)

Balcomb, K.C., J.R. Boran, R.W. Osborne, and N.J. Haenel. 1980. Observations of killer whales (*Orcinus orca*) in greater Puget Sound, State of Washington. Final report for MMC contract MM1300731-7. NTIS PB80-224 728. 42 pp. (A03)

Bean, M.J. 1985. United States and international authorities applicable to entanglement of marine mammals and other organisms in lost or discarded fishing gear and other debris. Final report for MMC contract MM2629994-7. NTIS PB85-160471. 65 pp. (A04)

Beddington, J.R., and H.A. Williams. 1980. The status and management of the harp seal in the north-west Atlantic. A review and evaluation. Final report for MMC contract MM1301062-1. NTIS PB80-206 105. 127 pp. (A07)

Bengtson, J.L. 1978. Review of information regarding the conservation of living resources of the Antarctic marine ecosystem. Final report for MMC contract MM8AD055. NTIS PB-289 496. 148 pp. (A08)

Bishop, J.B. 1985. Summary report of gill and trammel net (set-net) observations in the vicinity of Morro Bay, California, 1 November 1983 - 31 August 1984. Final report for MMC contract MM2629900-2. NTIS PB85-150076. 18 pp. (A02)

Bockstoce, J. 1978. A preliminary estimate of the reduction of the western Arctic bowhead whale (*Balaena mysticetus*) population by the pelagic whaling industry: 1848-1915. Final report for MMC contract MM7AD111. NTIS PB-286 797. 32 pp. (A08)


1 Price codes for printed reports (including postage) are shown in parentheses at the end of each citation. Microfiche copies of the reports are also available (price code A01). The key to the codes and ordering information can be found on the last page of this Appendix.


Brownell, R.L., Jr., C. Schoenwald, and R.R. Reeves. 1978. Preliminary report on world catches of marine mammals 1966-1975. Final report for MMC contract MM6AC002. NTIS PB-290 713. 353 pp. (A16)

Chapman, D.G., L.L. Eberhardt, and J.R. Gilbert. 1977. A review of marine mammal census methods. Final report for MMC contract MM4AC014. NTIS PB-265 547. 55 pp. (A04)

Contos, S.M. 1982. Workshop on marine mammal-fisheries interactions. Final report for MMC contract MM2079341-0. NTIS PB82-189 507. 64 pp. (A04)

Cornell, L.H., E.D. Asper, K.N. Osborn, and M.J. White, Jr. 1979. Investigations on cryogenic marking procedures for marine mammals. Final report for MMC contract MM6AC003. NTIS PB 291 570. 24 pp. (A03)

Dayton, P.K., B.D. Keller, and D.A. Ven Tresca. 1980. Studies of a nearshore community inhabited by sea otters. Final report for MMC contracts MM6AC026 and MM1300702-9. NTIS PB81-109 860. 91 pp. (A06)

DeBeer, J. 1980. Cooperative dedicated vessel research program on the tuna-porpoise problem: Overview and final report. Final report for MMC contract MM8AC006. NTIS PB80-150 097. 43 pp. (A03)

Dohl, T.P. 1981. Remote laser branding of marine mammals. Final report for MMC contract MM4AC011. NTIS PB81-213 449. 34 pp. (A03)

Erickson, A.W. 1978. Population studies of killer whales (*Orcinus orca*) in the Pacific Northwest: A radio-marking and tracking study of killer whales. Final report for MMC contract MM5AC012. NTIS PB-285 615. 34 pp. (A03)

Fay, F.H., H.M. Feder, and S.W. Stoker. 1977. An estimation of the impact of the Pacific walrus population on its food resources in the Bering Sea. Final report for MMC contracts MM4AC006 and MM5AC024. NTIS PB-273 505. 38 pp. (A03)

Foster, M.A. 1981. Identification of ongoing and planned fisheries in the Northwestern Hawaiian Islands. Final report for MMC contract MM1801069-7. NTIS PB81-207 516. 90 pp. (A05)

Foster, M.S., C.R. Agegian, R.K. Cowen, R.F. Van Wagenen, D.K. Rose, and A.C. Hurley. 1979. Toward an understanding of the effects of sea otter foraging on kelp forest communities in central California. Final report for MMC contract MM7AC023. NTIS PB-293 891. 60 pp. (A04)

Fowler, C.W., W.T. Bunderson, M.B. Cherry, R.J. Ryel, and B.B. Steele. 1980. Comparative population dynamics of large mammals: A search for management criteria. Final report for MMC contract MM7AC013. NTIS PB80-178 627. 330 pp. (A15)

Fowler, C.W., R.J. Ryel, and L.J. Nelson. 1982. Sperm whale population analysis. Final report for MMC contract MM8AC009. NTIS PB82-174 335. 35 pp. (A03)

Gaines, S.E., and D. Schmidt. 1978. Laws and treaties of the United States relevant to marine mammal protection policy. Final report for MMC contract MM5AC029. NTIS PB-281 024. 668 pp. (A99)

Gard, R. 1978. Aerial census, behavior, and population dynamics study of gray whales in Mexico during the 1974-75 calving and mating season. Final report for MMC contract MM5AC006. NTIS PB-274 295. 18 pp. (A02)

Gard, R. 1978. Aerial census and population dynamics study of gray whales in Baja California during the 1976 calving and mating season. Final report for MMC contract MM6AC014. NTIS PB-275 297. 20 pp. (A03)

Geraci, J.R., and D.J. St. Aubin. 1979. Biology of marine mammals: Insights through strandings. Final report for MMC contract MM7AC020. NTIS PB-293 890. 343 pp. (A16)

Geraci, J.R., S.A. Testaverde, D.J. St. Aubin, and T.H. Loop. 1978. A mass stranding of the Atlantic white sided dolphin, *Lagenorhynchus acutus*: A study into pathobiology and life history. Final report for MMC contract MM5AC008. NTIS PB-289 361. 141 pp. (A08)

Gerrodette, T. 1983. Review of the California sea otter salvage program. Final report for MMC contract MM2629677-5. NTIS PB83-262 949. 23 pp. (A03)

Gilbert, J.R., V.R. Schurman, and D.T. Richardson. 1979. Gray seals in New England: Present status and management alternatives. Final report for MMC contract MM7AC002. NTIS PB-295 599. 40 pp. (A03)

Glockner-Ferrari, D.A., and M.J. Ferrari. 1985. Individual identification, behavior, reproduction, and distribution of humpback whales, *Megaptera novaeangliae*, in Hawaii. Final report for MMC contract MM262975-5. NTIS PB85-200772. 41 pp. (A03)

Gold, J. 1981. Marine mammals: A selected bibliography. Final report for MMC contract MM1801254-3. NTIS PB 82-104 282. 91 pp. (A05)

Gonsalves, J.T. 1977. Improved method and device to prevent porpoise mortality: Application of polyvinyl panels to purse seine nets. Final report for MMC contract MM6AC007. NTIS PB-274 088. 28 pp. (A03)

Goodman, D. 1978. Management implications of the mathematical demography of long lived animals. Final report for MMC contract MM8AD008. NTIS PB-289 678. 80 pp. (A05)

Green, K.A. 1977. Antarctic marine ecosystem modeling revised Ross Sea model, general Southern Ocean budget, and seal model. Final report for MMC contract MM6AC032. NTIS PB-270 375. 111 pp. (A06)

Green-Hammond, K.A. 1980. Fisheries management under the Fishery Conservation and Management Act, the Marine Mammal Protection Act, and the Endangered Species Act. Final report for MMC contract MM1300885-3. NTIS PB80-180 599. 186 pp. (A09)

Green-Hammond, K.A. 1981. Requirements for effective implementation of the Convention on the Conservation of Antarctic Marine Living Resources. Final report for MMC contract MM2079173-9. NTIS PB82-123 571. 36 pp. (A03)

Green-Hammond, K.A. 1982. Environmental aspects of potential petroleum exploration and exploitation in Antarctica: Forecasting and evaluating risks. Final report for MMC contract MM2079173-9. NTIS PB82-169 772. 28 pp. (A03)

Green-Hammond, K.A., D.G. Ainley, D.B. Siniff, and N.S. Urquhart. 1983. Selection criteria and monitoring requirements for indirect indicators of changes in the availability of Antarctic krill applied to some pinniped and seabird information. Final report for MMC contract MM2324753-6. NTIS PB83-263 293. 37 pp. (A03)

Henry, M.E. 1987. Observations of gill and trammel net fishing activity between Pt. Buchon and Pt. Sur, California, June - October 1985. Final report for MMC contract MM3309511-8. NTIS PB87-184024. 32 pp. (A03)

Herman, L.M., P.H. Forestell, and R.C. Antinoja. 1980. The 1976/77 migration of humpback whales into Hawaiian waters: Composite description. Final report for MMC contracts MM7AC014 and MM1300907-2. NTIS PB80-162 332. 55 pp. (A04)

Hofman, R.J. (Editor). 1979. A workshop to identify new research that might contribute to the solution of the tuna-porpoise problem. Proceedings of a Marine Mammal Commission-sponsored workshop held on 8-9 December 1975 at the University of California, Santa Cruz. NTIS PB-290 158. 17 pp. (A02)

Hofman, R.J. 1982. Identification and assessment of possible alternative methods for catching yellowfin tuna. NTIS PB83-138 993. 243 pp. (A11)

Hofman, R.J. (Editor). 1985. Workshop to assess methods for regulating the distribution and movements of sea otters. Report of a Marine Mammal Commission-sponsored workshop held 25-26 October 1984 in San Francisco, California. NTIS PB85-229250. 39 pp. (A03)

Huber, H.R., D.G. Ainley, S.H. Morrell, R.R. LeValley, and C.S. Strong. 1979. Studies of marine mammals at the Farallon Islands, California, 1977-1978. Final report for MMC contract MM7AC025. NTIS PB-111 602. 50 pp. (A04)

Huber, H.R., D.G. Ainley, S.H. Morrell, R.J. Boekelheide, and R.P. Henderson. 1980. Studies of marine mammals at the Farallon Islands, California, 1978-1979. Final report for MMC contract MM1300888-2. NTIS PB80-178 197. 46 pp. (A04)

Huber, H.R., D.G. Ainley, R.J. Boekelheide, R.P. Henderson, and B. Bainbridge. 1981. Studies of marine mammals at the Farallon Islands, California, 1979-1980. Final report for MMC contract MM1533599-3. NTIS PB81-167 082. 51 pp. (A04)

Hui, C.A. 1978. Reliability of using dentin layers for age determination in *Tursiops truncatus*. Final report for MMC contract MM7AC021. NTIS PB-288 444. 25 pp. (A03)

Irvine, A.B., M.D. Scott, R.S. Wells, J.H. Kaufmann, and W.E. Evans. 1979. A study of the activities and movements of the Atlantic bottlenosed dolphin, *Tursiops truncatus*, including an evaluation of tagging techniques. Final report for MMC contracts MM4AC004 and MM5AC018. NTIS PB-298 042. 54 pp. (A04)

Jameson, G.L. 1986. Trial systematic salvage of beach-cast sea otter, *Enhydra lutris*, carcasses in the central and southern portion of the sea otter range in California: One year summary of results: October 1983 - September 1984. Final report for MMC contract MM2629849-8. NTIS PB87-108288. 60 pp. (A04)

Jeffries, S.J. 1986. Seasonal movement and population trends of harbor seals in the Columbia River and adjacent waters of Washington and Oregon, 1976-1982. Final report for MMC contract MM2079357-5. NTIS PB86-200 243. 41 pp. (A03)

Johnson, B.W., and P.A. Johnson. 1978. The Hawaiian monk seal on Laysan Island: 1977. Final report for MMC contract MM7AC009. NTIS PB-285 428. 38 pp. (A03)

Johnson, B.W., and P.A. Johnson. 1981. Estimating the Hawaiian monk seal population on Laysan Island. Final report for MMC contract MM1533701-4. NTIS PB82-106 113. 29 pp. (A05)

Johnson, B.W., and P.A. Johnson. 1981. The Hawaiian monk seal on Laysan Island: 1978. Final report for MMC contract MM8AC008. NTIS PB82-109 661. 17 pp. (A02)

Johnson, M.L., and S.J. Jeffries. 1977. Population evaluation of the harbor seal (*Phoca vitulina richardsi*) in the waters of the State of Washington. Final report for MMC contract MM5AC019. NTIS PB-270 376. 27 pp. (A03)

Johnson, M.L., and S.J. Jeffries. 1983. Population biology of the harbor seal (*Phoca vitulina richardi*) in the waters of the State of Washington: 1976-1977. Final report for MMC contract MM6AC025. NTIS PB83-159 715. 53 pp. (A04)

Kasuya, T., and Y. Izumizawa. 1981. The fishery-dolphin conflict in the Iki Island area of Japan. Final report for MMC contract MM1533791-7. NTIS PB81-171 357. 31 pp. (A03)

Katona, S.K. 1983. The Gulf of Maine whale sighting network: 1976. Final report for MMC contract MM6AC018. NTIS PB83-151290. 32 pp. (A03)

Katona, S.K., and S. Kraus. 1979. Photographic identification of individual humpback whales (*Megaptera novaeangliae*): Evaluation and analysis of the technique. Final report for MMC contract MM7AC015. NTIS PB-298 740. 29 pp. (A03)

Kraus, S.D. 1986. A review of the status of right whales (*Eubalaena glacialis*) in the western North Atlantic with a summary of research and management needs. Final report for MMC contract MM2910905-0. NTIS PB86-154 143. 61 pp. (A04)

Kooyman, G.L. 1982. Development and testing of a time-depth recorder for marine mammals. Final report for MMC contract MM6AC019. NTIS PB82-257 932. 10 pp. (A02)

Loughlin, T. 1978. A telemetric and tagging study of sea otter activities near Monterey, California. Final report for MMC contract MM6AC024. NTIS PB-289 682. 64 pp. (A04)

Marine Mammal Commission. 1974. Annual report of the Marine Mammal Commission, calendar year 1973. Report to Congress. NTIS PB-269 708. 14 pp. (A03)

Marine Mammal Commission. 1975. Annual report of the Marine Mammal Commission, calendar year 1974. Report to Congress. NTIS PB-269 710. 27 pp. (A04)

Marine Mammal Commission. 1976. Annual report of the Marine Mammal Commission, calendar year 1975. Report to Congress. NTIS PB 269-711. 50 pp. (A04)

Marine Mammal Commission. 1977. Annual report of the Marine Mammal Commission, calendar year 1976. Report to Congress. NTIS PB-269 713. 71 pp. (A06)

Marine Mammal Commission. 1978. Annual report of the Marine Mammal Commission, calendar year 1977. Report to Congress. NTIS PB-281 564. 101 pp. (A06)

Marine Mammal Commission. 1979. Annual report of the Marine Mammal Commission, calendar year 1978. Report to Congress. NTIS PB-106 784. 108 pp. (A06)

Marine Mammal Commission. 1980. Humpback whales in Glacier Bay National Monument, Alaska. Final report for an interagency review meeting. NTIS PB80-141 449. 44 pp. (A03)

Marine Mammal Commission. 1981. Annual report of the Marine Mammal Commission, calendar year 1979. Report to Congress. NTIS PB81-247 892. 100 pp. (A06)

Marine Mammal Commission. 1981. Annual report of the Marine Mammal Commission, calendar year 1980. Report to Congress. NTIS PB81-247 884. 114 pp. (A06)

Marine Mammal Commission. 1982. Annual report of the Marine Mammal Commission, calendar year 1981. Report to Congress. NTIS PB82-221 425. 102 pp. (A06)

Marine Mammal Commission. 1982. Report of a meeting to review on-going and planned research concerning humpback whales in Glacier Bay and surrounding waters in southeast Alaska. Final report of an interagency meeting. NTIS PB82-201 039. 20 pp. (A02)

Marine Mammal Commission. 1983. Annual report of the Marine Mammal Commission, calendar year 1982. Report to Congress. NTIS PB84-132 216. 106 pp. (A06)

Marine Mammal Commission. 1984. Annual report of the Marine Mammal Commission, calendar year 1983. Report to Congress. NTIS PB84-199 389. 118 pp. A06)

Marine Mammal Commission. 1986. Habitat protection needs for the subpopulation of West Indian manatees in the Crystal River area of northwest Florida. NTIS PB86-200 250. 46 pp. (A04)

Marine Mammal Commission. 1986. Annual report of the Marine Mammal Commission, calendar year 1985. Report to Congress. NTIS PB86-216 249. 180 pp. (A09)

Marine Mammal Commission. 1987. Annual report of the Marine Mammal Commission, calendar year 1984. Report to Congress. NTIS PB87-209573. 173 pp .(A09)

Marine Mammal Commission. 1987. Annual report of the Marine Mammal Commission, calendar year 1986. Report to Congress. NTIS PB87-154092. 193 pp. (A09)

Mate, B.R. 1977. Aerial censusing of pinnipeds in the eastern Pacific for assessment of population numbers, migratory distributions, rookery stability, breeding effort, and recruitment. Final report for MMC contract MM5AC001. NTIS PB-265 859. 67 pp. (A04)

Mate, B.R. 1980. Workshop on marine mammal-fisheries interactions in the northeastern Pacific. Final report for MMC contract MM8AC003. NTIS PB80-175 144. 48 pp. (A04)

Mathiesen, O.A. 1980. Methods for the estimation of krill abundance in the Antarctic. Final report for MMC contract MM7AC032. NTIS PB80-175 151. 26 pp. (A03)

Matkin, C.O., and F.H. Fay. 1980. Marine mammal-fishery interactions on the Copper River and in Prince William Sound, Alaska, 1978. Final report for MMC contract MM8AC013. NTIS PB80-159 536. 71 pp. (A05)

Mayo, C.A. 1982. Observations of cetaceans: Cape Cod Bay and southern Stellwagen Bank, Massachusetts 1975-1979. Final report for MMC contract MM1800925-5. NTIS PB82-186 263. 68 pp. (A05)

Medway, W. 1983. Evaluation of the safety and usefulness of techniques and equipment used to obtain biopsies from free-swimming cetaceans. Final report for MMC contract MM2324809-8. NTIS PB83-263 269. 14 pp. (A02)

Miller, L.K. 1978. Energetics of the northern fur seal in relation to climate and food resources of the Bering Sea. Final report for MMC contract MM5AC025. NTIS PB-275 296. 27 pp. (A03)

Montgomery, S. 1986. Workshop on measures to address marine mammal/fisheries interactions in California. Final report for MMC contract MM3309746-2. NTIS PB86-219 060. 123 pp. (A07)

Montgomery, S. 1987. Report on the 24-27 February 1987 workshop to assess possible systems for tracking large cetaceans. Final report for MMC contract MM4465764-2. NTIS PB87-182135. 61 pp. (A04)

Nolan, R.S. 1981. Shark control and the Hawaiian monk seal. Final report for MMC contract MM1801065-5. NTIS PB81-201808. 45 pp. (A03)

Norris, K.S., and J.D. Hall. 1979. Development of techniques for estimating trophic impact of marine mammals. Final report for MMC contract MM4AC013. NTIS PB-290 399. 16 pp. (A02)

Norris, K.S., and R.R. Reeves. (Editors). 1978. Report on a workshop on problems related to humpback whales (*Megaptera novaeangliae*) in Hawaii. Final report for MMC contract MM7AC018. NTIS PB-280 794. 90 pp. (A05)

Norris, K.S., W.E. Stuntz, and W. Rogers. 1978. The behavior of porpoises in the eastern tropical Pacific yellowfin tuna fishery: Preliminary studies. Final report for MMC contract MM6AC022. NTIS PB-283 970. 86 pp. (A05)

Odell, D.K. 1979. A preliminary study of the ecology and population biology of the bottlenose dolphin in southeast Florida. Final report for MMC contract MM4AC003. NTIS PB-294 336. 26 pp. (A03)

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# APPENDIX C

## SELECTED LITERATURE PUBLISHED ELSEWHERE RESULTING FROM COMMISSION-SPONSORED ACTIVITIES


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