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ANNUAL REPORT OF THE MARINE MAMMAL COMMISSION, CALENDAR YEAR 1989

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Executive Summary

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 this Report are circulated for review by Federal and State agencies and others involved in described activities.

Late in 1988, the Marine Mammal Protection Act was amended to address a number of issues. Among other things, the amendments exempted U.S. and some foreign fisheries from the general permit and small take provisions of the Act until 1 October 1993. Also enacted were new requirements to reduce incidental mortality of porpoise in the yellowfin tuna purse seine fishery. In 1989, the National Marine Fisheries Service, in consultation with the Commission, began developing and implementing the interim fisheries exemption program. In addition, the Commission initiated efforts to develop recommended guidelines to regulate incidental take after October 1993. Chapter II summarizes the 1988 amendments and discusses steps taken in 1989 to implement them.

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

In 1989, the plight of the West Indian manatee in Florida worsened. For the fifth time in the past six years, the annual manatee death toll from collisions with boats reached a record high level. In addition, total manatee deaths from all causes in 1989 was roughly 80 percent higher than the annual average level between 1978 and 1983. Although the Fish and Wildlife Service adopted a revised Manatee Recovery Plan and the State of Florida undertook aggressive efforts consistent with the Plan to strengthen its manatee protection efforts, sufficient support from the Fish and Wildlife Service for its research and management actions remained a serious problem in 1989. In Chapter III, these and other relevant matters relating to effective implementation of the updated Recovery Plan are discussed.

There are encouraging signs that certain management actions are helping to increase the number of Hawaiian monk seals, and that improved support and program guidance by the National Marine Fisheries Service are being put in place in an effort to sustain this progress. Of great importance to this species is the future of a remote field station operated by the Fish and Wildlife Service at Tern Island in the Hawaiian Islands National Wildlife Refuge. The Island, which includes the field station and an aircraft runway built in World War II, provides a critical research base and Federal presence near the middle of the Hawaiian Islands Archipelago. It is essential habitat for many species of birds, sea turtles, and the Hawaiian monk seal. The integrity of the Island is now threatened as the existing seawall deteriorates and portions of the Island wash away. Furthermore, as underground fuel tanks remaining from World War II become exposed, they constitute more serious environmental threats than in the past. At the close of 1989, it was clear that a major initiative involving the Fish and Wildlife Service and several services in the Department of Defense would be needed to address the situation on Tern Island.

In 1989, the small threatened population of sea otters along the central California coast continued to show some signs of growth. The greatest threats to the population remain incidental taking by commercial gillnet fishermen and oil spills. To address the former problem, the State of California began restricting gillnet fishing within the population's range in 1982. Since then, counts of sea otters have increased. To mitigate the impact of a large oil spill in or near the present range of the population, the Fish and Wildlife Service began a translocation program in 1987 to establish a reserve colony at San Nicolas Island off the California coast. The intent is to establish a colony that would not be affected by a major spill affecting the species' mainland habitat. By the end of 1989, 135 otters had been moved to San Nicolas Island. The percentage of animals remaining there at year's end suggests that it may be more difficult and take longer than expected to establish a self-sustaining sea otter colony at San Nicolas Island. The March 1989 Exxon Valdez oil spill in Alaska lent further importance to the translocation program; it also delayed efforts to update the Southern Sea Otter Recovery Plan.

Although North Pacific fur seals and Steller sea lions are not listed as endangered or threatened, their numbers off Alaska today are less than half their estimated levels 25 years ago. The cause or causes of the declines for both species are uncertain but may be related. A number of times since 1984, the Commission has recommended that the National Marine Fisheries Service prepare a conservation plan for North Pacific fur seals to identify and assess priority research and management needs. To help, the Commission provided the Service the outline of such a plan in 1985. The Service failed to act on the Commission's

recommendation. In 1988, Congress, supportive of the Commission's view, amended the Marine Mammal Protection Act to direct the Service to complete a fur seal conservation plan by 31 December 1989. At year's end, the Service was working on a draft plan for review in 1990.

In 1988, the Commission recommended that the National Marine Fisheries Service designate Steller sea lions as depleted and that it develop and implement a conservation plan to help guide efforts to restore the species. Neither was done. Recognizing the importance of the conservation plan, Congress, in its 1988 amendments to the Marine Mammal Protection Act, directed the Service to prepare a conservation plan for Steller sea lions by 31 December 1990. Further impetus for a conservation plan was provided by the 1989 range-wide survey of Steller sea lions conducted by the Service, various state agencies, and foreign scientists. This survey, which indicated that the decline had accelerated and spread, prompted the Environmental Defense Fund to petition the Service for emergency listing of this species as endangered under the Endangered Species Act. The Commission recommended that the Service act immediately on the petition and that it complete the conservation plan for sea lions by March 1990. These and related points are discussed in Chapter III.

In addition to recommending that the Service prepare conservation plans for North Pacific fur seals and Steller sea lions, the Commission has recommended since 1984 that it also prepare recovery plans pursuant to the Endangered Species Act for right whale, humpback whale, and other endangered whale populations in U.S. waters. As discussed in Chapter III, the Service agreed and, in 1987, appointed recovery teams for both right whales and humpback whales to help draft the plans. The draft plan for humpback whales was circulated for public review in October 1989, and a draft right whale recovery plan is expected early in 1990.

The final report of the clinical investigation of the 1987-1988 die-off of bottlenose dolphins along the east coast of the United States was submitted in 1989. The report indicates that most of the animals examined died from bacterial and viral infections that are not normally fatal and that animals may have been made vulnerable to secondary infections by eating fish containing biotoxins produced by Ptycodiscus brevis, the marine dinoflagellate that causes Florida's red tides. The report also indicates that high levels of organochlorines were found in some, but not all, animals examined, suggesting that environmental pollution may be an emerging problem. These and other matters, including the status of Atlantic coast and Gulf of Mexico dolphin populations and the Commission's continuing efforts to identify and recommend actions needed to determine the cause of the die-off, are discussed in Chapter III.

Hector's dolphins are found in New Zealand waters, and Gulf of California harbor porpoise are found in Mexican waters. Both have been the appropriate focus of substantial international attention. Thus, even though not found in U.S. waters, they are briefly discussed in Chapter III as well.

Probably the most serious domestic marine environmental catastrophe of 1989 was the Exxon Valdez oil spill. It is described in Chapter IV. In less than a day following the 24 March 1989 grounding of the tanker in Prince William Sound, Alaska, an estimated 11 million gallons of crude oil were released into the Sound. Subsequently, the oil spread over nearly 10,000 square miles and contaminated an estimated 2,045 miles of shoreline in Prince William Sound and the Gulf of Alaska. More than 1,000 sea otters and a number of other marine mammals were killed in the spill. By letter and memorandum, the Commission provided advice and direction to the Fish and Wildlife Service and the National Marine Fisheries Service with respect to protecting threatened animals and documenting effects in the wake of the spill. These are discussed in Chapter IV, as is the need for profiting from the experience to better prevent and protect against similar accidents.

The Marine Mammal Protection Act directs the Commission to review and provide advice to the Department of State and other Federal agencies on U.S. participation in international efforts affecting the conservation and protection of marine mammals. Commission activities in this regard are discussed in Chapter V, and in parts of Chapters II, III, IV, VII, and IX. Particularly important among these activities were those related to the International Whaling Commission and the Southern Ocean.

Since its inception, the Marine Mammal Commission has helped develop U.S. policy regarding whales and whaling. Commission representatives have participated in meetings of the International Whaling Commission (IWC) and its Scientific Committee since the mid-1970s. Major issues in 1989 concerned certain nations' compliance with conservation measures established by the IWC, preparations for the comprehensive assessment of the status of whale stocks to be undertaken by 1990, identification and evaluation of new procedures to set catch quotas for commercial whaling, and review of proposals to kill whales for scientific research purposes.

In 1989, the Japanese Government issued its nationals a permit to kill up to 330 minke whales in the Southern Ocean for research purposes. Also of concern are the developing fisheries, particularly the Antarctic krill fishery, and the possibility of oil, gas, and other non-living resource development. These now appear to pose substantial new threats to marine mammals. As discussed in Chapter V, the Marine Mammal Commission continued to provided in 1989 detailed advice to the Department of State and

other Federal agencies in their efforts to conclude and implement international agreements for the conservation of whales, seals, and other living resources of the Southern Ocean.

Lost and discarded fishing gear and other persistent marine debris are discussed in Chapter VI. These serious forms of marine pollution kill and injure marine mammals, seabirds, turtles, and invertebrates throughout the world. The Commission, instrumental in focusing attention on the issue domestically and internationally early in the 1980s, continued to play a major role in identifying and guiding research and management responses in 1989. That year, the Commission worked closely with the National Marine Fisheries Service to convene the Second International Conference on Marine Debris and to implement the Service's Marine Entanglement Research Program. It also assisted the Coast Guard in its efforts to address the problem of ship-generated garbage domestically and within the International Maritime Organization.

Marine mammals affect and are affected by a number of commercial and recreational fisheries. Commission efforts to identify and determine how best to resolve problems caused by interactions are described in Chapter VII. In 1989, the issues of greatest concern were high seas driftnet fisheries, particularly Japanese, Taiwanese, and South Korean driftnet fisheries for squid and salmon in the North Pacific Ocean, and the practice of setting purse seines around schools of porpoise in the eastern tropical Pacific Ocean to catch yellowfin tuna that associate with porpoise. The Commission provided detailed recommendations to the National Marine Fisheries Service and the Department of State on both issues in 1989.

Marine mammal conservation is particularly challenging in Alaska because of the large populations of many marine mammal species in State waters, their use for subsistence purposes by Alaska natives, interactions with commercial fishing, and development of oil and gas resources in marine mammal habitat. In 1988, the Commission completed ten species accounts with research and management recommendations. Chapter VIII discusses 1989 efforts to follow up on those recommendations, particularly for several of the species, including polar bear, sea otter, and walrus. It also discusses efforts to develop a marking, tagging, and reporting program to obtain better information on the numbers of animals taken in Alaska for subsistence and handicraft purposes and to help control illegal trade in certain marine mammal parts.

Oil spills, noise, and chemical pollutants associated with offshore oil, gas, and hard mineral exploration and development can affect marine mammals and their habitats. The Minerals Management Service is responsible for managing these activities in Federal waters and for ensuring that associated activities do

not have significant adverse effects on marine mammals or the ecosystems of which they are a part. To assist the Service, the Commission reviews Environmental Impact Statements for proposed lease sales and provides advice on studies conducted under the Service's Environmental Studies Program. Efforts undertaken in this regard in 1989 are discussed in Chapter IX.

The Marine Mammal Commission is directed to undertake or cause to be undertaken studies it considers necessary or desirable to protect and conserve marine mammals. The research and studies undertaken in 1989 in response to this directive are described in Chapter X. Other research-related activities, such as the annual survey of Federally-funded marine mammal research and participation in various scientific research program reviews and workshops, also are described in Chapter X.

Chapters XI and XII discuss regulations governing the care and maintenance of marine mammals in captivity and the process for issuing permits to take marine mammals for scientific research, public display, and enhancement. In 1989, particular attention was devoted to a review of the permit process undertaken by the National Marine Fisheries Service. The Service's review was prompted, in part, by new permitting authority established by the 1988 amendments to the Marine Mammal Protection Act, and by a need to update and streamline the regulations for issuing permits. The Commission provided detailed advice to assist the Service in its effort.

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.

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CHAPTER I

INTRODUCTION

Background

This is the seventeenth Annual Report of the Marine Mammal Commission, covering the period from 1 January through 31 December 1989. 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. During 1989, the Commissioners were: Robert Elsner, Ph.D., Fairbanks, Alaska; William W. Fox, Jr., Ph.D., (Chairman), Miami, Florida; and Francis H. Fay, Ph.D., Fairbanks, Alaska.

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; Michael L. Gosliner, Esq., General Counsel; Steven L. Swartz, Ph.D., Deputy Scientific Program Director; Melinda M. Paul, Administrative Officer; Jeannie K. Drevenak, Staff Assistant in charge of permits; and Eileen C. Shoemaker, Staff Assistant in charge of publications.

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 required to be knowledgeable in marine ecology and marine mammal affairs. At the end of 1989, its members were: Robert L. Brownell, Jr., Ph.D., U.S. Fish and Wildlife Service; Douglas G. Chapman, Ph.D. (Chairman), University of Washington; Murray L. Johnson, M.D., Burke Museum, University of Washington; Burney J. LeBoeuf, Ph.D., University of California, Santa Cruz; Jack W. Lentfer, Homer, Alaska; Marc Mangel, Ph.D., University of California, Davis; William Medway, Ph.D., D.V.M., University of Pennsylvania; John E. Reynolds, III, Ph.D., Eckerd College; and Tim D. Smith, Ph.D., National Marine Fisheries Service. During 1989, the following members completed their terms of service on

the Committee: Daniel Goodman, Ph.D., Montana State University; George A. Llano, Ph.D., Naples, Florida; Jane M. Packard, Ph.D., Texas A&M University; and Forrest G. Wood, San Diego, California.

In recognition of the importance of marine mammals in the lives of many Eskimos, Indians, and Aleuts, Matthew Iya of Nome, Alaska, serves as a Special Advisor to the Marine Mammal Commission on Native Affairs.

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
FY 89:	$953,000
FY 90:	$960,000

Funding in the amount of $1,003,000 is requested in the President's Budget for Fiscal Year 1991.

CHAPTER II

IMPLEMENTATION OF THE 1988 AMENDMENTS TO THE MARINE MAMMAL PROTECTION ACT

The Marine Mammal Protection Act was enacted in 1972 to protect and encourage the growth of marine mammal populations to the greatest extent feasible, commensurate with sound resource management policies. The Act provides that the primary objective of marine mammal management is to maintain the health and stability of the marine ecosystem. Whenever consistent with that objective, it is the goal of the Act to obtain optimum sustainable marine mammal populations while keeping in mind the carrying capacity of the habitat.

Since 1972, the Act has been amended several times, most recently in 1988. Among the more important substantive amendments to the Marine Mammal Protection Act enacted in 1988 were: an interim exemption from the Act's taking prohibition for commercial fisheries; new requirements for conducting status reviews and preparing conservation plans for depleted species; revisions to the statutorily mandated tuna-porpoise program; creation of permit provisions for activities designed to enhance the survival and recovery of marine mammal populations and stocks; revision of the requirements for public display and scientific research permits; and a directive to conduct a study of the 1987-1988 die-off of bottlenose dolphins in the North Atlantic Ocean. Implementation of these amendments is discussed below.

Interim Exemption for Commercial Fisheries

A Court of Appeals ruling in Kokechik Fishermen's Association v. Secretary of Commerce, 839 F.2d 795 (D.C. Cir. 1988) invalidated a permit issued to the Federation of Japan Salmon Fisheries Cooperative Association by the National Marine Fisheries Service to incidentally catch Dall's porpoise during the course of commercial salmon fishing in U.S. waters. The ruling overturned a longstanding National Marine Fisheries Service interpretation of the Marine Mammal Protection Act permit provisions. (For further discussion of this case, see Chapter VII of this Report.) The Court's decision cast doubt on the Service's ability to issue incidental take permits for other fisheries, including several domestic fisheries whose permits were to expire at the end of 1988.

In response to the Kokechik decision and in anticipation of the need to amend the incidental take provisions of the Act, representatives of the U.S. fishing industry and the environmental community began meeting late in 1987 to formulate a joint

legislative proposal. After lengthy negotiations, the coalition presented a proposal that included: a limited exemption to the Act's moratorium on taking, allowing taking incidental to commercial fisheries for a three-year period; limitations on the take of North Pacific fur seals and Steller sea lions; an industry-wide education program; an enhanced reporting program; a verification system with required observer placement; a new data reporting and archiving system; and procedures for reviewing the status of affected marine mammal populations. The joint agreement was presented to Congress and formed the basis for several of the provisions of a five-year interim exemption from the Act's taking prohibition for commercial fishermen that was ultimately enacted.

During the exemption period, which runs until 1 October 1993, the general permit and small take provisions of the Act do not govern the incidental taking of marine mammals in the course of commercial fishing operations by domestic fishermen or by foreign fishermen fishing pursuant to valid permits issued under section 204 of the Magnuson Fishery Conservation and Management Act. Rather, the incidental take is authorized and regulated in accordance with the exemption provisions of new section 114. Foreign fisheries not regulated under the Magnuson Act, such as the Japanese high seas salmon fishery at issue in the Kokechik case, were not included in the exemption. An exception was also made for the commercial yellowfin tuna purse seine fishery which will continue to operate under its present general permit.

Under the exemption provisions, commercial fishermen operating in fisheries identified by the National Marine Fisheries Service as frequently or occasionally taking marine mammals must have registered with the Service and have obtained an exemption certificate by 21 July 1989 in order to engage lawfully in that fishery. Vessel owners, masters, and crew members are not subject to penalties for the incidental take of marine mammals, except for the take of California sea otters or the intentional lethal take of Steller sea lions, cetaceans, or marine mammals from depleted populations, if the owner has obtained and maintains a current exemption.

In order for exemptions to remain valid, vessel owners must submit reports detailing any instances of incidental taking and providing other information prescribed by the National Marine Fisheries Service. In addition, owners of vessels engaged in fisheries that frequently take marine mammals must, if requested, accept the placement of natural resources observers on board their vessels or face exemption revocation. The exemptions, however, are not absolute. If the incidental taking is having an immediate and significant adverse impact on a marine mammal stock or if more than 1,350 Steller sea lions or 50 North Pacific fur seals will be killed during a calendar year, the Service, in consultation with the appropriate regional Fishery Management

Councils and state agencies, must prescribe emergency regulations to prevent, to the extent practicable, any further taking.

Fishermen engaged in fisheries determined to have only a remote possibility of taking marine mammals need not register with the Service or obtain an exemption certificate. They must, however, report all marine mammal mortalities incidental to their operations to avoid being liable for penalties.

The National Marine Fisheries Service was required by the amendments to publish, by 22 January 1989, a proposed list of all U.S. fisheries classifying them as category I (those with frequent incidental takes), category II (those with occasional incidental takes), or category III (those with either a remote possibility of or no known incidental takes). After opportunity for public comment, the Service was to publish a final list by 23 March 1989, along with information advising vessel owners how to obtain exemptions and otherwise comply with the new provisions. Other Service responsibilities included: establishing an observer program under which 20 to 35 percent of the operations by category I vessels will be monitored; creating an alternative observation program if less than 20 percent of the operations in a category I fishery will be observed; implementing an information management system capable of processing and analyzing observer data and reports required from vessel owners engaged in category I and category II fisheries; and consulting with the Fish and Wildlife Service before taking actions or making determinations with respect to marine mammal species under the jurisdiction of the Department of the Interior.

As noted above, the interim exemption was intended to govern marine mammal/fishery interactions for a five-year period. After that, Congress will re-examine the issue in light of the information gathered under the interim exemption and enact a permanent system under which incidental taking will be regulated. As a first step in developing the long-term regulatory regime, the Marine Mammal Commission was statutorily directed to transmit to the Secretary of Commerce, by 1 February 1990, recommended guidelines to govern the incidental taking of marine mammals in the course of commercial fishing operations after 1 October 1993.

As a first step in implementing the interim exemption for commercial fisheries, the Service, after consultation with the Commission, published an advance notice of proposed rulemaking on 27 January 1989. That notice provided a general description of the new statutory provisions and a proposed categorization for each U.S. fishery, based upon the frequency with which marine mammals were estimated to be taken incidentally. Fourteen fisheries were proposed for inclusion in category I, either because Congress specifically recommended such a listing or because "sufficient documented information" existed to indicate a frequent incidental take of marine mammals in the fishery.

Twenty-eight fisheries were proposed for placement in category II because there was some information indicating an occasional incidental take or, in the absence of such information, there was reason to believe that marine mammals were taken occasionally based on factors such as gear type, fishing techniques, target species, areas fished, or fishing season. The majority of fisheries, however, were proposed for listing as category III as fisheries having only a remote likelihood of taking marine mammals.

By letter of 3 March 1989, the Commission provided comments on the proposed list of fisheries. The Commission expressed concern that some probable category I fisheries had erroneously been placed in category II because there was insufficient documentary evidence from observation of these fisheries to support a category I listing. It recommended that, in the absence of documentary evidence, classification of these fisheries be based on analogy with other category I fisheries. The Commission also recommended that the Service take into account local and seasonal variations in the take of marine mammals and not categorize fisheries solely on the basis of a fishery-wide, season-long average take rate. In addition, the Commission provided specific comments on the placement of particular fisheries. The final list of fisheries, with minor revisions and the addition of some fisheries, was published by the Service on 20 April 1989 (see also Chapter VII).

Following discussions with the Commission, the Service issued interim regulations on 19 May 1989 to implement the provisions of the interim exemption. Among other things, those regulations: codified the criteria used to categorize fisheries (i.e., for determining if takings are frequent, occasional, or of remote likelihood); set forth procedures for fishermen in category I and II fisheries to register for and be issued exemption certificates; specified the terms and conditions of exemption certificates; required that category I vessels accept observers; established procedures for issuance of emergency and special regulations; and explained that reporting requirements would be addressed in a separate rulemaking.

A proposed rule setting forth reporting requirements and procedures was published in the Federal Register on 19 June 1989. Final reporting regulations were issued by the Service on 15 December 1989. Under the regulations, fishermen in category I and category II fisheries must maintain accurate daily logs of: fishing effort, including gear type and target species; numbers, species, and location of marine mammals taken; type of marine mammal interaction (e.g., disturbance, injury, or mortality); any intentional takes and the methods used to deter marine mammals from gear or catch; and any loss of fish or gear caused by marine mammals. Included along with the regulations were an approved log form and instructions for filling it out. In

addition to maintaining a log, exemption certificate holders must display an exemption decal on the vessel and must submit to the Service, by the end of each year, an annual report, consisting of a copy of the required logs. Category III fishermen are not required to submit annual reports, but must report all lethal incidental taking of marine mammals to the Service within 10 days after returning from the trip during which the taking occurred.

By the end of 1989, approximately 10,400 vessel owners had registered for and had been issued exemption certificates. Even though the reporting regulations had yet to enter into force, some 3,000 annual reports, based upon the requirements set out in the proposed rule, had been received. Based upon those reports, as well as other available information, including observer data, the Service expects to propose revisions to its classification of fisheries in 1990.

As discussed above, the 1988 amendments required establishment of an observer program to monitor between 20 to 35 percent of the fishing operations conducted by category I vessels. Early in 1989, however, it became apparent that anticipated funding levels would be insufficient even for minimal (20 percent) coverage of all designated category I fisheries. In response, National Marine Fisheries Service scientists met on 14-16 June to develop an observer strategy for Fiscal Years 1989 and 1990. At that meeting, the Service established criteria for ranking the priority for funding observer coverage in each category I fishery based upon: (1) whether depleted species are taken; (2) the population trends of the species taken in the fishery; (3) the annual take rate of marine mammals, expressed in terms of population percentage; and (4) whether marine mammals for which a quota has been established (i.e., Steller sea lions and North Pacific fur seals) are taken.

The Service also decided that, rather than providing straight 20 percent coverage in the top priority fisheries until funds were exhausted, it would consider reduced coverage in some fisheries if reliable estimates of incidental taking could be made from less than 20 percent coverage. Based upon its priority ranking of category I fisheries, the level of coverage needed to provide take estimates with a 20 percent coefficient of variation, and estimates of observer costs, and assuming that $850,000 would be available for observers in Fiscal Year 1989, the Service proposed to cover the category I fisheries as follows: four fisheries at 20 percent, one fishery at 15 percent, two fisheries at 10 percent, and no coverage for two fisheries. In actuality, observers were placed in only four category I fisheries in Fiscal Year 1989: the Bering Sea/Gulf of Alaska trawl fishery, the Washington and Lower Columbia River set gillnet fisheries, and the Gulf of Maine groundfish fishery. In addition, observers were voluntarily accepted by fishermen in the New England gillnet fishery, listed in category III.

Under the proposed observer plan for 1990, the projected funding of $4.5 million would be sufficient to place observers, even at reduced levels, on only the top four or five ranked category I fisheries. Assuming that the Prince William Sound set gillnet fishery would not occur in 1990 because of the Exxon Valdez oil spill, the Service estimated that minimal coverage of the listed category I fisheries would require approximately $6.12 million. For Fiscal Year 1990, $7.5 million has been earmarked for the observer program. At the end of the 1989, the Service expected to be able to place observers on board vessels in all category I fisheries during 1990 and, perhaps, in some category II fisheries that take quota species.

The Marine Mammal Commission was directed by the 1988 amendments to make available to the Secretary of Commerce and to the public recommended guidelines to govern the take of marine mammals incidental to commercial fishing operations after 1 October 1993, when the interim exemption expires. The Commission has been working on developing those guidelines since July. Late in the year, however, a possible new approach was suggested by members of the Commission's Committee of Scientific Advisors. To provide the needed time to analyze this new approach, the deadline for submission of the guidelines was moved to 30 March 1990.

Status Reviews and Conservation Plans

Section 115 of the Act, added by the 1988 amendments, sets forth procedures under which status reviews of marine mammal populations are to be conducted. The amendments authorize interested persons to petition the appropriate Service to undertake a review, specify that status determinations are to be made by rulemaking, and establish time limits for completing each step of the review. In addition, the Services were directed to prepare conservation plans as soon as possible for all depleted species or stocks unless they determine that such a plan will not promote the conservation of the species or stock. The National Marine Fisheries Service was specifically required to complete conservation plans for the North Pacific fur seal by 31 December 1989 and for the Steller sea lion by 31 December 1990.

At the end of 1989, the National Marine Fisheries Service had not provided a proposed conservation plan for the North Pacific fur seal to the Commission or other interested parties for review and it was not clear when it planned to do so (see Chapter III). It was also unclear what progress had been made by the Service in preparing the Steller sea lion conservation plan.

The Tuna-Porpoise Program

Changes to the legislative program governing the take of marine mammals by the U.S. tuna fishery and the importation of yellowfin tuna taken by foreign fleets were enacted in 1988. Under regulations published in the 6 January 1989 Federal Register, U.S. tuna fishermen must complete the process of backdown to remove porpoise from the net no later than 30 minutes after sundown. The restriction on sundown sets may be waived for individual certificate holders who, based on observer reports, have attained an incidental take rate for sundown sets that is no higher than the average daytime take rate for the fleet as a whole. The amendments also require the placement of an observer on every fishing trip made by U.S. vessels during 1989 and subsequent fishing seasons unless, for reasons beyond the control of the Secretary, an observer is not available. The 100 percent observer requirement may be waived after the 1991 fishing season if it is determined that a less extensive observer program will yield sufficiently reliable information.

Further, the amendments prohibit the use of explosives other than Class C pest control devices in the commercial yellowfin tuna fishery. They direct the Secretary to regulate the use of Class C explosives by 1 April 1990 based on a study to determine if such devices result in physical impairment or increased mortality of marine mammals.

The amendments also direct the Secretary to develop and implement, by the beginning of the 1990 fishing season, a system of performance standards designed to maintain the diligence and proficiency of certificate holders. Those skippers whose incidental marine mammal mortality rate is consistently and substantially higher than the average rate for the fleet will be subject to supplemental training. Continued poor performance may result in suspension or revocation of a certificate of inclusion.

New requirements were also placed on foreign nations seeking to import yellowfin tuna into the United States. In order for a foreign tuna/porpoise program to be found comparable to that of the United States, it must include: (1) by the beginning of the 1990 fishing season, prohibitions on encircling pure schools of marine mammals, conducting sundown sets, and such other activities as are applicable to U.S. vessels; (2) monitoring by observers from the Inter-American Tropical Tuna Commission or an equivalent international program; and (3) observer coverage equal to that for U.S. vessels unless an alternative observer program with lesser coverage is determined to provide sufficiently reliable documentary evidence of the nation's incidental take rate.

In addition, the average incidental take rate for a foreign fleet must be no more than twice that of the U.S. fleet during

the 1989 season and must be no more than 1.25 times the U.S. rate during the 1990 and subsequent seasons.

Limitations were also placed on the take of coastal spotted and eastern spinner dolphins. Beginning in 1989, eastern spinner dolphins may not account for more than 15 percent of a nation's total incidental take and coastal spotted dolphins may not exceed 2 percent of the nation's total take. Harvesting nations are also required to comply with all reasonable requests from the United States to cooperate in conducting its porpoise stock assessment and monitoring program.

The amendments also place restrictions on third-party nations seeking to export yellowfin tuna to the United States. An intermediary nation must certify and provide reasonable proof that it has acted to prohibit the importation of tuna from any country banned from directly exporting tuna to the United States. Intermediary nations have 60 days following the imposition of a U.S. import ban to implement a similar prohibition on tuna imports from the embargoed harvesting nation. Failure by the intermediary nation to adopt a parallel import ban within six months of U.S. action will prompt certification under the Pelly Amendment to the Fishermen's Protective Act and may result in restrictions on imports of all or some fish products from the intermediary nation.

In addition, the Secretary was directed to contract with the National Academy of Sciences for an independent review of possible alternative tuna fishing methods that do not involve the incidental take of marine mammals. This review was to have been completed by 8 September 1989 and the results submitted to Congress by 5 December 1989, along with the Service's proposed plan for research, development, and implementation of the identified alternatives. As discussed in Chapter VII, this study is now expected to be completed by 8 September 1990.

Implementation of these amendments is discussed, and other information with respect to the tuna-porpoise program is provided, in Chapter VII.

Research, Display, and Enhancement Permits

The provisions governing scientific research and public display permits were amended in 1988, and a new permit category was created allowing the Services to authorize activities designed to enhance the survival or recovery of marine mammal populations. Also, under the amendments, marine mammals that were pregnant at the time of taking, nursing at the time of taking, or less than eight months old may now be imported for public display if it is determined that such importation is necessary for the protection or welfare of the animal.

The amendments specify that public display permits may be issued only to an applicant that offers an acceptable education or conservation program, based upon professionally recognized standards of the public display community, and whose facility is open to the general public on a regularly scheduled basis. Likewise, the amendments specify that: before issuing a scientific research permit, the Service is required to determine that the proposed research is essential to meeting a bona fide scientific research need and does not unnecessarily duplicate other research; the Service can authorize lethal take of marine mammals for scientific research purposes only if the applicant demonstrates that non-lethal alternatives are not feasible; and the Service may authorize lethal take from depleted populations only if the Service first determines that the research will directly benefit the affected species or stock or fulfills a critically important research need.

The amendments provide that enhancement permits may be issued to authorize activities designed to contribute significantly to increasing or maintaining the distribution or size of a marine mammal population. Any such permit must be consistent with applicable conservation or recovery plans. Captive maintenance of depleted marine mammals under this authority is permitted only if the Service: (1) finds that such maintenance is likely to contribute to the survival or recovery of the species or stock; (2) determines that the expected benefit to the species or stock outweighs the likely benefit of alternatives that do not involve the removal of animals from the wild; and (3) requires that animals removed from the wild and their progeny be returned to their natural habitat as soon as feasible.

The authority of the Secretary or his designees to take actions for the benefit of marine mammals without obtaining a permit was also expanded. The Secretary may authorize the importation of a marine mammal if necessary to render medical treatment that is not otherwise available. Once treatment has been completed, steps must be taken to return the animal to the wild if it is feasible to do so.

As discussed in Chapter XII, the National Marine Fisheries Service has undertaken a comprehensive review of its permit program. Among the issues being examined in that review is how to implement the 1988 amendments. For example, the Service is examining: what constitutes an acceptable education or conservation program at a public display facility; how to determine if proposed research is bona fide and non-duplicative; and how to implement the new enhancement authority.

The Service published an interim policy with respect to education and conservation programs on 22 May 1989. Under that interim policy, the Service, when reviewing a public display

permit application, judges whether: an education or conservation program is a component of the proposed display; the program provides accurate information which is consistent with the purposes and policies of the Marine Mammal Protection Act; and the facilities are open on a regularly scheduled basis without limitation other than the charging of an admission fee.

During 1989, one application for an enhancement permit was received by the National Marine Fisheries Service. After review, however, it was determined that the proposed activity, freeing whales entangled in fishing gear, would be more appropriately authorized under section 109(h), as a taking necessary for the protection and welfare of the animal.

Bottlenose Dolphin Study

Another amendment directed the Secretary of Commerce to conduct a study of the 1987-1988 die-off of bottlenose dolphins in the North Atlantic Ocean. The purpose of the effort is to determine: to the extent possible, the cause or causes of the die-off; the effect of the die-off on the dolphin population(s); the extent to which pollution was a contributing factor; and whether other marine mammal species or populations were affected. As discussed further in the section on bottlenose dolphins in Chapter III, a report on that study was issued in April 1989.

CHAPTER III

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 to the Departments of Commerce and Interior on research and management actions needed to achieve the purposes of the Marine Mammal Protection Act and the Endangered Species Act. During 1989, the Commission continued to devote special attention to several species of marine mammals designated as endangered or threatened, including West Indian manatees, Hawaiian monk seals, California sea otters, humpback whales, right whales, bowhead whales, and Gulf of California harbor porpoise. Given the serious conservation issues involving several other marine mammal species or populations, the Commission also focused attention on North Pacific fur seals, Steller sea lions, bottlenose dolphins, Hector's dolphins, and polar bears. A review of the Commission's activities regarding these species and populations follows.

West Indian Manatee (Trichechus manatus)

West Indian manatees occur on the east coast of North and South America from the southeastern United States to northern Brazil. They prefer the lower reaches of rivers and protected coastal waters along the mainland coast of the western Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea. They also occur around the Greater Antilles from Cuba to Puerto Rico. The species is endangered throughout its range.

The largest known concentration of animals is centered in the rivers and coastal waters of Florida, where at least 1,200 animals occur. Remaining populations outside the United States are thought to be small and declining in numbers due to poaching, incidental take in gillnets, loss and degradation of habitat, and other threats. Thus, the long-term survival of a viable population of manatees very well may depend on the success of efforts to protect animals in the southeastern United States.

Survival of manatees in the United States, however, also is in grave doubt due to: (1) the killing and injuring of increasing numbers of animals by vessels on Florida's waterways; (2) degradation of remaining manatee habitat by intense coastal development; and (3) periodic episodes of high natural mortality. The first two factors are direct outgrowths of rapid human population increases in recent years.

As indicated on the table on the following page, known manatee mortality has increased in recent years and is continuing

to do so. In the six years prior to 1984, total known manatee mortality in the United States averaged 91 animals per year. Since 1984, it has averaged 135 animals per year. In 1989 a record high 174 animals were confirmed as having died. Such mortality is alarming, given the approximate number of animals in the southeast United States and the inherently low calving rate of female manatees (i.e., about one calf every two to three years or more).

Known Manatee Mortality in the United States Reported through the Manatee Salvage and Necropsy Program from 1978-1989

Year	Vessel-Related Deaths	Dependent Calf Deaths	Deaths Inside Florida	Deaths Outside Florida	Total No. of Deaths in U.S.
1978	21	10	84	0	84
1979	24	9	77	1	78
1980	16	13	63	4	67
1981	24	13	113	3	116
1982	21	14	117	6	123
1983	15	18	80	0	80
1984	35	25	128	3	131
1985	35	23	120	9	129
1986	33	27	122	3	125
1987	39	30	114	4	118
1988	43	30	133	1	134
1989*	51	36	166	8	174

* = Preliminary totals provided by the Florida Department of Natural Resources

Almost all of the increased mortality observed in recent years can be attributed to increases in two mortality categories: deaths caused directly by boats and barges; and dependent calf deaths. The number of deaths in each of these two categories reached record high levels in 1989 and, in each category, previous records have been equaled or exceeded in five of the past six years. Vessel-related and dependent calf deaths in 1989 were over twice the levels in the early 1980s. Carcasses classified as vessel-related deaths are those with slashes or other massive injuries obviously caused by propellers or by being crushed by vessel hulls. Between 1978 and 1983, vessel-related mortality averaged 20 animals per year. Since 1984, it has averaged 39 manatees per year.

Dependent calf deaths include carcasses of newborn or very young animals. Although the precise cause of death is rarely apparent, it is possible that recent increases in this mortality

category also are vessel-related. Virtually all adult animals bear wounds or scars from non-lethal collisions with boats, and it is reasonable to assume that at least some females with nursing calves are struck and killed or injured by boats. Even if they are not killed by boats, it is unlikely that severely injured mothers would be able to tend their calves. In addition, mother-calf pairs may become confused and separated when exposed to heavy boat traffic. Young calves unable to relocate their mothers likely would die. An average of 13 newborn and dependent calf carcasses were recovered per year between 1979 and 1983. Since then the number has averaged 29 animals per year.

Coincident with increasing vessel-related and perinatal deaths has been a substantial increase in the number and speed of boats in Florida. Early in the 1960s, about 100,000 commercial and recreational boats were registered in Florida. Typical top speeds at that time were about 30 MPH. The number of registered boats now exceeds 750,000 vessels, and about 300,000 additional boats enter Florida from out-of-state each year. Many boats now travel at speeds of 50 to 60 MPH, with some exceeding 80 and even 100 MPH. With more boats travelling at higher speeds, the probability of animals being struck is greatly increased. There is no question that the increase in manatee mortality is, in part, a reflection of changes in the types and numbers of boats.

A second major threat to manatees is degradation and loss of remaining habitat due to coastal development. Florida's net population growth has increased to about 1,000 people per day. Accompanying this growth has been an unprecedented increase in development, particularly along rivers and coastal shorelines. Development in or adjacent to important manatee habitat can cause siltation, other forms of water pollution, and direct removal and preemption of natural vegetation. This, in turn, can reduce manatee food supplies and eliminate natural secluded areas preferred for calving, nursing, or mating. In the long term, habitat losses due to increasing coastal development and environmental pollution may well be a more serious threat to manatees than vessel traffic.

Background on Recovery Activities

Late in the 1970s, a major effort was undertaken to develop an effective manatee recovery program. Among other things, the Marine Mammal Commission undertook a thorough review of Federal, State, and private manatee conservation activities. Based on its review, the Commission allocated a special Fiscal Year 1980 Congressional appropriation of $100,000 to critically needed manatee research and management tasks. Also in 1980, the Fish and Wildlife Service completed and adopted the West Indian Manatee Recovery Plan. As recommended by the Commission, the Plan was further supplemented by a Comprehensive Work Plan adopted by the Service early in 1982.

These planning activities focused attention on priority recovery needs through the early 1980s. They also helped forge a strong base of cooperation among numerous Federal, State, local, industry, and private agencies and organizations. A review of important contributions by the Commission, the Fish and Wildlife Service, the Florida Department of Natural Resources, the U.S. Army Corps of Engineers, the Florida Power & Light Company, the Save the Manatee Club, and other key agencies and groups is provided in previous Annual Reports.

Notable accomplishments during the first half of the 1980s included: developing technology to radio-tag and track manatees; improving and expanding the manatee salvage and necropsy program; implementing a well-conceived, cooperative research program; establishing and posting boat speed zones and no-entry zones in selected manatee habitats; adding new areas containing important manatee habitat to the existing system of Federal and State refuges and reserves; developing strong cooperative public information and education efforts; and fostering cooperative planning with local and regional planning bodies.

Despite these efforts, however, the most critical issues (i.e., record numbers of boat kills and increasing loss and degradation of essential habitat) were not being resolved and, in fact, were becoming worse. Therefore, in 1986, the Commission initiated a thorough reexamination of the manatee recovery program. Among other things, it contracted for a report to evaluate manatee recovery activities and needs and held its 1987 Annual Meeting in Florida to conduct a review of the manatee recovery program. To help prepare for that meeting, the Commission wrote to the Fish and Wildlife Service on 19 November 1987 outlining its preliminary views of the critical management issues.

In its letter, the Commission recommended that the Service, in cooperation with other involved parties: (1) update the West Indian Manatee Recovery Plan and Comprehensive Work Plan; (2) reconstitute and reconvene the West Indian Manatee Recovery Team; (3) complete manatee-related land acquisition projects in the Crystal River-Homosassa River area; (4) strengthen the system of boat speed regulatory zones and enforcement in essential manatee habitats; (5) control development of new boating facilities in essential manatee habitat; and (6) identify and undertake priority manatee research.

Those recommendations served as the focus of manatee-related discussions at the Commission's meeting, which was held on 10-12 December 1987. In addition to the Commission and its Committee of Scientific Advisors, participants included representatives of the principal Federal and State agencies, private organizations, and public interest groups involved in the manatee recovery program. During the meeting, there was general

agreement on the points recommended in the Commission's letter. It appeared that efforts initiated in the early 1980s were not misdirected, but rather were not sufficiently extensive to address the magnitude of the problems.

During 1988, substantial progress was made to strengthen the manatee program and address the points raised in the Commission's November 1987 letter. Among other things, the Commission: reviewed and distributed copies of a final contract report evaluating the manatee recovery program in Florida and needed improvements (see Appendix B, Reynolds and Gluckman 1988); completed and distributed a report identifying actions needed to protect essential manatee habitat on the east coast of Florida and Georgia (see Appendix B, Marine Mammal Commission 1989); and helped arrange cooperative efforts between the National Oceanic and Atmospheric Administration, the Fish and Wildlife Service, and the State of Florida to mark manatee-related boat speed zones and sanctuaries on future editions of nautical charts.

The Commission also dedicated most of its Fiscal Year 1988 research budget to manatees. It supported projects to: (1) convene a workshop on developing a computer-based geographic information system to help assess and manage manatee habitat; (2) investigate the feasibility of determining the age of manatees using bone growth layers; (3) assess the possible use of DNA fingerprinting to determine genetic variability, kinship relationships, and reproductive success of manatees; (4) assess the effects of manatee grazing on seagrass beds in Hobe Sound; (5) purchase a computer for field use in studies of seagrasses in Hobe Sound; (6) convene meetings of the Florida Department of Natural Resources Manatee Technical Advisory Council; and (7) prepare a popular article on the importance of saving manatees.

Also in 1988, the Fish and Wildlife Service and the Florida Department of Natural Resources took steps to address the Commission's recommendations. Among other things, the Service: reconvened a West Indian Manatee Recovery Team; completed a draft revised Recovery Plan for manatees in Florida; completed a proposal to expand the Chassahowitzka National Wildlife Refuge to include additional manatee habitat; and devoted substantial effort to reviewing Federal dredge and fill permit applications for marinas and boating facilities in manatee habitats. The Florida Department of Natural Resources continued to assume an increasingly important role in the manatee recovery program. It continued operations of the manatee salvage and necropsy program, supported additional research efforts, reviewed dredge and fill permit applications in manatee habitat, and worked closely with local officials to develop manatee protection measures and marina facility siting policies under authority of a State law that requires local growth management plans.

The above activities are discussed in greater detail in previous Annual Reports. The following describes actions taken by the Commission and others in 1989 to further strengthen cooperative manatee recovery efforts.

West Indian Manatee Recovery Plan and Recovery Team

A Recovery Plan for West Indian manatees was initially completed and adopted by the Fish and Wildlife Service in 1980. Because of new information developed early in the 1980s and the difficulty in resolving the critical issues confronting manatees in Florida, the Commission recommended in 1987 that the plan be updated and that a manatee recovery team be reconstituted to assist in that process. The Service agreed and, in 1988, a new team was convened. It included representatives of Federal and State agencies and public and private groups whose involvement in implementing plan provisions would be essential. With the Team's help, the Service completed a Revised Draft Plan that was circulated for review and comment in October 1988.

The Revised Plan was very well done and, by letter of 9 December 1988, the Commission commended the Service and the Recovery Team for its careful and thorough work. The Revised Plan integrated the earlier Recovery Plan and Comprehensive Work Plan into one document and did an excellent job of identifying manatee research and management priorities and responsibilities. By letters of 13 and 15 June 1989, the Commission received a copy of the Final Revised Florida Manatee Recovery Plan. Because its provisions required commitments by the Commission and others to help carry out various tasks, the Service asked the principal agencies and organizations to concur with and sign the plan.

On 21 June 1989, the Commission responded to the Service noting it was pleased to concur with the plan's provisions and to sign the document. The Final Plan was approved by the Regional Director of the Fish and Wildlife Service on 24 July 1989. In addition to the Commission, the following agencies provided their concurrence and signed the Final Plan: the Army Corps of Engineers; the Florida Department of Natural Resources; the Florida Game and Fresh Water Fish Commission; the Georgia Department of Natural Resources; the Florida Department of Environmental Regulation; the Florida Department of Community Affairs; the Marine Industries Association of Florida; the Save the Manatee Club; the Sierra Club; Sea World Enterprises; and the Florida Power & Light Company.

The Revised Recovery Plan identified more than 70 tasks needed to help recover manatees in Florida. Key provisions included tasks to: define manatee habitat use patterns and key population parameters; identify areas where the probability of manatees being struck by boats was greatest and implement site-specific protection measures to reduce vessel-related threats;

reduce potentially hazardous development in essential manatee habitats; and incorporate additional manatee habitat into the existing system of Federal and State refuges and preserves.

Commission Activities in Support of the Revised Manatee Recovery Plan

Although the Revised Recovery Plan for manatees in Florida was not adopted in final form until July 1989, certain high priority needs became apparent as the Plan was being updated in 1988. As noted above, the Commission began acting on a number of those needs immediately. Much of the work initiated in 1988 was carried forward in 1989 as described below.

Development of a Geographic Information System -- In 1988, the Commission provided funds for a workshop to examine opportunities and needs for developing a computerized geographic information system to assist manatee research and management activities. New computer technology for such systems now makes it possible to integrate, map, and display detailed site-specific information instantaneously. Because of increasing numbers of site-specific management decisions (e.g., permits for marinas and proposals for new boat speed zones) and the need for detailed, up-to-date data on manatee habitat use patterns, manatee mortality, zoning patterns, etc., the Commission and other agencies and groups are hopeful that this new technology can be applied to improve the quality and speed of these critical management decisions. The purpose of the workshop therefore was to determine how such technology could be adapted to meet manatee research and management needs.

The Workshop was held on 21-22 March 1989 and was convened by representatives of the Florida Department of Natural Resources and Eckerd College. Participants included representatives of the principal involved Federal, state, local, and private agencies and organizations as well as experts in geographic information systems. Based on discussion, the participants agreed that a geographic information system for manatees should be developed and that it should consist of: (a) a centralized data base operated by hardware and software with substantial analytical capability; and (b) a network of less powerful field terminals with access to the central system provided at offices of agencies and research centers throughout Florida and Georgia. Specific recommendations were made during the Workshop to develop the system. As the Florida Department of Natural Resources' Marine Research Institute had already made considerable progress towards establishing such a system, there was agreement that it should assume lead responsibility for creating and operating the central system. At the end of 1989, the final Workshop report was being reviewed for publication by the Florida Department of Natural Resources.

The Workshop was exceedingly productive and, by the end of 1989, the Florida Department of Natural Resources had made substantial progress on digitizing base maps and entering data to create a central data base. To help speed development, the Commission provided further support late in 1989 to the National Fish and Wildlife Foundation to help prepare base maps for the system (see also Chapter X).

Age determination studies -- An unresolved question important for assessing the status of manatee populations in Florida and elsewhere is the relationship between age and survival and reproduction rates. The question has remained unanswered because no reliable technique has been developed for determining the age of manatees. The need for research on this question was identified during the process of revising the Manatee Recovery Plan. However, because of funding limitations, the Fish and Wildlife Service has been unable to carry out research on this question.

Therefore, in 1988, the Commission supported a pilot study to determine if manatee bones have detectable variations useful for determining the age of individuals. The study was carried out in 1989 using ear bones, ribs, mandibles, and other bones of animals of known age. The final report, to be published early in 1990, demonstrates that it is possible to obtain useful results. Therefore, late in 1989, the Commission provided funds to the National Fish and Wildlife Foundation to begin aging a backlog of samples gathered through the manatee salvage program (see also Chapter X).

Radio-tagging and tracking studies -- One of the most important and immediate needs for making informed decisions on permit applications for marinas and other critical management issues is better information on manatee habitat use patterns and preferred habitats. To help develop this information, the Fish and Wildlife Service's National Ecology Research Center pioneered a successful approach for radio-tracking individual animals early in the 1980s.

The potential value of the technique, however, has not been realized because the Service's research staff has not received sufficient funding to purchase equipment and services needed to tag and track more than a few animals at a time. To ensure tagging of a representative sample of animals in each of the more or less discrete populations of manatees in Florida, the Commission wrote to the Service late in 1987 recommending that additional funds be provided over a five-year period to tag an additional 20 animals per year. The Service responded in early 1988 noting that it would be unable to provide any additional support in 1988.

In 1989, the Service was unable to provide funds to continue even a low-level tagging and tracking effort. Because of the fundamental importance of radio-tagging and tracking data for making management decisions and the lack of support from within the Service, the staff of the Service's National Ecology Research Center solicited contributions from other sources. Among other things, it submitted a proposal to the National Fish and Wildlife Foundation for funds to purchase tags and pay satellite monitoring charges needed to carry the work forward.

By letter of 13 January 1989, the Foundation asked the Commission for comments on the proposal. The Commission reviewed the status of the tagging program at its Annual Meeting on 23-25 February in Monterey, California. During the meeting, representatives of the Service noted that there were no plans to provide additional funding for radio-tracking work in 1989 and it was learned that deployed tags would have to be removed from animals within the next few weeks in the absence of additional funds.

Immediately after its meeting, the Commission responded to the Foundation's request for comments on the Center's proposal. By letter of 3 March 1989, the Commission strongly endorsed the proposed project and noted that: the proposed technology for tagging and monitoring manatees was now proven; the proposed methodology is probably the only cost-effective way presently available to gather detailed habitat use data needed for manatee-related management decisions; and it would be a tragic setback for the manatee program if the tagging work were not carried forward. The Foundation subsequently provided the requested funds to the National Ecology Research Center and, with additional contributions from the Port Everglades Authority and the Lockheed Space Operations Company, the Service was able to maintain a manatee tracking effort in 1989.

As discussed below, the Commission again recommended that the Service expand support for this critical research in 1990. As a partial contribution to that need, the Commission provided funds to the National Fish and Wildlife Foundation to help defray some of the costs of purchasing new radio-tracking equipment (see also Chapter X).

Identifying boat speed zones for manatees on nautical charts -- Over the past ten years, the Florida Department of Natural Resources and the Fish and Wildlife Service have designated approximately 25 areas in Florida as boat speed zones or no-entry areas to protect manatees. Although they are posted with signs, it was noted during the process of updating the Recovery Plan that one of the best ways to increase boater awareness of the need for caution in these areas would be to indicate their presence on nautical charts published by the National Oceanic and

Atmospheric Administration (NOAA). Therefore, the Commission agreed to help make arrangements for doing so.

As noted in last year's Annual Report, the Commission wrote to the National Oceanic and Atmospheric Administration in mid-1988 noting the importance and need for marking regulated areas to protect manatees on charts. In response, the agency noted that, while there were certain constraints in its abilities to add such information to the charts, it would be pleased to consider requests to do so. Representatives of the Commission and NOAA's Office of Charting and Geodetic Services subsequently met to discuss procedures and information for submitting applications to list areas on the charts.

Based on the discussions, the Commission, in consultation with the Fish and Wildlife Service and the Florida Department of Natural Resources, wrote to the Office on 10 March 1989 suggesting that the Service, in cooperation with the Department, assume the lead in assembling and submitting all charting applications related to manatees. The letter also suggested the type and form of information to be included in each application, possible chart notations, and an updated draft text on manatees for use in the Office's publication, Coast Pilot, which provides regional advice on navigation to vessel operators.

On 10 April, the Office responded favorably to the suggested approach and, on 1 May 1989, the Commission wrote to the Service and the Florida Department of Natural Resources asking them to develop the needed applications. The two agencies agreed and, on 2 October 1989, the Fish and Wildlife Service submitted applications for charting existing boat speed zones and manatee sanctuaries to the Office. Because of the schedule for updating nautical charts for Florida, it will take several years for all areas to be added. Applications for other existing zones and for speed zones established in the future will be forwarded to the Office following the established procedures.

Land acquisition -- In recent years, the Commission has worked closely with both the Fish and Wildlife Service and the State of Florida to identify manatee habitat appropriate for purchasing and adding to systems of Federal and State Refuges, Reserves, Preserves, Parks, etc. In 1984, the Commission completed a report on habitat protection needs for manatees in the Crystal River area of northwest peninsular Florida (see Appendix B, Marine Mammal Commission 1984). The report was used to develop a cooperative Federal-State approach for acquiring essential manatee habitat in that part of Florida.

Since 1984, much has been done to acquire a network of key manatee habitat areas in northwest peninsular Florida. Among other things, the State purchased lands along the Crystal River and the head of the Homosassa River (critical travel corridors

and wintering areas for manatees) and the Fish and Wildlife Service purchased substantial areas along the lower Suwannee River (preferred summer habitat for manatees). Acquisition efforts are continuing in the region and, as mentioned below, by letter of 1 August 1989, the Commission urged the Service to act on two particularly important acquisition efforts: the acquisition of lands along the lower Homosassa River (an addition to the Chassahowitzka National Wildlife Refuge) and acquisition of a refuge headquarters site on Kings Bay (for the Crystal River National Wildlife Refuge).

In 1988, the Commission completed a preliminary report on habitat protection needs for manatees on the east coast of Florida and Georgia (see Appendix B, Marine Mammal Commission 1988). The report was a preliminary document because important data on habitat use patterns from ongoing radio-tracking studies and aerial surveys were expected in the near future. Among other things, the report recommended acquisition of a number of east coast sites that were already on the 1988 list of recommended land acquisition projects for Florida's Conservation and Recreation Lands Trust Fund. Placement on that list does not assure acquisition and, to help evaluate priorities, the Commission provided its report to Florida's Land Acquisition Selection Committee, which administers the Trust Fund.

Early in 1989, the Commission became aware of a new proposal to add a 2,000-acre site along the Sebastian River on Florida's east coast to the State's recommended land acquisition list. The Commission's 1988 report had noted that the North Fork of the Sebastian River appeared to be an important resting area and fresh water source for manatees and recommended establishment of a speed zone for the area. However, from information available when the report was being prepared on the number of manatees using the river, it was not clear that acquisition of the area solely for the purpose of protecting manatees was warranted. Thus, the report did not recommend land acquisition in that area.

After the Commission's report was completed, however, new information from manatee radio-tracking studies confirmed the importance of the river to manatees. In locating a radio-tagged animal in the Sebastian River, Service scientists observed at least 50, and perhaps as many as 100, other manatees in the waterway adjacent to the proposed acquisition area.

The proposal to list the site on the State's recommended acquisition list was to be considered at a meeting of the Land Acquisition Selection Committee early in March 1989. Therefore, on 8 March 1989, the Commission wrote to Committee members noting that new information clearly supports the view that the North Fork of the Sebastian River is a core manatee habitat and that its acquisition would be an important contribution towards building a network of protected areas for manatees on the east

coast. At its March meeting, the Committee considered comments by the Commission and others and voted to pursue listing the project.

As noted in previous Annual Reports, important progress has been made in recent years to develop a network of protected areas for manatees. Much of that progress has been possible as a result of the Land Acquisition Selection Committee's administration of the Conservation and Recreation Lands Trust Fund. In the process, coastal habitats, particularly wetlands, important to many other endangered and non-endangered species also have been protected. Recognizing the importance and urgency of land acquisition for protecting manatees and its related benefits to many other species, the Governor directed the Department of Natural Resources to develop recommendations that would give manatee-related land acquisition proposals added weight with respect to Committee ranking and action. At a meeting of the Florida Cabinet in November 1989, the Department presented its recommendations for doing so and they were adopted.

Priority research and management needs -- Recognizing that fiscal constraints would make it impossible to undertake all of the needed tasks identified in the Revised Recovery Plan, the Commission wrote to the Fish and Wildlife Service on 1 August 1989 identifying those tasks which it felt must be undertaken immediately. In making its recommendations, the Commission noted that it considered the recommended actions to be the absolute minimum necessary to provide a reasonable hope of securing a long-term future for manatees in the southeast United States.

In its letter, the Commission recommended that the Service: acquire certain lands along the Homosassa River and Kings Bay as additions to the National Wildlife Refuge System and that it also coordinate acquisition of areas along the Sebastian River with the Florida Department of Natural Resources; fill the vacant Manatee Coordinator position and provide two additional staff members (including $80,000 for their salaries) to its Field Office to help implement the revised Recovery Plan and review development proposals affecting manatee habitat; increase the budget for its manatee research program by $150,000 and provide the research program with an additional staff member to tag and track an additional 20 manatees per year; and also provide its manatee research program with an additional $20,000 to speed efforts to develop a geographic information system for manatees.

In early October, the Commission learned that Congress had appropriated additional funds to the Service for work on manatees and certain other endangered species. As it had not yet received a reply to its 1 August letter, the Commission wrote to the Service on 10 October 1989 repeating its recommendations for additional funding and staff to expand manatee radio-tracking studies, implement provisions of the revised manatee Recovery

Plan, and develop a geographic information system for manatees. On 15 November, the Service responded to the 10 October letter noting that the Commission's recommendations would be taken into consideration in allocating funding for recovery activities.

Actions To Strengthen the State of Florida's Manatee Recovery Efforts

During 1989, it became increasingly apparent that vessel traffic was making Florida waterways unsafe not only for manatees but also for swimmers and boaters. Recent statistics indicated that human injuries and mortalities by boats in Florida accounted for more than 10 per cent of the nationwide total. Also, manatee mortality in the first half of 1989 was far above the record high pace set in 1988. To respond to this unacceptable situation, the Florida Governor and Cabinet asked, in June 1989, that the Florida Department of Natural Resources develop recommendations to better protect manatees and their habitat and to make State waterways safer. The Department was asked to submit its recommendations no later than the Cabinet's 14 September 1989 meeting.

Early in August 1989, the Florida Department of Natural Resources released a draft report identifying proposed actions to respond to the Governor and Cabinet's request ("Recommendations to Improve Boating Safety and Manatee Protection for Florida Waterways"). The draft report proposed an extensive set of initiatives that would require both administrative and legislative action to implement. To improve boating safety, the draft report proposed, among other things, establishing a maximum 30 MPH speed limit in all marked channels, phasing in a mandatory boating safety education program, and increasing enforcement capabilities.

With respect to manatee protection, the most stringent proposals were focused on 12 counties where manatees are most abundant and where boat-related manatee deaths have been most common. In those counties, proposed actions included establishing a 20 MPH speed limit in non-channel areas inhabited by manatees, and limiting construction of new marinas to one boat slip per 100 feet of shoreline pending adoption of more specific measures in county manatee protection plans and marina facility siting policies.

The Department's draft report also proposed: designating four new slow speed zones and two new no-entry areas in particularly important manatee habitat; adopting an emergency 90-day rule to limit boat speeds in the Banana River; accelerating development of a computer-based geographic information system to manage data on manatees and manatee habitat; authorizing 19 new positions for the manatee protection program and increasing the program budget to $1.5-$2 million per year; authorizing emergency

overtime pay for enforcement efforts by Florida Marine Patrol officers; and amending the Florida Manatee Sanctuary Act to clarify authority to regulate boat speeds and protect manatee feeding areas.

In mid-August 1989, the Department began a series of public meetings to solicit comments on its draft recommendations. A representative of the Commission participated in the first of those meetings and provided preliminary comments. Among other things, it was noted that the scope of the Department's proposed response seemed appropriate given the complexity and scale of the problem. By letter of 11 September, the Commission sent the Department more detailed comments.

In its letter, the Commission noted that the disturbance, injury, and death of animals by boats and habitat destruction due to development in and adjacent to essential manatee habitat were the two principal threats to manatees. It also expressed the view that the proposed actions would help address both problems by controlling boat speeds in areas used heavily by manatees and by steering development of new marinas to areas least important to manatees. The Commission noted that these were the only approaches with a reasonable chance of reducing the probability of collisions between manatees and boats and, therefore, it expressed strong support for the draft proposals.

With respect to the proposed non-channel speed zone in the 12 counties particularly important to manatees, the Commission noted that the proposal was an appropriate interim measure. However, it remained concerned that manatees would still be unable to avoid boats travelling at the proposed 20 MPH speed limit in shallow non-channel areas where they could not dive beneath oncoming boats. Thus, it noted in its letter that, in the long-run, replacement of the interim non-channel speed zone with a more extensive network of site-specific slow speed zones in the areas where manatees were most likely to be hit by boats would provide manatees more protection and be less burdensome on boaters. It was the Commission's understanding that such a network would be considered and developed during the preparation of county manatee protection plans, whose provisions would eventually supersede the interim measures.

With respect to the four new boat speed zones, three were located along the east coast of Florida. All three areas were recommended for establishment as slow and/or idle speed zones in the Commission's 1988 report on east coast manatee habitat protection. In its 11 September letter, the Commission expressed strong support for their designation. It noted, however, that its 1988 report recommended establishing many other new speed zones and that it understood those areas would be considered when county manatee protection plans were prepared. In this regard, the Commission's 1988 report recommended that the existing system

of 13 speed zones covering about 75 miles of waterway on the east coast of Florida be expanded to include 22 new areas and some 195 additional miles of waterway.

During the hearing process, some interested parties, principally those representing boat manufacturers, urged that proposed actions to limit boat speeds and marina development be deferred pending review by a blue ribbon panel. Regarding this point, the Commission's letter noted that potential measures to protect manatees from boats had already been carefully analyzed (e.g., in the Commission's report on east coast habitat protection needs and in the revised Recovery Plan), and that the urgency for implementing responsive actions was too great to be deferred. Therefore, it urged that any further reviews be directed at modifying and fine-tuning an implemented program as proposed by the Department, rather than continuing to debate what the optimal final system of regulated areas should be.

The Department's draft report was presented to the Florida Governor and Cabinet for its consideration at its 14 September 1989 meeting. During the meeting, the Commission's Executive Director spoke in support of the Department's proposals. He noted that the plight of the Florida manatee is clearly worsening and that the Commission firmly believes the situation is one of the country's most pressing wildlife conservation problems. He also noted that the Department's draft proposal was a solid effort to address the crucial issues, and that the set of recommended actions could provide appropriate interim protection while site-specific actions were being developed within the context of county manatee protection plans and facility siting policies.

At the 14 September meeting, two elements were acted upon by the Governor and Cabinet: the emergency 90-day rule for Brevard County and the proposal for overtime pay for law enforcement efforts. Both were adopted. Regarding other parts of the Department's draft proposal, the Governor and Cabinet asked the Department to proceed with developing a final set of proposed actions and to prepare a final report for consideration at its meeting on 24 October 1989.

The Department did so and the final report was presented to the Governor and Cabinet for consideration at its 24 October meeting. In response to comments and further analyses, some recommendations in the final report differed from those in the draft. For example: the proposed channel speed limit was changed from 30 MPH to 40 MPH in daylight with speeds limited to 30 MPH in all waters at night; a new recommendation was made to require vessel operator licenses based on successful completion of a boating education course and a test; the number of core manatee counties was increased from 12 to 13; and within those 13 counties, the Department recommended establishing an interim

shoreline slow speed zone within 300 feet of shore (except in marked channels), rather than a county wide 20 MPH speed limit.

A representative of the Commission attended the 24 October 1989 meeting of the Florida Governor and Cabinet and provided comments in support of the actions proposed in the Department's Report. Among other points, the Commission's comments expressed the view that the shoreline slow speed zone was preferable to the non-channel 20 MPH speed limit as an interim measure. This view was put forward because manatees often prefer shoreline areas and because a slow speed requirement (e.g., about 7 MPH) is far more likely to allow manatees to avoid oncoming boats than is a 20 MPH speed limit.

During its meeting, the Governor and Cabinet acted on two of the Department's proposals. It approved new rules to establish two new boat speed zones and to create a year-round motor boat exclusion area at a warm-water outfall at Port Everglades. It also adopted the interim boating facility siting policy conditionally limiting new development to one power boat slip per 100 feet of shoreline.

Regarding interim speed restrictions in the 13 key manatee counties, the Department was directed to work with county officials to develop proposed interim boat speed rules for Cabinet consideration in the spring of 1990. The counties were given the options of establishing: (1) a 300-foot county-wide shoreline slow speed zone (excluding marked channels); (2) county-wide speed limits of 30 MPH in marked channels and 20 MPH in all other waters accessible to manatees; or (3) submitting, within 60 days, locally developed ordinances which provide acceptable site specific protection to manatees. At the end of 1989, draft county proposals from most of the 13 counties either had been submitted to the Department or were expected to be received early in 1990. Their adoption will be considered by the Governor and Cabinet in 1990.

Most of the remaining recommendations would require authorization from the State Legislature (e.g., for requiring vessel operator licenses, amending the Florida Manatee Sanctuary Act, and increasing funding and staff for the Florida Marine Patrol and Manatee Recovery Program). At the end of 1989, it was the Commission's understanding that proposed bills to address those needs were being developed by the Department for consideration during the spring 1990 session of the Legislature.

Conclusion

During 1989, the plight of manatees in Florida became more serious. Known vessel-related mortality and total manatee mortality reached new record levels. Although substantial progress towards creating an effective response was made in July

1989 when the Fish and Wildlife Service adopted the new Florida Manatee Recovery Plan, the Service's support for some of the Plan's most important research and management tasks actually declined in 1989. Unfortunately, this happened at a time when additional support was most sorely needed. On a more positive note, the Florida Department of Natural Resources and the Florida Governor and Cabinet took aggressive action to meet the State's responsibilities under the new Recovery Plan and to substantially strengthen the effectiveness of its manatee protection efforts. The Commission believes that the actions identified in the Revised Recovery Program are appropriate and needed. It views the establishment of long-term commitments to levels of funding and personnel adequate to address these needs to be the most pressing manatee issue before Congress and the Fish and Wildlife Service in 1990.

Hawaiian Monk Seal (Monachus schauinslandi)

Hawaiian monk seals occur only in the Hawaiian Islands. Their distribution is limited almost entirely to the 1,100-mile chain of small, mostly uninhabited islets and atolls in the northwest Hawaiian Islands. A few individuals, however, have been seen in recent years around Kauai, the westernmost of the main Islands.

Harassment and over-exploitation by sealers during the 19th century brought the species close to extinction. The first systematic counts of animals were made in the 1950s, at which time the population was thought to be increasing. In subsequent years, the number of seals declined. Counts of animals in 1983 were roughly half the number counted in 1958. More recently there have been some encouraging signs that the population size may be increasing. Counts in 1987 and 1988 suggest that the number of births and the total number of animals on island beaches are greater than observed in 1983. It is difficult to determine if that trend is continuing because funding limitations precluded comparable sampling in 1989. There are estimated to be about 1,500 animals. The species is listed as endangered under the Endangered Species Act and as depleted under the Marine Mammal Protection Act.

Sandy beaches in the northwest Hawaiian Islands are used for pupping, nursing, and resting. Shallow waters surrounding the beaches, including lagoons, reef flats, and seaward slopes atop the submerged volcanic cones that form the chain, are essential feeding and mating areas. In 1987, the National Marine Fisheries Service, the Federal agency with lead responsibility for research and management concerning monk seals, designated the beaches, lagoons, and coastal waters out to a depth of 10 fathoms around most of the northwest Hawaiian Islands as critical habitat for monk seals under the Endangered Species Act. In 1988, at the

recommendation of the Marine Mammal Commission, the Service extended the designated area seaward to the 20-fathom contour so as to include a greater portion of the species' essential feeding ground.

Because of the species' small population size, the direct or indirect loss of even a few seals may have a significant effect on population trends. In this context, issues of particular importance include: disturbance of seals on pupping and haul-out beaches; entanglement in lost and discarded fishing gear and other marine debris; entrapment in a disintegrating seawall and various types of debris at Tern Island in French Frigate Shoals; interactions with commercial fishermen; potential die-offs caused by disease or naturally occurring biotoxins; food availability; shark predation; and the rehabilitation and release of pups recovered at pupping beaches in an emaciated condition. Also, in recent years, abnormal behavior exhibited on some islands by groups of adult male seals mobbing and killing or seriously injuring adult females and young animals also has been a source of concern. The species receives protection from human activities, however, by virtue of its remote habitat and the occurrence of most of its terrestrial habitat in the northwest Hawaiian Islands within the Hawaiian Island National Wildlife Refuge administered by the Fish and Wildlife Service.

Congressional concern for survival of the species has been expressed, in part, through special appropriations for monk seal-related activities. In 1981, Congress provided the Commission $100,000 to expand and strengthen research and management efforts for monk seals. Each year since 1981, Congress has appropriated money to the National Marine Fisheries Service specifically to carry that program forward. In 1985, it provided the Service $350,000 for monk seal work and, every year since then, including Fiscal Year 1989, it has provided $325,000.

In 1983, the National Marine Fisheries Service, in consultation with the Commission and other interested parties, adopted a Recovery Plan for Hawaiian monk seals. The plan quickly became outdated due to progress in developing and implementing recovery actions, the accumulation of new information, and recognition of new research and management issues. Therefore, in December 1986, the Commission recommended that the Hawaiian Monk Seal Recovery Team, which had not met since 1984, be reconstituted and reconvened to update the Hawaiian Monk Seal Recovery Plan. In 1987, the Service invited individuals to participate on the Team. However, it provided no funds for meetings and the Team did not meet in 1987.

As an interim measure, the Commission convened a Hawaiian monk seal program review during its Annual Meeting on 10-12 December 1987. Representatives of the Commission, its Committee of Scientific Advisors, and the National Marine Fisheries Service

participated. Among other things, participants reviewed matters concerning: program funding; the Kure Atoll Head Start Project to help rebuild the atoll's seal population; the designation of critical habitat for monk seals; consultation with the Coast Guard on ways to reduce disturbance of seals on Kure Atoll; ongoing and planned research; maintenance of the Fish and Wildlife Service's field station on Tern Island at French Frigate Shoals; and the removal and rehabilitation of emaciated pups from French Frigate Shoals to enhance their survival.

During the meeting, the Commission again raised the need for improving program oversight and direction by convening the Recovery Team to update the Recovery Plan. In 1988, however, the Service again provided no funds for meetings of the Recovery Team and there was no progress on updating the Recovery Plan. A discussion of developments and Commission activities in 1989 follows.

Kure Atoll Head Start Project

Kure Atoll, 1,150 miles northwest of Honolulu, is the westernmost island in the Hawaiian Islands chain. The number of seals at this atoll has decreased steadily since the 1960s apparently due to human disturbance and low survival rates of pups during the first year of life. High pup mortality was believed to have been caused by shark predation and attacks by adult male seals. As recruitment of young animals into the Kure Atoll population declined, the number of breeding females and the number of young seals gradually decreased.

To address the problem, the Service initiated a pup capture and release program known as the Head Start Project at Kure Atoll in 1981. The program has been one of the most successful elements of the monk seal recovery program. It involves removing newly weaned pups from the beaches of Kure, placing them in an enclosed pen on the atoll's shoreline for protection, raising them through their first summer of life in the protective enclosure, and then releasing them back into the wild at Kure.

From 1981 to 1988, 40 seals were "headstarted," and 85 percent of the pups survived through the first year. Nine seals were taken under the Project in 1989. To further supplement the female component of the seal population at Kure, emaciated and prematurely weaned pups also were taken from French Frigate Shoals. These pups, which were unlikely to survive on their own in the wild, were rehabilitated at facilities in Honolulu and then released at Kure.

The number of pups born on Kure Atoll reached an all-time low of one pup in 1986. Since then, pup production has begun to increase as females released through the Head Start Project have begun to give birth. The first such births began in 1987. As of

the end of 1989, six "headstarted" females had given birth to 10 pups and Head Start Project females are becoming the principal component of the atoll's reproductively active females. During the 1970s, juvenile seals were seen only occasionally on the beaches of Kure. As a result of the Head Start Project, immature seals now constitute a large proportion of the population and the trend in declining numbers at Kure Atoll appears to be reversing.

Hawaiian Islands National Wildlife Refuge Field Station at Tern Island

As part of its management program for the Hawaiian Islands National Wildlife Refuge, the Fish and Wildlife Service maintains and operates a field station on Tern Island at French Frigate Shoals, 500 miles west-northwest of Honolulu. The island, initially 11 acres in size, was expanded to 37 acres in 1942 by the Navy for use as an aircraft runway. The expansion was accomplished by constructing a sheet-metal bulkhead and back-filling with sand dredged from the adjacent lagoon. The small group of buildings on the island constitute the only permanently staffed facility in the entire Refuge.

Among other functions, the Fish and Wildlife Service's staff and facilities at Tern Island provide critical support for monk seal research and management activities. In cooperation with the National Marine Fisheries Service, the Refuge staff help to: locate and remove emaciated, prematurely weaned monk seal pups from French Frigate Shoals; remove and destroy marine debris that potentially could entangle and thereby injure or kill seals; conduct year-round censuses of seals on French Frigate Shoals; provide logistical support for various monk seal research and management activities; and provide an enforcement presence to discourage unauthorized landings on French Frigate Shoals.

Because of funding constraints and deteriorating facilities on Tern Island, the Fish and Wildlife Service in recent years has considered abandoning the island in favor of seasonal field camps. For many reasons, among them those noted above, the Commission wrote to the Service in 1986 urging that personnel be kept on the island year-round. Special appropriations by Congress for continuing operations at Tern Island have addressed recent funding needs and the Service has maintained staff on the island year-round over the past three years.

Long-term operation of the field station remains uncertain, however, due to severe deterioration of the seawall that protects the island. Gaps formed by years of corrosion and wave action have recently begun to cause serious erosion problems. As a result, the integrity of the runway is being threatened and long-buried cables, fuel tanks (at least some still containing fuel), and other debris, once covered when the island was being built up, are now being exposed. The debris, as well as pockets and

openings in the seawall itself, poses a serious entrapment threat for monk seals and endangered sea turtles.

The future of the Tern Island field station was discussed with representatives of the Fish and Wildlife Service at the Commission's Annual Meeting in Monterey, California, on 23-25 February 1989. During the meeting, the Service advised the Commission that the seawall had deteriorated to the point where a major storm could destroy the integrity of the runway on which the field station relied and that it planned to initiate an independent assessment of its long-term options regarding future operations and maintenance of the field station.

The assessment was undertaken in the summer of 1989. During the review, the Commission, as well as other agencies and groups familiar with the Tern Island field station, were asked to provide relevant information and views. The Commission did so and, in September 1989, the Service's report ("Evaluation of U.S. Fish and Wildlife Service Operations on Tern Island in the Hawaiian Islands National Wildlife Refuge: Recommendations for a Long-Term Course of Action") was completed. The report recommended repairing or replacing the seawall as soon as possible in order to continue the present level of operations for an additional 10 to 20 years. At the end of 1989, it was the Commission's understanding that the assessment of options and recommendations in the Report were being reviewed by the Service to determine the most appropriate course of action to follow.

Hawaiian Monk Seal Program Oversight and Direction

While there is clear evidence of progress in the Hawaiian monk seal recovery program (e.g., the success of the Head Start Program on Kure, efforts to clear beaches of marine debris and free entangled seals, and the collection of data needed to monitor population trends), it also has been apparent that the National Marine Fisheries Service has not provided the program with a level of support commensurate with the species' critically endangered status. Progress has instead relied upon the good will of Congress, and the generous, but unpredictable, contributions of other agencies, organizations, and committed volunteers.

To ensure that the recovery program addresses priority recovery activities and essential support needs, the Commission has recommended on several occasions since 1986 that the National Marine Fisheries Service convene a Recovery Team and update the Hawaiian Monk Seal Recovery Plan. As noted above, however, no Recovery Team meetings were held between 1984 and 1988. Therefore, at its Annual Meeting on 23-25 February 1989 in Monterey, California, the Commission again raised the need for convening the Recovery Team and updating the Recovery Plan. In response, representatives of the Service participating in the meeting

advised the Commission that, although invitations had been issued to Recovery Team members in 1987 and the new team had never met, the Service again was considering reconstituting the Team.

During the summer of 1989, the Service did so by reissuing invitations to new Team members. The first Recovery Team meeting since December 1984 was subsequently scheduled for 12-14 December 1989. To ensure that the meeting focused on the critical issues and that a comprehensive set of recommended actions would be available for its deliberations, the Commission scheduled a Hawaiian monk seal program review for 4-5 December 1989. The program review involved members of the Commission's staff, its Committee of Scientific Advisors, and representatives of the Service. It was held at the Service's Southwest Fisheries Center in La Jolla, California.

Among the issues addressed during the meeting were: Recovery Team activities; overall direction and operation of the research program; specific study needs; permit requirements; operation of the Animal Care Committee (see below); standards for captive maintenance and veterinary care; personnel; and funding. Immediately after the review, the Commission, in consultation with its Committee of Scientific Advisors, developed a comprehensive set of recommendations, which was sent to the Service by letter of 11 December 1989. Copies were also provided to all members of the Hawaiian Monk Seal Recovery Team for consideration at its 12-14 December meeting.

With respect to the activities of the Hawaiian Monk Seal Recovery Team, the Commission recommended in its letter that the Service direct the Team to: update the recovery plan by 1 March 1990; prepare a comprehensive work plan to implement the Recovery Plan by the end of March 1990 or as soon thereafter as possible; evaluate its terms of reference to ensure that it has sufficient latitude to provide the Service with meaningful advice; and establish new research and management priorities based on a thorough review of progress and developments since the Recovery Plan was first adopted in 1983. The Commission also recommended that the Service: (a) appoint a Recovery Team leader who is not directly involved in managing the program so as to minimize demands on his time; (b) expand the Team by adding an experienced marine mammal veterinarian and a physiologist; and (c) publish a schedule of annual Recovery Team meetings for the next four years by 15 January 1990.

During the program review, it became apparent that the research program had suffered from inadequate outside review, a lack of timely systematic analyses of collected data, limited publication of research results, high turnover in program personnel, and funding limitations that precluded hiring an adequate number of formally trained personnel to do the necessary field and analytic work. To address these deficiencies, the

Commission recommended in its 11 December 1989 letter that the Service immediately insure that the backlog of data be analyzed and reduced for publication, and that the Recovery Team and research program staff consult with outside experts to obtain certain information, analyses, and advice on various research needs. In this regard, the Commission provided the Service with a list of primary research and management tasks. The list identified those tasks the Commission felt could best be undertaken by the monk seal program staff, by outside contract, or by a combination of the two.

The Commission also identified a series of recommendations regarding specific research tasks. For example, in its letter, the Commission recommended that: research on the mobbing behavior of male seals initially focus on identifying the age classes of seals and the individual animals participating in the mobbing and the principal breeding animals before implementing any responsive management alternatives; consideration be given to extending the Head Start Project to Midway Island; the Service immediately establish a schedule of interagency consultations to mount a program to rebuild the Tern Island seawall and to remove abandoned fuel from the island; the Service seek the advice of the Recovery Team on methods to study at-sea behavior, movements, and energetics of seals; and a population model be developed by program staff in cooperation with outside modeling experts to produce population projections, evaluate management strategies, and identify critical data gaps.

The Commission's 4-5 December program review also indicated that personnel in the research program needed to pay greater attention to permit compliance and the processing of permits. In this regard, the Commission recommended that all field personnel carry copies of issued permits into the field and that they be given clear written and verbal guidance as to precisely what activities are authorized and what steps should be taken to minimize any disturbance to the seals. The Commission also recommended that the Service's Permit Office afford highest priority for work on monk seals and other endangered, threatened, and depleted species, and that the Recovery Program staff seek permits under the Marine Mammal Protection Act's new "enhancement" authority as soon as it becomes appropriate to do so.

Since adoption of the Recovery Plan in 1983, much work has been undertaken involving captive maintenance and rehabilitation of seals. This work, for the most part, was not contemplated in 1983, and procedures and facilities to meet captive maintenance needs have been adapted without the benefit of rigorous review and oversight. Therefore, during the summer of 1989, the National Marine Fisheries Service established an Animal Care Committee. The Committee was charged, among other things, with establishing written guidelines for the care and maintenance of captive Hawaiian monk seals, examining holding facilities,

developing standard operating procedures in the event of illness or death of seals, and establishing procedures for screening seals to be returned to the wild to prevent the introduction of new diseases into the population.

With regard to the Animal Care Committee, the Commission recommended in its letter that the Committee be expanded to include a marine mammal veterinary scientist versed in animal care committee responsibilities and an interested member of the public. It also recommended that the Committee have responsibility for responding fully to any questions placed before it by individuals concerned about the care, maintenance, handling, and health of captive and wild monk seals.

Also, with respect to the captive maintenance of seals, the Commission's 11 December letter noted a need for further training in maintaining facilities and meeting seal nutritional needs. The Commission recommended that the Service ask the Department of Agriculture's Animal and Plant Health Inspection Service and outside consultants to provide a training program in January 1990 for individuals involved in caring for captive Hawaiian monk seals.

In its letter, the Commission also recommended that: protocols on animal care and reintroducing seals back into the wild be developed before the January training session; necropsies be performed by a veterinarian with marine mammal experience who, if possible, is a board-certified pathologist; arrangements be made with a reputable laboratory to promptly work up specimen material taken from captive or wild monk seals on a routine basis; and holding facilities for seals at the Kewalo Basin on Oahu, Hawaii, not be used for maintaining any marine mammals unless they are completely rebuilt.

Staffing needs for the Hawaiian monk seal program were examined during the program review, and the Service advised the Commission that it intended to hire a biometrician to work on monk seal data by March 1990. It was apparent, however, that there also was a need for a full-time data manager and an administrative assistant to relieve the monk seal recovery program project leader of extensive administrative burdens. The Commission therefore recommended that the Service move expeditiously to fill all three positions and that it make the appropriate changes in its current budget to accomplish this.

Finally, the Commission noted in its 11 December 1989 letter that the program suffered serious problems because of inadequate funding from the Service and excessive reliance on the good will and charity of Congress, other agencies, and volunteers. Among other things, this situation has required the staff to operate in a constant atmosphere of budgetary crisis and uncertainty, and it has precluded efforts to effectively plan and carry out an

organized program of field work, captive studies, other related projects, and reporting and publication. The situation also has undermined program productivity and seriously compromised important year-to-year continuity essential for maximizing research and management results. The Commission therefore recommended that the Service promptly develop, in consultation with the Recovery Team and with reference to the Comprehensive Work Plan, a well documented three year budget that provides for support of the Hawaiian monk seal program at a level sufficient to allow an organized and rational approach to all issues.

The comments and recommendations set forth in the Commission's 11 December 1989 letter were made available to members of the Hawaiian Monk Seal Recovery Team for their consideration at their meeting on 12-14 December. Results of the Team's deliberations had not been received by the Commission by the end of 1989. Also by the end of 1989, the Commission had not received a response from the Service. To help further strengthen the Hawaiian monk seal recovery program in 1990 and to facilitate broad involvement by interested parties in that process, the Commission arranged to hold its 1990 Annual Meeting in March in Honolulu, Hawaii. At that meeting, the Commission expects to undertake a thorough review of the Service's efforts to implement an effective Hawaiian monk seal recovery program, including its response to the recommendations in the Commission's 11 December 1989 letter.

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 from central Baja California, north along the coasts of California, Oregon, Washington, British Columbia, and southern Alaska, west around the Aleutian, Pribilof, Commander, and Kuril Islands, and south along the Kamchatka Peninsula and 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 the Soviet Union, 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 protective measures, the population grew slowly and, by the mid-1970s, occupied nearshore areas along about 160 miles of the central California coast. The population at that time was estimated to number fewer than 1,800 animals. At the

same time, the risk of oil spills in and near the population's 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 would not be threatened by oil spills would be to establish one or more sea otter colonies outside the existing population's range in California. 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 Marine Mammal Commission recognized the need to consider and 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. Brief summaries of some of these efforts and descriptions of actions taken in 1989 are provided 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. Thousands of seabirds and non-target fish species, as well as sea otters and other marine mammals, also were being caught and killed in gill and trammel net fisheries along the central California coast.

The State of California recognized the problems being caused by this indiscriminate by-catch and, beginning in 1982, enacted a series of regulations prohibiting the use of gill and trammel nets in areas where birds, sea otters, and other marine mammals were likely to be entangled. These prohibitions have reduced the incidental take of sea otters and the results of recent sea otter surveys, as shown in the table below, indicate that the population has begun to increase again.

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	*
1988	Spring	1505	219	1724	*
	Fall	(no count taken)			
1989	Spring	1574	290	1864	*
	Fall	1484	115	1599	*

* = 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 efforts in 1981 to identify and evaluate possible translocation sites, develop a translocation plan, and assess the possible environmental and other consequences of the proposed action.

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 held in the spring of 1985. At the end of 1985, Congress enacted legislation authorizing continued appropriations to the Fish and Wildlife Service 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.

Complying with the Congressional directive, the Fish and Wildlife Service prepared and, on 31 July 1986, issued a Draft Environmental Impact Statement. 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.

In the fall of 1986, Congress passed and the President signed Public Law 99-625. This law, which extended the Wetlands Loan Act, included provisions authorizing and encouraging 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 might occur outside that zone. It also required that the area surrounding the translocation zone be designated a management zone from which sea otters are to be excluded by non-lethal means. This would protect fishery resources by prohibiting expansion of the sea otter population south of Point Conception.

The Fish and Wildlife Service's proposal to translocate 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 under the Marine Mammal Protection Act. It also constituted a major Federal action under the Coastal Zone Management 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.

Steps taken by the Commission and others to make the required determinations and satisfy the conditions of applicable statutes and regulations are described in the Commission's previous Annual Reports. A final rule and record of decision regarding the translocation was issued by the Fish and Wildlife Service on 11 August 1987.

Following this action, a group representing several fishing interests filed suit in California State Court seeking a temporary restraining order to stop the translocation from proceeding. This and subsequent efforts, described in the Commission's previous Annual Reports, failed to block or overturn the proposed action.

Summary of Translocation Efforts To Date

Capture of sea otters for translocation to San Nicolas Island was initiated on 24 August 1987 by biologists from the Fish and Wildlife Service and the California Department of Fish and Game. During the first two years of the effort (11 August 1987 through 11 August 1989), a total of 228 sea otters were caught along the central California coast. Of these, 134 were judged to be healthy and of the right age and sex for translocation and were transported by van to the Monterey Bay Aquarium, tagged, screened for possible health abnormalities, and prepared for shipment to San Nicolas Island. Five otters died while at the Aquarium and four others were returned to the original capture site and released. The remaining 125 sea otters (29 males and 96 females) were flown to San Nicolas Island in groups of 1-24 animals. During the last four and a half months of 1989 (the beginning of year three), an additional 10 sea otters (two males and eight females) were captured and translocated to San Nicolas Island.

During November 1989, only 12 of the 135 animals taken to San Nicolas Island were sighted in the vicinity of the island. Of the remaining otters taken to the island, 29 had been sighted back in the existing California sea otter range, four had last been seen in the "no-otter" Management Zone; 10 (four males and six females) were known to be dead, three were suspected to have been caught and killed in fishing gear, and the remaining 77 were unaccounted for.

Containment -- From September 1987 through July 1988, there were 37 reports and 15 verified sightings of sea otters within the designated Management Zone. During the second year of the translocation, reports of sea otters sighted in the Management Zone dropped by about 50 percent. From August 1988

through June 1989, there were 19 reports and 8 verified sightings of groups of one to three animals, all of which were located just inside the northern end of the Management Zone. As was the case during the first year, sea otters sighted in the Management Zone apparently did not remain there. Surveys carried out by the Service of all offshore islands and the mainland south of Point Conception did not reveal any resident sea otters.

Modification of the Translocation Plan

The Translocation Plan adopted by the Fish and Wildlife Service in August 1987 authorized the Service to translocate up to 70 sea otters a year, but totaling no more than 250 otters in a five-year period. The Plan required, among other things, that: up to 20 of the otters translocated each year were to be adults; captures could be conducted only from August through mid-October when weather conditions generally are good; a minimum of 20 otters must be translocated at a time and, once at San Nicolas Island, the otters must be transferred to a stationary floating pen and held for up to five days before release.

As discussed in the previous Annual Report, experience gathered during the first year of the translocation effort indicated that some of these provisions were hindering rather than helping the effort. Therefore, during 1988 the Fish and Wildlife Service took steps to revise regulations regarding the Translocation Plan to: provide more flexibility in selecting the ages of otters for translocation; eliminate the requirement to capture otters only from August to mid-October; eliminate the requirement to surgically implant up to 30 sea otters with radio transmitters; provide flexibility to either transport captured otters immediately or hold them on the mainland before transport to San Nicolas Island; and eliminate the requirement to translocate a minimum of 20 otters at a time and to hold the otters at San Nicolas before release. The revised regulations took effect on 27 September 1988. In promulgating the revised regulations, the Service noted that the majority of the animals to be translocated each year were to be weaned, immature sea otters with a sex ratio of about 4 to 1 females to males. Of the adult sea otters selected for translocation, approximately three out of every four animals were to be female.

Following the second year of experience in translocating sea otters and consultation with the reconstituted Sea Otter Recovery Team (see below), the Service concluded that it would be advisable to revise further the translocation regulations. A preliminary draft of the proposed revisions was circulated to the Commission and others in mid-October 1989. Among other things, the Service proposed to: provide greater flexibility in selecting the ages of otters moved; permit translocation of females with dependent pups; and modify restrictions on the

numbers of sea otters moved each year to allow the Service to "carry over" otters not moved under the previous year's quota.

The Commission reviewed the draft of the proposed revisions and, by letter of 16 November 1989, relayed its comments to the Service. In its letter, the Commission expressed concern about the lack of sufficient information to support the proposed changes. The Commission recommended that the background section be expanded to indicate the numbers of otters moved during each of the first two years, the age composition of the translocated otters, and the fate of the otters. The Commission further recommended that a discussion section be added to explain why the regulatory changes were needed or desirable, why the Service believed that reproduction and/or weaning would be enhanced as a result of the proposed changes, and how the objectives of the translocation would be furthered by the amendments.

The Commission noted that many, if not all, of the proposed changes had been recommended by the Southern Sea Otter Recovery Team, and that mention of this fact in the draft revisions would lend scientific weight to the proposals. In addition, the Commission noted that the Recovery Team had recommended that 10 multiparous female otters, thought to be pregnant, be translocated during year three, but that the draft rule did not propose implementation of this recommendation. The Commission suggested that it would be desirable to expand the proposed revisions to permit implementation of this recommendation and, at a minimum, the Service should explain why it had chosen not to adopt this recommendation. The Commission further suggested that the Service's proposed rule include a discussion of the Exxon Valdez oil spill and the effects that a similar spill would have had on sea otters, had it occurred off California, as had been discussed by the Recovery Team. Inclusion of this discussion would help support the Service's decision to continue with the translocation beyond the second year even though success to this point has been limited. The Commission suggested that the Service should also explain why it thinks that allowing more than 70 animals a year to be translocated in year three will enhance the chances for successfully establishing a sea otter colony at San Nicolas.

Update of the Southern Sea Otter Recovery Plan

As noted earlier, the Southern Sea Otter Recovery Plan was adopted by the Fish and Wildlife Service in 1982. Some of the research and management actions recommended by the Plan have been fully implemented, while others have been partially implemented or not implemented at all. There is a need, therefore, to review and update the Plan.

The Fish and Wildlife Service recognizes the need to review and to update or revise the Plan as necessary. As a first step

in this regard, the Service, by letter of 27 May 1988, advised the Commission that it was considering re-establishing the Southern Sea Otter Recovery Team to assist in evaluating and updating the Plan. It asked the Commission to suggest possible candidates to serve on the Recovery Team.

The Commission considered the Service's request and, by letter of 17 June 1988, advised the Service that it agreed it would be desirable to review efforts to implement the Southern Sea Otter Recovery Plan and to determine what should be done to update and improve implementation of the Plan. The Commission questioned, however, whether re-establishment of the Recovery Team was the best way to accomplish this. The Commission noted that care must be taken not to compromise either the understandings that led to Public Law 99-625 or the agreements and programs subsequently developed to implement the Southern Sea Otter Translocation Plan. The Commission suggested that it might be more effective to conduct an in-house review of the Plan, in consultation with the Commission and the California Department of Fish and Game, update the Plan accordingly, and then convene a series of meetings with representatives of other Federal agencies, State agencies, and private and public interest groups to agree on who should be taking the identified steps to implement the revised Plan. The Commission noted that, if this approach were adopted, it should be possible to complete the update by the end of the year, to organize and hold planning and coordination meetings in January and February 1989, and to complete and adopt a Comprehensive Implementation Plan by April or May of 1989.

On 20 April 1989, the Fish and Wildlife Service responded to the Commission's 17 June 1988 letter. In its response, the Service noted that it agreed with the Commission that care must be taken not to compromise existing understandings and agreements affecting protection and management of the southern sea otter population. The Service indicated that an important first step in updating the Southern Sea Otter Recovery Plan would be to obtain the latest available information on the biology and ecology of the southern sea otter population, including knowledge gained through the ongoing efforts to reestablish sea otters at San Nicolas Island. The Service further indicated that the reconstituted Southern Sea Otter Recovery Team could best provide an update and evaluation of available information concerning the biology and ecology of the southern sea otter population. For these reasons, the Service said it had reconstituted the Recovery Team and asked it to review and provide updated information on the biology and ecology of the southern sea otter population.

The reconstituted Southern Sea Otter Recovery Team met on 6-7 July 1989 to discuss, among other things, the merits of continuing efforts to establish a sea otter colony on San Nicolas Island. Members of the Recovery Team acknowledged that their

thinking on the translocation question had been affected by the extent and duration of the Exxon Valdez oil spill (see Chapter IV of this Report) and its impact on sea otters and other marine species. Specifically, the team noted that a spill of similar magnitude along the California coast could affect the coastline from Point Reyes to the U.S.-Mexican border. Thus, the ability to establish a sea otter colony outside the existing range was seen as essential to ensure that a spill could not jeopardize the continued existence of this population.

The Recovery Team recognized that the translocation effort to date has had only limited success (fewer than 25 percent of the sea otters moved to San Nicolas Island have remained there). However, because of the recent experience with the Exxon Valdez spill, the Recovery Team recommended that additional sea otters be moved to San Nicolas Island in order to determine experimentally the optimum composition and number of otters to translocate in order to establish new colonies.

After reviewing the available data on loss rates of translocated otters, the Team concluded that size of the animal did not affect the loss rate. In order to maximize the probability that translocated animals or their pups will not emigrate from San Nicolas Island, the Team recommended the following age and sex composition for use in selecting animals for translocation: 20 adult females with dependent pups; 15 animals (of either sex) under 35 pounds; 10 multiparous females thought to be pregnant; and 5 adult males. The Team further recommended that a minimum of 20 animals translocated in year three be instrumented with radio transmitters to facilitate monitoring.

Finally, the Team proposed the following failure criteria to be used in evaluating the success of the translocation: (1) the loss rate of translocated animals in year three is not significantly better than the loss rate from years one and two; and (2) pup production at San Nicolas does not occur in either years three or four.

Early in 1990, the Commission, in consultation with its Committee of Scientific Advisors, will review the continuing efforts by the Fish and Wildlife Service to establish a sea otter colony on San Nicolas Island and actions to update the Southern Sea Otter Recovery Plan.

North Pacific Fur Seal (Callorhinus ursinus)

North Pacific or northern fur seals occur seasonally in waters throughout the northern rim of the North Pacific Ocean from southern California to Japan. The species was taken commercially for its pelt from the 1700s to 1984 and is presently taken by Native residents of the Pribilof Islands in Alaska for

subsistence purposes. Most pupping and breeding occur on Robben Island, the Kurile Islands, and the Commander Islands in the Soviet Union and on the Pribilof Islands in United States.

The Pribilof Islands' fur seal population, which historically has constituted about three-fourths of the total number of northern fur seals, is estimated to have numbered between 2 and 2.5 million animals when the Pribilof Islands were first discovered in 1786. Although the number of fur seals on the islands has fluctuated widely since then as a result of changing sealing practices, the population size was estimated to have been at that level as recently as the 1950s. Over the past three decades, the number of seals on the Pribilof Islands has declined significantly for uncertain reasons that possibly include entanglement in lost and discarded nets and other marine debris, disease, change in prey availability, or other causes. Recent estimates place the number of seals on the islands at about 800,000 animals. A similar decline appears to be occurring at Robben Island in the Soviet Union.

As noted in previous Annual Reports, the nations involved in commercial fur seal harvests have managed fur seal herds under a series of international agreements during most of the 20th century. Between 1957 and 1984, northern fur seals were managed cooperatively by the Governments of Canada, Japan, the Soviet Union, and the United States under provisions of the Interim Convention on the Conservation of North Pacific Fur Seals. The Interim Convention, which was extended four times during that period, sought to bring the North Pacific fur seal herd to the level that would provide the greatest harvest year after year, with due regard for the productivity of other living marine resources.

The Convention lapsed in 1984 when the United States did not ratify a protocol to extend the Convention for an additional four-year period. As a result, management authority in the United States became subject to domestic laws, including the Marine Mammal Protection Act. Among other things, the Act precludes commercial harvesting, unless the Act's moratorium on taking is waived, and provides for subsistence harvests by Natives of the Pribilof Islands. Since 1984, directed taking of fur seals in the United States has been limited to Native subsistence harvesting.

The 1989 Subsistence Harvest

Until 1984, Alaska Natives on the Pribilof Islands relied on meat and other by-products from the commercial seal harvest to meet subsistence needs. Beginning in 1985, Native residents have conducted directed subsistence harvests governed by regulations issued by the National Marine Fisheries Service under authority of the Marine Mammal Protection Act and the Fur Seal Act.

Under the current regulations, annual subsistence harvests are limited to taking juvenile male seals between the end of June and the second week of August. In mid-August, female seals begin arriving at the rookery in larger numbers and young male and female seals, which are not easily distinguished, become intermixed. The regulations also require the National Marine Fisheries Service to estimate the minimum and maximum number of seals needed for subsistence purposes by Native residents on both St. George Island and St. Paul Island (the two principal islands in the Pribilofs) before the start of each year's harvest. If the minimum estimate is reached, the harvest must be suspended pending a determination by the Service that additional seals are required to meet subsistence needs.

The regulations provide for extending the harvest to as late as 30 September if subsistence needs are not met by 8 August. In 1988, the Service noted that there was an increased risk of taking female seals during the extension period and it announced its intent to eliminate this provision of the regulations for 1989 and subsequent years. However, it took no further action before the 1989 harvest and, in its 7 August 1989 notice of estimated harvest levels, the Service again indicated its intent to eliminate the provision beginning with the 1990 harvest. No further action on this matter was taken in 1989.

In 1988, 1,145 seals were killed during the subsistence harvest on St. Paul Island and 113 seals were taken on St. George Island. For 1989, the Service projected subsistence needs at 1,600 to 1,800 seals for St. Paul Island and 533 to 600 seals for St. George Island. The actual subsistence harvests in 1989 were 1,340 seals on St. Paul Island and 181 seals on St. George Island. No female seals were taken on either island.

Preparation of A Conservation Plan for the North Pacific Fur Seal

The Marine Mammal Protection Act requires the Secretary of Commerce or the Interior, in consultation with the Marine Mammal Commission and its Committee of Scientific Advisors, to designate a species or population of marine mammals as depleted if it is determined to be below its optimum sustainable population level. Once designated as such, animals may be taken only for certain, limited purposes, such as Alaska Native subsistence and handicrafts, limited taking incidental to commercial fishing operations, scientific research, and enhancement of the species' survival.

The term "optimum sustainable population" has been defined as a range of population levels between the largest supportable within the ecosystem (i.e., carrying capacity) and the population level that results in the greatest net annual increment in numbers or biomass (i.e., the maximum net productivity level). Based on precedents established for other species and analyses of

fur seal population data, the maximum net productivity level for fur seals would be 60 percent or more of carrying capacity. In the late 1970s and early 1980s, the estimated size of the Pribilof Islands' fur seal population declined to about 871,000 animals or less than 50 percent of its estimated size (1.8 million seals) in the early 1950s.

In view of the population's continuing decline, the Commission recommended in 1984 and again in 1985 and 1986 that the National Marine Fisheries Service designate the Pribilof Islands' population of North Pacific fur seals as depleted. The action was taken after the Humane Society of the United States and Friends of Animals/Committee for Humane Legislation filed suit against the Secretary of Commerce, seeking to compel the issuance of the depletion finding. By letter of 29 November 1985, the Commission also recommended that the Service prepare a conservation plan to provide a basis for identifying and directing priority research and management actions needed to restore the population. It was recommended that the plan be similar to the recovery plans required for endangered and threatened species under the Endangered Species Act. By letter of 6 December 1985, the Commission provided the Service with a preliminary plan outline.

On 18 May 1988, the National Marine Fisheries Service published a Federal Register notice announcing that, effective 17 June 1988, the Pribilof Islands' population of North Pacific fur seals would be added to the list of depleted species under the Marine Mammal Protection Act. By the end of 1988, however, the Service had not completed a conservation plan for the fur seal population as recommended by the Commission.

As noted in Chapter II of this Report, the Marine Mammal Protection Act was amended on 23 November 1988. Among other things, a new section was added to the Act requiring the preparation of conservation plans for species listed as depleted. With respect to North Pacific fur seals, the new section explicitly directed the Service to prepare a conservation plan by 31 December 1989. At the end of 1989 the Service had not released a draft plan to the Commission or other interested parties. It was the Commission's understanding that a draft plan was being reviewed within the Service.

International Cooperation

As noted above, the Interim Convention on the Conservation of North Pacific Fur Seals expired in 1984. As discussed in the previous Annual Report, consideration was given to negotiating a new fur seal convention in 1987 and 1988. However, the Service, in consultation with the Commission, suspended efforts to pursue a new agreement in July 1988 and no further action was taken on the matter in 1989.

As a related matter, however, the United States concluded agreements in 1989 with Japan, Taiwan, and Korea to monitor the take of marine resources, including North Pacific fur seals, in the high seas driftnet fisheries in the North Pacific Ocean. Those agreements are discussed in Chapter VII. In addition, the United States put forward, but later withdrew, a proposal to list the North Pacific fur seal on Appendix II to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. This proposal is discussed further in Chapter V.

Steller Sea Lion (Eumetopias jubatus)

Steller sea lions (also called northern sea lions) inhabit coastal areas around the northern rim of the North Pacific Ocean from the Channel Islands in southern California to northern Hokkaido, Japan. The largest pupping colonies occur in the Gulf of Alaska and the Aleutian Islands. Available information indicates that Steller sea lions have declined substantially since the late 1970s in several areas including: the Kurile and Commander Islands; the Aleutian Islands, the Pribilof Islands, Bristol Bay, and the central and western Gulf of Alaska; and the California Channel Islands.

In December 1986, the National Marine Fisheries Service held a workshop to review the species' status. The results, published in March 1987, indicated that the number of adult and juvenile Steller sea lions at principal haul-out sites in Alaska (including areas from the central Aleutian Islands to the central Gulf of Alaska) declined from about 140,000 animals in 1956-1960 to about 68,000 animals in 1985 -- a decline of about 52 percent. The greatest decline was in the eastern Aleutian Islands where numbers decreased nearly 80 percent during that period. The cause or causes of the decline were uncertain; however, participants in the 1986 workshop concluded that the decline was likely to continue given reduced juvenile and adult female survival rates.

During June and July 1989, the National Marine Fisheries Service, in cooperation with scientists from the Soviet Union and the State of Alaska, conducted a range-wide survey of Steller sea lions at principal haul-out sites. The survey confirmed that the decline is continuing, that it has spread to virtually all areas except southeast Alaska, and that, in many areas, the rate of decline has increased. At the principal haul-outs in Alaska, counts declined to approximately 25,000 animals -- a level 63 percent below the 1985 count and 82 percent below the 1956-1960 counts. The largest declines again were in the eastern Aleutian Islands where numbers dropped to less than 3,000 animals -- 93 percent below the 1956-1960 levels. In the central Aleutian Islands, where numbers declined by only 8 percent between the

mid-1950s and 1985, counts declined by 70 percent between 1985 and 1989 (from 25,759 animals to 7,759 animals).

One of the possible causes of the decline examined at the 1986 workshop was fisheries-related mortality, including entanglement in lost nets, and incidental and intentional taking by commercial fishermen. While information on incidental take in foreign fisheries and entanglement was not sufficient to explain observed declines and the number of animals killed annually by domestic fishermen was unknown, participants concluded that the combined take by all fisheries could account for a large portion of the observed declines. A second cause considered by participants to be a possible contributor to the decline was disease. No new information is available to alter or confirm these possibilities.

In response to the decline in Steller sea lion numbers, the National Marine Fisheries Service published an advance notice of proposed rulemaking to designate the species as "depleted" under the Marine Mammal Protection Act on 6 May 1988. The Commission, in consultation with its Committee of Scientific Advisors, commented in support of the proposed action by letter of 8 July 1988. In its letter, the Commission noted that available information clearly justified listing Steller sea lions in at least some areas as depleted. The Commission recommended that the Service immediately list the species as depleted and that a Conservation Plan (i.e., a plan similar to recovery plans required under the Endangered Species Act) be developed and implemented for the species.

As discussed in Chapter II, in November 1988, the Marine Mammal Protection Act was amended. Among the changes made in the Act was the addition of a new section concerning the preparation of conservation plans for depleted marine mammals. The new section directed the Secretary of Commerce to prepare a Conservation Plan for Steller sea lions by 31 December 1990. On 6 December, 1988, the Commission wrote to the Service to provide recommendations for implementing the Act's new requirements. With respect to Conservation Plans, the Commission noted that much of the information and analysis needed to prepare a Plan for Steller sea lions had recently been compiled in the Steller sea lion account prepared for the Commission in Selected Marine Mammals of Alaska: Species Accounts with Research and Management Recommendations. It therefore noted that the Service should be able to complete a plan for Steller sea lions within three to six months.

During 1989, the Commission did not receive a draft Conservation Plan for Steller sea lions from the Service and the Service did not act on its pending depletion finding. In view of the continuing population decline, the Environmental Defense Fund petitioned the Service on 21 November 1989 for an emergency

listing of Steller sea lions as "endangered" under the Endangered Species Act. On 20 December 1989, the Commission wrote to the Service recommending that it act immediately on that petition and that it complete and distribute a draft Steller Sea Lion Conservation Plan by March 1990 at the latest. In its letter, the Commission noted that, because designation as endangered or threatened automatically confers depleted status upon a population or species, there is no purpose to be served by pursuing depleted status separately.

Concern for the status of Steller sea lions also was expressed by the North Pacific Fisheries Management Council at its December 1989 meeting. Recognizing the seriousness of the situation, the Council called upon the Secretary of Commerce to: (1) intensify research on the causes of the decline with particular regard for man-made impacts; (2) initiate an aggressive program to educate the fishing industry on fishing strategies that will minimize incidental capture or inadvertent harassment of sea lions; and (3) establish a working group of scientists, fishery managers, members of the fishing industry, and representatives of the environmental community to determine what can be done immediately to help reverse the population decline.

At the end of 1989, it was the Commission's understanding that the Service was reviewing the petition to list Steller sea lions as endangered and preparing its response.

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. In 1970, the species was designated as endangered under the U.S. Endangered Species Preservation Act, which was replaced by the Endangered Species Act of 1973. As noted in Chapter V of this Report, the International Whaling Commission has authorized the take of up to three humpback whales annually for traditional subsistence purposes by residents of St. Vincent and the Grenadines.

Three of thirteen recognized stocks of humpback whales occur in U.S. waters. The primary threats to recovery of these stocks are commercial and recreational vessel traffic, offshore oil and gas development, commercial fisheries, and coastal development.

Draft Recovery Plan

As noted in previous Annual Reports, the Commission recommended in 1984 and again in 1986 that the National Marine

Fisheries Service prepare recovery plans for humpback whales, right whales, and other endangered cetacean species that occur in U.S. waters. In response to these recommendations, the Service, in July 1987, constituted a Humpback Whale Recovery Team to assist in preparing a Recovery Plan.

The Recovery Team prepared a draft Humpback Whale Recovery Plan and, on 16 October 1989, the National Marine Fisheries Service made it available for agency and public review. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the draft plan and provided comments to the Service by letter of 30 November 1989. In its letter, the Commission noted that the draft plan provided a very thorough and useful synthesis of available information on the biology and status of humpback whales worldwide, but that it did not identify needed research and management tasks in sufficient detail to effectively guide development of actual recovery programs. Further, the Commission noted that problems were sufficiently different in different regions to merit development of independent recovery programs for populations in the western North Atlantic, the eastern North Pacific, and the central North Pacific Oceans. The Commission recommended that the Recovery Plan outline and narrative be restructured and expanded to provide a clearer indication of the specific research and management actions necessary to rebuild each of the separate populations in U.S. waters. It also recommended that: the revision of the draft Recovery Plan be completed and distributed for further comment by 15 February 1990; a series of regional meetings with representatives of relevant state and Federal agencies be held by June or July 1990 to discuss and agree on priority research and management tasks and the agencies with lead responsibility for those tasks; detailed implementation plans tailored to each of the three populations in U.S. waters be drafted by October 1990; and the implementation plans be used as the basis for agreement on precisely what needs to be done and which agencies or organizations will be responsible for doing it.

Interactions between Humpback Whales and Vessel Traffic

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. As noted in previous Annual Reports, the problem has been a matter of particular concern in Hawaiian waters and in waters off southeast Alaska, New England, and California.

Hawaii -- The shallow, coastal waters of the main Hawaiian Islands, particularly Maui, Molokai, Lanai, and Kahoolawe, appear to be the principal calving/breeding grounds for the northeast Pacific population of humpback whales. To minimize disturbance from whale watching and other activities, the National Marine

Fisheries Service, in 1979, published a "Notice of Interpretation of Harassment of Humpback Whales in Hawaiian Waters." This notice provided guidelines for approaching whales and advised boat and aircraft operators of steps that should be taken to avoid harassing whales and, thus, violating the Marine Mammal Protection Act.

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 whale watching guidelines outlined in the Service's Notice of Interpretation. The guidelines do not have the legal force of regulations, and the Service has had difficulty prosecuting violators. To overcome this problem, the Service, in 1986, proposed formal regulations to replace the 1979 Notice of Interpretation. The Commission commented on the proposed rule and expected it to be finalized in 1988. However, the Service decided not to proceed with adoption of final regulations until it had considered the findings of a whale watching workshop held in November 1988 (see below). At the end of 1989, no further action had been taken by the Service and the interim regulations were still in effect.

In addition to the whale-watching regulations, other measures may be needed to protect humpback whales and critical calving, nursing, and breeding areas in Hawaiian waters. For example, studies supported by the Commission (see e.g., Glockner-Ferrari and Ferrari, 1985, in Appendix B) suggest that increased boating activity may be causing whales to abandon or avoid certain traditional calving and nursing habitats. The Commission and its Committee of Scientific Advisors plan to meet in Hawaii in March 1990 to consider these and other matters bearing upon the conservation and protection of marine mammals in the North Pacific.

Alaska -- Part of the central North Pacific humpback whale population inhabits Glacier Bay and surrounding waters in southeast Alaska during the summer months. In the late 1970s, the number of whales using Glacier Bay declined. It was believed that increased tour boat and other vessel traffic may have caused or contributed to the decline and, in 1979, the National Park Service initiated steps to limit vessel traffic during the summer when whales are present.

As discussed in previous Annual Reports, the Commission, in consultation with the National Park Service and the National Marine Fisheries Service, convened planning meetings in October 1979 and December 1981 to identify possible causes of the humpback whale decline in Glacier Bay and research needed to document the actual cause or causes. In addition, the National Park Service initiated consultations with the National Marine Fisheries Service pursuant to section 7 of the Endangered Species

Act to identify measures necessary to protect humpback whales and their habitat in Glacier Bay.

Based on results of those meetings and consultations, the National Park Service initiated a multi-year 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, reduced the number of large commercial tour ships and smaller recreational vessels that could enter the bay to 1976 levels (i.e., the year before the marked decline in whale numbers was observed in the bay). The temporary regulations also established a mechanism for designating "whale waters" in which certain vessel operating restrictions were to apply. These regulations were modified and reissued annually until 1985, when the National Park Service adopted permanent regulations for the protection of humpback whales in the Glacier Bay Park and Preserve. These regulations establish a permit system for vessel entries, prohibit fishing for certain humpback whale prey species in the bay, and provide for designating "whale waters."

Since the early 1980s, the National Park Service has allowed a gradual increase in the number of vessels allowed to enter the bay during the summer whale season. In 1988, the authorized entry level was twenty percent greater than the 1976 level. The Park Service considered authorizing an additional increase in the access level again in 1989. To assess the possible consequences of various alternatives, the Service again consulted the National Marine Fisheries Service pursuant to section 7 of the Endangered Species Act.

After reviewing the alternatives and the results of whale monitoring studies conducted by the Park Service in 1988 and 1989, the National Marine Fisheries Service advised the Park Service, on 5 October 1989, that an increase in vessel traffic could not be justified. In support of this determination, the National Marine Fisheries Service noted that it had recommended in 1983 that no additional vessel traffic be allowed in Glacier Bay unless the number of whales entering the bay remained equal to or greater than the 1982 level (22 during the standard 9 July-16 August observation period) and that the number of whales that entered the bay during the standard observation period in 1988 and 1989 (17 and 20, respectively), both were below the 1982 level of 22 whales. The National Park Service accepted the recommendation and decided to limit vessel access to the bay in 1990 to the 1989 level.

Workshop on Whale Watching

As noted above, efforts to assess and prevent or mitigate the effects of whale watching and other vessel activities on humpback whales and other cetaceans have generally been

approached from a local or regional perspective. Similar problems have become evident in a number of areas and the National Marine Fisheries Service is considering the possible advantages of promulgating regulations that would be generally applicable and provide a more consistent approach to regulating whale watching and other activities in different areas.

In 1988, the National Marine Fisheries Service contracted with the Center for Environmental Education (now the Center for Marine Conservation) to organize and convene a workshop to assess and determine how best to avoid disturbance, stress, and other problems potentially caused by whale watching. The workshop, held in Monterey, California, on 14-16 November 1988, included representatives of the Commission, the whale-watching industry, environmental groups, and the scientific community. The workshop concluded, among other things, that: (1) whale watching provides useful opportunities for educating the public, for developing an ecologically sound conservation ethic, and for conducting basic research on the distribution, abundance, and behavior of whales; (2) whale watching can disturb and alter the behavior of whales which, in turn, may affect vital processes such as feeding and reproduction, and cause decreases in the survival or productivity of whales; and (3) a licensing or permit system should be developed to help insure that operators of whale-watching vessels are aware of applicable regulations and operate accordingly.

The workshop report, completed early in 1989, is being reviewed by the National Marine Fisheries Service to help determine what regulations or other measures may be necessary to insure that whale watching is not inconsistent with the goals and provisions of the Marine Mammal Protection Act.

Other Efforts To Protect Humpback Whales

The western North Atlantic population of humpback whales breeds and calves during the winter months in the Caribbean, principally on Silver, Navidad, and Mouchoir Banks north of the Greater Antilles. About 85 percent of the whales winter in the vicinity of Silver Bank, which is located primarily in waters of the Dominican Republic, about 80 miles north of the island of Hispaniola.

As discussed in previous Annual Reports, the Center for Marine Conservation initiated a public education program in the Dominican Republic in 1985 to promote efforts to protect humpback whales on their winter grounds. 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 report of the inventory was completed in 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 hunting, capturing, or injuring any marine mammal within the sanctuary boundaries. It also bans the dumping of "contaminated, explosive or electrical materials" and the dredging, drilling, or alteration of the sea bottom in the sanctuary.

Additional measures to protect the calving and breeding habitat of the northwest Atlantic humpback whale population could be taken under the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region. Commission efforts in this regard are discussed in Chapter V.

Northern Right Whale (Eubalaena glacialis)

The northern right whale is the world's most endangered large whale. It occurs in the North Atlantic and North Pacific Oceans and was reduced to exceedingly low levels throughout its range by commercial whaling, which continued into the early 20th century. In the 1930s, commercial hunting of right whales was banned under a series of ad hoc agreements developed by the League of Nations. That ban has been carried forward by the International Whaling Commission since its inception in 1949. Despite this protection, there is no evidence of increases in either the North Atlantic Ocean or North Pacific Ocean populations over the last 60 years.

The largest of the remnant populations is in the western North Atlantic Ocean off Canada and the United States where the best available information suggests that about 350 animals survive. Whaling records dating back to the 16th century indicate that, during the 80-year period between 1530 and 1610, Basque whalers off Newfoundland and Labrador in eastern Canada took between 25,000 and 40,000 whales (about 300 to 500 animals per year). Although some of those animals were bowhead whales, most are believed to have been right whales.

Historically, northern right whales also occurred in the eastern North Atlantic Ocean off Europe. Few, if any, animals appear to remain in that area. In the North Pacific Ocean, right whales may number only a few tens of animals and may be too few to recover. There have been only a few documented sightings of right whales in the North Pacific during the 1980s, and few, if any, of those have involved more than two whales at once.

Right whales spend much, if not most, of their time in coastal waters. All areas known to be inhabited seasonally by right whales in the western North Atlantic Ocean lie over the continental shelf off the eastern United States and Canada and some of those areas are directly adjacent to the coast. For example, the only calving area known to be used regularly by right whales in the western North Atlantic Ocean is in nearshore

waters off Georgia and northern Florida. Most whales sighted during the winter calving period are within five miles of shore, occasionally no more than a few yards from the beach.

Because of their occurrence in coastal waters, right whales are exposed to human activities and environmental pollution more than pelagic species. Of particular concern in this regard are: collisions between whales and ships and disturbance by vessel traffic; entanglement in active and lost and discarded fishing gear and other marine debris; dredging and dredge spoil disposal in important right whale habitat; disturbance by whale watching boats; noise and disturbance from activities associated with offshore oil and gas exploration; oil spills from tanker traffic; and pollution from ocean dumping, municipal outfalls, and industrial discharges.

As described in previous Annual Reports, the Commission has supported several studies and workshops on right whales. Among other things, these efforts sought to improve information on right whale habitat use patterns (e.g., Winn 1984 and Winn et al. 1985 in Appendix B and Brownell et al. 1986 in Appendix C) and to identify research and management needs (e.g., Kraus 1986 in Appendix B and The Georgia Conservancy 1986 in Appendix C). Congress also has recognized the need for better information on the status of and threats to the northwest Atlantic Ocean right whale population. In 1986, it appropriated $500,000 to the National Marine Fisheries Service to develop a research program on northwest Atlantic right whales and each year since then it has appropriated $250,000 to carry that program forward.

As noted in previous Annual Reports, the Commission has recommended on several occasions that the National Marine Fisheries Service constitute a recovery team and prepare a recovery plan for right whales as required by the Endangered Species Act. In response, the Service constituted a Recovery Team in July 1987. Among other things, the Team was asked to review a draft Recovery Plan which the Service had developed and provided to the Team in May 1988. At its initial meeting on 30 November-2 December 1988, the Recovery Team concluded that the Draft Plan would require substantial revisions and additions. It was agreed, therefore, that the Recovery Team would develop and submit to the Service a revised recommended draft recovery plan.

By fall 1989, a draft recovery plan had not been released for agency or public review and, on 19 October 1989, the Commission wrote to the Service asking to be advised as to the Service's schedule for developing and adopting a Recovery Plan. By letter of 14 November, the Service replied, noting that there had been delays in receiving materials from the Recovery Team and that it was exploring ways to expedite the process. At the end of 1989, it was the Commission's understanding that a draft plan would be available for review early in 1990.

Bowhead Whale (Balaena mysticetus)

Bowhead whales occur only in the northern hemisphere where they are circumpolar in distribution. They are associated with ice-bound regions of the Arctic and sub-arctic. Historically, there are believed to have been at least four or five 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 in the western Arctic, where animals migrate seasonally between the Bering Sea and the Chukchi and Beaufort Seas. In recent years, improved information has led to a series of revised estimates of the number of whales in the population. The most recent estimate accepted by the International Whaling Commission at its 1988 meeting was 7,800 animals with a 95 percent confidence interval of 5,700 to 10,600 whales. The population is important to Alaska Natives who continue to hunt bowhead whales for subsistence and cultural purposes. Both the bowhead whale population and the availability of whales to Native subsistence hunters could be affected by offshore oil and gas exploration and development in the Beaufort, Chukchi, and Bering Seas.

Eskimo Whaling

The International Whaling Commission reviews the status of whale populations from which animals are taken for subsistence purposes, including the western Arctic bowhead population from which animals are taken by Alaska Eskimos. Based on the best available scientific information, the International Whaling Commission adopts recommended quotas for subsistence whaling that are implemented by member nations. In the United States, the Secretary of Commerce and the Alaska Eskimo Whaling Commission share responsibility for regulating, monitoring, and enforcing the Alaska Eskimo bowhead whale hunt pursuant to a Memorandum of Understanding signed in 1981. The quotas set under this agreement have been consistent with those established by the International Whaling Commission. The table on the following page identifies the quotas adopted by the International Whaling Commission and the results of the Eskimo hunts since 1977.

Research Planning and Coordination

In December 1977, the International Whaling Commission lifted its total ban on subsistence taking of bowhead whales that had been adopted the preceding June. It did so based, 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 is responsible for planning and implementing this program. Relevant research

Quotas and Number of Bowhead Whales Taken: 1977-1989

Year	IWC Quotas*			Takes by Alaska Eskimos		
	Landings	Strikes		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		23	6	29
1989	41	44		17	8	25
1990 +++	41	44		--	--	--
1991	41	44		--	--	--

* In establishing quotas for both landings and 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 years 1981 to 1983. In any one year, the number landed was not to exceed 17 and the number struck was not to exceed 27.

*** In 1983, a block quota was set on strikes alone for 1984 and 1985 with a one year strike limit of 27.

\+ In 1985, a quota of 26 strikes per year was set for the years 1985-1987. Strikes not used in any one year could be used the following year provided that no more than 32 strikes were made in any single year.

++ In 1987, the IWC modified its 1987 quota to 32 strikes.

+++ In 1988, a quota of 44 strikes or 41 landings was adopted for the years 1989 to 1991. Up to three strikes not used in 1988, 1989 or 1990 may be used the following year.

also has been conducted or supported by the Alaska Eskimo Whaling Commission, the North Slope Borough, the Minerals Management Service, the State of Alaska, and the oil and gas industry.

As noted in previous Annual Reports, the Marine Mammal Commission played a major role in planning and coordinating bowhead whale research. Among other things, the Commission convened an interagency meeting in August 1977 to identify critical research needs. Based on meeting results, it developed and transmitted a recommended bowhead whale research plan to the National Marine Fisheries Service in September 1977. The plan, modified and adopted by the Service in 1977, was the first such plan for bowhead whales. In 1978, the Bureau of Land Management also initiated research on bowhead whales in response to consultations with the Service conducted pursuant to section 7 of the Endangered Species Act on the effects of proposed offshore oil and gas exploration and development activities in the Beaufort Sea.

It appeared that some elements of the Bureau's research program duplicated research planned by the National Marine Fisheries Service. Therefore, between 1978 and 1981, the Commission recommended and helped organize a series of meetings that resulted in coordination of the research programs of the two agencies. In 1982, at the recommendation of the Marine Mammal Commission, the National Marine Fisheries Service assumed responsibility for organizing and convening the bowhead whale research coordination meetings.

In recent years, formal coordination meetings have not been held and it is not clear that everything necessary is being done to ensure that bowhead whale studies continue to be well-designed and properly coordinated. In this regard, on 20 March 1989, the Commission wrote to the National Marine Fisheries Service providing comments on a scientific research permit application involving bowhead whales. During review of the application and discussion of planned bowhead whale research at the Commission's Annual Meeting in Monterey, California, on 23-25 February 1989, questions were raised as to whether the objectives of the proposed study were realistic, given the described study design. Also, given other bowhead whale studies scheduled for the same general time and area, concerns were raised regarding possible cumulative effects of planned research on the bowhead whale population and the annual subsistence hunt by Alaska Eskimos.

The Commission recommended that the Service issue the permit with the condition that the funding agency (the Minerals Management Service), in consultation with the National Marine Fisheries Service, would constitute a Quality Review Board to review the planned study design and recommend modifications as may be needed. The Commission also recommended that the Service's Alaska Regional Director convene a meeting of all

authorized researchers, before the start of the spring bowhead whale research season, to ensure that the various research activities are properly coordinated. The Minerals Management Service subsequently constituted a Quality Review Board as recommended by the Commission. Likewise, the National Marine Fisheries Service organized and held a program coordination meeting before the beginning of the 1989 summer field season.

In 1990, the Commission will consider and advise the National Marine Fisheries Service as to further actions that should be taken to improve the planning, coordination, and conduct of bowhead whale research and monitoring programs.

Bottlenose Dolphin (Tursiops truncatus)

The bottlenose dolphin is the most common cetacean in the coastal waters of the southeast United States. It is also the cetacean species most frequently maintained in captivity for public display and scientific research. Capture of bottlenose dolphins for these purposes began early in the 1900s, and considerable numbers of animals were taken prior to enactment of the Marine Mammal Protection Act in 1972. Since that time, 573 bottlenose dolphins have been collected under permits issued by the National Marine Fisheries Service.

It is unlikely that live captures and removals have caused significant declines in the affected populations. However, a profoundly more disturbing threat emerged in mid-1987 when large numbers of bottlenose dolphins began washing up on the beaches from New Jersey to Florida. Over the next eleven months, more than 740 animals were found dead along the Atlantic coast. This unprecedented mortality may have had significant adverse impacts on bottlenose dolphins in U.S. waters. A discussion of the Commission's activities in 1989 regarding bottlenose dolphins follows.

Die-Off of Bottlenose Dolphins

Prior to 1987, an average of about 12 dead bottlenose dolphins a year washed up on beaches from New Jersey to Cape Hatteras. In June 1987, large numbers of animals began to die and wash up on New Jersey beaches. This unprecedented mortality continued throughout 1987 and into 1988, and moved southward with the seasonal migration of the species.

As discussed in its past two Annual Reports, the Marine Mammal Commission learned of the die-off in July 1987 when unusually high numbers of bottlenose dolphins began to wash 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., at that time a member of its Committee of Scientific Advisors on Marine Mammals and an 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.

Preliminary results of the continuing investigations were reviewed during the Commission's Annual Meeting in Miami, Florida, on 10-12 December 1987. It was apparent that further studies were required to determine whether one or more viruses, environmental pollutants, or natural environmental fluctuations were the primary cause or a factor contributing to the die-off. It also was apparent that further studies were necessary to identify the distribution and patterns of mortality and its impact on nearshore and offshore stocks of bottlenose dolphins and other marine species.

Following its Annual Meeting, the Commission consulted with the National Marine Fisheries Service and others to determine what might be done to expedite the investigation. On 16 March 1988, the Commission wrote to the National Marine Fisheries Service noting that, although it had not been anticipated at the end of 1987, the die-off had continued and that the cause or causes of mortality were still unknown. Therefore, the Commission recommended, among other things, that: (1) the Service appoint a senior scientist to administer the program; (2) all four elements of the program (medicine, environmental correlates, natural history, and population dynamics) be reviewed by involved scientists and independent experts with respect to plans for continuation of the investigation and development of contingency plans, should the die-off resume in the summer; and (3) a second full review be scheduled for sometime in early summer to finalize plans to address a die-off, should one occur again in 1988.

The Service wrote to the Commission on 8 April 1988, responding directly to the recommendations contained in the Commission's 16 March letter. In its letter, the Service stated that it had assigned lead responsibility for the die-off investigation to a senior staff scientist; that a program review would be convened with involved and independent scientists; that attention would be focused on contingency planning, should a similar die-off occur in the future; that other Federal agencies would be invited to participate in the program review; and that the review would be an opportunity for the Service to query what support might be forthcoming.

The cause or biological significance of the 1987-1988 die-off had not been determined by mid-1988 when Congress was addressing reauthorization of the Marine Mammal Protection Act. Therefore, in the amendments to the Act, signed into law on 23 November 1988, Congress directed that the National Marine

Fisheries Service conduct a study to examine: (1) the cause or causes of the epidemic; (2) the effect of the epidemic on coastal and offshore populations of Atlantic bottlenose dolphin; (3) the extent to which pollution may have contributed to the epidemic; (4) whether other species and populations of marine mammals were affected by those factors which contributed to the epidemic; and (5) any other matters pertaining to the causes and effects of the epidemic. No funds were appropriated to the Service for this study.

The amendments required that the Service submit a plan for conducting the study to the Senate Committee on Commerce, Science, and Transportation and the House Committee on Merchant Marine and Fisheries by 1 January 1989. However, because the final report of the die-off investigation was not expected to be completed until the end of January 1989, the Commission, by letter of 6 December 1988, suggested that the Service advise the concerned Congressional Committees of this fact when submitting its required study plan. The Commission also pointed out that, while the forthcoming report was expected to identify the likely cause of the die-off, it would not provide an assessment of the impact of the die-off on the affected population or populations or indicate the follow-up studies that would be necessary to determine how soon the population(s) may recover. The Commission therefore suggested that the Service include in its research plan a study to evaluate the impact of the die-off on the affected populations and the recovery of the populations over time.

A final report on the bottlenose die-off, "Clinical Investigation of the 1987-88 Mass Mortality of Bottlenose Dolphins along the U.S. Central and South Atlantic Coast," was submitted to the National Marine Fisheries Service, the Office of Naval Research, and the Marine Mammal Commission in April 1989. The report concluded that the proximate cause of the die-off was brevetoxin, a neurotoxin produced by the dinoflagellate Ptychodiscus brevis, which causes "red tide." The brevetoxin purportedly made the animals susceptible to a host of bacterial and viral pathogens which ultimately killed them. The report noted that high levels of contaminants (e.g., organochlorines) found in some but not all dolphins also may have made them more susceptible either to the toxin or to the microorganisms that eventually killed them.

By letter of 15 December, the National Marine Fisheries Service reported to Congress on its study of the die-off, addressing the five points specified in the 1988 amendments to the Marine Mammal Protection Act. The Service identified brevetoxin poisoning, complicated by viral and bacterial infections, as the probable cause of the mortalities. The Service noted that, although such a conclusion is a reasonable hypothesis based upon the Response Team's data, the cause(s) of the epidemic had yet to be established conclusively.

The investigation indicated that both coastal-migratory and offshore stocks of bottlenose dolphins may have been affected by the die-off. However, the best available information suggests that the primary impact was on the central, coastal-migratory stock that ranges from Florida to New Jersey. The magnitude of the population declines from the die-off remains uncertain due to a lack of data and imprecision in estimates of natural mortality rates. Nevertheless, the Service estimates that the die-off resulted in a decline in the coastal-migratory stock of more than 50 percent.

Tissues from 143 dolphins were analyzed for organochlorines and heavy metal compounds as part of the Service's investigation. The results were highly variable. Some animals had among the highest levels of PCB contamination ever recorded in marine mammals, while in others, contaminant levels were no higher than those observed in healthy dolphins. Based upon the available evidence, the Service concluded that pollutants were unlikely to have been the proximate cause of the die-off. It is possible that pollutants could have contributed to dolphin mortalities, but, as theorized by Dr. Geraci in his report to the Service, something else, such as a biotoxin, would have had to stress the dolphins and trigger the release of contaminants from tissues where they were accumulated.

The report indicates that the die-off was restricted almost exclusively to bottlenose dolphins. One spotted dolphin and one striped dolphin were the only other marine mammals identified as having died from the epidemic.

The Service indicated in its letter to Congress that it was continuing to investigate the causes and effects of the die-off. The Service is in the process of collecting all specimen materials and test results, which will be deposited with the Registry of Comparative Pathology at the Walter Reed Medical Center. Those materials will be made available to the scientific community for further investigation. The Service also plans to conduct population assessment surveys of the mid-Atlantic bottlenose dolphin stock to determine more accurately the magnitude of the die-off. Other survey programs, including those of the Environmental Protection Agency and the Smithsonian Institution, will be used to monitor the recovery of the stock. In addition, the Service plans to develop a National Marine Mammal Tissue Bank to store samples from stranded and/or incidentally killed marine mammals for future study, particularly with respect to understanding the effects of pollutants and biotoxins upon living marine resources.

Workshop on Biotoxins -- The unusual dolphin mortality and a somewhat similar die-off of humpback whales in Cape Cod Bay in December 1987 (see the Commission's Annual Report for Calendar Year 1988) raised concern that biotoxins might represent a human

health hazard as well as a threat to marine mammals. Therefore, in 1988, the National Marine Fisheries Service initiated a "coast watch" program using weekly satellite data on ocean surface thermal and salinity conditions to monitor red tide blooms reported along the North Carolina coast at that time. In addition, on 8-9 May 1989, the National Marine Fisheries Service and the Woods Hole Oceanographic Institution convened a group of experts at Woods Hole, Massachusetts, to discuss the possible link between natural biotoxins and the recent mass mortalities of bottlenose dolphins and humpback whales along the eastern coast of the United States. The focus of the discussion was on the possible role of dinoflagellate toxins in these events. The objectives of the meeting were to review and assess the existing evidence and to recommend research needs and priorities.

As regards bottlenose dolphins, the Workshop participants concluded that no single pathological disorder could be identified as common to all dead dolphins. The report of the Workshop noted that a compound equivalent to, or at least structurally and functionally similar to, the dinoflagellate neurotoxin brevetoxin was found in the livers of some dolphins that died during the 1987 mortality event. Analyses of several specimens of wild-caught menhaden and specimens from dolphin stomachs also contained a brevetoxin-like compound. This supports the hypothesis that brevetoxin-contaminated food fish instigated the mass mortality by suppressing the dolphins' immune systems, thus increasing their susceptibility to secondary microbiological insults. The participants noted that evidence for this scenario was largely circumstantial and that other explanations were possible.

On the basis of the discussions, the Working Group concluded that implications with respect to marine mammal mortalities, commercial fisheries, and public health were sufficient to justify further investigations into the impact of dinoflagellate toxins on higher trophic levels, and it suggested a series of research and monitoring programs. Specifically, as regards Tursiops populations, the Working Group recommended that tissues be collected from animals stranded on Gulf of Mexico and Atlantic coast beaches or taken incidental to commercial fisheries, that they be analyzed for the presence of brevetoxin, and that funds be allocated for the necessary chemical analyses and assays.

Proposal for Depleted Designation -- 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. Data from animals that died and washed ashore in the summer of 1987

were insufficient to judge when, where, and how many animals might have been affected. Therefore, the National Marine Fisheries Service began a series of coastal and offshore aerial surveys in the fall of 1987 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.

The survey results suggest that only the nearshore bottlenose dolphin population may have been affected by the 1987-1988 die-off and that the impact was substantial. Perhaps 50 percent or more of the population died, and at least some of the survivors were severely debilitated and therefore unlikely to breed. On 11 November 1988, the Center for Marine Conservation petitioned the National Marine Fisheries Service to initiate action to list the mid-Atlantic coastal migratory stock of bottlenose dolphins as depleted under the Marine Mammal Protection Act. In response, the Service, by Federal Register notice of 11 October 1989, published an advance notice of proposed rulemaking and request for comments on the proposal. In the notice, the Service concluded that the coastal migratory stock of bottlenose dolphins in the mid-Atlantic probably declined by more than 50 percent as a result of the 1987-88 die-off. It further stated that, if the stock was determined to be depleted, the Service would prepare a conservation plan for the purpose of conserving and restoring the stock to its optimum sustainable population, as required by the 1988 amendments to the Marine Mammal Protection Act. Such a plan would include: (a) an assessment of the existing and possible threats to the population, such as pollution and commercial fishing,; (b) a discussion of critical information needs such as post die-off abundance indices and stock differentiation, (c) a description of research and management objectives, and (d) a schedule for implementation.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the notice of proposed rulemaking and, by letter of 21 December 1989, forwarded its comments to the National Marine Fisheries Service. In its letter, the Commission indicated that the Service's notice provided a reasonable hypothetical basis for designating the nearshore stock of bottlenose dolphins that appears to migrate seasonally along the coasts of the mid-Atlantic states as depleted. The Commission noted that the Service's rationale for listing the stock as depleted was based largely on a number of assumptions which would be difficult, if not impossible, to verify. In this context, the Commission noted that the Federal Register notice did not indicate what could or would be done to determine when the affected population or populations had recovered and could then be delisted.

In its letter, the Commission pointed out that further studies were needed to: (1) better determine the relationship, if any, between the nearshore and offshore stocks of bottlenose dolphins along the east coast of the United States; (2) determine the present size and productivity of the nearshore stock; and (3) monitor selected indices of the nearshore stock to better determine how it might have been affected by and recover from the unusual mortality of 1987-88.

The Commission noted that, in its opinion, it would be ill-advised to list the nearshore mid-Atlantic bottlenose dolphin stock as depleted without, at the same time, describing the steps that would be taken to verify the assumptions upon which the designation was based and to determine when the population no longer was depleted. The Commission suggested that the conservation plan, required under section 114 of the Marine Mammal Protection Act as amended, would be an appropriate vehicle through which to address, among other things, the assumptions being made by the Service and the uncertainties surrounding how one would determine that the affected stock or stocks have recovered. The Commission recommended that the Service develop a conservation plan for the stock as soon as possible, but before taking final action on the proposed depletion designation, and then act promptly to implement the plan.

At the end of 1989, the Commission was looking forward to receiving and commenting on a conservation plan for the bottlenose dolphin population(s) affected by the 1987-1988 die-off.

Issues Concerning Live-Capture of Dolphins for Public Display and Scientific Research

As noted earlier, capture of bottlenose dolphins for purposes of public display and scientific research began early in the 1900s and as many as 1,800 animals appear to have been taken from coastal U.S. waters prior to passage of the Marine Mammal Protection Act in 1972. In the waters of Florida alone, at least 600 animals were taken prior to 1972. Since that time, an additional 573 animals have been collected from waters off the southeastern United States under permits issued by the National Marine Fisheries Service.

Despite the considerable number of animals that have been removed from U.S. waters, these removals probably have not had a significant adverse effect on the species as a whole. However, the species does not occur uniformly throughout its range and a number of more or less discrete "local" populations may exist. If so, repeated captures and removal of animals from certain geographic areas could have an adverse effect on these local populations. Such effects could be compounded by incidental take in fisheries and by disturbance and environmental degradation

resulting from coastal development, offshore oil and gas development, and other human activities.

The National Marine Fisheries Service is responsible, under the Marine Mammal Protection Act, for assuring that live-capture and removals do not have significant adverse effects on individual bottlenose dolphins or the populations of which they are a part. To help meet this responsibility, the Service, in consultation with the Commission, developed and, in 1977, adopted a system for regulating the number of bottlenose dolphins authorized to be taken annually from specified management areas. The system is based on four assumptions: (1) there are localized populations of bottlenose dolphins in the coastal areas from which dolphins are taken for purposes of public display and scientific research; (2) the populations are at or near historic levels; (3) there are no additional sources of mortality other than natural mortality and live-capture and removal; and (4) the populations will not be reduced below their maximum net productivity (MNP) levels, provided that removals are limited to no more than two percent of the minimum estimated population size.

In 1978, again in consultation with the Marine Mammal Commission, the Service convened a workshop to determine the information necessary to (a) accurately identify and assess the status of populations that may have already been affected by removal of animals, and (b) better determine the number of animals, by age and sex, that could be taken from various management areas without causing possible local populations to be reduced below their optimum sustainable levels. Subsequently, the Southeast Fisheries Center of the National Marine Fisheries Service developed and initiated a long-range program for assessing and monitoring the number, age/sex composition, and productivity of dolphins in areas where past and current collection activities were concentrated.

In November 1988, the National Marine Fisheries Service received a request from Ouwenhands Dierenpark, Rhenen, The Netherlands, for authorization to capture four bottlenose dolphins in the Gulf of Mexico and export them to The Netherlands for public display. As required by the Marine Mammal Protection Act, on 6 February 1989, the Service forwarded the application to the Commission for review by its Committee of Scientific Advisors. Also on 6 February, the Service was petitioned by the Animal Protection Institute of America to hold a public hearing on the Ouwenhands permit application in order to address the unknown cumulative effects of all forms of taking on bottlenose dolphin populations in the Gulf of Mexico. The Service agreed to hold a public meeting on the permit request.

On 12 April 1989, the Commission wrote to the National Marine Fisheries Service commenting on its notice to hold a public hearing on the Ouwenhands application. In its letter, the

Commission noted that information put forward during the hearing may affect this and future permit applications regarding bottlenose dolphins, and the Commission therefore was suspending consideration of this and future applications to take bottlenose dolphins from the Gulf of Mexico until the hearing had been held, the information obtained was evaluated and the Service had completed and provided to the Commission its assessments of: (a) the status of the affected dolphin stocks; and (b) the effectiveness of the Service's special management and research programs to insure that the stocks are not disadvantaged by such taking.

The Commission noted that, among other things, the Service's assessments should include evaluation of: (1) the appropriateness of the geographic management units currently being used; (2) the assumption that each designated management stock is near the upper limit of its optimum sustainable population range and will not be reduced below its maximum net productivity (MNP) level as long as the annual removal from the stock is two percent or less of the minimum estimated stock size; (3) the adequacy of existing stock estimates and monitoring programs; (4) the adequacy of existing incidental take data and planned or proposed report verification programs; (5) the theoretical merits and practical value of the two percent rule; and (6) the possible effects of chase and capture on bottlenose dolphins.

Coincidentally, by letter also dated 12 April 1989, the Service forwarded to the Commission its most recent review of quotas for Atlantic bottlenose dolphins in southeast regional waters. The review included: (1) an updated assessment of minimum population levels for established and proposed quota areas; (2) a review of the current management procedure (the two percent quota rule); (3) a review of the total take by management area and year; and (4) updated quota recommendations. In its letter, the Service noted that it was planning a review of the quota system for removal of Tursiops in the waters of the southeast United States.

Earlier in 1989, the Service had determined that it would be advisable to undertake a detailed review of the bottlenose dolphin research program as part of a broader review of the Southeast Fisheries Center's marine mammal program. A number of issues raised in the Commission's 12 April letter were addressed during the review, held on 2-3 May.

Representatives of the Marine Mammal Commission participated in that meeting. Subsequently, the Commission, in consultation with its Committee of Scientific Advisors, reviewed the background material provided for the program review, including the updated population assessments and revised quota recommendations. By letter of 23 May 1989, the Commission provided comments to the Service. In its letter, the Commission noted that the assess-

ments and related quota recommendations generally appeared to be well founded but that there were a number of issues that required further consideration before a decision was made to adopt the revised quotas as recommended. In particular, the Commission indicated that it would be desirable to: (1) arrange for an independent review of the available survey data and the analyses done to date to insure that uncertainties concerning the data and analyses have been clearly identified and considered appropriately in developing the recommended quotas; (2) review available incidental take data and generate a first-order approximation of the numbers of bottlenose dolphins being caught and killed or injured incidental to commercial fisheries in each of the areas for which live-capture quotas have been established; (3) review available chase and capture data to determine if particular age/sex classes of dolphins, or dolphins in general, are becoming more difficult to find or capture in areas from which dolphins have been or are being taken for public display and scientific research; and (4) identify the research and monitoring programs required to: (a) better determine the relative discreteness and ranges of inshore/offshore and local stocks of bottlenose dolphins along both the Atlantic and Gulf coasts of the United States; (b) obtain reliable estimates of and monitor the numbers of bottlenose dolphins, by age and sex, being taken incidentally by fisheries in and near each of the designated management areas; and (c) better determine and detect 10-20 percent changes in the size and productivity of dolphin stocks subject to live captures and removals and/or incidental take in commercial fisheries.

With regard to point 1, the Commission noted that it believed a review could best be accomplished by convening a workshop of both independent and federal agency scientists. The Commission further suggested that the workshop be convened at the Service's Southeast Fisheries Center in June or July of 1989. In its letter, the Commission also noted that there are uncertainties concerning the reliability of some local abundance estimates and that currently authorized levels of take for scientific research and public display, when combined with incidental take in commercial fisheries, may be exceeding two percent of the minimum population estimate in some areas. Pending completion of the recommended workshop and the assessments outlined in the Commission's letter of 12 April 1989, the Commission recommended that live captures and removals be authorized at existing levels, except in areas where there is reason to believe that the authorized level of take, combined with incidental take in fisheries, might exceed two percent of the minimum population estimate. In those areas, any quotas should be adjusted accordingly.

On 26 June 1989, the Service replied to the Commission's 23 May letter noting that it agreed it was desirable to conduct an independent review of available survey data. It also noted that

such a review could best be accomplished by a workshop of government and non-government scientists involved in work on bottlenose dolphins and that it had therefore established a core review group. However, conflicting schedules of review group members had made it impossible to meet before fall 1989. Therefore, to accelerate review of the survey data, the Service had decided to begin the review process through the mail and had sent relevant materials to the core review group on 8 June 1989. The Service noted that it would respond to the remaining recommendations laid out by the Commission in its 23 May letter in the near future.

On 24 November 1989, the Commission received a letter from the Service, addressing the issues raised in the Commission's letters of 12 April and 23 May 1989. In its response, the Service noted that it was unable to comment on the Commission's question concerning the possible effects of chase and capture on bottlenose dolphin survival and reproduction. It added that it was currently collecting available data and querying permit holders and collectors for information on numbers of animals chased, encircled, and released. Once collected, these data must be analyzed to determine the possible effect of chase and capture on bottlenose dolphin survival. Among others things, the Service noted that it would develop quota recommendations for taking of bottlenose dolphins from management units based on the resolution of the available data by January 1990.

On 28 December 1989, the Commission responded to the Service's 24 November letter. Among other things, the Commission noted that, with respect to monitoring, the program proposed by the Service's Southeast Fisheries Center would allow detection of declines on the order of 40-45 percent over periods of three to five years, but that the Center had not received adequate funding to fully implement the planned monitoring program. The Commission further noted that, whether or not funding is available, a more basic problem was that the proposed program seemed inadequate to verify that authorized removals, by themselves and in conjunction with other removals such as incidental take in commercial fisheries, did not cause any of the affected porpoise populations to be reduced below their maximum net productivity level. The Commission therefore suggested that the Service provide an assessment of the type of program (including cost estimates) that would be required to monitor the affected populations with sufficient precision to detect population declines before such populations can be reduced below their maximum net productivity levels. The Commission also requested that the Service provide an assessment of what it would cost the public display industry if the cost of the population monitoring program were passed on, in whole or in part, to the institutions taking and/or maintaining dolphins for public display.

In its letter, the Commission also noted that uncertainties concerning the numbers, sex, and ages of bottlenose dolphins

being taken incidentally in commercial fisheries in the Gulf of Mexico raise serious questions about the validity of the assumptions upon which live-capture quotas presently are based. In the Commission's opinion, if the uncertainties cannot be resolved, the Service will not be able to justify authorizing any live-captures and removals in or near management units where incidental take may be occurring. In this regard, the Commission suggested that the Service should provide: (1) an assessment of the types and levels of commercial fisheries in and near each of the bottlenose dolphin management units currently in place; (2) an assessment of the best available information concerning the levels of incidental take in each area; (3) descriptions of steps being taken or planned to obtain more reliable information on the incidental take of bottlenose dolphins by fisheries in the Gulf of Mexico; and (4) the estimated costs of the assessments described in items 1 and 2 above.

Gulf of California Harbor Porpoise (Phocoena sinus)

The Gulf of California harbor porpoise is one of the smallest and perhaps the rarest of all cetaceans. Its range appears to be limited to the northern Gulf of California where the estimated population may be as few as 50 to 100 animals. In 1985, the species was designated as endangered under the U.S. Endangered Species Act. Major threats to its survival include incidental take in various net fisheries and degradation of habitat as a result agricultural run-off and sewage flow into the northern Gulf of California and reduction in the flow of the Colorado River.

Since 1986, researchers from the University of California, Santa Cruz, have conducted annual spring surveys (February-May) in the northern Gulf of California. From 1986 to 1988, a total of 99 animals were sighted -- 30 in 1986, 46 in 1987, and 23 in 1988. In September 1989, University researchers carried out an aerial survey of the northern Gulf during which 13 animals were sighted. Gulf harbor porpoise were found in the same areas where they had been sighted during the spring surveys, indicating that animals are present in the northern Gulf in the fall as well as the spring even though water temperatures may be 30 degrees F warmer in the fall.

As noted above, incidental take in fisheries is a major threat to the species. The fishery of greatest concern is the gillnet fishery for totoaba (Totoaba macdonaldi), which operated from the late 1940s until 1975 when it was closed by the Mexican Government to allow recovery of the fish stock. In the spring of 1985, the Mexican Government conducted experimental fishing operations to assess the status of the totoaba stock in the upper Gulf. During this experimental fishery, at least 13 harbor porpoise were caught and killed. Illegal and limited experi-

mental fishing continued in the spring of 1986 and 1987, and at least a few porpoise were taken. Although the directed fishery for totoaba remains closed, the incidental take of harbor porpoise may be continuing because of illegal fishing and a general increase in the use of gillnets and tangle (trammel) nets for a variety of other fish species.

In 1988, researchers from the Center for the Study of Deserts and Oceans and the Universidad Nacional Autonoma de Mexico began a cooperative program, funded by the Center for Marine Conservation, to interview fishermen in the northern Gulf of California. The objectives were to obtain better information on incidental porpoise mortality and to advise fishermen and others of the rare and endangered status of the species.

In September 1989, the results of the study were provided to the Marine Mammal Commission and others. From information gathered during interviews with fishermen, the researchers concluded that: (1) 90 percent (20 of 22) of the porpoise taken incidental to fishing operations were caught in five- and six-inch mesh nets; (2) take occurred from January through August, with most animals caught between March and June; (3) 43 percent of the 14 animals taken in six-inch mesh nets were caught in the area between Adair's Bay and the Colorado River, 36 percent between the Colorado River and San Felipe, and 21 percent in the area of Isla San Jorge and Puerto Penasco; (4) the take in five-inch mesh nets occurred predominately in the area between the Colorado River and San Felipe; and (5) all reported take occurred in waters less than 50 meters deep. The report estimated that the harbor porpoise population in the northern Gulf of California is being depleted at a rate of 32.3 animals per year largely due to entanglement in the nets of totoaba and shark fishermen.

To reduce or eliminate the incidental take of harbor porpoise, the report recommended that: (1) gillnet fishing be prohibited in the northern Gulf of California and/or the shrimp protection zone (i.e., a Reserve Zone established in 1955 to protect spawning shrimp in the upper Gulf of California) be expanded to include waters north of San Felipe and to exclude shrimp fishing and gillnetting with five- and six-inch mesh nets; (2) funds be obtained to buy buoys and mark protected areas; (3) actions be taken to prevent the sale of totoaba, particularly in the United States; (4) efforts be taken to develop alternative sources of income, such as aquaculture, for fishermen in this area of Mexico; (5) fishermen be educated on the danger of over-exploiting Gulf of California marine resources; and (6) a meeting be convened to develop a plan of action.

At the end of 1989, the Commission was reviewing the report to determine actions that might usefully be taken by the United States to assist Mexico's ongoing efforts to protect and encourage recovery of the Gulf of California harbor porpoise.

Hectors's Dolphin (Cephalorhynchus hectori)

Hector's dolphins, which reach a maximum length of about five feet, are one of the smallest cetaceans in the world. They are known only from coastal waters of New Zealand and they are most abundant along the east and west coasts of South Island. Surveys carried out in the mid-1980s indicate a total population size of perhaps 3,000 to 4,000 animals. Females appear to become sexually mature at about seven to nine years of age and bear a single calf every two years at most. Because of its low reproductive potential, small population size, and preference for coastal habitats, the species is particularly vulnerable to potential adverse effects of human activities.

In recent years, Hector's dolphins have been taken in significant numbers incidentally in commercial and recreational gillnets. The problem has been particularly severe in the Banks Peninsula area on the east coast of New Zealand's South Island. Between 1984 and 1988, 223 dolphins were reported killed in that area alone. The greatest number of dolphins have been entrapped in gillnets during the austral summer (November through February) when seasonal movements bring females inshore to bear their calves and when gillnet fisheries are most intense.

In response to this information, the New Zealand Department of Conservation prepared a discussion paper in 1988 identifying and assessing alternative ways to increase protection of Hector's dolphins. In late 1988, the Department selected as its preferred alternative, the establishment of a 1,140 square kilometer marine mammal sanctuary in the waters around the Banks Peninsula. The Sanctuary, named the Banks Peninsula Marine Mammal Sanctuary, and its implementing regulations became effective on 1 November 1989.

Within the Sanctuary, all forms of gillnetting are prohibited during the summer months of November through February when animals are most abundant. During the remainder of the year, when dolphins are much less abundant in inner harbors and bays, the regulations restrict gillnetting to recreational fishermen and impose controls that reduce the likelihood of animals drowning in nets. Specifically, the regulations apply two levels of restrictions depending on location within the Sanctuary. In the upper reaches of the Peninsula's four largest harbors, gillnets may be no longer than 60 meters in length. They can be left unattended between March and October. In all other parts of the Sanctuary, nets can be no longer than 30 meters, may be set only in daylight hours, and must be attended at all times. Throughout the Sanctuary, fishermen are prohibited from carrying more than one gillnet in their boats.

CHAPTER IV

THE *EXXON VALDEZ* OIL SPILL, PRINCE WILLIAM SOUND, ALASKA

Prince William Sound, which lies near the top of the 850-mile arc of the Gulf of Alaska, is one of the largest undeveloped marine ecosystems in the United States with a shoreline of more than 2,000 miles. On 24 March 1989, the pristine character of Prince William Sound was altered, perhaps irrevocably. Shortly after midnight, the tanker *Exxon Valdez,* carrying more than 50 million gallons of crude oil, ran aground and ruptured its hull on Bligh Reef. The result was the largest oil spill in U.S. history. In less than five hours, approximately 11 million gallons of crude oil poured into the sound. Five months later, the oil had contaminated nearly 10,000 square miles of water in Prince William Sound and the Gulf of Alaska. In addition, an estimated 2,045 miles of shoreline were contacted by oil, more than 550 miles of which by heavy to moderate amounts of oil.

Assessment and Mitigation of Impacts on Marine Mammals

At least seven species of marine mammal inhabit or occur seasonally in Prince William Sound. These include the sea otter (*Enhydra lutris*), the northern or Steller sea lion (*Eumetopias jubatus*); the harbor seal (*Phoca vitulina*); the harbor porpoise (*Phocoena phocoena*); Dall's porpoise (*Phocoenoides dalli*); the killer whale (*Orcinus orca*); and the humpback whale (*Megaptera novaeangliae*). In addition, several other marine mammal species, including the gray whale (*Eschrichtius robustus*) and the northern fur seal (*Callorhinus ursinus*), are found in the Gulf of Alaska. Prince William Sound also is an important breeding area for seabirds and provides seasonal habitat for migrating shorebirds and waterfowl. It is one of the most valuable fishing grounds in the United States, both for commercial and recreational fisheries.

At the time of the 24 March oil spill, the *Exxon Valdez* had just left the Valdez terminal en route to Long Beach, California. The 987-foot-long single-bottom tanker was loaded to a draft of 56 feet with 53 million gallons of North Slope crude oil. The collision with Bligh Reef tore open eight of the vessel's 11 cargo tanks and three saltwater ballast tanks. Even after the initial 11-million gallon spill, 80 percent of the ship's cargo remained onboard. A critical account of the oil spill and State and Federal efforts to assess and minimize the damage are

provided in a report, "The Exxon Valdez Oil Spill: A Management Analysis," prepared for the Center for Marine Conservation.[1]

As noted above, the Exxon Valdez ran aground in the early hours of March 24. The Marine Mammal Commission learned about the oil spill later that day. During the next 24 hours, the Commission consulted with representatives of the involved State of Alaska and Federal agencies and others with knowledge of the situation to determine what was being and should be done to assess and mitigate the impacts of the spill on sea otters and other marine mammals.

Within 24 hours of the spill, marine mammal specialists from the Fish and Wildlife Service, the National Marine Fisheries Service, and the Alaska Department of Fish and Game were on site to assess and determine how best to minimize the effects of the spill on marine mammals. Also, on 25 March, a specialist from Hubbs Marine Research Institute, San Diego, California, under contract to Exxon, arrived in Valdez to set up a sea otter rehabilitation facility, and rescue of oiled sea otters began on 29 March. Additional rehabilitation facilities were later established in Seward and Homer.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the situation in Prince William Sound, and, by correspondence dated 4 April and 6 April 1989 advised the Fish and Wildlife Service and the National Marine Fisheries Service, respectively, as to how marine mammals might be affected and what steps should be undertaken to effectively assess and mitigate these effects. In its correspondence, the Commission noted that some effects of the oil spill and related operations could be immediate and obvious while others may be less apparent and could occur over long periods of time. For all species, immediate effects may include mortality or morbidity due to:

-- contact with oil and/or chemical dispersants (most likely to affect sea otters and fur seals that depend on fur for insulation from cold water);

-- inhalation of fumes as volatile components of the oil evaporate (could cause respiratory distress in all species);

-- direct ingestion of oil and dispersants or ingestion of oil-or dispersant-contaminated prey

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[1] "The Exxon Valdez Oil Spill: A Management Analysis," September 1989, by Richard Townsend and Burr Heneman. Available from the Center for Marine Conservation, 1725 DeSales Street, N.W., Washington, D.C. 20036.

(most likely to affect sea otters that could ingest oil in the process of grooming and eating shellfish from contaminated shellfish beds, baleen whales whose food-filtering baleen plates may be fouled by oil and cause large quantities of oil and oil-contaminated food to be ingested, and seals and sea lions that feed on fish that become easier to catch because oiling affects their ability to evade capture);

-- disruption of mother-pup bonds or transport of toxic substances from parent to offspring through the mother's milk and from the skin or fur of an oiled mother (nursing seal, sea lion, and sea otter pups and cetacean calves); and

-- increased vulnerability to predation (sea otters, sea lions, and seals preyed upon by killer whales, sharks, and eagles).

The Commission further noted that long-term effects on all species may include such things as premature pupping, increased incidence of spontaneous abortion, congenital and genetic birth defects, mortality, and morbidity. These could be caused by such things as direct exposure to toxic dispersant and hydrocarbon compounds, eating fish and shellfish that have picked up and accumulated toxic compounds by absorption or ingestion of tainted prey, starvation due to reduction of food supplies, and destruction of kelp beds which may be essential for successful rearing of sea otter pups.

In its letter to the Services, the Commission outlined several different types of required response actions, including:

(1) where possible, animals in danger of death due to contact with oil must be located, cleaned, rehabilitated, and held until fit for release either at the original capture sites once the spill is cleaned up or in new, uncontaminated areas;

(2) beach, boat, and aerial surveys must be conducted to document when, where, and how many animals may have been exposed to spilled oil, and how many were killed or debilitated by the contact;

(3) complete necropsies, including histopathology, toxicological screens, and stomach content analysis, must be done on representative samples of all species found dead in or near areas exposed to oil or dispersants to document cause of death;

(4) directed or opportunistic studies should be done to: (a) test and evaluate possible alternative methods for avoiding oiling and for capturing, handling, cleaning, and rehabilitating oiled sea otters, sea lions, harbor seals, and fur seals; (b) determine how various species behave in the vicinity of spilled oil and containment/clean-up operations; and (c) determine whether various species are more or less likely to eat oil-contaminated or uncontaminated prey; and

(5) long-term (5-, 10-, 20-year) studies must be designed and carried out to determine: (a) the chronic, long-term effects of the spill on various species and key components of their habitat; (b) how the spill affected the demography and reproductive capacity of the various species; and (c) the manner and rate that the affected species and habitats recover from the impacts of the spill and associated activities.

While these comments were deemed applicable to all marine mammals, the Commission noted that the species most likely to be affected by the oil spill was the sea otter, which depends on fur for insulation. The Commission noted that research carried out in 1985 by a Minerals Management Service contractor indicated that oil-contaminated sea otters can be effectively immobilized for cleaning. However, because cleaning removes natural as well as foreign oils, cleaned otters must be dried, kept warm, fed, and given veterinary care to prevent or treat hypothermia, shock, and secondary disease, particularly pneumonia. The Commission further noted that these study results suggest that animals must be kept in holding facilities for at least one to two weeks before release to insure a reasonable probability of survival.

In addition to the fact that the restraint and cleaning techniques being used had not previously been tested under field conditions, the Commission pointed out there were other uncertainties as well. It was not known, for example, whether oiled otters were likely to remain in oil-contaminated areas, haul out on land, or attempt to find and move to oil-free areas. It also was not known whether oiled otters could be captured effectively using standard capture techniques before they were so debilitated that successful rehabilitation would be unlikely; whether there was some critical time period after which rehabilitation efforts were likely to be unsuccessful; and whether otters that died as a result of oil contamination were likely to be found hauled out on remote beaches, floating in the water, or not found at all. Consequently, the Commission pointed out that there was no basis for predicting what proportions of oiled otters were likely to be found, either dead or alive, or for predicting what capture, cleaning, and rehabilitation techniques most likely would be successful.

To resolve these uncertainties, while at the same time capturing, cleaning, and rehabilitating as many oiled sea otters as possible, the Marine Mammal Commission recommended that the Service:

(1) conduct aerial and/or boat surveys to identify areas where sea otters had been and were being oiled and areas where sea otters had not yet been, but were likely to be oiled;

(2) radio-tag and track a representative sample of sea otters in one or more areas where otters had not yet been but likely would be contacted by oil to determine what otters did and where they went after they were oiled (e.g., do they haul out on remote beaches, do they ingest significant quantities of oil while grooming, do they remain at sea and sink or float after death, and are they eaten by eagles or killer whales?);

(3) sample benthic communities in one or more of the selected study areas, before and at periodic intervals after the areas were contaminated with oil, to determine how the quantity and quality of sea otter prey (food) species were affected by the spill and related activities such as the use of chemical dispersants;

(4) consult with scientists familiar with the seasonal distribution and movements of sea otters in Prince William Sound to identify important feeding, resting, and breeding areas that possibly could be protected by deploying oil containment booms, and, where feasible, deploy containment booms to prevent oil from reaching these areas;

(5) develop a contingency plan and obtain necessary authorization to capture and relocate large numbers of otters in the event that the spill approaches high-density sea otter areas in eastern Prince William Sound or the Kodiak/Afognak Island area and thus threatens to jeopardize the continued existence and viability of these sea otter populations;

(6) establish an additional facility or facilities to clean and rehabilitate oiled otters;

(7) secure the services of scientists, technicians, and veterinarians experienced in capturing, sedating, cleaning, and caring for sea otters, to staff the facility(ies), train volunteers, and assist in capture/transportation activities;

(8) make available a sufficient number of boats and aircraft to search for, capture, and transport oiled sea otters (and other marine mammals and seabirds) to designated rehabilitation centers; establish standard procedures for

reporting and responding to reports of oiled sea otters; and evaluate possible alternative methods for capturing, handling, sedating, cleaning, and caring for oiled otters (and other marine mammals).

(9) tag all otters handled with individually recognizable tags, and radio-tag and track a subset of rehabilitated otters to determine what proportion survives and whether any or all of the animals attempt to return to areas where they may again be oiled;

(10) consult with persons with first-hand knowledge of the distribution, movements, habitat requirements, and historic range of sea otters in Alaska to identify areas that may be suitable for releasing rehabilitated otters;

(11) maintain on site a veterinary pathologist to do necropsies and properly prepare and preserve specimen materials for subsequent laboratory examination to document cause or causes of death; secure the services of additional veterinarians experienced in sea otter biology and medicine, as necessary, to assist with rehabilitation efforts and necropsies; collect tissue and stomach content samples, under the supervision of a veterinary pathologist, and provide these to the Fish and Wildlife Service's Veterinary Services Laboratory in Madison, Wisconsin, or other qualified, independent laboratories to conduct histo-pathological and toxicological analyses; and continue such work until there is no evidence that oil or chemicals used to disperse the spill are causing or contributing to sea otter mortality;

(12) collect skulls and reproductive tracts from all otters found dead in or near areas contacted by the oil spill for examination by qualified biologists to determine the ages, reproductive history, and reproductive condition of the animals at the time of death;

(13) identify and periodically survey beaches where sea otter carcass counts have been conducted in the past to gather information on the number of animals dying or washing up dead on these beaches; and compare these data with data collected previously to estimate the increase in mortality rate and total mortality possibly attributable to the oil spill; and

(14) organize and convene a planning meeting or workshop, including outside experts as well as marine mammal biologists from the Fish and Wildlife Service, the National Marine Fisheries Service, the Alaska Department of Fish and Game, and the Marine Mammal Commission, to (a) identify the types of studies needed to document the long-term effects of

the spill on sea otters and other marine mammals, and (b) describe the time, money, and special logistic support needed to do the necessary studies.

In its letter to the Fish and Wildlife Service, the Commission noted that most of the preceding recommendations had been discussed with the Alaska Regional Director the previous week. The Commission emphasized its belief that all haste should be made to bring members of the U.S. Fish and Wildlife Service's California staff and others familiar with the care and handling of sea otters to Alaska to: assist at the existing cleaning and rehabilitation station; establish one or more additional stations; undertake tagging (already authorized under a Marine Mammal Protection Act permit) of sea otters as a part of an experimental effort to determine and better understand the impact of the oil spill; and assist with other activities described above. Subsequently, representatives of the Commission and its Committee of Scientific Advisors visited Prince William Sound to determine what was being done and what more should be done to assess and minimize the effects of the spill on marine mammals.

As provided by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, and the Clean Water Act, the State of Alaska and three Federal agencies -- the Department of Agriculture, the Department of Commerce, and the Department of the Interior -- are acting together as trustees to protect and assess injuries to natural resources resulting from the Exxon Valdez oil spill. The Environmental Protection Agency has assisted the trustees in the damage assessment and coordinating the restoration effort with the State of Alaska. To manage the assessment, the trustees established a Trustee Council, headquartered in Alaska.

One of the responsibilities of the Council is to develop a damage assessment plan. To initiate development of the plan, meetings of State and Federal agency scientists and other experts were held in Anchorage in April 1989 to identify and describe critical information needs. A Commission representative participated in meetings to define information needs relative to marine mammals.

Also, on 21-26 April 1989, the Commission's Scientific Program Director conducted a site visit to consult with representatives of the Fish and Wildlife Service, the State of Alaska, and others involved in the clean-up and damage assessment effort. Following this visit, the Commission, by letter of 12 May 1989, suggested to the Fish and Wildlife Service that it contract with an expert to serve as the Sea Otter Impact Assessment Coordinator. The Commission provided the Service draft terms of reference for the suggested contract. The Service subsequently contracted with a recognized expert on sea otters to carry out this task. In this context, the Service is planning to

hold a workshop in April 1990 to review experience gained as a result of the Exxon Valdez oil spill to determine if it is possible to apply what has been learned toward developing a response plan in the event of a similar oil spill in the future.

On 18 August 1989, the Trustee Council released for comment the public review draft of the State/Federal Natural Resource Damage Assessment Plan and Restoration Strategy for the Exxon Valdez Oil Spill. The assessment included three major components: (1) determination and quantification of injury; (2) determination of damages; and (3) development of a restoration strategy.

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors, reviewed the public review draft and, by letter of 29 September 1989, provided comments on those parts of the plan bearing upon the assessment and mitigation of impacts of the oil spill on marine mammals. In its comments, the Commission noted that, while the draft plan provided a comprehensive overview of the studies required to assess natural resource damage from the spill, it did not contain sufficient information to judge the likelihood that the component studies would, in fact, provide a reliable assessment of natural resource damage or whether the cost estimates were reasonable. The Commission noted, for example, that none of the study descriptions included in the Plan indicated precisely when, where, or how the planned studies would be done. Neither did they identify or indicate the qualifications of the individuals who would be conducting the studies or how the cost estimates were calculated.

To ensure development of the best possible Damage Assessment Plan, the Commission recommended that, if it had not already done so, the Trustee Council: require development of comprehensive project descriptions, including detailed cost estimates; have the detailed project descriptions reviewed by groups of knowledgeable experts not associated with the damage assessment program; and revise the Plan, as appropriate, to take account of the expert review. The Commission further recommended that, if it had not already done so, the Council make arrangements for periodic meetings of the principal investigators of the various studies to facilitate information transfer and cooperative analyses of study results as well as cooperative planning.

With respect to program planning, the Commission noted that it understood that some beaches in areas affected by the spill remained substantially oiled, that oil in beach sediments may leach into adjacent marine areas, and that there likely would be a continuation of clean-up efforts in the spring and summer of 1990. Leaching of oil into marine areas and related containment and clean-up operations may further impact marine mammals, both directly and through food chain effects. This action could

provide an opportunity to verify hypotheses concerning such things as the ability of sea otters, seals, and whales to detect and avoid oil and the effects of noise from containment and clean-up operations on the behavior, movements, and habitat-use patterns of sea otters, seals, and whales. Therefore, the Commission recommended that, if it had not already done so, the Council direct that possible future oiling and containment/clean-up operations be considered and factored into the design of ongoing and planned studies to assess the impacts of the Exxon Valdez oil spill on marine mammals and other components of the ecosystems affected by the spill. The Commission also recommended that, if it had not already done so, the Council make arrangements for information transfer and program coordination meetings and take steps to expand the Damage Assessment Plan or to develop a companion plan to indicate, based on the experience gained from the Exxon Valdez spill, steps that are being or should be taken to be better prepared to respond to future oil spills.

Information available to the Commission at the end of 1989 indicated that at least 1,016 sea otters died as a direct result of the spill. It is likely that at least small numbers of harbor seals and Steller sea lions also died as a direct result of the spill. Although not documented, it is possible that a number of killer whales and other cetaceans may have died as a result of consumption of oil-contaminated prey.

Oil Spill Legislation

In the wake of the Exxon Valdez oil spill, an assortment of bills related to oil pollution was introduced in Congress. Primary among these were S. 686 and H.R. 1465. On 4 August 1989, the Senate unanimously passed S. 686, the Oil Pollution Liability and Compensation Act of 1989. The measure would, among other things, substantially increase liability limits for oil producers, transporters, and refineries; create a $1 billion Federal fund, financed by assessing a per barrel fee, to cover clean-up and other costs; require the Federal government to take charge of clean-up efforts if it determines that the liable parties cannot guarantee the effective restoration of natural resources; establish eight regional oil spill response teams; require the preparation of oil spill contingency plans; provide funds for research and development; and allow states to enact more stringent oil spill laws.

On 9 November 1989, the House of Representatives passed H.R. 1465, the Oil Pollution Prevention, Response, Liability and Compensation Act of 1989, by a vote of 375 to 5. This bill is similar to S. 686 in most respects, but would establish somewhat higher liability limits for oil tankers, require preparation of a fish and wildlife response plan, and, through implementation of

international conventions on oil spill liability, limit, to some extent, the ability of states to impose stricter requirements. A conference committee is expected to meet early in February 1990 to reconcile differences between the two bills. Among the issues to be examined are certain provisions of the tax code that limit coverage from the proposed fund to $500 million per incident and natural resources damages to $250 million per incident.

Several other bills have been introduced in response to the Exxon Valdez spill that would prohibit oil and gas exploration in and/or the transport of oil through marine sanctuaries or other specified marine areas. No action was taken on any of these bills during 1989, but Congress is expected to consider the matter during 1990.

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 Marine Mammal Commission, seek to further the protection and conservation of marine mammals under existing international agreements and take such initiatives as may be 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 1989 with respect to the International Whaling Commission, conservation and protection of marine mammals in the Southern Ocean, 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.

International Whaling Commission (IWC)

During 1989, representatives of the Marine Mammal Commission consulted with the U.S. Commissioner to the IWC and others in preparation for the Forty-first Annual Meeting of the IWC and participated in meetings of the IWC and its Scientific Committee. As discussed below, the Marine Mammal Commission consulted with the National Oceanic and Atmospheric Administration, the Department of State, and others throughout 1989 on matters related to participation of the United States in the IWC.

The 1989 Meeting of the IWC and Its Scientific Committee

Membership and Participation -- Representatives of 28 of the IWC's 41 member nations participated in the IWC's Forty-first Annual Meeting, held in San Diego, California, 12-16 June 1989.

Moratorium on Commercial Whaling -- As noted in previous Annual Reports, the IWC added a new paragraph to its Schedule of regulations in 1982. The new provision (paragraph 10 e) established that, beginning with the 1985-1986 pelagic and 1986 coastal whaling seasons, all catch limits for commercial whaling would be set at zero. The new measure also provided that, by 1990 at the latest, the IWC would undertake a comprehensive assessment of the effect of the zero catch quota on whale stocks

and consider modifying the provision and establishing catch limits other than zero.

Since 1982, no action has been taken at the IWC meetings, including the 1989 meeting, to change this provision. Therefore, catch limits for commercial whaling remain at zero for all stocks of whales. Catch limits for commercial whaling will continue to be set at zero unless and until a three-quarters majority of IWC members votes to modify Schedule paragraph 10 (e).

Two nations, Norway and the Soviet Union, continued to maintain objections to Schedule paragraph 10 (e) during 1989. Under the 1946 Whaling Convention, this action removes the obligation of their respective Governments to comply with the requirements of the provision. However, neither nation engaged in whaling under their objections in 1989. Thus, notwithstanding the killing of whales during the course of scientific research conducted under special permits (see below), all IWC members refrained from commercial whaling in 1989.

As noted below and in previous Annual Reports, the IWC has taken steps to plan for and undertake the comprehensive assessment required by 1990 under Schedule paragraph 10 (e).

Comprehensive Assessment -- At an April 1986 meeting of the IWC Scientific Committee, a recommended work plan and timetable were developed for conducting the comprehensive assessment. The work plan was approved by the IWC that year and, as noted in previous Annual Reports, various workshops and studies have since been supported by the IWC to help provide the basis for undertaking this assessment.

At its 1989 meeting, the IWC Scientific Committee continued to review progress and make recommendations on planning for the comprehensive assessment. Results of its review were provided to a Joint Working Group of the Technical and Scientific Committees on the Comprehensive Assessment, and the reports of both bodies were considered by the IWC at its meeting as discussed below.

Recognizing that a comprehensive assessment could not be completed for all whale stocks in 1990, the IWC agreed that priority attention at and before the 1990 IWC meeting should be directed towards three stocks of whales -- Southern Hemisphere minke whales, North Atlantic minke whales, and eastern North Pacific gray whales.

Adoption of catch limits other than zero will depend, in part, on the existence of acceptable management procedures. Past procedures used by the IWC failed to maintain whale stocks at desired levels and, at recent meetings, it has been the U.S. position that the moratorium provision is currently the preferred management procedure until agreement on a new approach can be

reached. This view is shared by a number of other members, and consideration of new management procedures is therefore being undertaken in conjunction with the comprehensive assessment.

In this regard, the IWC accepted a proposal put forward by its Scientific Committee to establish three broad objectives to guide development of a new management procedure: (1) the risk of depleting a stock below some chosen level (e.g., some proportion of its carrying capacity) must be acceptable; (2) catch limits should be stable over time to allow orderly development of the whaling industry; and (3) catch limits should seek to achieve the highest possible continuing yield from the stock. It was the majority view that highest priority should be given to the first objective and the latter two objectives must be balanced against one another. The Scientific Committee is developing five alternative management procedures and it was agreed that an intercessional workshop should be held in February 1990 to pursue the matter. The Scientific Committee expects to present a recommended management approach to the IWC at its 1991 meeting.

During the 1989 meeting, some members of the IWC suggested that the IWC select one of the five proposed alternative procedures as an interim procedure to establish a catch limit for certain stocks at the meeting in 1990. Most other countries, including the United States, noted that any interim procedure would be inappropriate and disruptive to the process of developing and testing an appropriate procedure. No action was taken with respect to selecting an interim procedure for establishing catch limits other than zero at the 1990 meeting.

The IWC also adopted a number of other recommendations put forward by the Scientific Committee and endorsed by the Joint Working Group on the planning for the comprehensive assessment. Among other things, it was agreed that: an intercessional meeting should be held to carry out a comprehensive assessment of eastern North Pacific gray whales; an intercessional workshop should be held on the genetic analysis of cetacean populations; and, following the 1990 IWC meeting, a special meeting of the Scientific Committee should be held in Reykjavik, Iceland, to conduct a comprehensive assessment of North Atlantic fin whales. Japan appealed for similar consideration of the western North Pacific minke whales. The IWC took note of Japan's appeal, but no action was taken to schedule a stock assessment in 1990 or beyond.

Aboriginal/Subsistence Whaling -- During its 1989 meeting, the IWC adopted the following new aboriginal subsistence catch limits:

-- central north Atlantic minke whales (taken by East Greenlanders): 12 whales in each of the years 1990-1992;

-- West Greenland minke whales (taken by West Greenlanders): a two-year block quota of 190 whales for the years 1990-1991, with a maximum limit of 100 whales in any one year; and

-- West Greenland fin whales (taken by West Greenlanders): a two-year block quota of 42 whales for the years 1990-1991, with a maximum limit of 23 whales in any one year.

No changes were made in aboriginal subsistence catch limits previously established for the Bering-Chukchi-Beaufort Seas stock of bowhead whales taken by Alaskan Eskimos. No more than 44 bowhead whales may be struck or 41 whales landed annually from 1989 to 1991, except that up to three strikes not used in the years 1989 or 1990 may be reallocated to the following year. Previously adopted catch limits also were left unchanged for eastern North Pacific Ocean gray whales taken on behalf of Soviet aboriginal natives and by Alaskan Eskimos (up to 179 whales per year through 1991) and North Atlantic Ocean humpback whales taken by Bequians of St. Vincent and The Grenadines (three whales per year through 1989/90).

Special Permits for Scientific Research -- The IWC's whale conservation program provides that member nations may issue special permits to their citizens to kill whales for purposes of scientific research. However, members also must submit certain information on proposed research activities to the IWC and its Scientific Committee to provide them an opportunity to review and comment on proposed permits. In this regard, the IWC adopted a resolution at its 1987 meeting identifying criteria to be used in reviewing research proposals that involve killing whales, and calling upon members to refrain from issuing special permits for research that does not meet those criteria. Although advice adopted by the IWC in the form of a resolution reflects the majority view of voting IWC members, the rules of the IWC provide that such advice is not binding upon contracting governments.

At the 1989 IWC meeting, Iceland, Japan, and Norway submitted proposed research programs, involving the killing of whales, for review by the Scientific Committee and the IWC. The Icelandic proposal extended a research program that was begun in 1986 and was subsequently modified in response to comments by the IWC and others. Icelandic research considered at the 1989 meeting involved killing 80 fin whales and 10 sei whales. During the course of the meeting, however, representatives of Iceland announced that: Iceland would take no whales for scientific purposes in 1990; it had no plans to take whales for scientific research after 1990; and it would not issue a special permit to take sei whales in 1989.

Taking into account the views of the Scientific Committee and the comments of Iceland's representatives at the meeting, the IWC adopted a Resolution calling upon Iceland to reconsider its proposed take of 80 fin whales in 1989. Following the vote on the Resolution, Iceland's representative announced that, after reconsideration, it had decided to issue a special permit to take no more than 68 fin whales.

With respect to other proposed scientific research programs considered at the 1989 meeting, Japan submitted a proposal to kill 400 minke whales in Area 4 of the Southern Hemisphere, and Norway proposed killing 20 minke whales in the eastern North Atlantic Ocean off Norway. The IWC adopted Resolutions on both the Japanese and Norwegian research proposals by votes of 16 to 6 (8 abstaining) and 15 to 6 (6 abstaining), respectively. Both Resolutions expressed the view that the proposed research did not fully satisfy criteria set forth in earlier IWC Resolutions on scientific research programs and invited the sponsoring governments to reconsider their research programs. (As noted below, Japan submitted a revised proposal to the IWC in October 1989.)

Finance and Administration -- The IWC faces a critical financial situation. In recent years, a number of contracting governments have either not paid or only partially paid their required dues, leaving substantial shortfalls after operational expenses. In the past, the IWC has drawn on reserves in its General Fund to cover the shortfalls. Doing so in 1989, however, would have reduced the fund to a dangerously low level and would have risked insolvency by May 1990.

To avert insolvency in 1990 and carry out the large number of activities critically needed in the coming year, the IWC adopted a budget for 1989-1990 that departed from its typical budget. Among other things, the adopted budget substantially increased members' contributions, set expenditures at levels considered to be minimal, and precluded the possibility of funding further scientific research or rebuilding the General Fund.

Small Cetaceans -- Although the Whaling Convention does not explicitly mention small cetaceans, and some members believe that the IWC has no authority to make recommendations regarding their management, the IWC Scientific Committee has established a small cetacean subcommittee to gather and review information concerning the conservation of these species.

At the 1989 meeting, information was presented by representatives of Japan on the take of Dall's porpoise in the Japanese hand-harpoon fishery. The Committee was advised that the take in this fishery increased from about 13,000 porpoise in 1987 to about 39,000 porpoise in 1988. It was noted that this

increase may have been prompted by the diminished access to large whales after Japan suspended commercial whaling in coastal waters in 1988. The fishery appears to involve at least two stocks of Dall's porpoise whose combined size is estimated to be about 105,000 animals.

In its report to the IWC, the Scientific Committee indicated that it considered it urgent that the catch be reduced at least to the levels of previous years and that assessments of the status of those stocks be carried out to determine safe levels of catch for each stock. The Scientific Committee requested that catch data be collected and reported on a stock-by-stock basis. It also requested that the Republic of Korea be asked to provide data to the IWC on the by-catch of Dall's porpoise (and other cetaceans) taken in its squid gillnet (i.e., driftnet) fishery.

Post-Meeting Activities

Scientific Research Permits -- At its 1987 meeting, the IWC adopted a Resolution on scientific research programs offered by the United States and five co-sponsors. The Resolution: (1) asks the IWC Scientific Committee to review proposed research programs that involve the killing of whales to determine, among other things, if they will provide information necessary to assess the status of affected whale stocks; (2) sets forth criteria to be met by the research; and (3) calls upon IWC members to refrain from issuing or to revoke permits for research that the IWC, taking into account the views of its Scientific Committee, finds inconsistent with those criteria.

The United States has considered failure to follow advice adopted by the IWC in the form of a resolution to be grounds for certification under two provisions of domestic U.S. law, the Pelly Amendment to the Fishermen's Protective Act and the Packwood-Magnuson Amendment to the Magnuson Fisheries Conservation and Management Act.

The two amendments require the Secretary of Commerce to notify the President if he determines that foreign nationals are conducting fishing operations, including whaling, in a manner that diminishes the effectiveness of an international fishery conservation program. Certification under the Packwood-Magnuson Amendment mandates an immediate 50 percent reduction in the offending nation's fishery allocation from U.S. waters. Under the Pelly Amendment, the President has discretion to impose additional economic sanctions by restricting imports of fishery products into the United States from the certified nation. As a result of actions taken at the 1989 IWC meeting, certification under these domestic laws was considered, as discussed below.

Iceland -- As noted above, Iceland's delegation submitted a whale research program for review at the 1989 IWC meeting and the

IWC adopted a Resolution calling upon Iceland to reconsider issuing a special permit to take fin whales. Iceland subsequently announced that, after reconsidering the matter, it would issue a special permit to take only 68 fin whales. It did so and 68 whales were taken from the eastern North Atlantic stock of fin whales in the weeks following the 1989 IWC meeting.

As noted above, Iceland also announced that it would take no whales for scientific research in 1990 and had no plans to take whales for research purposes after 1990. These actions were considered positive steps towards bringing Iceland's research policies into conformance with IWC's conservation program. As a result, the Secretary of Commerce took no action after the 1989 IWC meeting to certify Iceland for its research whaling program.

Japan -- As noted in the previous Annual Report, the Secretary of Commerce certified Japan under the Packwood-Magnuson and Pelly Amendments on 9 February 1988 for authorizing a research program to take up to 330 Southern Hemisphere minke whales. The action was taken after it was confirmed that whales were in fact being taken by Japanese research whaling vessels and while the IWC was in the process of conducting a postal vote on a Resolution (subsequently adopted) recommending that Japan refrain from issuing a special permit for the proposed research.

Under the Packwood-Magnuson Amendment, Japan's allocation of fish from U.S. waters was immediately reduced by 50 percent. Following the recommendation of the Secretary of Commerce, on 6 April 1988, the President directed the Secretary of State to withhold 100 percent of Japan's fishery allocations within U.S. waters, as well as any future fishery allocations. Before considering further sanctions under the Pelly Amendment, the President asked the Secretary of Commerce, in consultation with the Secretary of State, to monitor Japanese whaling practices and to report back to him by 1 December 1988. He also directed the Secretaries to continue consultations with other IWC nations to ensure that all whaling that diminishes the effectiveness of the IWC conservation program, specifically including that conducted under Japan's research program, is brought to a halt.

On 1 December 1988, the Secretary of Commerce advised the President that, despite Japan's submission of a revised research proposal after the 1988 IWC meeting, there had been no significant change in the circumstances that had led to the certification. He advised the President that he therefore was preparing recommendations for further sanctions to encourage Japan to embrace the IWC conservation program. In the winter of 1988-1989, Japan took 241 minke whales in the Antarctic. In consideration of the death of the Japanese Emperor Hirohito and subsequent reorganization within the Japanese Government, the United States did not pursue the issue of sanctions early in 1989.

As noted above, at the 1989 meeting of the IWC, Japan presented a revised research proposal that called for killing 400 minke whales in the Southern Hemisphere. The IWC Scientific Committee agreed that the proposal addressed many of the concerns expressed regarding earlier programs; however, concerns were still expressed regarding the ability of the program to achieve its stated objectives and provide information relevant to the comprehensive assessment. Considering these views, the IWC adopted a new Resolution inviting the Government of Japan to reconsider its research program.

In the fall of 1989, the Secretariat of the IWC received from Japan a revised proposal for the 1990 whale research program. The Secretariat promptly circulated the revised proposal to contracting governments for comment. In mid-November, the Government of Japan advised the United States that its research fleet had left port, headed for the Antarctic whaling grounds. The revised proposal involved killing up to 330 whales (the same number authorized to be killed in the preceding year's program, rather than 400 whales), extended the research period by one month, and increased the study area. In other respects, the revised proposal was substantially unchanged.

The National Oceanic and Atmospheric Administration, in consultation with the Marine Mammal Commission, reviewed the revised proposal and concluded that the proposed modifications did not adequately address the concerns raised by the IWC Scientific Committee at its 1989 meeting. Accordingly, it did not appear to reflect any progress towards embracing the IWC's recommended conservation program.

By December 1989, the Secretary of Commerce had not yet forwarded recommendations to the President regarding possible sanctions against Japan under the Pelly Amendment. In formulating recommendations for the Secretary on this matter, the National Oceanic and Atmospheric Administration elected to advise representatives of the Government of Japan of the above-stated conclusions in hopes that Japan would quickly take steps to bring its research program and future plans in line with the IWC's recommended conservation program. At the end of 1989, no further information had been received from the Government of Japan, and the Secretary of Commerce had not provided recommendations to the President on additional sanctions against Japan under the Pelly Amendment.

Norway -- In 1986, the Secretary of Commerce certified the Government of Norway under the Pelly and Packwood-Magnuson Amendments for exceeding quotas adopted by the IWC for the North Atlantic Ocean minke whales for the 1985-1986 whaling season. Norway's action was contrary to the moratorium provision adopted by the IWC in paragraph 10 (e) of its Schedule of regulations (see above). As discussed in last year's Annual Report, that

certification finding has remained in place pending retraction of a formal Norwegian objection to the paragraph filed with the IWC. However, the President chose not to impose sanctions against Norway under the Pelly Amendment because of an announcement by the Norwegian Government of its plans to suspend whaling indefinitely after 1987.

At the 1988 IWC meeting, Norway submitted information on a proposed research program involving the kill of 35 minke whales in the North Atlantic Ocean. After reviewing the Norwegian research proposal, the IWC adopted a Resolution expressing the view that it did not meet criteria established for research involving the killing of whales and calling upon Norway to refrain from issuing a special permit for the research. After the 1988 IWC meeting, Norway was advised that the Secretary of Commerce would be faced with considering a new certification if Norway proceeded with its proposed research program.

In July 1988, representatives of Norway and the United States met to discuss the details of Norway's research proposal and the questions raised by the IWC. The Norwegians provided additional information on their research and pledged to provide the IWC Scientific Committee with additional information on the rationale, results, and plans for its research program at next year's IWC meeting. That summer, Norway took 29 minke whales as part of its research program.

At the 1989 IWC meeting, however, Norway's performance was unconvincing. Based on the 1988 bilateral discussions, it was the understanding of the United States that Norway would: (a) contribute key scientific papers to the IWC Scientific Committee explaining the rationale for their "ecosystem" research program (e.g., the "multispec" ecosystem model); (b) work within the IWC framework established for reviewing special scientific research permits; and (c) initiate work in 1988 on key research activities which, during the bilateral discussions, were agreed to be the most scientifically important parts of Norway's research program (e.g., direct sampling of whale prey as well as the sampling of prey in the stomachs of the whales themselves).

With the exception of sampling stomach contents, Norway did not indicate it had done any of these things, and the results it presented at the 1989 meeting described neither why the research was needed nor the scientific rationale for its sampling program. As noted above, the IWC again adopted a Resolution expressing the view that its criteria for research involving the killing of whales had not been fully satisfied and calling upon Norway to reconsider its research program. In the weeks immediately following the 1989 IWC meeting, Norway issued a special permit under which 17 whales were killed.

Upon learning that whales were being taken under the research program, the United States advised Norway that a certification finding under domestic U.S. law was being processed. In response, Norwegian officials, at their request, met with U.S. officials, including representatives of the Marine Mammal Commission, on 14-15 September 1989. At the meeting, the Norwegian representatives presented new information on their research program, but they did not indicate whether Norwegian nationals would continue to take whales under the program in 1990.

Further bilateral discussions between the Secretary of Commerce and other Department officials and Norwegian officials were held in November. However, at the end of 1989, results of those discussions had not yet been announced, and no action had been taken to certify Norway for its research whaling program. It was the Marine Mammal Commission's view that actions taken by Norway would support a certification finding under the Pelly and Packwood-Magnuson Amendments.

Review of U.S. Whaling Policy -- Over at least the next two years, the IWC will be conducting a comprehensive assessment to consider, among other things, whether and under what conditions it might be appropriate to establish catch limits for whaling, other than aboriginal subsistence whaling, at levels other than zero. To help assess appropriate U.S. policy in light of present circumstances and expected developments within the IWC, the U.S. IWC Commissioner wrote to the Secretary of State and Secretary of Commerce on 29 September 1989 to recommend that an interagency group be established to review and provide advice on U.S. policy on whaling.

The Secretaries agreed and, by letter of 13 November 1989, the National Oceanic and Atmospheric Administration asked the Marine Mammal Commission and certain other agencies to participate on a Whale Policy Review Task Force. The letter noted that existing U.S. policy has been one of clear opposition to commercial whaling until certain stringent conditions, not yet met by the IWC, have been satisfied, and that, at present, the United States supports continuation of the IWC moratorium on commercial whaling. Recognizing that a continuation of this policy likely will result in escalating political and economic costs to a variety of U.S. interests, the letter noted that it is an appropriate time to carefully examine all relevant considerations.

The first Task Force meeting was held on 14 December 1989. It was chaired by a representative of the National Oceanic and Atmospheric Administration. Other participants included representatives of the Department of State, the Department of Justice, the Council on Environmental Quality, the International Trade Administration in the Department of Commerce, and the Marine Mammal Commission. During the meeting, a tentative schedule of

activities was developed calling for an interagency document based on final Task Force policy recommendations to be provided to the President by the National Oceanic and Atmospheric Administration in the spring of 1990.

At the end of 1989, the Commission looked forward to continued participation on the Task Force and to otherwise assisting in efforts to develop and shape U.S. policies on whaling.

Litigation

On 3 August 1988, environmental and animal welfare organizations filed a lawsuit against the Secretaries of Commerce and State seeking to enjoin an agreement entered into between the United States and Iceland on 22 June 1988. Under the agreement, the United States agreed not to certify Iceland for killing a certain number of whales in its scientific research program in return for certain concessions from Iceland (see previous Annual Report). Among other things, the plaintiffs alleged that the Secretary of Commerce, in entering into the agreement, acted arbitrarily by failing to certify Iceland under the Pelly and Packwood-Magnuson Amendments when, under similar circumstances, he had certified Japan.

The Federal defendants filed a motion to dismiss the case on 14 July 1989. The Government argued that the matter was moot since Iceland's 1988 research whaling program had been completed and a new program, covering 1989, had been adopted. The plaintiffs conceded that they would not challenge the 1989 program. On 17 August 1989, the District Court granted the Government's motion to dismiss on the grounds of mootness, concluding that the exception for claims that are capable of repetition did not apply since plaintiffs did not intend to challenge the 1989 research program.

Conservation and Protection of Marine Mammals in the Southern Ocean

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

In 1972, the Antarctic Treaty Consultative Parties concluded the Convention for the Conservation of Antarctic Seals. This

Convention, which entered into force in 1977, provides for the regulation of commercial sealing, should it resume in the Antarctic. In 1982, the International Whaling Commission agreed to a moratorium on commercial whaling, which took effect in 1986. Although Japan continues to conduct "research" whaling in the Southern Ocean (see the preceding section of this Chapter), neither commercial sealing nor commercial whaling presently poses threats to the continued existence of 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 continuing interest in possible mineral exploration and development pose threats to seals, whales, and other components of the Southern Ocean 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 seals and Antarctic fur seals; Adelie, chinstrap, macaroni, and rockhopper penguins; several other species of 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, and the National Oceanic and Atmospheric Administration, including 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, exploration and development of non-living resources, and related activities in the Southern Ocean. In addition, since 1978, Marine Mammal 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 the Scientific Committee established under the Convention on the Conservation of Antarctic Marine Living Resources.

Background information and a description of activities undertaken in 1989 are provided below.

The XVth Antarctic Treaty Consultative Meeting

The XVth Antarctic Treaty Consultative Meeting was held in Paris on 9-21 October 1989. Delegations from the twenty-five

Antarctic Treaty Consultative Parties and thirteen of the fourteen non-Consultative Parties attended the meeting.[1] Matters considered by the meeting included: comprehensive measures for the protection of the Antarctic environment; revision of the Code of Conduct on Waste Disposal; preventing and minimizing the effects of marine pollution; environmental impact assessment; the Antarctic Protected Area System; and improving the accessibility and comparability of scientific data concerning Antarctica.

Comprehensive Environmental Protection Measures -- At the Preparatory Meeting for the XVth Consultative Meeting, held in Paris on 9-13 May 1989, the delegation of Chile proposed that a special consultative meeting be held in 1990 to consider "comprehensive measures" for the protection of the Antarctic environment. Subsequently, the Government of Australia announced that it would not sign the Convention for the Regulation of Antarctic Mineral Resource Activities (see below) and, with the Government of France, proposed that a special consultative meeting be held in 1990 to negotiate a "comprehensive environmental protection convention" to augment the Antarctic Treaty system.

While there was widespread support at the XVth Consultative Meeting to hold a special consultative meeting, there were differing views on meeting purposes. France and Australia, as noted above, proposed that the meeting initiate negotiation of a comprehensive convention for protection of the Antarctic environment, while Chile, the United States, and other countries proposed that the 1990 meeting be used to identify and determine steps that could and should be taken to overcome deficiencies in the environmental protection provisions of the existing components of the Antarctic Treaty system -- i.e., the Antarctic Treaty, the Agreed Measures for the Conservation of Antarctic Flora and Fauna, the Convention for the Conservation of Antarctic Seals, the Convention on the Conservation of Antarctic Marine

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[1] The signatory countries eligible to participate in the taking of decisions under the Antarctic Treaty (i.e., the Antarctic Treaty Consultative Parties) include: Argentina, Australia, Belgium, Brazil, Chile, China, Federal Republic of Germany, Finland, France, German Democratic Republic, India, Italy, Japan, New Zealand, Norway, Peru, Poland, Republic of Korea, South Africa, Spain, Sweden, Union of Soviet Socialist Republics, United Kingdom, United States, and Uruguay. Signatories not eligible to participate in the taking of decisions under the Antarctic Treaty (i.e., non-Consultative Parties) include: Austria, Bulgaria, Canada, Colombia, Cuba, Czechoslovakia, Denmark, Ecuador, Greece, Hungary, The Netherlands, Papua New Guinea, People's Republic of Korea, and Rumania. Papua New Guinea was the only Antarctic Treaty Party not represented at the meeting.

Living Resources, the Convention for the Regulation of Antarctic Mineral Resource Activities, and the various recommendations adopted to give effect to the Antarctic Treaty. It was agreed that a special consultative meeting would be held in 1990 to explore all proposals for protection of the Antarctic environment.

Revision of the Code of Conduct on Waste Disposal -- At the VIIIth Consultative Meeting held in Oslo, Norway, in June 1975, the Antarctic Treaty Consultative Parties adopted a Code of Conduct for Antarctic Expeditions and Station Activities. Among other things, the Code recommended procedures for disposing of various types of wastes generated by expeditions and station activities.

A number of improvements in technologies and procedures for dealing with waste disposal have been developed since the Code of Conduct was developed. In addition, there is growing recognition that even limited, localized environmental contamination may jeopardize the Antarctic environment and reduce its scientific value as an indicator of the status of global climate and pollution. Therefore, at the XIIth Antarctic Treaty Consultative Meeting (Canberra, September 1983), the Consultative Parties agreed to seek the advice of their respective Antarctic operating agencies concerning the desirability and feasibility of revising the Code of Conduct.

At the XIIIth Consultative Meeting (Brussels, October 1985), the Consultative Parties requested that the Scientific Committee on Antarctic Research undertake a comprehensive review of the Code of Conduct adopted in 1975 and provide advice regarding revisions in waste disposal procedures and standards that would be desirable to achieve at coastal and inland stations and field camps. In response to this request, the Scientific Committee on Antarctic Research constituted a panel of experts to compile and evaluate information concerning existing practices and new technologies. The report of the panel, entitled Waste Disposal in the Antarctic, was provided to and considered by the XVth Consultative Meeting. The meeting adopted a revised Code of Conduct, taking into account the recommendations of the Scientific Committee on Antarctic Research Panel of Experts, and, based upon a U.S. proposal, cast the elements of the Code as obligations which the Antarctic Treaty Parties are bound to enforce. Among other things, the revised Code requires Parties to minimize the amounts of packing and other waste-generating materials transported to Antarctica, to prohibit burning of plastics, rubber products, and other materials that might produce toxic by-products when burned, and to remove batteries, fuel drums, and other such materials from the Antarctic Treaty area after use.

The subject of waste disposal will be considered further at the Special Treaty Meeting to be held in 1990.

Marine Pollution -- As tourist and other activities increase in the seas around Antarctica, there is an increased risk of marine pollution from accidental oil spills, ship wrecks, dumping of garbage and other debris, and normal operations. To minimize the possibility and impacts of marine pollution in Antarctica, the United States proposed and the Meeting adopted a recommendation which calls upon the Antarctic Treaty Consultative Parties to insure that their vessels operating in the Antarctic Treaty area comply with the relevant provisions of: the 1972 Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matters (The London Dumping Convention); the 1973 International Convention for the Prevention of Pollution from Ships, including Annexes I, II, III, and V (MARPOL 73/78); the 1974 International Convention for the Safety of Life at Sea and its 1978 Protocol, the 1978 International Convention on Standards of Training, Certification, and Watch-keeping for Seafarers; the 1976 International Convention on Load Lines; and the 1972 Convention on the International Regulations for Preventing Collisions at Sea. The recommendation also calls upon states party to MARPOL 73/78 to take action in the International Maritime Organization (IMO) to secure formal designation of the waters south of 60 degrees south latitude as a special area under Annexes I and V of MARPOL. In addition, the recommendation calls for the establishment of contingency plans for responding to oil spills and for convening a group of experts, before the regular Consultative Meeting in 1991, to consider and provide advice on the development of contingency plans.

In addition to adopting the marine pollution recommendation, the Parties agreed, in the future, to consider questions of liability for marine pollution damage.

Environmental Impact Assessment -- At the XIVth Antarctic Treaty Consultative Meeting held in Buenos Aires, Argentina, in 1987, the Antarctic Treaty Consultative Parties adopted a recommendation calling upon national organizations responsible for Antarctic activities to carry out environmental impact assessments as part of the planning process leading to new or increased activities in Antarctica. The XVth Consultative Meeting noted the importance of giving effect to this recommendation and endorsed a proposal by the Managers of National Antarctic Programs to hold a workshop on environmental impact assessment procedures in conjunction with their next meeting to be held in July 1990. The meeting also agreed that consultations should be undertaken to develop cooperative programs for monitoring key parameters of Antarctic environments and that consideration should be given to requiring application of environmental impact assessment procedures to all human activities in Antarctica, including tourism. (Recommendation

XIV-2 applies only to scientific and related logistic support activities and is not binding on non-Consultative Parties considering establishment of research stations in Antarctica.)

The Antarctic Protected Area System -- The Agreed Measures for the Conservation of Antarctic Flora and Fauna and other measures adopted by the Antarctic Treaty Consultative Parties provide for the designation and protection of Sites of Special Scientific Interest, Specially Protected Areas, and historic sites and monuments. The XIIIth Antarctic Treaty Consultative Meeting, held in Brussels in 1985, requested that the Scientific Committee on Antarctic Research review and provide advice on the possible need for an additional category of protected area. The response of the Scientific Committee on Antarctic Research was provided in a 1987 report entitled The Protected Area System in the Antarctic. It recommended, among other things, that management plans be developed for Specially Protected Areas, as well as for Sites of Special Scientific Interest, and that an additional multi-purpose category of protected area be added to the existing protected area system.

As noted in the Commission's report for Calendar Year 1987, there was insufficient time at the XIVth Consultative Meeting to fully consider and give effect to the Scientific Committee on Antarctic Research recommendations. In addition, there was insufficient time to fully consider a U.S. proposal to establish a new category of single-purpose protected area, tentatively called "Special Reserves," to provide unambiguous authority for protecting areas of outstanding geological, recreational, scenic, and wilderness value. It was agreed that these matters would be considered further at the XVth Consultative Meeting and that, to facilitate consideration of the Scientific Committee on Antarctic Research recommendation concerning establishment of a new, multiple-use category of protected area, Parties should provide illustrative management plans for areas that might benefit from such land-use planning. To assist in this regard, the Marine Mammal Commission, as noted in its previous Annual Report, organized and held a workshop in November 1988 to describe the biological research program and the measures needed to protect research sites in the vicinity of the U.S. Palmer Station on the Antarctic Peninsula.

At the XVth Consultative Meeting, the United States proposed recommendations: (1) to establish a new, single-purpose category of protected area to provide for the protection of areas of outstanding geologic, scenic, and wilderness value; (2) to require preparation of management plans for Specially Protected Areas as recommended by the Scientific Committee on Antarctic Research; and (3) to establish a new, multiple-use category of Antarctic protected area also as recommended by the Scientific Committee on Antarctic Research. All three proposals were adopted by the XVth Consultative Meeting. In addition, the XVth

Consultative Meeting established three new Sites of Special Scientific Interest and designated the monument to Richard E. Byrd, located at McMurdo Station, and the Antarctic Service Expedition's East Base, Stonington Island, constructed and used by the United States in 1940-1941, as a historic monument and site, respectively.

Development and operation of the Antarctic Protected Area System will be considered further at the Special Antarctic Treaty Consultative Meeting to be held in 1990.

Improving the Comparability and Accessibility of Antarctic Data -- Much of the data currently being compiled by national Antarctic programs may be useful in the future for assessing the possible environmental effects of scientific research programs, fisheries, tourism, and other 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 XIIIth Antarctic Treaty Consultative Meeting requested that the Scientific Committee on Antarctic Research consider and provide advice on steps that might usefully be taken to improve the comparability and accessibility of environmental data regarding Antarctica. Taking into account the subsequent advice provided by the Scientific Committee on Antarctic Research, the XVth Consultative Meeting adopted a recommendation calling for the establishment of an Antarctic Scientific and Environmental Data System and, towards this end, agreed to hold a meeting of government and non-government data management experts, in advance of the 1991 Antarctic Treaty Consultative Meeting, to consider and provide advice on how best to establish and maintain the data system.

Activities Related to 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, concerns that the developing fisheries, particularly the krill fishery, could affect seals, whales, and other non-target species, as well as the target species being caught, led the Antarctic Treaty Consultative Parties to negotiate and adopt the Convention on 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 Antarctic Commission and its Scientific Committee were held in 1982. The Marine Mammal Commission's involvement in negotiation of the Convention and the first seven meetings of the Commission and Scientific Committee established by the Convention are described in previous Annual Reports.

The 1989 meetings of the Commission and Scientific Committee for the Conservation of Antarctic Marine Living Resources were held in Hobart, Australia, on 6-17 November 1989. During the meetings, the Commission and Scientific Committee considered a broad range of issues, including finfish conservation, krill research and monitoring, initiation of a squid fishery, establishment of a system of observation and inspection, assessment and avoidance of incidental mortality, and ecosystem monitoring.

Finfish Conservation Measures -- Vessels from six countries (France, Japan, South Korea, Taiwan, the United Kingdom, and the Soviet Union) fished in the Convention Area during the 1988/1989 fishing season. The total fish catch was 104,397 metric tons, up significantly from the catch of 86,987 metric tons in 1987/1988. Much of the increase was due to a doubling of the catch of Myctophids (small, pelagic schooling fish) from 15,172 metric tons in 1987/1988 to 30,800 metric tons in 1988/1989. There also was a substantial increase in the catch of Dissostichus eleginoides (from 2,855 metric tons in 1987/1988 to 5,824 metric tons in 1989) due primarily to the initiation of a long-line fishery in the area around Shag Rocks. There also was an increase in the catch of Champsocephalus gunnari (from 37,931 metric tons in 1987/1988 to 45,965 metric tons in 1988/1989). Most of the finfish catches, as well as the krill catches (see below), were made by Soviet fishing vessels.

Consideration of conservation measures focused on fisheries in areas around South Georgia Island (statistical subarea 48.3). As noted in previous Marine Mammal Commission reports, both finfish and krill fishing have tended to be concentrated in this area and have resulted in the over-exploitation of several local finfish populations, including populations of Notothenia rossii and C. gunnari. C. gunnari catches have been high and have involved by-catches of other depleted species. For this reason, most members of the Living Resources Commission supported a one- or two-year closure of this mixed species fishery to allow the depleted populations to recover. The Soviet Union opposed such a closure but, as a compromise, agreed to: (a) an 8,000 metric ton Total Allowable Catch (TAC) for C. gunnari in the South Georgia area during the 1989/1990 fishing season; (b) a prohibition on directed fishing for C. gunnari in the South Georgia area between 20 November 1989 and 15 January 1990 and 1 April and 4 November 1990; (c) the prohibition of directed fishing for Notothenia gibberifrons, Chaenocephalus aceratus, Pseudochaenichthys georgianus, and Notothenia squamifrons; and (d) a 300-metric ton limit on the by-catch of Notothenia rossii, Notothenia gibberifrons, Chaenocephalus aceratus, and Pseudochaenichthys georgianus in the South Georgia area. The Commission also adopted a catch limit of 12,000 tons on Patagonotothen brevicauda guntheri, and a new catch reporting system, based upon five rather than ten-day reporting periods. Further, the Commission adopted a resolution urging that all members conducting long-

line fisheries in the Convention Area investigate and, as soon as possible, introduce safety measures to minimize the incidental mortality of seabirds in such fisheries.

Krill Research and Monitoring -- The total catch of Antarctic krill in the Convention Area in 1988/1989 was 382,205 metric tons, up slightly from the 1987/1988 catch of 370,663 metric tons. Most of the catch was from the South Georgia area (381,988 metric tons) and was taken by Soviet fishing vessels (301,498 metric tons). During the 1989 meetings of the Commission and Scientific Committee, Soviet representatives announced that plans were being developed to expand the krill fishery in the Southern Ocean.

It is unlikely that the present level of krill fishing in the Southern Ocean has had any adverse effects on either krill stocks or krill predators, except possibly in the area around South Georgia Island where much of the krill fishing has been focused. Because of the possible local effects, the Commission and Scientific Committee considered imposing a precautionary limit on the krill catch in the South Georgia area. There were differing views as to the need for such a precautionary measure and what would be an appropriate limit. To provide a better basis for considering the matter in 1990, the Commission requested that the Scientific Committee consider and provide the best possible estimate of biomass and potential yield of krill in the South Georgia area and advice on measures that may be needed to protect krill-dependent predators and young and larval fish in the South Georgia area.

It was agreed that the Scientific Committee's Krill Working Group would meet in Leningrad from 27 August-3 September 1990 to continue consideration of measures needed to better assess, monitor, and conserve Antarctic krill stocks. It also was agreed that all krill fishing vessels should record catch and effort data on a haul-by-haul basis; haul-by-haul data should be analyzed after a three-year trial basis to determine whether it can provide a useful index of krill abundance; and acoustic data should be compiled and analyzed to better determine swarm size, number of swarms per unit area, and inter-swarm distance within areas.

Squid Fishing -- An exploratory squid fishery was initiated in the Convention Area in 1988/1989. The fishing was done by two Japanese and one Taiwanese squid jigging vessels operating in statistical subarea 48.3. A total catch of eight metric tons was reported. During discussion of this and related information, the Scientific Committee noted that the species involved, Martialia hyadesi, probably was not present in the Convention Area at predictable times and places, and in sufficient quantities to constitute an important commercial resource and that there

consequently was little likelihood that squid fishing would expand in the Convention Area in the near future.

Squid are important components in the diet of several species of cetaceans, pinnipeds, and birds that occur in the Southern Ocean. It was agreed, therefore, that any further development of a squid fishery should be carefully monitored, that fine-scale catch and effort data should be submitted to the Commission, and that the Secretariat should develop a recommended system for reporting squid jigging catch and effort statistics.

Observation and Inspection -- As noted in the Marine Mammal Commission's previous Annual Report, a Standing Committee was constituted during the 1987 meeting of the Living Resources Commission to help develop and oversee implementation of the system of observation and inspection mandated by Article XXIV of the Convention on the Conservation of Antarctic Marine Living Resources. This Committee met during the 1988 Commission meeting and formulated basic provisions for a system of observation and inspection which subsequently were adopted by the Commission. The Standing Committee met again during the 1989 meetings of the Commission and Scientific Committee. Among other things, it developed: a pennant to identify vessels carrying inspectors; an inspection report form; an inspector identification card; a list of conservation measures currently in effect; and an inspectors' operating manual. Completion of these technical/administrative details permits implementation of the system of observation and inspection during the 1989/1990 fishing season.

Assessment and Avoidance of Incidental Mortality -- Seals, whales, birds, and other marine organisms may be caught and killed incidentally during commercial fishing operations, may be entangled and killed in lost or discarded fishing gear, and may die as a result of ingesting plastic bags and other debris discarded in the Convention Area (see Chapter VI of this Report for more detailed discussions of these problems). The Commission for the Conservation of Antarctic Marine Living Resources has recognized these problems 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.

During the VIIIth meeting of the Living Resources Commission, seven Parties -- Argentina, Australia, Japan, the Republic of Korea, the U.S.S.R., the United Kingdom, and the United States -- reported on ongoing efforts to assess and avoid accidental and incidental mortality of Antarctic marine living resources. Australia reported that it had conducted systematic surveys of the coasts of Heard Island in 1986/1987 and 1987/1988 and of Macquarie Island in 1988 and 1989 to determine the types, quantities, rates of accumulation, and possible sources of marine debris washing up on the islands, and had found a high proportion

of plastic in the debris, including plastic bottles, plastic packing straps, net fragments, and buoys and ropes from bottom trawl and long-line fisheries. The United Kingdom reported finding 208 fur seals entangled in marine debris of human origin on Bird Island, South Georgia, during the 1988/1989 pup rearing season (this represented 0.5 to 1.0 percent of the total population and suggests that as many as 5,000 to 10,000 fur seals may be entangled in marine debris). The United Kingdom also reported that long-line fisheries, such as the one initiated in the Antarctic by the Soviet Union in 1988/1989, may incidentally catch substantial numbers of albatrosses, other seabirds, and marine mammals.

As noted in Chapter VI of this report, gillnets are particularly hazardous to marine mammals and seabirds as well as fish species. Therefore, the United States sought and received confirmation that no members are using or plan to use gillnets in the Convention Area. In this context, representatives of Japan and the Soviet Union indicated that, in their view, there are no fishery resources in the Convention Area that can be caught effectively using gillnets.

The Commission called upon its members to review measures taken to date and to take such additional measures as may be necessary to insure that operators of vessels engaged in fishing and related operations in the Convention Area maintain records and report incidents of incidental catch of marine mammals and birds as had been agreed previously. It requested that the Scientific Committee consider and provide advice on steps that might be taken to better assess and minimize the incidental take of marine mammals and seabirds during commercial and exploratory fishing operations. In addition, it agreed that members who had not already done so would consider and take such steps as appropriate to accept or ratify MARPOL Annex V and to insure that their nationals and vessels operating in the Convention Area comply with the provisions of the Annex.

Ecosystem Monitoring -- The Convention for the Conservation of Antarctic Marine Living Resources requires that fishing and related activities in the Convention Area be managed to prevent irreversible changes in the structure and the dynamics of the Antarctic marine ecosystem as well as to prevent overfishing and depletion of harvested populations. In 1984, the Scientific Committee for the Conservation of Antarctic Marine Living Resources established a Working Group to formulate and coordinate implementation of a multi-national research program to assess and monitor the status of the Antarctic marine ecosystem. Since then, the Working Group has developed and members have begun implementing a long-range program plan with three major components: (1) monitoring of representative krill predators (e.g., Antarctic fur seals and Adelie penguins) at a network of sites throughout the Antarctic; (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. The Working Group also has taken steps to develop standard methods for collecting, and formats for reporting, various types of predator, prey, and environmental data.

The Working Group met for the fourth time in Mar del Plata, Argentina, from 23-30 August 1989. The report of the Working Group, presented to the Scientific Committee at its meeting in November 1989, recommended changes in the long-range program plan and steps that should be taken to improve methods for collecting standard types of data concerning krill predators. The Scientific Committee endorsed the Working Group's recommendations and called attention to the importance of obtaining fine-scale information on krill catches and better information on the energy requirements and foraging ranges of krill predators.

The Working Group will meet from 6-13 September 1990, in Stockholm, Sweden, to continue elaboration of methods for collecting, analyzing, and interpreting ecosystem data.

The U.S. Antarctic Marine Living Resources Research Program

The Antarctic Marine Living Resources Convention Act of 1984 established the domestic authority necessary for the United States to implement the Convention on 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 this directive, the National Marine Fisheries Service has prepared 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, representatives of the U.S. fishing industry, and representatives of interested U.S. environmental groups.[2]

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[2]Details of the National Marine Fisheries Service's Antarctic Marine Living Resources Research Program can be obtained from the Director, Southwest Fisheries Center, 8604 La Jolla Shores Drive, P.O. Box 271, La Jolla, California 92038.

In 1988, responsibility for the National Marine Fisheries Service's Antarctic Marine Living Resources Research Program was transferred from the Service's Laboratory in Narragansett, Rhode Island, to its Southwest Fisheries Center in La Jolla, California. In early 1989, the NOAA ship Surveyor was sent to the Antarctic to conduct oceanographic and fishery surveys in the South Atlantic sector of the Southern Ocean and to provide logistic support for land-based studies of seals and penguins at Seal Island.

To assist in evaluating and updating the Antarctic Marine Living Resources Research Plan, the Southwest Fisheries Center held a strategic planning workshop on 18-20 April 1989. Workshop participants included scientists from other countries conducting marine research in the Antarctic, as well as representatives of U.S. agencies and organizations with interests and expertise in marine resources-related research. On 10 July 1989, representatives of the Marine Mammal Commission, the National Science Foundation, the Department of State, and U.S. environmental groups met with representatives of the Southwest Fisheries Center to review and comment on the product of the strategic planning Workshop.

In November 1989, the National Marine Fisheries Service advised the Marine Mammal Commission and others that it would be sending the NOAA ship Surveyor to the Antarctic again during the 1989/1990 Antarctic field season to conduct oceanographic, phytoplankton, krill, and krill predator studies in the vicinity of Elephant Island. These studies will help to establish the United States as a leader in conducting directed as well as basic research in support of the Living Resources Convention, in addition to providing information needed to effectively implement the Convention.

The Marine Mammal Commission believes that both basic and directed research are essential to effective operation of the Antarctic Treaty System. In 1990, 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 other organizations to facilitate development of both basic and directed marine research programs in the Antarctic.

Activities Related to Non-Living Resources

As noted in previous Commission reports, Arab oil embargoes in the 1970s led to growing interest in potential oil, gas, and other non-living resources in Antarctica. Disturbance, noise, oil spills, and other environmental pollutants possibly 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 Antarctic marine

and terrestrial ecosystems. The Antarctic Treaty Consultative Parties have recognized this possibility and, at the XIth Antarctic Treaty Consultative Meeting (Buenos Aires, Argentina, 23 June-7 July 1981), agreed that an international agreement 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 activities; and (3) governing those activities determined to be acceptable.

Negotiation of the agreement was begun in June 1982 and, following ten subsequent negotiating sessions, was concluded at a session held in Wellington, New Zealand, in June 1988. The agreement -- the Convention on the Regulation of Antarctic Mineral Resource Activities -- provides, among other things, that no mineral resource activities shall take place in the Antarctic unless available information is adequate to conclude that the activities would not have significant adverse effects on wildlife, the Antarctic environment, or the special scientific, historic, aesthetic, and wilderness values of the Antarctic. It provides for the establishment of a Commission to oversee its implementation, regulatory committees to govern mineral resource activities judged to be acceptable, and a Scientific, Technical, and Environmental Advisory Committee to provide advice to the Commission and regulatory committees.

Before the Convention can enter into force, a liability protocol must be negotiated and the Convention must be ratified, accepted, or otherwise approved by 16 of the 22 Antarctic Treaty Consultative Parties that existed at the time the Convention was opened for signature on 25 November 1988. Further, the Convention cannot enter into force unless ratified by all of the countries that maintain claims, or the basis of claims, to territory in Antarctica -- i.e., Argentina, Australia, Chile, France, New Zealand, Norway, the Soviet Union, the United Kingdom, and the United States.

When the Convention was concluded in June 1988, the nations involved in the negotiations agreed to refrain from mineral exploration and development in the Antarctic pending entry into force of the Convention. As noted earlier, the Government of Australia indicated in May 1989 that it would not sign the Convention. If Australia, any other claimant state, the United States, or the Soviet Union fails to ratify the Convention, it will not enter into force. This does not mean, however, that mineral resource activities necessarily would be prohibited.

The Bahia Paraiso Oil Spill

On 28 January 1989, the Bahia Paraiso, an Argentine Navy ship carrying tourists and supplies for Argentine Antarctic

stations, ran aground near the U.S. Palmer Station on the Antarctic Peninsula. The ship sustained major hull damage and was abandoned. On 31 January, the ship floated free, drifted nearer Palmer Station, grounded again, rolled over, and sank, leaving about twenty percent of the ship above the sea surface.

When it grounded, the ship was carrying approximately 200,000 gallons of diesel fuel, 21,000 gallons of JP-1 (a light-weight jet fuel used by the ship's two helicopters), 18,000 gallons of gas oil, and 13,000 gallons of lubricating oil. It also was carrying 450 55-gallon drums of diesel fuel and 217 canisters of compressed butane and propane gas. The tear in the ship's hull allowed oil to seep out. When the ship rolled over and sank on 31 January, barrels of fuel and canisters of gas broke free and floated away.

Personnel from Palmer Station and two tour ships operating in the area -- Society Explorer and Illyria -- assisted in rescuing the 317 passengers and crew from the Bahia Paraiso. Immediately after learning about the accident, the National Science Foundation began organizing an oil spill containment and clean-up effort. Equipment and personnel from the National Science Foundation, the U.S. Navy, the National Oceanic and Atmospheric Administration, the U.S. Coast Guard, and private contractors were flown aboard a U.S. Air Force C-5B air transport from Norfolk, Virginia, to Punta Arenas, Chile, on 1 February 1989. In Punta Arenas, the equipment and personnel were transferred to the Unitd States' research ship Polar Duke for transport to Palmer Station.

Between 4 and 7 February, ships and airplanes from the Argentine and Chilean Navies surveyed the wreck site. The U.S. team arrived on 7 February and initiated clean-up operations. By then, between 125,000 and 150,000 gallons of petroleum products were estimated to have leaked into the marine environment.

Within four days after the ship ran aground, leaking oil covered a 10.5-square-mile area and had washed up on the beaches of all islands within two to three miles of the wreck site. Preliminary observations indicated that the oil killed limpets in exposed intertidal areas and that consumption of oil-contaminated krill resulted in the death of virtually the entire cohort of skua chicks in the area. Unknown numbers of Adelie penguins, cormorants, gulls, petrels, seals, and other marine organisms also were affected.

Oil continues to leak from the ship and to affect marine and terrestrial environments and organisms in the area. The National Science Foundation has initiated a long-term research program to assess and monitor the disposition and effects of the oil. This

effort involves scientists from Argentina and Chile, as well as from the United States.[3]

The Bahia Paraiso was the third ship to sink in the Antarctic since 1980. In December 1981, the Gotland II, an ice-strengthened West German research ship, sank off the coast of northern Victoria Land. In January 1986, the Southern Quest, a private expedition ship, sank near McMurdo Station. The latter two ships were crushed by the pack ice and sank in deep water.

As tourism and other human activities increase in Antarctica, the potential for such accidents increases. Therefore, as noted earlier, it is becoming increasingly important to identify and take such steps as may be possible to avoid and minimize the environmental impacts of such accidents. In 1990, the Commission will work with the Department of State, the National Science Foundation, and other Federal agencies to assist in promoting development of contingency plans and other measures to avoid and minimize pollution of the Southern Ocean.

New International Interest in Antarctica

As noted in previous Commission reports, there is growing international interest in Antarctica. This growing interest reflects, in part, recognition of the unique scientific value of Antarctica and the influence of Antarctica on global climate and weather patterns. The interest also reflects efforts by a number of countries to identify and exploit undeveloped fishery resources in areas not under national jurisdiction, and speculation about potential non-living mineral resources, particularly possible offshore oil and gas resources. In addition, as noted earlier, there is also growing interest in tourism and an increasing tourist industry.

Speculation about possible non-living resources appears to have been a major factor in stimulating an initiative started by Malaysia in 1983 to involve the United Nations in Antarctic matters. In 1989, the "Question of Antarctica" was raised again during the Forty-fourth Session of the United Nations General Assembly. A resolution subsequently adopted by the General Assembly urges all members of the international community to support efforts to ban mineral prospecting and mining in and around Antarctica; expresses the conviction that the establishment, through negotiations with the full participation of all members of the international community, of Antarctica as a nature reserve or a world park would insure the protection and conservation of Antarctica and its dependent and associated

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[3] The information summarized here is derived from reports published in the June 1989 edition of the Antarctic Journal of the United States.

ecosystems for the benefit of all mankind; and also expresses the conviction that there is a need to prevent or minimize environmental impacts resulting from the increasing number of scientific stations and expeditions in Antarctica and that this can be accomplished though the establishment of international stations devoted to scientific investigations of global significance and regulated by stringent environmental safeguards.

The Marine Mammal Commission believes that the Antarctic Treaty and the related agreements that form the Antarctic Treaty system provide the necessary basis for protecting and conserving marine mammals and their habitat in the Southern Ocean. In 1990, the Commission will continue to work with the Department of State, the National Science Foundation, the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, and other Federal agencies to help improve and implement the Antarctic Treaty system. In this regard, the Commission will pay particular attention to evaluating the system in preparation for the Special Consultative Meeting to be held in 1990.

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, which entered into force in 1975, provides an international framework for regulating trade in animals and plants that are or may become threatened with extinction. There are 103 Parties to the Convention, including the United States.

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. Species also may be included on Appendix II if they are similar in appearance to those that may be threatened. 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. 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 Seventh Conference of Parties to the Convention was held on 9-20 October 1989 in Lausanne, Switzerland. The Fish and

Wildlife Service acts as the lead agency on U.S. delegations to such meetings. In preparation for the Seventh Conference of Parties, the Fish and Wildlife Service published a 14 September 1988 Federal Register notice soliciting suggestions for additions, deletions, or reclassifications of species listed on the appendices. In response, the National Marine Fisheries Service proposed that North Pacific fur seals be added to Appendix II and that northern elephant seals be removed from Appendix II.

On 18 May 1988, the National Marine Fisheries Service designated the Pribilof Islands' population of North Pacific fur seals as depleted under the Marine Mammal Protection Act. By Federal Register notice of 31 August 1988, the Service indicated that the population was being considered for listing as threatened under the Endangered Species Act. The decline of the Pribilof Islands' population from 2.2 million in the 1950s to about 800,000 currently led to those actions and also prompted the Service to seek an Appendix II listing for the species.

In proposing the Appendix II listing, the National Marine Fisheries Service noted that fur seal parts taken commercially prior to 1985 under the Interim Convention on Conservation of North Pacific Fur Seals may be traded without restriction. However, the Service stated, international demand for seal bacula (seal sticks) and skins could lead to significant illegal trade. Among other things, the Service noted that: (1) Aleuts have, as recently as 1988, retained seal sticks from the subsistence seal harvest, "apparently intended for sale to Korean importers"; (2) an illegal shipment of fur seal skins from the 1985 subsistence harvest was seized by the Service after the skins were sent to a commercial processor; (3) no inventory of skins and seal sticks taken in the commercial harvest was ever maintained, making it difficult to determine if shipments of fur seal parts entering international trade are legal; and (4) foreign fishermen engaged in high seas driftnet fisheries may be taking substantial numbers of North Pacific fur seals, parts of which have the potential to enter international commerce.

On 1 June 1989, the Commission recommended that the Fish and Wildlife Service, on behalf of the United States, propose to the Seventh Meeting of the Conference of Parties that North Pacific fur seals be added to Appendix II. In doing so, the Commission agreed with the National Marine Fisheries Service that, because seal parts taken in the commercial harvest are indistinguishable from those taken in the subsistence harvest, the potential for illicit trade involving this species is great. In addition, the Commission speculated that a CITES listing may facilitate legitimate trade by enabling Aleuts and others seeking to export seal parts to obtain documentation attesting to the legality of their shipments. It was also noted that listing fur seals on Appendix II may discourage high seas fishermen from engaging in pelagic

sealing or seeking markets for parts from seals that are incidentally taken, and that CITES reporting requirements would yield needed information on the extent of international trade and may provide insight into the numbers of fur seals taken in driftnets.

Accordingly, the proposal to list North Pacific fur seals on Appendix II was among those submitted by the Fish and Wildlife Service for consideration by the Seventh Conference of Parties. Nevertheless, on 11 July 1989, the Service wrote to the National Marine Fisheries Service, suggesting that "some of the intended purposes of this potential listing might be accomplished better in other ways." In addition, the Fish and Wildlife Service asked for "specific documentation ... that trade may be occurring that rises to a level threatening the existence of the [species]." The Fish and Wildlife Service also recommended that greater efforts should be made to obtain data on the extent of the take of fur seals in high seas driftnet fisheries and that existing stocks of legal (pre-1985) seal parts be documented.

Questions regarding the advisability of listing fur seals on Appendix II were raised in comments submitted to the Fish and Wildlife Service by the State of Alaska, Alaska Natives, and at least one environmental group. These questions were precipitated, in large part, by a critique of the proposal prepared by a National Marine Fisheries Service scientist, which presented contrary information on the present status of the Pribilof Islands' pupping colonies, the levels of incidental take in high seas driftnet fisheries, and the potential for parts from incidentally taken seals entering into trade.

After reviewing this new information, the Commission, on 5 October 1989, wrote to the National Marine Fisheries Service pointing out the need for a detailed summary and analysis of recent fur seal population data, an assessment of the existing and potential future demand for fur seal skins and bacula, and further analysis of the possibility that incidental taking in high seas fisheries could lead to a directed fishery or to entangled animals being killed and retained. In light of the limited time available to provide this information, the Commission recommended to the National Marine Fisheries Service that: (1) the listing proposal be withdrawn; (2) the National Marine Mammal Laboratory provide a detailed description and analysis of data on the status and trends of the Pribilof Islands' fur seal population through at least 1988; and (3) a workshop be held in advance of the next research season to review the population and other assessments done by the Laboratory staff. While recommending that the Appendix II listing be deferred, the Commission advised the Fisheries Service that a listing on Appendix III may be warranted, pending re-evaluation of the Appendix II proposal.

Coincidentally, also on 5 October 1989, the National Marine Fisheries Service provided additional population data and other information to the Fish and Wildlife Service in support of the proposed listing. Nevertheless, it requested that its proposal be withdrawn to allow more time for reviewing unresolved concerns as to whether and under which Appendix a listing would be appropriate and to consult with interested groups and individuals. In response, the Fish and Wildlife Service informed the CITES Secretariat that it was withdrawing the fur seal proposal.

On 12 December 1989, the National Marine Fisheries Service responded to the Commission's 5 October letter. In its response, the Service stated that there have been no significant changes in population parameters since its 1988 determination and that no additional reports or workshops are needed until its fur seal conservation plan is completed. The Service indicated that it was considering the possibility of proposing an Appendix III listing, but that it would, as the Commission had recommended, consult with interested parties before taking any action. In addition, the Service explained that, because the Appendix II proposal was not withdrawn until just before the Conference of Parties meeting, most parties came prepared to vote on it.

As noted in the previous Annual Report, in 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. Because there is no known international trade in this species, the National Marine Fisheries Service again in 1989 recommended the deletion of northern elephant seals from Appendix II. The species occurs in Mexico as well as in the United States and, during the Seventh Session, Mexico's Director General of Ecological Conservation and Natural Resources expressed opposition to delisting. Therefore, the Fish and Wildlife Service chose not to propose the delisting.

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, commonly known as the Cartagena Convention, is part of the Caribbean Environment Program, one of eleven Regional Seas Programs developed and sponsored by the United Nations Environment Program. Regional Seas Programs seek to protect marine resources and habitats that are vulnerable to human activities by encouraging regional nations to commit financial and human resources to cooperative research and management programs. Each Regional Seas Program

includes an action plan that outlines 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.

As noted in the Commission's previous Annual Report, the Action Plan for the Caribbean Environment Program was developed and approved in 1981. The Cartagena Convention, which provides a complementary legal framework for the Action Plan, was concluded in 1983 and entered into force in 1986. Sixteen nations have ratified or acceded to the Convention and its Protocol on combating oil spills. At the end of 1989, 35 states and territories were participating in the Caribbean Environment Program.

The Convention calls for cooperation in controlling marine pollution from ships, from land-based and atmospheric sources, from man-made structures at sea, and from activities involving exploration and exploitation of the seabed; protecting and preserving rare and fragile ecosystems and the habitat of depleted, threatened, and endangered species; responding to emergencies caused by pollution; assessing the potential impacts of proposed activities on the environment and notifying any nation that could be affected by such impacts; and cooperating in scientific and technical matters, especially in 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 it. To date, only one Protocol has been adopted. It provides for cooperation among 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, and endangered species" by establishing protected areas. When the Convention was concluded in March 1983, a resolution was adopted calling upon the Parties to adopt 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 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 (now the Center for Marine Conservation),

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 Guadeloupe meeting, the contracting parties noted the draft protocol prepared by non-governmental organizations and agreed that it would be desirable to develop a protocol on specially protected areas and wildlife in the wider Caribbean region. They also agreed that it would be desirable to develop a protocol on land-based sources of pollution. Further, the U.S. delegation called attention to the need to increase awareness of the problem of ship-generated marine debris and the need to amend the existing protocol on oil spill emergencies to include other types of hazardous substances.

A meeting of experts was held in St. Croix, U.S. Virgin Islands, on 24-26 October 1988 to draft a protocol on specially protected areas and wildlife for consideration at the second meeting of contracting parties held in Mexico City in 1989. Commission efforts to assist in preparing for the St. Croix meeting are described in its previous Annual Report. Although progress was made, the St. Croix meeting did not produce an agreed text. It therefore was agreed that a second meeting of experts should be held in April 1989 to complete a protocol text that could be considered at the October 1989 meeting of contracting parties.

To assist in preparing for the April 1989 meeting, the coordinator of the Caribbean Environment Program requested that the United States and other Parties to the Cartagena Convention comment on the draft protocol text developed by the October 1988 meeting of experts. Following consultations with the Commission and other interested agencies, the State Department provided comments on the draft text by letter of 14 January 1989. The coordinator of the Caribbean Environment Program subsequently prepared and circulated a revised draft protocol.

The second meeting of experts, originally scheduled to be held in Kingston, Jamaica, on 10-14 April, was delayed until 19-23 June 1989. To assist in preparing for the meeting, the Commission reviewed and, by letter of 26 May 1989, provided comments to the State Department on the revised draft protocol. In its letter, the Commission noted, among other things, that the draft text appeared to give unusual authority to the United Nations Environment Program's Regional Coordinating Unit and that proposed provisions regarding establishment of a scientific and technical advisory committee should be revised to clarify the functions and organization of the advisory committee.

Comments provided by the Commission, other Federal agencies, and non-governmental organizations were used by the Department of

State to prepare positions on various issues discussed during the 19-23 June 1989 meeting of experts. Although agreement was not reached on all points, the second meeting of experts developed a text which most members believed could be used as the basis for concluding the protocol at the meeting of the Cartagena Convention Contracting Parties, scheduled to be held in Cartagena, Colombia, on 23-26 October 1989.

Non-governmental organizations have made substantial contributions to efforts to draft and adopt the protocol on specially protected areas and wildlife. For example, the National Wildlife Federation, Chelonia Institute, and Monitor International hosted a meeting on 18 September 1989 involving representatives of non-governmental organizations and Federal agencies. The purpose of the meeting was to identify and exchange views on steps that might be taken to facilitate conclusion and implementation of the protocol. Commission representatives participated in the meeting and subsequently consulted representatives of non-governmental organizations to help identify and determine how best to cooperatively resolve deficiencies in the revised draft protocol.

The meeting of contracting parties scheduled for October in Colombia was cancelled and now is scheduled for 10-12 January 1990 in Kingston, Jamaica. In preparing for this meeting, the Department of State consulted with the Commission and other interested Federal agencies to identify changes in the revised draft protocol that would be necessary or desirable before the protocol could be accepted by the United States. By letter of 5 December 1989, the Commission noted a number of drafting as well as possible substantive problems that merited consideration prior to the January meeting. Among other things, the Commission noted that the draft protocol raised questions as to what, if anything, it would obligate parties to do, in addition to that which they are obligated to do by their own domestic laws and regulations. Conversely, the Commission also noted that certain provisions in the draft protocol could be interpreted to impose prohibitions on taking listed species that would be more restrictive than those established by the Endangered Species Act, Marine Mammal Protection Act, and other relevant U.S. laws. The Commission also suggested that the United States propose and seek a meeting of government experts be held within a year after signature of the protocol to identify and begin work on priority issues that will have to be considered by the scientific and technical advisory committee to be established when the protocol enters into force.

At the end of 1989, the Commission was continuing consultations with the Department of State and other Federal agencies to prepare for the 10-12 January meeting to conclude the protocol. Among other things, the Commission was preparing a list of marine mammal species and populations that should be afforded special protection under the protocol.

CHAPTER VI

IMPACTS OF MARINE DEBRIS

The tendency of marine mammals, seabirds, 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, other problems resulting from marine debris have become apparent. These include ingestion of plastic bags and other plastic objects by marine animals and the fouling of beaches, shorelines, and coastal waters by all types of flotsam. Problems caused by plastic debris exist throughout the world, but the situation is particularly acute in certain ocean areas. For example, in the North Pacific Ocean, debris-related injuries and mortality may have contributed 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 assess and reduce the extent of the problem for marine mammals and other species. Past efforts are discussed in detail in previous Annual Reports. Activities undertaken by the Commission and others during 1989 are discussed below.

Background

Since the early 1950s, plastics have become commonly used for more and more purposes. Because most plastic products degrade slowly and many are made for only one-time use (e.g., plastic bags and bottles), they have contributed to an increase in the amount of plastic debris accumulating in the marine environment. Those items that float may be suspended at the sea surface for extended periods of time, those that sink may remain intact on the sea floor for years or even decades, and still others may remain suspended at different depths in the water column.

As the amount of such debris increases, so too does its threat to marine mammals, seabirds, 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, that 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 erroneous perception that chance encounters between marine animals and debris would be unlikely, and an absence of large numbers of marine animals strangled, drowned, starved, or choked by marine debris being found on beaches or at sea. However, plastic debris may be concentrated by 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 associated prey species attracted by the cover it provides, because it represents an object of play, or because the debris itself resembles natural prey. Thus, encounters between certain marine species, or age groups within species, and marine debris may be relatively common. At the same time, evidence of such encounters may not be readily apparent because animals affected at sea are likely to be scattered by their own movements between the time they become entangled or ingest debris and die, and because they may be consumed by predators, decompose, or sink.

By the early 1980s, it was becoming apparent that the threat to marine life from plastics and other marine debris was far greater than had been realized. Initial concern focused on entanglement of North Pacific fur seals, but it soon became clear that other species, including endangered Hawaiian monk seals, were being killed or injured due to entanglement and ingestion of debris.

As the extent of the problem became apparent, the Marine Mammal Commission took a number of steps to address the issue and initiate an effective response. In 1982, the Commission urged the National Marine Fisheries Service to convene a workshop to assess the extent of the marine debris pollution problem and to identify possible solutions. Frustrated by the Service's lack of responsiveness, the Commission subsequently drafted the terms of reference for the workshop and provided the initial funds.

Thanks to these efforts and the competent work of the staff of the Service's Honolulu Laboratory, the International Workshop on the Fate and Impact of Marine Debris was held on 27-29 November 1984 in Honolulu, Hawaii. The Workshop was the first attempt to carry out a thorough review of the marine debris problem. Its findings, discussed in previous Annual Reports, alerted many governmental and non-governmental groups to the problem and prompted Congress to begin appropriating money to the National Marine Fisheries Service in 1985 to develop and implement a responsive program. These efforts have been carried forward by the Service since then as the Marine Entanglement Research Program.

Over the past decade, the Commission also devoted substantial effort in other areas. For example, it worked closely with the State Department, the Coast Guard, and the National Marine Fisheries Service to secure U.S. ratification of Annex V of the International Convention for the Prevention of Pollution from Ships (see below) which prohibits disposal of plastics into the sea from ships. The Commission also helped the Service develop the initial plan of activities undertaken in the Marine Entanglement Research Program. From its own budget, the Commission has supported various research and study activities designed to address the problem.

Domestic Activities in 1989

During 1989, the Commission continued to help strengthen domestic programs to address debris-related problems. In particular, it continued to work with the National Marine Fisheries Service to develop and implement the Marine Entanglement Research Program and it helped the Coast Guard to develop the domestic program to implement MARPOL Annex V.

The U.S. Marine Entanglement Research Program

As noted earlier, Congress has appropriated funds to the National Marine Fisheries Service since 1985 to support efforts to resolve problems created by marine debris. In appropriating those funds, Congress directed that the Service obtain the concurrence of the Marine Mammal Commission on how those funds were to be spent. Thus, in 1985, the Commission, in consultation with the Service, developed a program plan outlining priority tasks to be undertaken during the first year of work. Since then, the Commission has reviewed annual plans drafted by the Service to carry that program forward. The approved plans have been carried out as the Service's Marine Entanglement Research Program.

In Fiscal Year 1985, Congress appropriated $1,000,000 to the Service for the first year of work. For each of Fiscal Years 1986 and 1987, Congress appropriated $750,000 to the Service and, for each of Fiscal Years 1988 and 1989, it appropriated $706,000. The reduction in 1988 was due to the requirements of the Balanced Budget and Emergency Deficit Control Act.

In June 1988, the Marine Mammal Commission participated in a meeting convened by the Service to review the status and results of research undertaken to date and to identify priority tasks for funding in Fiscal Year 1989. Based on results of the meeting, the Service forwarded a proposed program plan to the Commission in December 1988. The Plan proposed allocating $702,700 among 21 tasks, including 13 continuing research projects and eight new research tasks. On 23 December 1988, the Commission advised the

Service that, with one exception, it concurred with the proposed task descriptions and recommended that they be implemented.

The exception involved support for a task to monitor high seas squid driftnet fishing. The Service proposed placing U.S. observers aboard foreign commercial squid fishing vessels in the North Pacific Ocean to monitor fishing areas, times, catch rates, bycatch, gear loss, etc. The placement of observers had been arranged during negotiations with Japanese officials in the winter of 1987-88. However, it was the Commission's understanding that those agreements had been voided by subsequent developments prohibiting Japanese salmon driftnet vessels from fishing in U.S. waters. Therefore, in its 23 December letter, the Commission asked the Service if the proposed work were still possible, and, if the study had to be revised or funds reallocated, to provide the Commission descriptions of work to be supported with funds previously directed towards the squid driftnet monitoring study.

On 13 February 1989, the National Marine Fisheries Service confirmed that earlier arrangements had been voided, and it recommended supporting different tasks related to the high seas driftnet fisheries. The revised work proposed four sub-tasks: placing U.S. observers aboard two commercial squid driftnet vessels; participating in cooperative research cruises with the Republic of Korea, Taiwan, and Canada; participating in a research cruise of the R/V Townsend Cromwell; and continuing cooperation and negotiations on data management, analysis, and reporting with the governments of nations operating driftnet fleets in the North Pacific Ocean.

On 28 March 1989, the Commission, in consultation with its Committee of Scientific Advisors, responded to the Service's new proposal. The Commission noted that observer coverage of high seas driftnet fishing would be expanded significantly if ongoing negotiations with foreign governments were successful, and that funding for the expanded program would have to come from sources other than the Marine Entanglement Research Program (see Chapter VII). The Commission agreed, however, that collecting and analyzing data on high seas driftnet fishing in the North Pacific Ocean was urgently needed and, therefore, as an interim measure, it concurred with the recommended allocation of funds to support this task.

On 6-7 July 1989, the Service convened a meeting in Seattle, Washington, to begin planning for the Fiscal Year 1990 Marine Entanglement Research Program. Representatives of the Commission participated in the meeting and, based on its results, the Service developed a proposed Program Plan that was sent to the Commission for review on 22 November 1989. The Plan recommended allocating $706,000 among 18 tasks. On 22 December 1989, the Commission, in consultation with its Committee of Scientific

Advisors, wrote to the Service noting that the proposed projects and funding levels for Fiscal Year 1990 appeared appropriate and recommending that the Plan be implemented.

Under the Fiscal Year 1990 Program Plan, eight projects begun in previous years will continue: (1) education and public awareness efforts; (2) production of marine debris education program supplies; (3) support for the national beach clean-up database; (4) monitoring and destroying accumulations of marine debris hazardous to Hawaiian monk seals in the Hawaiian Islands National Wildlife Refuge; (5) surveys of entangling debris on Alaska beaches; (6) studies of juvenile male fur seal entanglement in marine debris; (7) the National Seashore Marine Debris Survey Program; and (8) monitoring entanglement of pinnipeds in the California Channel Islands National Park and National Marine Sanctuary.

In addition, the following new tasks will be supported with Fiscal Year 1990 funds: (1) designing and implementing model port/marina projects in Puerto Rico and convening a symposium to assess project results and marine debris issues in the Gulf of Mexico and Caribbean Sea region; (2) evaluating economic costs and impacts of marine debris; (3) convening a workshop to assess techniques to reduce loss rates and impacts from lost fishing gear; (4) developing a handbook on methodologies to gather information on the types, amounts, and distribution of marine debris; (5) undertaking an information outreach project to disseminate information on marine debris to environmental/solid waste agencies and environmental groups in coastal states; (6) developing advice on port reception facilities and shipboard incineration that could be used to supplement the guidelines established by the International Maritime Organization on implementing Annex V of the International Convention for the Prevention of Pollution from Ships; (7) evaluating physical and physiological effects of plastics ingested by loggerhead sea turtles; (8) assessing the likelihood of loggerhead turtles interacting with marine debris in the North Atlantic Ocean; and (9) studying the fate and impact of lost gillnets off the northeast United States.

The Marine Plastic Pollution Research and Control Act of 1987

The U.S. ratified Annex V of the International Convention for the Prevention of Pollution by Ships, commonly referred to as MARPOL, on 31 December 1987. The Annex establishes international standards for regulating the disposal of garbage from ships, a major source of marine debris in the world's oceans. The provisions of Annex V prohibit the disposal of plastics by ships at sea, set discharge limitations for other types of ship-generated garbage, and require that port reception facilities be provided to receive garbage returned to shore. As discussed in

previous Annual Reports, the Commission worked closely with other Federal agencies and the Congress to secure its ratification.

As part of the ratification process, the U.S. Senate unanimously adopted a Resolution on 5 November 1987 providing its advice and consent. In doing so, the Senate noted that Annex V provided for designating "Special Areas" in which dumping of all garbage, except for food wastes, is prohibited beyond 12 nautical miles from land. Because of particularly severe marine debris problems on Texas beaches and because large numbers of endangered sea turtles occur in the Gulf of Mexico, the Senate included an understanding in its Resolution that the U.S. Government would make every reasonable effort to seek designation of the Gulf of Mexico as a Special Area under the Annex.

In addition, because existing U.S. law did not provide clear authority to regulate disposal of garbage by ships as set forth in Annex V, Congress had to pass implementing legislation. This need was addressed by H.R. 3674, which was passed by the House of Representatives and the Senate on 18-19 December 1987. Title II of the bill, entitled the "Marine Plastic Pollution Research and Control Act of 1987," amended the Act to Prevent Pollution from Ships and provided the needed authority in the United States to implement Annex V requirements. The bill was signed into law by the President on 29 December 1987 and became effective on 31 December 1988, the date on which the provisions of Annex V entered into force.

The U.S. Coast Guard has responsibility for administering and enforcing the amendments to the Act to Prevent Pollution from Ships that relate to Annex V. To help implement the new requirements, the Coast Guard published a Federal Register notice on 24 June 1988, announcing its intent to draft related rules and requesting comments. The notice indicated that the Coast Guard would not consider rules related to "Special Area" status for the Gulf of Mexico until that designation, which would require amending Annex V, had been formally adopted under MARPOL.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the Federal Register notice and sent comments to the Coast Guard on 25 July 1988. As noted in the 1988 Annual Report, the Commission recommended, among other things, that: the term "disposal" be defined to include the loss of garbage into the sea due to improper handling and storage aboard ship as well as intentional disposal; large ports and marinas serving vessels using only U.S. waters be required to obtain Certificates of Adequacy for their port reception facilities; and operational guidelines on handling, processing, and storing garbage aboard ship be developed to facilitate the use of procedures and technology that would enhance compliance with Annex V and the amended Act. The Commission also advised the Coast Guard that it was cooperating with the National Ocean

Pollution Program Office to support a review of information on marine debris in several areas, including the Gulf of Mexico and the Caribbean Sea, that would be useful when considering designation of the Gulf as a "Special Area" under Annex V.

On 27 October 1988, the Coast Guard published proposed rules to implement the amendments to the Act to Prevent Pollution from Ships relating to Annex V. The proposed rules addressed most of the Commission's comments although they did not require Certificates of Adequacy for large ports and marinas servicing commercial and recreational vessels that only ply U.S. waters. On 28 April 1989, the Coast Guard published interim rules that became effective on 30 May 1989 to implement MARPOL Annex V. Comments on those rules were accepted by the Coast Guard through 31 December 1989. In 1990, it is expected that the interim rules, perhaps with some modification, will be adopted as final rules.

The interim rules apply to all U.S. ships (except certain government-owned and operated ships) wherever they operate throughout the world. They also apply to any foreign flag ships when in navigable waters of the United States or within the U.S. 200-mile Exclusive Economic Zone. The term "ship" includes commercial vessels, fishing vessels, recreational boats, and virtually every other type of craft, as well as oil drilling rigs, and offshore platforms. The rules also apply to ports and terminals in that they must provide facilities to receive ship-generated garbage.

Among other things, the rules prohibit the disposal of all plastics from ships into the oceans or navigable waters of the United States. This includes synthetic ropes and fishing nets, plastic bottles and cups, plastic bags, or any other garbage in which these items are mixed. The rules also adopt discharge limitations for other types of ship-generated garbage. These are set forth in the table on the following page.

Garbage that cannot be legally discharged at sea must be returned to shore. Therefore, as noted above, the interim regulations also require U.S. ports and terminals to provide adequate port reception facilities to receive and properly dispose of garbage generated by the ships using that port. In this regard, the rule requires certain larger ports to obtain a Certificate of Adequacy from the Coast Guard. The purpose of the Certificate is to ensure that the larger ports have the equipment and services needed to handle the types and amounts of garbage brought in by the vessels it serves.

The ports that must obtain Certificates include those that service: oceangoing tankers or ships larger than 400 gross tons carrying residues and mixtures of oil; oceangoing ships carrying noxious liquid substances; and fishing vessels that off-load more than 500,000 pounds of commercial fishing products annually.

SUMMARY OF GARBAGE DISCHARGE LIMITATIONS UNDER
THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (1973/1978)
AND THE UNITED STATES ACT TO PREVENT POLLUTION FROM SHIPS AS AMENDED

Garbage Type	All Vessels		Offshore Platforms and Associated vessels[3]
	Outside Special Areas[1]	Inside Special Areas[2]	
Plastics - includes synthetic ropes and fishing nets and plastic bags	Dumping Prohibited	Dumping Prohibited	Dumping Prohibited
Dunnage, lining, and packing materials that float	less than 25 miles from nearest land	Dumping Prohibited	Dumping Prohibited
Paper, rags, glass, metal bottles, crockery, and similar refuse	less than 12 miles from nearest land	Dumping Prohibited	Dumping Prohibited
Paper, rags, glass, etc., comminuted or ground[4]	less than 3 miles from nearest land	Dumping Prohibited	Dumping Prohibited
Food waste not comminuted or ground	less than 12 miles from nearest land	less than 12 miles from nearest land	less than 12 miles from nearest land
Mixed refuse types	More stringent requirements apply	More stringent requirements apply	More stringent requirements apply

1. Under the Act to Prevent Pollution from Ships, discharge limitations in the United States apply within all navigable waters, including rivers, lakes, and other inland waters.
2. Special Areas are the Mediterranean, Baltic, Red, and Black Seas and the Gulfs area.
3. Offshore Platforms and associated vessels include all fixed or floating platforms engaged in exploitation or exploration of seabed minerals resources and all vessels alongside or within 500 m of such platforms.
4. Comminuted or ground garbage must be able to pass through a screen with a mesh size no larger than 25 mm.

Although other ports and marinas also must provide facilities to receive and dispose of garbage generated by the vessels that use them, they are not required to obtain a Certificate of Adequacy.

When the Coast Guard published its interim regulations, it reserved three sections under which it intended to propose additional requirements at a later date. The three reserved sections addressed record-keeping requirements, vessel waste management plans, and the posting of placards aboard ships. On 6 September 1989, the Coast Guard published a notice of proposed rulemaking under the three reserved sections and requested comments.

In its notice, the Coast Guard proposed the following requirements for ships documented in the United States: ocean-going ships 70 feet or longer that engage in commerce must keep records of garbage discharges; oceangoing ships 40 feet or longer that are equipped with galleys and berths and engage in commerce must maintain a waste management plan on board; and all ships 26 feet or longer must prominently post information placards to advise crew and passengers of the restrictions and fines regarding the disposal of plastics and other garbage.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the proposed rule and, on 2 November 1989, provided comments to the Coast Guard. It noted that the proposed rules should help reduce the amount of potentially hazardous marine debris that might otherwise enter the ocean and it expressed its full support for adopting them.

With respect to the proposed record-keeping requirements for ships longer than 70 feet, the Commission recommended that either a new section be added to the regulations to ensure that vessel operators record certain types of data (including, at a minimum, the date, location, and method of discharge as well as the type and quantity of garbage discarded) or that the format of the record books be established to ensure the entry of that data.

International Activities in 1989

Plastic debris enters the world's oceans from ships and shores of all coastal nations. Much of this pollution may drift with ocean currents hundreds or thousands of miles from its point of origin. Therefore, to successfully address plastic debris pollution will require international cooperation. To facilitate appropriate action, the Commission, in cooperation with other agencies and organizations, undertook the following actions in 1989.

The Second International Conference on Marine Debris

As noted above and in previous Annual Reports, the National Marine Fisheries Service convened a Workshop on the Fate and Impact of Marine Debris in November 1984. The initial recommendation, planning, and seed money for the Workshop was provided by the Marine Mammal Commission. The Workshop results prompted Congress to appropriate funds to the National Marine Fisheries Service (see above) and encouraged other agencies and organizations in the United States and elsewhere to take steps to address the problem of marine debris.

In view of the many efforts undertaken in the wake of the workshop, the Marine Mammal Commission recommended to the National Marine Fisheries Service late in 1986 that it begin planning a second international conference on marine debris to review and summarize progress and to identify and direct future efforts. The Service agreed and, in March 1988, it convened a Steering Group, which included a representative of the Commission, to organize the conference.

To assist the Steering Group, the Commission recommended terms of reference for the conference, an agenda, and key participants. The Commission also provided partial support which included, among other things, funds for a professional rapporteur for the Conference and for report preparation.

The Second International Conference on Marine Debris was held on 2-7 April 1989 in Honolulu, Hawaii. Sponsors, in addition to the Marine Mammal Commission and the National Oceanic and Atmospheric Administration, included: the Canada Department of Fisheries and Oceans; the Council for Solid Waste Solutions; the Intergovernmental Oceanographic Commission; the National Coastal Resources Research and Development Institute (USA); the Pacific Rim Fishing Industries; Sea Grant Colleges, University of Hawaii; the State University of New York at Stony Brook Marine Sciences Research Center's Waste Management Institute; the University of Hawaii, School of Ocean and Earth Science and Technology; the Environmental Protection Agency; the Fish and Wildlife Service; the Minerals Management Service; and the U.S. Navy.

The Workshop was organized into technical sessions and working group sessions on each of seven broad areas. During the technical sessions, scientists, resource managers, industry representatives, and others presented formal papers on recent research and management activities. In the working group sessions, experts evaluated the status of information and activities related to their particular topic and recommended areas needing further work. The seven topics included: assessments of the types and amounts of marine debris; entanglement of marine life and ghost fishing; ingestion of

debris by marine life; economic impacts; solutions through technology; law and policy; and information and education.

At the end of 1989, the Conference proceedings and final Conference report were in preparation. The following is a preliminary summary of some of the Conference findings and conclusions.

The Working Group on methods to assess the amounts and types of marine debris reviewed the various methodologies currently used to survey debris floating at the sea surface, washed up on beaches, and resting on the sea floor. The Group noted that there have been significant differences in methodologies used by investigators to collect, record, and analyze data on marine debris. To make maximum use of dedicated research efforts and to encourage opportunistic collection of useful data by other researchers, the Working Group recommended that a procedures manual be prepared setting forth instructions on preferred ways to carry out surveys of marine debris floating at the sea surface, resting on the sea floor, and stranded on beaches. In order for surveys to provide results useful for monitoring trends in the types and amounts of debris in the environment, it was recommended that regional networks of long-term study sites be established (especially within MARPOL Annex V Special Areas).

The Working Group on Entanglement and Ghost Fishing concluded that, based on anecdotal evidence, at least a few individuals of virtually all species of large marine animals become entangled in marine debris occasionally. The most severe entanglement problems, however, appear to involve the endangered Hawaiian monk seal and many otariid seals (i.e., sea lions and fur seals), particularly young animals. As regards entanglement of marine turtles and seabirds in marine debris, the Group concluded that there is no evidence of problems comparable to the level of effects caused by incidental entanglement in active fishing gear or losses of nesting habitat.

The Working Group recommended, among other things, that efforts be continued to monitor, remove, and destroy lost or discarded nets or other debris hazardous to monk seals, sea turtles, and other marine life in the northwest Hawaiian Islands, and that efforts be continued to monitor the numbers, survival, breeding success, and incidence of entanglement of North Pacific fur seals. It also recommended that the impact of entanglement on right whales in the northwest Atlantic Ocean and Kemp's ridley turtles in the Caribbean Sea be investigated.

Because of the very large amount of fishing gear now in use and the increasing use of non-degradable materials, the Working Group concluded that ghost fishing (i.e., the continued catch of fish, invertebrates, and other species by fishing gear that is lost or abandoned) is a potentially serious problem. It also

concluded that traps and gillnets pose the greatest problem in this regard and that trawl nets and longlines present a lesser threat. Mitigation of ghost fishing by traps was considered technologically simple due to the availability of time-failure mechanisms to release trap panels.

To address ghost fishing problems, the Working Group recommended, among other things, that: (1) fishery agencies conduct simulation studies using different types of fishing gear to determine the extent to which the gear can cause ghost fishing, and the species affected; (2) steps be taken to develop and require time-failure mechanisms for crab and fish traps in fisheries known or suspected to have ghost fishing problems; and (3) further studies of pelagic gillnets be conducted to assess the rates at which they ball up and the length of time they pose a significant entanglement hazard to marine life.

The Working Group on Ingestion of Debris concluded that, regardless of taxa, there appear to be three general categories of possible ingestion effects: mechanical blockage or injury of the digestive tract; lessening feeding drives by filling stomachs and providing a false sense of satiety; and absorption of toxic chemicals from plastics. The Working Group recommended that sea turtles be accorded highest priority with respect to ingestion research and that studies be undertaken to assess the range and significance of plastic induced pathophysiological effects (e.g., correlating lesions in the digestive tracts of turtles with the prevalence of plastics in the gut). Regarding birds, the Group recommended that studies be undertaken to determine: (1) if plastics can induce a false sense of satiety; (2) the retention time and erosion rates of ingested plastics; and (3) if ingested plastics pose any toxic threat.

The Working Group on Economic Impacts of Marine Debris concluded that, in view of the need to change human behavior, incentive schemes may be an appropriate and cost-effective way to control marine debris pollution if education and moral suasion are insufficient. The Group proposed a list of projects to investigate the use of fees and incentives, including: deposits on non-degradable products; fees on the use of non-degradable materials; and incentives at the production level. The Working Group also recommended that studies be undertaken to assess economic costs associated with debris on beaches, entanglement of wildlife, ghost fishing, damage to vessels and fishing gear, and possible lost or diminished sales of seafood due to consumer perceptions of pollution problems prompted by marine debris.

The Working Group on Technological Solutions concluded that further work is needed to define the types and amounts of marine debris returned to port due to Annex V requirements. However, it felt that technologies and methodologies now exist to manage most of the wastes generated at sea. The Group recommended that data

on the types, quantities, and distribution of plastic materials returned to port be collected and provided to the plastics industry to encourage consideration of recycling alternatives. The Working Group also recommended that new ships be designed to accommodate at-sea management strategies for ship-generated garbage, and that studies be undertaken to determine air emissions from low technology burning. Given the return of ship-generated garbage to shore for disposal, the Working Group also recognized that, in many areas, satisfactory resolution of the issue will be linked to resolving terrestrial waste disposal problems.

The Working Group on Law and Policy also concluded that solutions to marine debris problems should be developed and implemented in concert with efforts to address broader solid waste management issues and that the key to compliance with the provisions of Annex V will be the availability of port reception facilities to off-load garbage. The most pressing needs identified were: (1) expanding participation in relevant international agreements, particularly MARPOL Annex V; (2) assuring that adequate port reception facilities are available at all ports and harbors to receive ship-generated garage; and (3) adopting national policies and programs, such as recycling and innovative packaging, to reduce quantities of generated solid waste.

Among other things, the Working Group recommended that parties to MARPOL consider expanding advice in the International Maritime Organization's Guidelines on implementing Annex V as they relate to port reception facilities (see below). It also recommended that the International Maritime Organization and parties to MARPOL Annex V develop incentives to encourage vessel owners and operators to comply with garbage disposal regulations and that vessel owners and operators be encouraged to report ports and harbors that do not have required port reception facilities.

The Working Group on Education assembled and reviewed a comprehensive list of education materials on the marine debris issue. It concluded that the greatest need was to improve distribution of those materials to appropriate groups. In this regard, the Working Group identified five broad target audiences: the general public; the media; teachers and educators; school children; and marine user groups. To reach commercial fishermen and recreational boaters, the Group suggested including education material in government mailings for fishing licenses or boat registrations.

Annex V of the Convention for the Prevention of Pollution from Ships

As noted in previous Annual Reports, Annex V of the MARPOL Convention was opened for signature by acceding nations in 1978. On 31 December 1987, when the U.S. submitted its instrument of ratification, the criteria necessary for the Annex to enter into force (i.e., ratification by at least 15 nations representing 50 percent of the world's commercial shipping tonnage) were met. After an additional one-year period during which acceding nations ensured that implementing programs were in place (i.e., on 31 December 1988), the provisions of Annex V became binding on signatory parties.

The Marine Environment Protection Committee of the International Maritime Organization is the international body responsible for overseeing international cooperation regarding the implementation of MARPOL Annex V and its regulations governing the disposal of garbage from ships. At the request of the State Department, the U.S. Coast Guard heads U.S. delegations to periodic Committee meetings, which are held at the International Maritime Organization headquarters in London.

As noted in previous Annual Reports, the Marine Mammal Commission assisted the Coast Guard in efforts to encourage and provide advice to the Marine Environment Protection Committee on this issue. Among other things, the Commission drafted U.S. papers describing the problem and needed actions submitted by the Coast Guard to the Committee. It also drafted portions of the Guidelines for implementing Annex V which were subsequently put forward by the United States and adopted by the Committee. The Commission also assisted efforts to seek U.S. ratification of the Annex and, as indicated above, has helped develop responsive domestic programs.

28th Session of the Marine Environment Protection Committee -- In the years after Annex V was opened for signature but before the necessary ratification criteria had been met, possible changes to strengthen its provisions were identified. However, it was agreed that any action to amend the Annex would be deferred until after it had entered into force. This understanding was reached because several nations already had ratified Annex V and any changes could necessitate repeating the ratification process in those countries and ultimately delaying its entry into force.

Annex V became effective on 31 December 1988 and, at the 28th session of the Marine Environment Protection Committee convened on 17 October 1989 in London, two amendments identified after the Annex was opened for signature were considered for adoption. One amendment, which was proposed by Belgium, Denmark, Federal Republic of Germany, France, Norway, Sweden, and the

United Kingdom, called for adding the North Sea to the list of Special Areas under regulation 5 of Annex V. The other amendment, put forward by the United States, proposed deleting language that provided an exception in the Annex to the plastics disposal prohibition. The exception allowed at-sea discharge of net fragments generated during the repair of nets by fishermen.

During the 28th session, both amendments were adopted unanimously. Unless objected to by one-third or more of the parties, the amendments will be deemed to be accepted on 17 August 1990 and will enter into force on 18 February 1991. Special Area designation for the North Sea will establish more stringent discharge limitations for garbage in that area and the deletion of the exception for the discharge of net fragments will improve protection of marine life which might otherwise become entangled in such wastes.

Consideration of the Gulf of Mexico as a Special Area under Annex V -- As noted above, when the U.S. Senate gave its advice and consent on Annex V, it did so with an understanding that the U.S. Government would take every reasonable effort to seek an amendment to the Annex designating the Gulf of Mexico as a Special Area. The effect of that designation is indicated by the discharge limitations under the new U.S. regulations developed to implement Annex V provisions (see table on page 125).

As of 1986, a thorough review of available information on marine debris problems in the Gulf of Mexico and certain other areas of concern to the United States had not been conducted. Therefore, the Marine Mammal Commission and the National Ocean Pollution Program Office in the National Oceanic and Atmospheric Administration cooperated to support a study to help address this need. The result was a study of published and unpublished information on the sources, amounts, types, distribution, and effects of persistent debris in the northwest Atlantic Ocean, the Wider Caribbean Area and the west coast of Baja California, Mexico. The report was completed in 1988 (see Heneman 1988 in Appendix B) and provided to the Coast Guard to, among other things, help with efforts to pursue designation of the Gulf of Mexico as a Special Area.

To help further considerations on designating the Gulf of Mexico as a Special Area, the Commission also wrote to the U.S. Ambassador to Mexico on 21 June 1989. In its letter, the Commission referenced the serious litter problem on beaches along the U.S. Gulf of Mexico coast, particularly in Texas, and the Senate's understanding on the matter in its Resolution giving advice and consent on Annex V. The letter requested the Ambassador's help in persuading Mexico, which was not a party to MARPOL, to accede to the Convention and to Annex V so that the Gulf can be so designated.

During the 28th session of the Marine Environment Protection Committee, representatives of the delegations from the United States and Mexico met informally and discussed the proposed designation of the Gulf of Mexico as a Special Area under Annex V. Based on those discussions, it was the understanding of the U.S. delegation to the meeting that the Government of Mexico will support the designation and that, as a first step, it was considering the feasibility of ratifying the MARPOL Convention.

On 1 December 1989, the Gulf of Mexico Program Office of the Environmental Protection Agency distributed a report summarizing technical information supporting the designation of the Gulf of Mexico as a Special Area under Annex V. The document noted the high volume of ship traffic in the area, the large amounts of garbage associated with those ships, and physical oceanographic conditions which tend to concentrate marine debris in certain areas of the Gulf. The report further noted that, together, those factors placed many valuable living resources, including seabirds, endangered sea turtles, and commercially valuable species, at risk.

Based on comments received, the document will be modified as necessary and submitted as a background document to the next meeting of the Marine Environment Protection Committee for its consideration with respect to designating the Gulf of Mexico as a Special Area.

Port Reception Facility Guidelines -- For the 24th Session of the Marine Environment Protection Committee in February 1987, the Commission, in consultation with the National Oceanic and Atmospheric Administration and the Coast Guard, drafted a paper that was submitted on behalf of the United States recommending that Guidelines be developed to provide advice on steps to implement Annex V. The paper was well-received and the Committee adopted the recommendation. After the meeting, the Commission helped the National Oceanic and Atmospheric Administration and the Coast Guard draft a set of recommended guidelines, which were put forward for consideration at the 25th Session of the Committee. The draft Guidelines were well-received and, with some modifications, they were adopted during the Committee's 26th session in September 1988.

The "Guidelines for the Implementation of Annex V, Regulation for the Prevention of Pollution by Garbage from Ships" adopted by the Committee provide vessel owners and operators, port operators, and responsible government officials with practical advice on procedures, equipment, and matters related to compliance with the requirements of the Annex. However, because little information was available on port reception facilities for garbage when the guidelines were developed, advice on that matter was less extensive than might have been desired.

During the Second International Conference on Marine Debris in April 1989, much new information was presented on experiences in developing port reception facilities for garbage. Much of that information had been developed under National Marine Fisheries Service Marine Entanglement Research Program. Given the new information and the amount of additional information expected in the near future due to initial experiences in implementing Annex V, the Conference Working Group on Law and Policy recommended that the Marine Environment Protection Committee review its Guidelines with a view towards providing additional advice on ways to develop effective port reception facilities.

On 25 September 1989, the Marine Mammal Commission, in consultation with its Committee of Scientific Advisors wrote to the Coast Guard expressing its view that this recommendation had considerable merit. It noted that, while discharge limitations are clearly the heart of Annex V, broad compliance likely will depend on: (a) educating seagoers as to the need for and provisions of the restrictions, and (b) making compliance as easy as possible by ensuring the availability of convenient port reception facilities. In this context, Annex V requirements and the related section of the Guidelines for port reception facilities are particularly crucial.

Therefore, to ensure that the best possible advice is provided to encourage and guide development of port reception facilities for garbage, the Commission recommended that the Coast Guard raise the need to strengthen advice on this matter at the 29th Session of the Marine Environment Protection Committee scheduled for 12-16 March 1990. To help in this regard, the Commission drafted and enclosed with its 25 September letter to the Coast Guard, a paper which it suggested be submitted by the U.S. delegation for consideration at the Committee's March 1990 session.

The draft paper reviewed new information related to port reception facilities for garbage and noted the importance of strengthening advice concerning: administrative arrangements and procedures for setting up and operating port reception facilities; the types and costs of equipment for receiving and handling ship-generated garbage in port; space requirements and siting considerations for port reception equipment and storage; recovering operating costs; educating port users on the availability and use of port reception facilities; and projecting the amounts and types of garbage likely to be returned to port. To help provide that advice on these matters, the suggested paper recommended that the Committee consider the need to expand the port reception facility section of its Guidelines for Annex V. It also recommended that the Committee ask member governments to provide information on their experiences in developing such

facilities so that it could be considered within the context of the need to expand this section of the Guidelines.

By letter of 20 November 1989, the Coast Guard responded noting that it was in the process of evaluating the proposed draft paper and that the results of its review would be provided to the Commission when they were completed. As of the end of 1989, the Commission had not yet received the results of the review and it looked forward to assisting the Coast Guard with its efforts to modify the draft paper as needed and to provide such other help as it could to prepare for deliberations regarding Annex V at the 29th session of the Marine Environment Protection Committee.

Cooperative Actions Concerning the Southern Ocean -- At the XVth Consultative Meeting of Antarctic Treaty nations held on 9-19 October 1989 in Paris, the U.S. delegation presented a discussion paper addressing the need to prevent and control marine pollution, including marine debris. As a result, the Consultative Meeting adopted a resolution calling on states to take measures within their competence to prohibit certain discharges and disposal from vessels within the Antarctic Treaty Area, and to ensure compliance with relevant provisions of international conventions on vessel safety and pollution control. This is discussed in more detail in Chapter V of this Report.

At the eighth meeting of the Commission for the Conservation of Antarctic Marine Living Resources, held 6-17 November 1989 in Hobart, Australia, the parties reviewed information on steps being taken by member nations to assess and avoid mortality of Antarctic marine living resources caused by entanglement and ingestion of persistent marine debris of human origin. As discussed in Chapter V of this Report, the members also heard reports from the Scientific Committee on Antarctic Research Bird Biology Subcommittee and its Group of Specialists on Seals. The Commission requested that its Scientific Committee continue consultations to assist in identifying, designing, and implementing programs necessary to assess and monitor the effects of marine debris and incidental catch on marine mammals and seabirds in the Convention area.

As regards MARPOL Annex V, the Living Resources Commission agreed that those members who have not already done so should consider and take steps to accept or ratify the Annex. The Commission also agreed that Members should take steps to ensure that their nationals and vessels operating in the Convention Area comply with the provisions of the Annex. It was agreed that this item should be included in the agenda for subsequent annual meetings of the Living Resources Commission.

CHAPTER VII

MARINE MAMMAL/FISHERIES INTERACTIONS

Marine mammals may interact with fisheries in a number of ways. They may be disturbed, harassed, injured, or killed, either accidentally 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 or injure fishermen 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 fishermen for the same fish and shellfish resources.

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, to reduce the incidental taking of marine mammals to insignificant levels approaching a zero mortality and serious injury rate.

Marine mammals are taken incidentally in the course of many fisheries. One of the principal issues is this regard is the "tuna-porpoise" issue, which involves the incidental mortality and serious injury of porpoise entrapped in purse seine nets used by commercial yellowfin tuna fishermen in the eastern tropical Pacific Ocean. Over the past two decades, it has been the subject of intense concern and controversy. More recently, there has been growing recognition that incidental take in other fisheries, particularly high seas driftnet fisheries, pose serious threats to numerous species of marine mammals, seabirds, sea turtles, and other marine organisms. The Commission's activities during 1989 related to the tuna-porpoise, high seas driftnet, and other fisheries issues are described below. Commission efforts in previous years to identify and determine how to solve conservation problems caused by marine mammal/ fisheries interactions are described in previous Annual Reports.

The Tuna-Porpoise Issue

Discussions of the Commission's past activities and a historical summary of the efforts to resolve the tuna-porpoise problem are presented in previous Annual Reports. As discussed below, the Commission, the National Marine Fisheries Service, the U.S. Congress, the U.S. tuna industry, and others continued to devote substantial attention to the issue in 1989. Much of this effort was directed towards: (1) implementation of amendments to

the Marine Mammal Protection Act's tuna-porpoise provisions enacted in November 1988; and (2) a further reduction in the incidental mortality of porpoise in both the domestic and foreign fishing fleets.

The 1989 Fishing Season

In 1980, the National Marine Fisheries Service promulgated final regulations establishing annual quotas for individual porpoise stocks and a total annual allowable take for U.S. fishermen of 20,500 porpoise for the years 1981-1985. A general permit to take porpoise in compliance with those regulations was also issued in 1980 to the American Tunaboat Association. In 1984, the Marine Mammal Protection Act was amended to extend the annual quotas, the regulations, and the general permit indefinitely and to add quotas for eastern spinner and coastal spotted dolphins. Estimates of the annual incidental kill of porpoise by the U.S. and foreign tuna purse seine fleets since passage of the Marine Mammal Protection Act are listed in the following table.

Estimated Incidental Kill of Porpoise in the Tuna Purse Seine Fishery In the Eastern Tropical Pacific Ocean*

Year	U.S. Vessels	Non-U.S. Vessels
1972	368,600	55,078
1973	206,697	58,276
1974	147,437	27,245
1975	166,645	27,812
1976	108,740	19,482
1977	25,452	25,901
1978	19,366	11,147
1979	17,938	6,837
1980	15,305	29,598
1981	18,780	17,146
1982	22,736	5,065
1983	9,589	(no data)
1984	17,732	15,018
1985	19,205	36,032
1986	20,696	103,905
1987	13,992	97,941
1988	19,712	65,169
1989	12,643**	--

* = Figures do not include possible deaths of seriously injured porpoise released alive.

** = Preliminary estimate.

In 1986, the U.S. tuna fleet reached the allowable mortality level of 20,500 in mid-October and was required to cease catching tuna by setting on schools of porpoise. The quota may have been reached because of an increased number of problem sets (i.e., sets resulting in the death of 15 or more porpoise) and/or a record high catch rate of 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 also may have made it more difficult to release porpoise during the backdown procedure.

Porpoise mortality in the U.S. tuna fishery was significantly lower in 1987. The total estimated kill was 13,992 porpoise. In 1987, the catch rate of tuna was about 20 tons of tuna per set. This suggests that incidental mortality of porpoise may be correlated with the size of the catch per set. In 1988, porpoise mortality in the U.S. tuna fleet again approached the maximum allowable level. Estimated total mortality was 19,712 porpoise. As in 1986, the fleet experienced a high number of problem sets, those that account for the highest porpoise mortality. The catch rate of tuna in 1988 was approximately 19 tons of tuna per set.

The 1984 amendments to the Marine Mammal Protection Act established a quota of 2,750 for the eastern spinner stock. In 1987, despite a relatively low overall mortality of marine mammals, an estimated 2,688 eastern spinner dolphins were killed compared to 1,608 killed in 1986 when the overall quota of 20,500 porpoise was reached. In 1988, the quota for eastern spinner stock was exceeded for the first time with an estimated mortality of 2,832 animals taken by the U.S. fleet. A possible explanation for the high mortality of this stock in 1987 and 1988 is that tuna, and hence fishing effort, were concentrated in the areas where eastern spinner dolphins are more abundant.

In recent years, there has been a declining trend in the percentage of sets made by U.S. tuna fishermen on porpoise. In 1986, 94 percent of the sets made were set on porpoise; in 1987, it was 78 percent of the sets; and in 1988, it was 65 percent of the sets.

In 1989, the overall take of porpoise, including eastern spinner dolphins, by U.S. tuna fishermen was reduced substantially. Observed incidental mortality was 12,643 porpoise, the lowest level since the El Nino year of 1983 and the second lowest ever. The incidental take of eastern spinner dolphins was 1,468 animals. The catch of tuna was approximately 21 tons per set and the percentage of problems sets in 1989 was six percent. Although the percentage of problem sets was comparable to the 1988 level, the number of sets with mortality greater than 50 may have been reduced substantially. Other factors which may have contributed to the reduced incidental mortality in 1989 were the

prohibition on sundown sets instituted by the 1988 amendments and a decline in the number of U.S. vessels in the fishery from the mid-30s between 1985 and 1988 to 29 in 1989.

Domestic Program

Observers -- The 1988 amendments to the Marine Mammal Protection Act addressed the issue of observer coverage in the tuna fleet by requiring that the Service place an observer aboard each vessel on all trips during 1989 and subsequent years unless, for reasons beyond the Service's control, an observer is not available. The 100 percent observer requirement may be waived after the 1991 fishing season if the Service determines, after notice and opportunity for public comment, that lesser coverage will provide sufficiently reliable information.

On 19 December 1988, the National Marine Fisheries Service issued a statement that, despite recent amendments to the Act, it lacked sufficient funding to implement 100 percent observer coverage in 1989. Subsequently, the Service indicated that it would place observers on all trips beginning on or after 1 January 1989, although, if additional funding were not made available, reduced coverage might be required later in the year. On 5 January 1989, Earth Island Institute applied for a temporary restraining order to prevent two U.S. tuna vessels that had left port before the first of the year without an observer from engaging in fishing operations on porpoise. The matter came before the District Court for the Northern District of California on 17 January, and the following day a preliminary injunction was issued ordering that no certificated U.S. tuna vessel could depart on a fishing trip to the eastern tropical Pacific or could set on porpoise without an observer on board, unless the Court had determined that, for reasons beyond the control of the Secretary of Commerce, an observer was not available.

At the Senate reauthorization hearing held on 13 April 1988, representatives of Earth Island Institute asserted that there was a systematic underestimation of marine mammal mortality in U.S. and foreign tuna fisheries. To support its claim with respect to the reliability of mortality data for the U.S. fleet, Earth Island Institute, on 15 May 1988, provided the Commission with affidavits from three former U.S. observers. Among other things, the former observers alleged that: vessel captains and crews threatened and coerced them into reporting lower than observed mortality figures; mortality in sundown sets is seriously underestimated due to difficultly in viewing the backdown area; animals with fatal injuries were counted as "released alive" if they showed any sign of life; and vessels do not always use prescribed dolphin-saving gear and techniques when observers are not present.

On 17 June 1988, the Commission wrote to the National Marine Fisheries Service recommending that the allegations be investigated. It also recommended that the Service: arrange for independent interviews of returning observers to identify any possible coercion or intimidation by fishermen; publicize the fact that it is illegal to interfere with the performance of an observer's duties; restrict a captain's access to observer logs and data sheets; determine whether reported mortality figures for sundown sets are accurate; re-evaluate the methods used to estimate mortalities and injuries, particularly with respect to the reporting of seriously injured animals; and re-evaluate the need for 100 percent observer coverage as a means of ensuring use of porpoise-saving gear and techniques. On 8 December 1988, the Commission sent a second letter to the Service seeking a response to the allegations made by the former observers.

On 19 January 1989, the Service replied, noting that it was considering prosecution of some of the alleged violations. In response to the Commission's other recommendations, the Service noted that: all returning observers were interviewed and that an Inspector General investigation of the program found no serious problems related to observer harassment at sea; vessel captains are informed of all regulations, including those pertaining to interference with observers; more confrontations can be avoided than are precipitated by allowing skippers access to observer logs; sundown sets will not be allowed except in very limited situations under the 1988 amendments; the methodology for estimating porpoise mortality, including how to count seriously injured animals, is under review; and the 1988 amendments require 100 percent coverage until at least 1992.

Performance Standards -- Late in 1986, the Service began developing regulations to establish performance standards for individual vessels and/or captains in the U.S. tuna fleet concerning incidental porpoise kill rates. The performance standards were intended to address the matter of problem sets that arose in 1986 when certain vessels and/or captains experienced exceptionally high kill rates.

The American Tunaboat Association voiced strong opposition to implementation of such 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." On 8 April 1987, the association submitted an alternative proposal, recommending criteria and procedures for evaluating the porpoise mortality performance of vessel operators. Under that proposal, the Expert Skippers Panel would review circumstances surrounding trips in which a problem set occurred, the operator's experience and other relevant factors, and work with operators to improve performance. If performance problems recurred, the Service could suspend the operator's Certificate of Inclusion.

By late 1988, the Service had taken no action to implement performance standards. However, the 1988 amendments to the Marine Mammal Protection Act directed the National Marine Fisheries Service to develop and implement a system of performance standards for U.S. tuna fishermen by the beginning of the 1990 fishing season. The system must include a mechanism for identifying and providing supplemental training to certificate holders whose incidental marine mammal mortality is consistently and substantially higher than the fleet average. It also must provide for suspending or revoking the certificates of those fishermen whose high rate of incidental take reflects a lack of diligence or proficiency in the use of required fishing techniques and gear.

Early in 1989, the Service drafted a paper setting forth a proposed operator performance system. On 8 February, the Service convened a meeting of interested parties to discuss its contemplated approach. At that meeting, representatives of the Commission commented that draft standards appeared to be lenient and suggested the addition of a performance standard that considered an operator's performance throughout the entire fishing season. The Commission also indicated that the comparability standard chosen by the Service needed to be justified and should be statistically based.

The Service subsequently reworked its proposal and provided a draft proposed rule to the Commission for review. The draft rule proposed two separate standards for judging the performance of U.S. tuna vessel operators. Any skipper who exceeds the five-year fleet-wide average porpoise mortality rate by a factor of five on any fishing trip, or who exceeds the mortality standard by 1.5 times on three consecutive trips, would be subject to certificate suspension.

By letter of 4 August 1989, the Commission reiterated its earlier comments that a performance standard also was needed regarding long-term performance. The Commission also noted that the standards apparently had not been based on a statistical analysis of mortality rate performance observed within the fleet. In addition, the Commission noted that, prior to 1989, U.S. tuna fishermen were allowed to conduct sundown sets, which have a higher mortality than daylight sets. It therefore recommended that the Service exclude such sets from the data used to calculate the five-year average against which performance is judged.

On 11 August 1989, the Service wrote to the Commission indicating that, due to scheduling considerations, it could not incorporate the suggested revisions before publication of the proposed rule but that it would make the Commission's comments part of the record on the proposed rule. The proposed rule was published without any substantive changes on 1 November 1989.

On 12-13 December, the Service held a tuna-porpoise review meeting in San Pedro, California, to consider several aspects of the Service's research and management programs. Following that meeting, on 28 December, the Commission commented on several issues and questions that were raised during the discussions. In its letter, the Commission supplemented its earlier comments on the proposed performance standards. The Commission noted that the presentation of the performance standards at the review meeting did not indicate that the recommended analysis had been done or that the standards were statistically based. It therefore again recommended that such an analysis be done before publication of a final rule. The Commission also recommended that the proposed performance standards be expanded to indicate how vessel as well as operator performance will be evaluated and to specify sanctions that would be imposed against vessel owners who repeatedly employ skippers with substandard performance records or whose vessels have a history of high porpoise mortality because of mechanical problems.

Sundown Set Restrictions -- The 1988 amendments to the Marine Mammal Protection Act also directed the Secretary of Commerce to publish regulations by 1 January 1989 requiring U.S. tuna fishermen to complete the process of backdown to remove porpoise from the net no later than 30 minutes after sundown. The restrictions on sundown sets may be waived for individual certificate holders who, based on observer reports, have attained an incidental take rate for sundown sets that is no higher than the average daytime take rate for the fleet as a whole.

An interim final rule to implement this and other provisions was signed by the National Oceanic and Atmospheric Administration's Assistant Administrator for Fisheries on 29 December 1988 but not published in the Federal Register until 6 January 1989. Although the Commission and others had recommended that the Service establish a time before sunset beyond which a set could not be initiated, the Service did not adopt this approach. Instead, its rule merely required the backdown of the net be complete and rolling of the purse seine to "sack up" be begun before one-half hour after sundown. Thus, it is up to the vessel operator to determine when a set should not be started.

The interim rule also sets forth the procedures and standards for issuing waivers of the sundown set prohibition. To qualify, an operator must have had a minimum of five observed sundown sets since 1 July 1986 and must have had an average kill rate in those sets that was 0.154 porpoise per ton of tuna caught or less. As of the end of 1989, nine applications for waivers had been received, two of which were issued and seven of which are still being reviewed. The two operators that engaged in sundown sets in 1989 continued to have an exemplary record. Their kill rates during sundown sets were approximately one-half the fleet-wide average daytime mortality rate.

Other Requirements -- The 1988 amendments of the Marine Mammal Protection Act also require the Service to: (1) establish procedures for permitting experimental fishing operations to test gear or methods that might reduce the mortality or injury of marine mammals; (2) prohibit the use of explosives other than Class C pest control devices in the U.S. tuna fishery; (3) undertake a study to determine if the use of Class C explosives results in physical impairment or increased mortality of marine mammals and, based on the results, regulate their use by 1 April 1990; and (4) contract with the National Academy of Sciences for an assessment, to be completed by 8 September 1989, of alternative fishing methods that do not involve the incidental take of marine mammals.

Regarding some of these requirements, the interim final rule on sundown sets published on 6 January 1989 also implemented procedures for granting experimental fishing permits and prohibited the use of explosives other than Class C devices. A study of the effects of Class C explosives on porpoise also has been undertaken by the Service. As part of the study, the Service is observing the explosives in use, estimating the numbers of porpoise exposed to explosives, and analyzing whether the devices cause temporary or permanent hearing damage, other physical injury, or social disruption to porpoise. A preliminary analysis has been completed and a workshop to evaluate the results was held on 27-29 November 1989. The Service expects to complete its review and have the required regulations in place by the 1 April 1990 deadline.

With respect to the mandated assessment of alternative fishing methods, the National Marine Fisheries Service held a workshop on 11-12 October 1988 to assist in developing terms of reference for the National Academy of Sciences study. A contract for the study was concluded in September 1989, and the Academy has constituted a panel to carry out the assessment. The first meeting of the panel was held 4-5 December 1989 and a second meeting was scheduled for early February 1990.

Foreign Programs

Comparability of Programs -- During reauthorization hearings on the Marine Mammal Protection Act in 1984, the Commission, the National Marine Fisheries Service, the tuna industry, and the environmental community expressed concern 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. Therefore, 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 would 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 noting that the existing foreign nation reporting and certification standards were not as stringent as those required by the 1984 amendments. By early 1986, no regulations had been proposed and the Commission again wrote to the Service on 22 May 1986, pointing out the need for immediate action.

On 13 August 1986, the Service published proposed regulations to implement the foreign nation reporting and certification requirements of the 1984 amendments. The proposed regulations would have required foreign nations to demonstrate that their regulatory program is comparable to that of the United States and that reliable data indicate a level of take in their tuna fleet that is comparable to that of the U.S. fleet. The proposed regulations stated 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 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.

Publication of the rule was delayed, in part, to accommodate consultations between the Service and the Inter-American Tropical Tuna Commission on developing a system to provide reliable data with which to compare U.S. and foreign fleet performance.

During 1987, the Commission worked closely with the Service to prepare final regulations. By letter of 29 December 1987, the Commission recommended that regulations be adopted, with certain modifications. 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 compari-

son 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.

On 18 March 1988, the National Marine Fisheries Service published an interim final rule implementing the 1984 amendments. The interim final rule did not address several points raised in the Commission's 29 December 1987 letter and, on 17 May 1988, the Commission repeated the above recommendations.

The Service met with interested parties, including representatives of the Commission, on 1 June 1988 to discuss the comments received on the interim final rule. The Service planned to respond to the public comments on the interim rule and publish a "permanent" final rule before the end of 1988. However, during reauthorization of the Marine Mammal Protection Act, amendments were made to the importation provisions further delaying promulgation of "permanent" final regulations. Among other things, the amendments require that, by the end of the 1989 fishing season, each foreign fleet must have achieved a porpoise mortality rate that is not more than twice that of the U.S. fleet and, by the end of the 1990 season, the foreign nation's mortality rate must be no more than 1.25 times that of the U.S. fleet.

In addition, the amendments require that, beginning in 1990, comparable foreign programs must include all prohibitions on encircling pure schools of marine mammals, conducting sundown sets, and other activities that are applicable to U.S. tuna fishermen. Although no stock-specific numerical quotas were imposed on foreign nations exporting tuna to the United States, the amendments require that no more than 15 percent of their total annual mortality be eastern spinner dolphins and no more than 2 percent be coastal spotted dolphins. To be found comparable to the U.S. program, the take by a foreign nation must be monitored by the observer program of the Inter-American Tropical Tuna Commission or an equivalent international program in which the United States participates. In addition, observer coverage for the foreign fleet must be equal to that for the U.S. fleet unless the National Marine Fisheries Service determines that an alternative observer program will provide sufficiently reliable documentary evidence of the nation's incidental take rate.

To implement the 1988 amendments, the Service published revised interim final regulations governing the importation of tuna taken in association with marine mammals on 7 March 1989. The regulations incorporated the statutorily imposed kill rate standards of two times the U.S. rate for 1989 and 1.25 times the U.S. rate for 1990 and subsequent years. The regulations also

described: what would constitute a comparable observer program; changes that would have to be made to foreign programs by the beginning of 1990; and limitations on the allowable mortality of eastern spinner and coastal spotted dolphins. A "permanent" final rule was undergoing final review at the close of 1989 and is expected to be published early in 1990.

Intermediary Nations -- The 1988 amendments also restrict tuna imports from intermediary nations. Before exporting tuna to the United States, each such nation must now provide reasonable proof that it has prohibited the importation of tuna from any nation prohibited from exporting tuna to the United States. In addition, any fishing or intermediary nation that has been banned from exporting tuna to the United States for a six-month period must be certified under the Pelly Amendment to the Fishermen's Protective Act. Pelly Amendment certification may result in a ban on the importation of some or all fish products from the offending nation.

These requirements were implemented through new provisions added in the 7 March 1989 interim rule. Under those regulations, intermediary nations are not required to implement a ban on tuna imports from a country embargoed by the United States if the Service is satisfied that the intermediary nation imports tuna products only from sources other than the embargoed country. To date, no embargoes of intermediary nations have been necessary.

Observer Programs -- As noted above, the 1988 amendments require that, before a foreign program may be found comparable to that of the United States, the Secretary must determine that:

> "the rate of incidental taking of marine mammals of the harvesting nation during the 1989 and subsequent fishing seasons is monitored by the porpoise mortality observer program of the Inter-American Tropical Tuna Commission or an equivalent international program in which the United States participates and is based upon observer coverage that is equal to that achieved for United States vessels during the same period, except that the Secretary may approve an alternative observer program if the Secretary determines ... that such a ... program will provide sufficiently reliable documentary evidence of the average rate of incidental taking by a harvesting nation...."

Other amendments required the United States to implement 100 percent observer coverage beginning in 1989.

On 10 May 1989, the National Marine Fisheries Service published a notice proposing to find that 33 percent observer coverage for all nations fishing for tuna in the eastern tropical Pacific Ocean and participating in the Inter-American Tropical

Tuna Commission observer program would provide sufficiently reliable documentary evidence of the average rate of incidental taking and was acceptable. Absent such a determination, no foreign program could be found comparable to that of the United States without substantially increasing its observer coverage.

The Commission commented on the proposed finding on 12 July 1989. The Commission noted that 33 percent observer coverage might be acceptable for large fleets, but seriously questioned whether this level of coverage would provide an acceptable coefficient of variation in the estimated mortality for fleets with fewer than 10 vessels. The Commission also noted that, because the mortality rate on unobserved trips is almost certainly higher than on observed trips, 33 percent observer coverage, even for large fleets, may not be sufficient.

Therefore, the Commission recommended in its letter that, before a final determination on observer coverage was made, the Service should examine its rationale for assuming that the kill rate on observed trips would be representative of the performance of the fleet as a whole. The Commission also noted that observers serve an enforcement function and questioned whether reduced observer coverage for foreign fleets could provide an enforcement program comparable to that of the United States. In light of these difficulties, the Commission recommended that the Departments of Commerce and State take steps to expand the Inter-American Tropical Tuna Commission's observer program to provide as close to 100 percent coverage as possible.

Shortly after the Service made known its intention to accept lesser observer coverage for foreign fleets, Earth Island Institute, in its pending lawsuit, filed a motion for partial summary judgment on this issue. Earth Island Institute argued that the alternative observer program provision of the 1988 amendments was intended to allow the Service to approve an observer program in which the United States does not participate but did not authorize the Service to accept a program that provides less coverage than the United States program. The Court ruled on 24 August 1989 that the statute did not unambiguously require foreign observer programs to provide observer coverage equal to that of the United States and that the Service's interpretation was reasonable. While ruling on the legal construction of the statute, the Court was not faced with the factual question of whether 33 percent coverage met the statutory standard by providing a reliable estimate of incidental mortality for each fleet.

Late in 1989, the Commission reviewed a draft proposal by the Service to accept 33 percent observer coverage for large fleets and 50 percent coverage for small fleets during the 1990 fishing season. On 1 November, the Commission reiterated its concerns about enforcement program comparability and whether the

estimated mortality rate would be reliable in light of the likely higher kill rate in unobserved sets. This latter problem, it noted, would take on added importance in 1990 when the sundown set restrictions currently in place for U.S. operators become a required part of comparable foreign programs. The draft proposal also raised statistically based questions of whether the proposed observer program would provide reliable estimates of porpoise mortality.

The Service published a somewhat revised version of its proposal for 1990 on 19 December 1989. In addition to proposing 33 percent observer coverage for fleets of 10 or more vessels and 50 percent observer coverage for smaller fleets, the Service discussed and requested comments on the methods under consideration for determining whether the estimated mortality for a foreign nation is comparable to that of the United States. At year's end, the Commission was reviewing and preparing comments on that notice.

Comparability Findings -- Under a 18 March 1988 interim final rule, all findings of comparability for tuna fishing nations then in effect expired on 15 October 1988 unless, by 17 August 1988, the nation filed a substantially complete application for a new finding under the new regulations. Only Mexico filed such an application by the deadline and, beginning on 15 October, the importation into the United States of yellowfin tuna from all other nations was prohibited. Shortly before the import ban was to go into effect, four nations (Ecuador, Vanuatu, Panama, and Venezuela) filed applications seeking findings of comparability.

By letters of 8 and 9 November 1988, the Commission provided the Service with comments on the applications submitted by Vanuatu and Ecuador. The Commission expressed its view that neither country had provided the detailed description of its enforcement program required by the Service's interim final regulations and recommended that the Service defer issuing findings of comparability until such detailed descriptions had been provided. In a 16 November letter, the Commission provided similar recommendations for Venezuela and Panama, which, in the Commission's opinion, had also not sufficiently described their enforcement programs.

Despite the Commission's recommendations, the Service issued positive determinations of comparability for the programs of all four countries. In a 5 December 1988 letter to the Commission, the Service indicated that the four nations had provided "limited information" on the details of their enforcement programs, but the Service had found them to be adequate "since these [foreign] laws or regulations are newly enacted and, as a result, there is no enforcement experience to document at this time." The Service further explained that it would be able to judge the nations'

enforcement programs better after the submission of annual reports by the four countries in July 1989.

A positive finding of comparability was issued for Mexico on 12 September 1989 and, based upon their 1988 annual reports, the findings for Venezuela, Panama, Vanuatu, and Ecuador were renewed on 11 December. Also, the ban on importation of tuna from El Salvador that had been in effect since 10 October 1986 was rescinded by Federal Register notice of 19 September 1989 when it was determined that El Salvador's last purse seine vessel of greater than 400 tons carrying capacity had been sold and was now operating under the flag of Panama.

To some extent, the problem of the adequacy of foreign enforcement programs raised by the Commission in 1988 was alleviated in 1989. The Inter-American Tropical Tuna Commission, for the first time, established procedures whereby governments would be provided observer reports in a form that could be used for enforcement purposes. As indicated above, however, questions remain as to whether an enforcement program comparable to that of the United States is possible at substantially lower observer coverage rates.

Other Issues

As discussed above, the Commission participated in an international review of the Service's tuna-porpoise program on 12-13 December 1989. In a follow-up letter to that meeting, the Commission raised several issues regarding the implementation of the foreign tuna-porpoise program. Representatives of several tuna fishing nations that attended the meeting expressed the view that the United States had acted precipitously, without scientific justification, and without consultation, when, in 1988, it amended the Marine Mammal Protection Act to require that tuna be embargoed from any nation whose marine mammal mortality rate is more than twice that of the U.S. fleet in 1989 or more than 1.25 times the U.S. rate in 1990 or subsequent years. The fact that these nations apparently were not aware that the comparability requirements were established by the 1984, not the 1988, amendments bespeaks a serious communications problem between the Service and foreign nations.

At the review meeting, the Executive Director of the Inter-American Tropical Tuna Commission described its basic objectives as: (1) maintaining high levels of tuna stocks in the eastern tropical Pacific; (2) maintaining porpoise stocks affected by the tuna fishery at levels sufficient to prevent their extinction; and (3) making every reasonable effort to avoid the needless and careless killing of porpoise. Noting that these objectives were not the same as those of the Marine Mammal Protection Act, the Commission recommended that the Service and the Department of State seek to revise the Tuna Commission's objectives and advise

foreign nations that the Marine Mammal Protection Act's objectives include (1) the reduction of incidental mortality and serious injury rates to as near zero as is technologically and economically feasible and (2) the restoration and maintenance of all marine mammal stocks at optimum sustainable levels.

The Commission also stressed the need to reconcile any differences in the forms used by U.S. and Tuna Commission observers, recommended that the use of video equipment to record sets be considered, and suggested that greater use of foreign nations in ongoing tuna-purpose research be made.

The Dall's Porpoise Issue

Dall's porpoise (Phocoenoides dalli) are entangled and killed in drift gillnet fisheries in the North Pacific Ocean and Bering Sea. Historically, most of this take has occurred incidental to operations of the Japanese high seas salmon fleet. In past years, the Japanese were permitted to fish for salmon inside the U.S. 200-mile Exclusive Economic Zone pursuant to the International Convention for the High Seas Fisheries of the North Pacific. As a result of recent litigation, however, the National Marine Fisheries Service is unable to issue a permit to allow the incidental take of marine mammals in this fishery and, thus, the Japanese are prohibited from fishing for salmon within the U.S. Exclusive Economic Zone.

With the exclusion of the Japanese high seas salmon fishery from U.S. waters, issues with respect to Dall's porpoise have changed. There is still concern about the incidental take of Dall's porpoise in the Japanese salmon fishery outside the U.S. zone. Also, as noted in the following section on high seas driftnet fisheries, Dall's porpoise is one of the marine mammal species taken incidentally in undetermined numbers in the squid driftnet fisheries that have flourished in the past ten years in the North Pacific Ocean. In addition, as discussed in Chapter V, Dall's porpoise are taken in a directed fishery by Japanese fishermen. A total of 39,000 Dall's porpoise were reported to have been taken in that fishery in 1988.

Previous Annual Reports have included detailed discussion of the Dall's porpoise issue since an incidental take permit was issued to the Federation of Japan Salmon Fisheries Cooperative Association in 1981. That permit authorized the annual incidental take of up to 5,500 Dall's porpoise, 450 northern fur seals, and 25 Steller sea lions and, in 1982, was legislatively extended through 9 June 1987. At the conclusion of a formal rulemaking, the Under Secretary of Commerce, on 22 May 1987, issued a three-year permit to the Federation, authorizing the incidental take of up to 6,039 Dall's porpoise over the life of

the permit with a maximum annual take of 2,942. The take of other marine mammal species was not explicitly authorized.

Shortly after the permit was issued, Alaska Native fishing groups and environmental organizations filed lawsuits, claiming, among other things, that the permit violated the Marine Mammal Protection Act because it applied only to Dall's porpoise when there was a virtual certainty that other marine mammals would also be taken. On 15 June 1987, the court issued a preliminary injunction invalidating the permit. This ruling was upheld on appeal and the Secretary of Commerce, on 9 September 1988, petitioned the U.S. Supreme Court for review of the case. The Supreme Court denied the petition, declining to review the Court of Appeals decision, on 9 January 1989. On 21 March 1989, the District Court entered an order granting summary judgment for the environmental and Alaska Native plaintiffs, thus ending the case.

The decision in the Dall's porpoise case (Kokechik Fishermen's Association v. Secretary of Commerce) cast serious doubt on the ability of the Secretary to issue incidental take permits for several other fisheries, including many domestic fisheries. In response, in 1988, the Marine Mammal Protection Act was amended to provide a limited five-year exemption from the incidental take prohibition for domestic fisheries other than the tuna industry. In establishing this exemption, Congress made clear that it did not apply to the Japanese salmon gillnet fleet. Provisions of this amendment and its implementation during 1989 are discussed in Chapter II of this Report.

High Seas Driftnet Fisheries

The development of lightweight monofilament and multi-filament fishing nets in recent decades has permitted the development and expansion of several high seas driftnet fisheries. These fisheries catch large numbers of marine mammals, seabirds, sea turtles, and non-target as well as target finfish. In addition, the synthetic materials used to construct these nets are not readily degraded; thus, nets and net fragments that are lost or discarded may continue to entangle marine mammals and other marine organisms indefinitely.

The three fisheries of particular concern to the United States occur in the North Pacific Ocean. They are: the high seas squid driftnet fishery operated by Japan, Korea, and Taiwan; the high seas salmon driftnet fishery operated by Japan; and the Japanese large-mesh driftnet fishery for billfish and tuna. Together these fisheries involve approximately 1,000 vessels ranging in size from 100 to 200 metric tons. Each driftnet vessel sets from 15 kilometers (salmon fishery) to more than 50 kilometers (squid fishery) of gillnet daily. The nets consist of sections, or "tans," 50 meters long and 8-9 meters deep with a

corkline at the surface and a leadline at the bottom. The nets are set at the surface at night and retrieved at daybreak. It is estimated that the squid driftnet fleets alone set approximately 32,000 kilometers of net each night during the height of the fishing season which lasts from May to December.

Evaluation of the impact of driftnet fisheries on marine mammals and other bycatch species is hindered by lack of reliable information on fishing effort, incidental catch by species, fishing area, and seasonal movements of fishing vessels. Although there are fairly reliable estimates of the numbers of marine mammals, particularly Dall's porpoise taken in the Japanese salmon mothership driftnet fishery, there are no good estimates of the numbers of marine mammals caught incidentally in any of the high seas squid driftnet fisheries or the large-mesh billfish and tuna driftnet fisheries. The species known to be taken in driftnet fisheries in addition to Dall's porpoise include harbor porpoise, northern right whale dolphins, Pacific whitesided dolphins, common dolphins, striped dolphins, northern fur seals, and Steller sea lions.

Development of Cooperative Marine Mammal Observer Programs

The International North Pacific Fisheries Commission serves as a forum for coordinating the collection, exchange, and analysis of scientific data regarding anadromous fish in the North Pacific Ocean. Because marine mammals were taken incidentally within the U.S. Exclusive Economic Zone in the high seas salmon driftnet fishery operating pursuant to the Annex of the International North Pacific Fisheries Convention, the Federation of Japan Salmon Fisheries Cooperative Association (the Federation) was required to obtain a general permit to take marine mammals incidental to their commercial fishing activities (see the preceding discussion). The general permit, originally issued to the Federation for three years beginning in 1981, was legislatively extended until 9 June 1987. On 22 May 1987, the National Marine Fisheries Service issued a new, three-year general permit to the Federation, authorizing the incidental take of Dall's porpoise.

Among the conditions of the 1987-1989 general permit, the Japanese were required to accept the placement of observers aboard all motherships and a specified number of catcherboats operating in the high seas salmon fishery. The permit also required Japan to accept the placement of U.S. marine mammal observers on its land-based salmon fleet and its high seas squid gillnet fleet, to the extent that such observers could be provided. Although a memorandum of understanding to implement the other permit conditions was signed by the United States and Japan on 8 June 1987, it did not include a provision for the placement of observers in the high seas squid driftnet fleet.

Later in 1987, the United States and Japan re-initiated negotiations to arrange for the placement of U.S. observers on the squid fishing vessels. Concurrent with bilateral salmon talks, discussions were initiated concerning a pilot observer program in that fishery. In November 1987 and February and March 1988, U.S. and Japanese representatives, scientists, and technical specialists held further consultations and, in April 1988, an exchange of letters was made outlining a squid driftnet fishery pilot observer program for the 1988 fishing season.

The 1988 exchange of letters between U.S. and Japanese representatives called for a pilot program in the high seas squid driftnet fishery that included, among other things: placement of scientific observers; exchange of field data; and collection of incidental take data with respect to marine mammals, salmon, and other non-target finfish, seabirds, and marine turtles. The agreement was contingent upon Japan's ability to operate the mothership salmon fleet within the U.S. Exclusive Economic Zone in 1988. When the Federation's general permit was invalidated by the courts in Kokechik Fishermen's Association v. Secretary of Commerce, operation of the Japanese mothership salmon fishery within U.S. waters was prevented. As a result, Japan withdrew from the agreement and the United States was no longer permitted to place observers on either Japanese salmon or squid driftnet vessels.

The Driftnet Impact Monitoring, Assessment and Control Act of 1987

Because of concerns over the impact of driftnet fisheries on U.S. salmon stocks and other marine resources, the Driftnet Impact Monitoring, Assessment, and Control Act (the Driftnet Act) was enacted by the United States in 1987. Among other things, the Act directs the Department of State, in conjunction with the National Oceanic and Atmospheric Administration, to negotiate agreements with those countries conducting high seas driftnet fisheries in the North Pacific Ocean to obtain "statistically reliable cooperative monitoring and assessment of the numbers of marine resources of the United States killed and retrieved, discarded, or lost by the foreign government's driftnet fishing vessels." The Act stipulates that failure of a driftnet fishing nation to enter into and implement an "adequate" monitoring and assessment agreement by 29 June 1989 would result in certification of that nation and possible imposition of sanctions under the Pelly Amendment to the Fishermen's Protective Act of 1967.

In 1988, in the wake of the Kokechik decision and the nullification of the pilot observer program for the Japanese squid fishery, the Secretary of Commerce and the Secretary of State entered into negotiations with representatives of Japan, Taiwan, and the Republic of Korea. In the spring of 1989, the Department of State announced that it had reached an ad

referendum agreement with Japan. However, the Department of Commerce advised the Department of State of certain concerns regarding the extent to which the agreement satisfied the terms of the Driftnet Act. Particular areas of concern in this regard involved provisions related to the level of observer coverage, the placement of transmitters aboard vessels to pinpoint their location at sea, and the types of data to be collected.

In addition, the Commission wrote to the Department of State on 18 May 1989 recommending that the driftnet monitoring agreement developed with Japan for the 1989 season be accepted, provided that an effort be initiated at once to determine the observer effort needed to obtain statistically significant results and that this information be used as the basis for seeking broader observer coverage in 1990. After renegotiating several points, the Secretary of State informed the President, on 29 June, that the Secretary of Commerce had reviewed the revised driftnet agreement reached with Japan and found that it satisfied the terms of the Driftnet Act. He also noted that the agreement included commitments to expand the observer programs in 1990 and beyond and that Japan, therefore, would not be certified under the Pelly Amendment.

Although negotiations were also undertaken with Taiwan and the Republic of Korea, the Secretary of Commerce advised the President, by letter of 29 June 1989, that satisfactory agreements had not been reached. Both Taiwan and South Korea were therefore certified under the Pelly Amendment of the Fishermen's Protective Act. Later in the summer, agreements were reached with both Taiwan and South Korea for the 1989 and 1990 seasons. In the Secretary's view, the agreements met the minimum requirements of the Driftnet Act, and the President imposed no sanctions.

On 1 November 1989, the Commission wrote to the Department of State providing comments on the agreements. A copy of the letter was sent to the National Marine Fisheries Service. The letter noted that the agreements with Japan, Taiwan, and South Korea sought to obtain "statistically reliable data" on the catch of target and non-target species, but that the details of the 1990 programs had not been determined. The Commission also noted that there had not been a critical examination of the provisions of any of the three agreements to see if they were, in fact, adequate to provide for the collection of statistically meaningful data.

The Commission suggested that a group of quantitative scientists and biologists be convened to describe monitoring and analysis programs that would satisfy the intents and provisions of the Driftnet Act. The Commission recommended the group meet and report the results of its discussions well in advance of negotiations on the 1990 observer program with Japan, Taiwan, and

South Korea. On 7 November 1989, the Department of State responded to the Commission. It agreed that there was a pressing need for data on the impact of driftnet fisheries on marine resources, and noted that it intended to work closely with National Oceanic and Atmospheric Organization scientists and others during negotiations on the levels of observer coverage, tracking vessels, and the types of data to be collected in the 1990 driftnet programs.

By letter of 20 November 1989, the National Oceanic and Atmospheric Administration's Assistant Administrator for Fisheries also concurred with the Commission's views and indicated that the Service had attached priority to ongoing efforts to secure statistically reliable information on the impacts of pelagic driftnet fisheries. No new information on the development of the three agreements had, however, been received by the Commission by the end of 1989.

Other U.S. Domestic Actions To Control Driftnet Fishing

In July 1989, a bill (H.R. 2958) directing the Department of State to negotiate agreements banning the use of gillnets on the high seas was introduced and referred to the House Committee on Merchant Marine and Fisheries for consideration. The essence of the bill, called the "Driftnet Use Cessation Act of 1989," was appended to proposed amendments to the Magnuson Fishery Conservation and Management Act in October and was approved by the Committee on Merchant Marine and Fisheries and sent to the full House of Representatives. At the end of the 1989 Congressional session, the amendments to the Magnuson Fishery Conservation and Management Act had not been approved by the Senate. After conclusion of the 1989 Congressional session, three other pieces of driftnet legislation were introduced: H.R. 3373, which calls for negotiating a regional convention to establish a driftnet-free zone in the South Pacific in support of the Tarawa Declaration (see below); H.R. 3496, which calls for prohibiting the importation of fish or marine animal products from Japan, Taiwan, or South Korea into the United States until those countries cease driftnet fishing; and House Congressional Resolution 214, which expresses support for regional efforts to protect marine resources from driftnet fisheries in the South Pacific Ocean.

Other International Action on Driftnets

Other countries also have undertaken efforts to address marine conservation problems caused by driftnet fisheries. The Federated States of Micronesia banned driftnet fisheries in their waters because of an "alarming" incidental catch of marine mammals, marine turtles, seabirds, and other non-target species in a trial joint venture fishery during February and March 1989. In May 1989, the New Zealand Government banned driftnet fishing

within the New Zealand Exclusive Economic Zone and territorial sea and prohibited driftnet fishing vessels from using New Zealand ports. In June 1989, the South Pacific Forum Fisheries Agency, a subsidiary body of the South Pacific Forum, which includes New Zealand, Australia, and other South Pacific island states, expressed concern over "indiscriminate and irresponsible use of driftnets" by Japan, Taiwan, and South Korea in the South Pacific. The agency called for a cessation of driftnet fishing in the South Pacific Ocean until a satisfactory management regime to monitor and assess these fisheries is established.

In July 1989, the Government of Australia announced that it would press for a global ban on the use of driftnets. Also in July, the South Pacific Forum approved the "Tarawa Declaration," which calls on the international community to support and cooperate in the negotiation of a regional convention to establish a driftnet-free zone in the South Pacific region and, pending conclusion of this convention, calls for an immediate cessation of driftnet operations in the region by Japanese, Taiwanese, and South Korean vessels. At the 29th session of the South Pacific Conference in Guam in October 1989, the South Pacific Commission, which includes the United States, supported a resolution calling for an immediate ban on driftnet fishing in the South Pacific region to allow time for developing a comprehensive fishery management program.

Late in November 1989, in Wellington, New Zealand, several South Pacific nations signed the Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific. The Convention bans driftnet fishing within the 200-mile Exclusive Economic Zones of the signatory nations and within certain adjacent high seas areas designated by the Convention. Two protocols specifying the terms of the Convention and the responsibilities of the parties have yet to be finalized. They will be addressed at a meeting set for March 1990 in Wellington.

At the November 1989 meeting of the Commission for the Conservation of Antarctic Marine Living Resources in Hobart, Australia, the United States delegation called attention to the possibility that seabirds and marine mammals may be more vulnerable to incidental capture in driftnets than in other types of fishing gear. The delegation requested and received confirmation of its understanding that no gillnets currently were being used in the Southern Ocean, nor was their use planned by members of the Antarctic Commission.

In December 1989, the United Nations General Assembly unanimously adopted a resolution on "large-scale pelagic driftnet fishing and its impact on the living marine resources of the world's oceans and seas." The resolution calls for a ban on driftnet fishing in the South Pacific Ocean, beginning 1 July 1991, and for a worldwide ban beginning 30 June 1992 unless

"effective conservation and management measures" are taken to regulate these fisheries. By calling for joint analyses of the conservation and management measures taken by driftnet fishing countries, the resolution places pressure on those countries that permit driftnet fishing to prove that the use of driftnets on the high seas is ecologically acceptable. It thereby encourages research and monitoring to better document the impact of this technology on marine resources.

The Commission will continue to review and provide advice to the Departments of Commerce and State on actions needed to better assess and prevent marine mammal and other marine resource conservation problems being caused by pelagic driftnet fisheries.

Interactions off Alaska

To address interactions between marine mammals and fisheries in Alaska, the Commission, among other things, works with the National Marine Fisheries Service and the North Pacific Fisheries Management Council on developing and modifying fishery management plans for relevant fisheries. Past efforts in this regard are discussed in previous Annual Reports. Activities undertaken in 1989 are discussed below.

King and Tanner Crab Fishery

By letter of 6 March 1989, the National Marine Fisheries Service asked the Commission to comment on an environmental assessment and proposed fishery management plan for commercial king and tanner crab fisheries in the Bering Sea and Aleutian Islands areas. The document noted that, on rare occasions, sea otters are drowned in crab pots set in shallow nearshore waters where fishing activity and sea otters overlap. It proposed delegating management authority to the State of Alaska and included measures for fishery observers and data reporting.

As noted in Chapter II of this Report, amendments to the Marine Mammal Protection Act governing the incidental take of marine mammals by commercial fishermen were signed into law in November 1988. In January 1989, the National Marine Fisheries Service published proposed rules to implement the new provisions. Those rules established a new system for authorizing the take of marine mammals, receiving reports from commercial fishermen on marine mammal/fishery interactions, and placing observers aboard fishing vessels to record data on interactions.

The document forwarded by the Service did not discuss or identify the requirements of the 1988 amendments to the Marine Mammal Protection Act. Therefore, by letter of 20 March 1989, the Commission, in consultation with its Committee of Scientific Advisors, recommended to the Service that the assessment and plan

be expanded to identify and describe the management measures that will be in effect for king and tanner crab fishermen with respect to incidental taking of marine mammals.

Bering Sea and Aleutian Islands Area Groundfish Fishery

Recent information suggests that yellowfin sole trawl fishing near Round Island in the northeast Bering Sea may be affecting walrus. The island is one of the principal summer hauling areas for walrus in the United States. In 1960, the State of Alaska designated it and other islands comprising the Walrus Islands as a State Game Sanctuary to protect habitat important to walrus and other wildlife. In 1986, at least 12,500 walrus were hauled out on Round Island. Over the past two years, however, the number has declined by more than 50 percent. The decline coincided with the onset of yellowfin sole trawl fishing near the island, suggesting that noise and disturbance from the trawlers may be the cause.

During 1989, the North Pacific Fisheries Management Council considered amendments to the fishery management plan for groundfish in the Bering Sea and Aleutian Islands area. In doing so, it identified proposed and alternative measures to mitigate the possible impacts of trawl fishing on walrus at Round Island. The Council forwarded its proposals to the National Marine Fisheries Service and, by letter of 9 August 1989, the Service asked the Commission for comments on an Environmental Assessment and Regulatory Impact Review for Amendment 13 to the Fishery Management Plan for Groundfish in the Bering Sea and Aleutian Islands and Amendment 18 to the Fishery Management Plan for Groundfish in the Gulf of Alaska.

With respect to Round Island, the document proposed an experimental four-year seasonal fishing closure in waters between three and 12 miles around the Walrus Islands and Cape Pierce to prevent groundfish fishing vessels from disturbing walrus. (A proposal to restrict vessel access to state waters within three miles of Round Island was being considered at the same time by the State of Alaska.) After four years, the effectiveness of the closure would be reviewed and, based on the results, the measure would be extended, terminated, or modified.

Among the alternative actions identified was a larger seasonal closure encompassing the entire embayment beyond three miles from shore between Cape Pierce and Cape Constantine in which the Walrus Islands are located. The document also proposed amendments for a new recordkeeping and reporting system to monitor fishing operations and marine mammal interactions, and for a framework observer program to place observers aboard domestic fishing vessels.

By letter of 13 September 1989, the Commission, in consultation with its Committee of Scientific Advisors, provided comments to the Service on the proposed amendments. In its letter, the Commission concurred that the possible cause-effect relationship between fishery development in the area and the decline in walrus numbers warranted establishing an experimental closed fishing area. The Commission noted, however, that the document did not identify the criteria that would be used to determine, after four years, whether the closure had the desired effect. Also, it did not fully describe the research and monitoring programs that would be needed to evaluate the closure's effectiveness. Therefore, the Commission recommended that the Service identify the criteria and the research and monitoring studies that would be needed to assess the effectiveness of the proposed and alternative actions.

In this regard, the Commission noted that the proposed closure around the individual islands could concentrate fishing along the perimeter of the islands and create a curtain of noise and disturbance that might discourage walrus from approaching the islands. This would not be the case under the alternative of closing the entire embayment between Cape Pierce and Cape Constantine. Moreover, the document noted that recent fishing surveys indicated that the embayment is a significant yellowfin sole spawning ground. Therefore, the Commission recommended that the document be expanded to assess the potential benefits to the fishery from preventing harvests of spawning fish in the embayment between the two capes. It also expressed its view that the alternative seasonal closure of waters between Cape Pierce and Cape Constantine was preferable to the proposed action.

In its letter, the Commission expressed strong support for the proposed recordkeeping and reporting system and the framework observer program. The Commission noted, however, that the document did not reflect relevant requirements stemming from the 1988 amendments to the Marine Mammal Protection Act. The Commission therefore recommended that the Service review the details of the proposed and alternative data reporting and observer programs to ensure that they are fully consistent with the program requirements developed to implement the 1988 Marine Mammal Protection Act amendments.

On 6 December 1989, the National Marine Fisheries Service published a Federal Register notice announcing it was adopting a rule giving force to the Council's recommended action. The rule established a two-year seasonal groundfish fishing closure in Federally controlled waters between 3 and 12 miles around Round Island and certain other islands in the Walrus Islands, and around Cape Pierce. The closure is effective between 1 April and 30 September in both 1990 and 1991.

Also, in April 1989, the Alaska Board of Game adopted a measure authorizing the Alaska Department of Fish and Game to control all access to state waters within three miles of Round Island. Subsequently, the Department adopted regulations, effective 1 July 1989, requiring anyone wishing to enter waters within three miles of Round Island to obtain a State permit. At this time, it is the Department's policy to deny permit requests to groundfish fishing vessels.

Other Problem Fisheries

As noted in Chapter II, the 1988 amendments to the Marine Mammal Protection Act suspended the incidental take permit requirements of the Act until 1 October 1993 for U.S. fishermen. The suspension does not apply to fishermen engaged in the yellowfin tuna purse seine fishery in the eastern tropical Pacific Ocean and foreign fishermen holding valid fishing permits issued under the Magnuson Fishery Conservation and Management Act of 1976. Among other things, the amendments required that the National Marine Fisheries Service, in consultation with the Commission, categorize and publish a list of fisheries -- along with the marine mammals and number of vessels or persons involved in each fishery -- according to the frequency of taking marine mammals incidentally in the fisheries.

As required, in December 1988, the Service provided and sought Commission comments on a draft list of fisheries. The Commission's comments on the draft list, provided by letter of 13 January 1989, were used in part to develop a proposed list of fisheries and an advance notice of proposed rulemaking. This notice was published by the National Marine Fisheries Service in the 27 January 1989 Federal Register to help give effect to the five-year commercial fisheries incidental take permit exemption established by the 1988 amendments. The Commission commented on the proposed fisheries list and related matters in letters of 3 March and 10 March to the Service.

By Federal Register notice of 20 April 1989, the Service published the final list of fisheries, categorized according to the frequency of taking marine mammals incidentally in the fisheries. The notice identified 39 species of marine mammals known to be taken, at least occasionally, in commercial fisheries in U.S. waters. Of the 167 fisheries categorized, 11 were judged to take marine mammals frequently (category I fisheries), 27 were judged to take marine mammals at least occasionally (category II fisheries), and the remaining 129 were judged to take marine mammals seldom if ever (category III fisheries). Fisheries judged to take marine mammals frequently included salmon gillnet fisheries in Alaska, Washington and Oregon; gillnet fisheries for shark, swordfish, and halibut in Washington, Oregon, and California; gillnet fisheries for groundfish and mackerel in the

Gulf of Maine; trawl fisheries for groundfish in the Bering Sea and Gulf of Alaska; and the foreign mackerel trawl fishery off the southern New England and mid-Atlantic states. The marine mammal species taken most frequently in these fisheries include the California sea lion, Steller sea lion, North Pacific fur seal, harbor seal, northern elephant seal, harbor porpoise, Dall's porpoise, pilot whale, humpback whale, and California sea otter. Several species or populations have been substantially affected and are discussed in detail in Chapter III.

In 1990, the Commission, in consultation with its Committee of Scientific Advisors, will continue to review and provide advice to the National Marine Fisheries Service, the Fish and Wildlife Service, and the Department of State on actions needed to minimize the adverse effects of marine mammal/fisheries interactions on both the affected fisheries and the affected marine mammals.

CHAPTER VIII

MARINE MAMMAL MANAGEMENT IN ALASKA

A number of states are confronted with important conservation problems that involve one or more species of marine mammals. Alaska, however, by virtue of its large populations of many different marine mammal species, its extensive coastline, the use of marine mammals for subsistence purposes, interactions with commercial fisheries, and many other management issues concerning marine mammals, presents extraordinary conservation challenges. In recognition of this fact, the Commission has devoted particular attention to marine mammal issues in Alaska. Past activities, which are summarized below, are discussed more fully in previous Annual Reports. Activities undertaken in 1989 are discussed following the background section.

Background

When the Marine Mammal Protection Act was passed in 1972, it gave the Federal Government primary authority for marine mammal management. However, it included certain procedures whereby the Secretaries of Commerce and the Interior, at the request of a state, could transfer marine mammal management authority to the state. Shortly after passage of the Act, the State of Alaska took steps to seek return of management authority for nine marine mammal species of particular concern to its residents. Late in the 1970s, the State of Alaska received management authority for one of those species -- the walrus. However, due to a court decision which effectively prevented the State from regulating Native subsistence hunting of walrus, it relinquished management authority back to the Federal Government in 1979 and suspended efforts to seek management authority for other marine mammal species.

In 1981, the Marine Mammal Protection Act's provisions for return of management were amended. Among other things, the procedure for transferring management authority to states was streamlined and the provisions governing state authority to manage subsistence use were clarified. In 1982, the State of Alaska again took steps to consider whether to seek management authority, this time for ten species of marine mammals. After numerous public hearings and revision of the State law governing subsistence hunting, the State focused its deliberations on requesting management authority for three species (polar bears, sea otters, and walrus). Additional hearings were held and, by letter of 9 March 1988, the Commissioner of the Alaska Department of Fish and Game notified interested parties that the State had decided not to apply for management authority for these or any other species. Instead, the State indicated that it would work

cooperatively with other parties on developing and implementing comprehensive management plans for species of particular concern.

Throughout this process, it has been the Marine Mammal 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. It was the Commission's understanding that this would be done within the context of action on return of management authority to the State of Alaska. This turned out not to be the case, however, and, as noted in previous Annual Reports, the Commission established a series of working groups in 1984 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), Steller sea lion (Eumetopias jubatus), beluga whale (Delphinapterus leucas), and sea otter (Enhydra lutris).

The Commission adopted the working group approach to focus attention on the species in question, rather than bureaucratic processes. It did so 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 carefully consider 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 working groups included biologists, biometricians, Native subsistence users, conservationists, and State and Federal wildlife resource managers. Each group was asked to: (1) prepare comprehensive summaries of available information on biological, ecological, and other factors affecting conservation of the species in question; (2) describe the research and management activities which they believed should be undertaken; and (3) estimate costs and priorities for the identified research and management tasks.

In 1988, the Commission published the reports of the working groups in Selected Marine Mammals of Alaska: Species Accounts with Research and Management Recommendations (see Lentfer 1988, Appendix B). The reports summarize pertinent biological information and identify research and management priorities for each species. To help develop research and management programs for the various species, the Commission distributed the publication widely to Federal and State agencies, Native groups, and others interested in the conservation of marine mammals in Alaska.

Species Management and Conservation Plans

The need for research and management plans for certain marine mammals also was addressed in late 1988 in amendments to the Marine Mammal Protection Act. As noted in Chapter II, the 1988 amendments added a new section to the Act requiring marine mammal status reviews and the development of conservation plans (similar to recovery plans required under the Endangered Species Act) for depleted marine mammal populations. With respect to marine mammals in Alaska, the amendments directed the Secretary of Commerce to prepare conservation plans for North Pacific fur seals and Steller sea lions by 31 December 1989 and 31 December 1990, respectively. The Senate report accompanying the amendments also indicated that, at the discretion of the Secretaries, the Act's provisions could be applied to development of conservation plans for non-depleted marine mammal species that could benefit from the preparation of such plans.

On 6 December 1988, the Commission wrote to the National Marine Fisheries Service to provide comments and recommendations on implementing the 1988 amendments. With respect to conservation plans, the Commission noted that it had first provided the Service with a draft conservation plan outline for North Pacific fur seals in 1985, and that much of the work to develop a plan for Steller sea lions had been done in the species account for that species in the Commission's publication on selected marine mammals in Alaska. The Commission therefore noted that it should be possible to complete plans for both species within three to six months.

At the Commission's Annual Meeting in Monterey, California, in February 1989, the Commission was advised by the Service that work had begun on both plans. At the end of 1989, however, the statutorily established date for completing a North Pacific fur seal conservation plan passed without release of a draft plan by the Service and the Commission had received no further information regarding the development of a plan for Steller sea lions.

On 11 January 1989, the Commission wrote to the Fish and Wildlife Service regarding implementation of the 1988 amendments to the Marine Mammal Protection Act. In its letter, the Commission noted that it believed that the Service, while not specifically required to do so, should prepare conservation plans for walrus, polar bears, and sea otters. It also noted that much of the needed background work for those plans was included in the species accounts for those species in its publication on selected marine mammals in Alaska. On 3 March 1989, the Service replied noting that: it planned to develop conservation plans for all three species; it had already begun to develop a plan for walrus; and it intended to begin the planning process for polar bears and sea otters shortly.

By December 1989, the Commission had received no further information on the Fish and Wildlife Service's progress on plan development. Therefore, on 13 December 1989, the Commission wrote to the Service to ask about the status of the plans. In its letter, the Commission noted that, while it recognized work on the plans had undoubtedly been delayed due to demands placed on the Service's Alaska staff by the Exxon Valdez oil spill, it hoped that rapid progress on the plans could be made in the near future. It offered to help in this regard and asked to be advised of the schedules for completing the plans. A response to the Commission's letter had not been received by the end of 1989.

In 1990, the Commission hopes to work with both Services to ensure that conservation plans needed to protect and conserve certain marine mammal species in Alaska are completed and implemented as quickly as possible.

Alaska Sea Otters

As noted in the previous Annual Report, a lawsuit was filed in 1985 in the U.S. District Court for the District of Alaska (Katelnikoff v. U.S. Department of the Interior) involving the take of sea otters for handicraft purposes. At issue was confiscation by the Service of certain items -- teddy bears, hats and mittens, fur flowers, and pillows -- made of sea otter pelts by Alaska Natives and offered for sale as handicrafts. The Service confiscated the items because it did not consider them to be traditional Native handicrafts of the type made prior to passage of the Marine Mammal Protection Act in 1972. It is the Service's view that the Act's exemption allowing Natives to take marine mammals for handicraft purposes applies only to traditional handicrafts commonly made before the Act was passed. The suit noted that the Act preserved the right of Alaska Natives to take marine mammals for handicraft purposes and challenged the validity of the Fish and Wildlife Service's regulatory definition of "authentic Native articles of handicrafts and clothing."

On 21 July 1986, the Court ruled in favor of the Service, holding that the language of the Act and its legislative history supported establishing 1972 as a cutoff date in its regulations. However, a new challenge to the Service's definition was filed by an intervening party in October 1987. The challenge claimed that the Service's regulation is unconstitutionally vague because, with respect to sea otters, it does not provide sufficient guidance to determine what handicrafts were commonly produced before 21 December 1972 when the Act became effective.

On 27 June 1988, the Court issued an order stating that it would entertain this constitutional challenge to the regulation. The order also strongly implied that the regulatory definition would be found to be vague. It therefore suggested that the

Service undertake an administrative review to determine if the use of sea otters for handicrafts by Natives calls for a special regulation or, at least, a definitive interpretation of the handicraft definition as it applies to sea otters.

The Service followed the Court's advice and reviewed the relevant information. Based on the review, it concluded that sea otters were not being taken for handicraft purposes when the Marine Mammal Protection Act was passed and, apparently, had not been taken legally by Alaska Natives for such purposes in living memory. Therefore, on 14 November 1988, the Service published a proposed rule providing additional guidance on allowable uses of sea otters in the making and selling of traditional handicrafts and clothing. Noting that the intent of the Act was to preserve existing Native uses of marine mammals, the Service proposed amending its regulatory definition of "authentic Native articles of handicrafts and clothing" to indicate clearly that no items created in whole or in part from sea otters fit within the definition and, therefore, such items cannot be sold.

The comment period on the proposed rule, initially scheduled to close on 13 January 1989, was extended first to 13 April and subsequently to 30 November 1989. The extensions were necessary to give interested persons in remote parts of Alaska an opportunity to comment and to allow time for the Service to hold public hearings on the proposal in Alaska and California. Between 1 September and 30 October, the Service held public meetings in 10 coastal Alaska locations and one site in California.

During 1989, no further action was taken in response to the challenge filed by the intervenor and, pending completion of the Service's rulemaking, the proceedings have been stayed. At the end of 1989, the Commission expected to forward comments on the proposed rule early in 1990, and it understood that the Service would publish a final rule in April 1990.

Polar Bears

Expanding development of renewable and nonrenewable resources in the Arctic has led to increasing numbers of interactions between humans and polar bears. Defending human life or property in encounters with polar bears can result in injury or destruction of bears. In addition, preemption or disturbance of polar bear denning areas could force animals to avoid preferred denning sites. The loss of a small number of bears, especially mature females, potentially could affect the Beaufort Sea polar bear population, which numbers approximately 1,800 to 2,000 animals and has a low reproductive potential.

As noted in Chapter IX of this Report, the Commission has provided comments to the Minerals Management Service on its proposed Alaska Regional Studies Plans for Fiscal Years 1989 and 1990. In its comments, the Commission cited the lack of plans for polar bear studies, particularly in light of uncertainties regarding the number of female bears denning near existing or proposed lease sale areas. The Commission suggested that studies be undertaken to: (a) determine what proportion of the Alaska polar bear population or populations could be affected by offshore oil and gas exploration and development; and (b) assess the likely effectiveness of measures that could be taken to avoid or minimize interactions between bears and people as a result of OCS activities.

In subsequent discussions with representatives of the Fish and Wildlife Service and the Alaska Department of Fish and Game, the Commission noted a number of uncertainties regarding what could and should be done to eliminate or minimize interactions between oil field workers and polar bears. As a result, the Commission, in cooperation with the Fish and Wildlife Service and the Alaska Department of Fish and Game, sponsored a workshop in Anchorage, Alaska, on 24-25 January 1989, to identify and recommend actions that should be taken by the Minerals Management Service and other agencies to adequately protect polar bears and their habitat in Alaska and adjacent areas.

Objectives of the workshop were to: review known and possible direct and indirect effects of oil and gas activities on polar bears and their habitat; identify additional information which may be necessary to assess the effects of oil and gas exploration and development on polar bears; describe the research required to obtain the additional information and the time, money, and special equipment needed to carry out the research; identify and assess potential measures that could be taken to avoid or mitigate the adverse effects of bear-human interactions on both bears and people; describe additional research that may be necessary to evaluate the utility of such measures; and describe the types of long-term population and other studies that would be required to verify the predicted effects and to detect the possible unforeseen effects of oil and gas exploration and development on Alaska polar bears.

Participants in the workshop included researchers from the United States and Canada with experience in polar bear biology and management. Among the groups represented at the workshop were: the Alaska Department of Fish and Game, the Canadian Wildlife Service, the Department of Renewable Resources of the Government of the Northwest Territories, the Department of Wildlife Management of the North Slope Borough, the Inuvialuit Game Council of the Northwest Territories, the Marine Mammal Commission, the Minerals Management Service, and the Fish and Wildlife Service.

Among the information provided at the workshop was a description of a Canadian program to reduce bear-human conflicts and manage bear problems. The program was developed in 1981 by the Northwest Territories Wildlife Service, in cooperation with industry and other Canadian Government agencies. It includes research on methods to reduce polar bear problems and implementation of appropriate and proven detection and deterrent methods, along with proper education of people living and working in bear habitat. Participants in the Workshop agreed that the Canadian program could serve as a useful model for addressing polar bear issues in Alaska.

The Exxon Valdez oil spill in Alaska waters in March 1989 preempted efforts to complete and follow up on the results of the polar bear workshop in 1989. It is anticipated that the workshop report will be completed early in 1990.

Pacific Walrus

Pacific walrus occur primarily in the Bering and Chukchi Seas between the United States and the Soviet Union. Aerial surveys of walrus have been conducted since the 1960s, and cooperative U.S.-U.S.S.R. surveys of walruses have been conducted every five years since 1975. The most recent survey conducted in 1985 indicates a population size of about 232,500 animals. This is lower than the 1980 survey estimate of 246,000, which is similar to levels that some biologists believe existed prior to exploitation by Europeans, but is substantially above estimates from the 1960s of less than 100,000 animals. Walruses have traditionally been an important subsistence resource for Native peoples in both Alaska and the Soviet Union.

As noted elsewhere in this Report, several efforts were initiated or continued in 1989 to improve the effectiveness of walrus research and management: the State of Alaska and the National Marine Fisheries Service have closed certain waters around the Walrus Islands and Cape Pierce for purposes of yellowfin sole trawling to prevent disturbance of walrus haul-out areas (see Chapter VII); the Fish and Wildlife Service is taking steps to prepare a conservation plan for walrus (see above); and the Commission is providing support to help convene an international workshop on population ecology and management of walruses in March 1990 (see Chapter X).

Federal Marking and Tagging Regulations

In 1981, the Marine Mammal Protection Act was amended to provide the Fish and Wildlife Service and the National Marine Fisheries Service 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.

Marking and tagging regulations were published by the Fish and Wildlife Service on 28 June 1988. The regulations require that, within 30 days of taking any polar bear, walrus, or sea otter, the Alaska Native hunter must report the take to the Service and present specified parts of the animal taken to be marked and tagged. Polar bear and sea otter skins and skulls and walrus tusks must all be marked or tagged. Reports must include, among other things, the date and location of the take and the sex of the animal taken. Raw, unworked, or tanned parts from these three marine mammal species taken between 21 December 1972 (the date the Marine Mammal Protection Act became effective) and 26 October 1988 (the effective date of the regulations) that had not yet been converted into handicrafts or clothing were required to be presented for marking by 24 April 1989. Possession or transportation of unmarked marine mammal parts, except as authorized in the regulations, is a violation of the Act.

Since promulgating its regulation, the Service has worked closely with Native groups and officials of the State of Alaska to explain the new requirements to subsistence hunters. Among other things, the Service has: held training sessions in remote coastal villages; prepared and disseminated videotapes, bulletins, posters, and other instructional materials; and distributed a quarterly newsletter to taggers and Native leaders to provide timely information about the program.

To date, 88 individuals throughout coastal Alaska have been trained and authorized to tag marine mammal parts taken by Alaska Natives. The taggers include 67 Native village residents working under contract to the Service as well as Service employees generally stationed at National Wildlife Refuges. Taggers are responsible for specific geographic areas and, in addition to affixing official tags and marks to marine mammal parts, they collect information on the harvested animals. The Service expects to have a computerized data management system for harvest information in place early in 1990. The table on the following page presents data on the number of marine mammals tagged through the end of 1989.

Litigation

United States v. Nusunginya -- In 1988, an Alaska Eskimo whaler was criminally prosecuted for allegedly hunting and killing a bowhead whale in excess of his village quota in violation of the Cooperative Agreement between the National Oceanic and Atmospheric Administration and the Alaska Eskimo Whaling Commission (see Chapter III). Under regulations

The Number of Sea Otters, Walrus, and Polar Bears Taken and Presented for Marking and Tagging by Alaskan Natives

Year	Sea Otters	Walrus	Polar Bears
Pre-rule*	430	945	23
1988**	52	0	--
1989	317	677	144***

* "Pre-rule" refers to stocks of raw, unworked, or tanned marine mammal parts from animals taken between 21 December 1972 and 26 October 1988 and still held by Native hunters when the regulations became effective.

** Figures include only marine mammals taken after 26 October 1988.

*** Figure includes those polar bears taken between 1 July 1988 and 30 June 1989.

implementing the Whaling Convention Act, it is illegal to take whales except in accordance with the Cooperative Agreement.

On 24 October 1988, the defendant filed a motion to dismiss the charges against him, arguing that: the Cooperative Agreement was not in force when the alleged violations occurred because notice of its extension beyond 31 December 1987 had not been published in the Federal Register; the Cooperative Agreement impermissibly delegated management and enforcement authority for subsistence whaling to the Alaska Eskimo Whaling Commission, a non-governmental body; and the charged offenses are unconstitutionally vague.

A United States Magistrate in the District of Alaska reviewed the defendant's motion to dismiss and, on 15 November 1988, recommended that it be denied. In support of that recommendation, the Magistrate found that: when read in concert, the three applicable statutes -- the Whaling Convention Act, the Marine Mammal Protection Act, and the Endangered Species Act -- authorized entry into the Cooperative Agreement; the defendant had actual notice of the applicability of the provisions of the Cooperative Agreement when he allegedly undertook the prohibited activities; under the regulatory scheme, whaling may be conducted only in accordance with the Cooperative Agreement and, if the Cooperative Agreement had lapsed, no whaling would be authorized;

and the statutes and regulations challenged by the defendant provided fair notice of the conduct that they forbade.

A trial was scheduled for 18 November 1988; however, when the District Court adopted the Magistrate's recommended positions, the defendant entered a guilty plea but reserved the right to appeal the interpretations of the applicable law. The defendant was sentenced on 1 March 1989 to two months in a community treatment center, a fine of $3,000, and three years' probation, during which time he was forbidden from whaling.

The defendant filed a notice of appeal on 3 March 1989, arguing that the Federal Government does not have authority to regulate whaling by Alaska Natives. In its brief filed on 21 August 1989, the Government argued that the defendant was precluded from challenging the authority of the United States before the appellate court because the issue was not raised at trial. In addition, the Government claimed that the defendant had not made the requisite factual showing to prove that he possesses legally recognizable aboriginal hunting rights. Further, it was argued that, even if such rights are presumed, those rights have been abrogated by subsequent Federal legislation, including the Whaling Convention Act, the Marine Mammal Protection Act, and the Endangered Species Act. Oral argument in the matter was heard on 7 December 1989 by the Ninth Circuit Court of Appeals. At the end of 1989, no decision had been issued.

United States v. Clark -- Another criminal prosecution of an Alaska Native involving the take of marine mammals occurred in 1989. The defendant, a Yup'ik Eskimo, was charged with taking marine mammals in a wasteful manner by failing "to salvage for human consumption the edible meat of approximately nine walrus." Prior to trial, the defendant filed a motion to dismiss the charges. He claimed that the Marine Mammal Protection Act's requirement that the taking of a marine mammal by an Alaska Native not be accomplished in a "wasteful manner" was unconstitutionally vague. The motion to dismiss was denied and the trial was held on 19-20 July 1989. The jury found the defendant guilty of illegally taking marine mammals in a wasteful manner. On 24 August, he was sentenced to three months in jail and fined $550.

A stay of the sentence pending appeal was granted and, on 30 August 1989, a Notice of Appeal was filed. The defendant's appellate brief, filed on 1 December 1989, argued that the statutory requirement that Native taking not be wasteful and the Fish and Wildlife Service's regulatory implementation of the provision are unconstitutionally vague because "affected persons must guess at what conduct is proscribed and because arbitrary enforcement is encouraged."

On 20 December, the Alaska Federation of Natives petitioned the Court of Appeals for leave to file an amicus curiae brief and to participate in oral argument. In its brief, the Federation asserts not only that the statutory provision and the Service's regulations should be declared void for vagueness, but also that the regulations prohibiting Natives from taking marine mammals in a manner "which results in the waste of a substantial portion" of the animal is an impermissible interpretation of Congressional intent.

The Government's reply brief is due in February 1990.

National Society for Animal Protection v. Turner -- In addition, a lawsuit involving marine mammals in Alaska arose in 1989. On 13 November 1989, a complaint was filed in the District Court for the District of Columbia by an animal welfare group challenging the issuance of a permit for scientific research by the Fish and Wildlife Service under the Marine Mammal Protection Act.

The permit authorized the temporary capture and sampling of up to 650 Alaskan sea otters and the surgical implantation of transmitters in up to 275 of those otters. The research is part of the Service's efforts to determine the magnitude, extent, and duration of impacts from the Exxon Valdez oil spill on the sea otter population.

The plaintiffs charged that the permit violated the Marine Mammal Protection Act in that the authorized research would be unnecessarily duplicative and would not produce scientifically valid data. In addition, the plaintiffs asserted that the decision to authorize the research was premature because, although the study was to be conducted as part of the Natural Resources Damage Assessment Plan prepared pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, the permit was issued prior to the close of the public comment period on the draft Assessment Plan and prior to approval of the Plan. The Federal defendant's answer is due 12 January 1990.

CHAPTER IX

OUTER CONTINENTAL SHELF OIL, GAS, AND MINERAL DEVELOPMENT

Activities and environmental contamination 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 1989 are discussed below.

Proposed Oil and Gas Lease Sales #131, #135, and #137 Central, Western, and Eastern Gulf of Mexico

The Minerals Management Service is tentatively planning to hold three proposed lease sales in the Gulf of Mexico in 1991. Sale #131 (scheduled for March 1991) would involve up to 5,657 blocks or 30.3 million acres of submerged lands in the central Gulf; sale #135 (August 1991) would involve 5,072 blocks or 27.9 million acres in the western Gulf; and sale #137 (November 1991) would involve 8,345 blocks or 47.5 million acres in the eastern Gulf. Twenty-eight species of marine mammals, including seven endangered species, are known to occur in or migrate through the proposed lease sale areas. Two marine mammal species of special concern found in the Gulf of Mexico leasing areas are the endangered West Indian manatee (Trichechus manatus) and the bottlenose dolphin (Tursiops truncatus).

On 10 May 1989, the Minerals Management Service announced its intent to prepare an environmental impact statement on the proposed lease sales and asked the Commission and others for any pertinent information on the proposal. The Commission, in consultation with its Committee of Scientific Advisors, reviewed the Service's "Call for Information and Notice of Intent" on the proposed action and, by letter of 12 June 1989, forwarded comments and recommendations to the Service.

In its letter, the Commission advised that, for most of the species involved, there was not sufficient information on distribution, abundance, movements, and habitat requirements to determine how the proposed activities might affect the stocks. The Commission noted that the bottlenose dolphin is the most common marine mammal in the coastal waters of the northern Gulf of Mexico and the species therefore is the one most likely to be exposed to and be affected by the proposed action. The Commission further noted that available information indicates that bottlenose dolphins are not distributed uniformly throughout their range and appear to be composed of a number of more or less discrete "local" populations or subpopulations. Thus, possible cumulative effects of deliberate and incidental take in the course of commercial fishing operations and habitat degradation/destruction on local populations must be considered when assessing the possible effects of offshore oil and gas exploration and development in the Gulf of Mexico.

Accordingly, the Commission recommended that, if the Service had not already done so, it consult with the National Marine Fisheries Service to: (a) obtain the best available information on the distribution, discreteness, size, productivity, essential habitats, and status of bottlenose dolphin populations that could be affected by the proposed action; and (b) determine the research and monitoring programs that would be required to accurately assess and detect the possible effects of activities related to the proposed action on these populations and their habitat.

The Commission also noted that the marine mammal species most at risk as a result of the proposed sale may be the endangered West Indian manatee. The largest remaining concentrations of manatees in the United States are located along the east and west coasts of Florida, and if an oil spill or activity related to the proposed sale were to damage essential manatee habitat, it could seriously threaten the species potential recovery and long-term survival. The Commission noted that deferral of tracts within 20 miles of the West Florida coast as discussed in the Service's Call for Information could substantially reduce potential effects on manatees and their habitats. The Commission recommended that, if the Minerals Management Service had not already done so, it consult with the Fish and Wildlife Service pursuant to section 7 of the Endangered Species Act to determine measures that may be needed to assess and avoid or mitigate both direct and indirect effects and to detect and monitor the possible unforeseen effects of the proposed action on West Indian manatees.

Five-Year OCS Oil and Gas Leasing Program

On 2 July 1987, the Secretary of the Interior approved a Final Five-Year OCS Oil and Gas Leasing Program for the period mid-1987 to mid-1992. In response to legal challenges filed by several states and environmental groups, the U.S. Court of Appeals for the District of Columbia ruled that the Final Environmental Impact Statement (FEIS) on the proposed leasing program failed to adequately analyze cumulative effects, including effects of simultaneous development in different regions, on migrating species of birds, marine mammals, and fish. Therefore, to help determine if changes in the five-year leasing program might be warranted, the Minerals Management Service prepared a Draft Supplemental Environmental Impact Statement (DSEIS) on the program. By letter of 16 August 1989, the Commission was asked to review and comment on the supplemental statement.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the Supplemental Statement and, by letter of 17 October 1989, provided comments to the Minerals Management Service. In its letter, the Commission noted that the DSEIS had concluded, among other things, that the level of cumulative impact on northern fur seals is likely to be high; the level of cumulative impact on Steller sea lions is likely to be moderate; and the level of cumulative impacts on other migratory marine mammals, including both endangered and non-endangered species, is likely to range between moderate and very low. The Commission noted, however, that the DSEIS considered potential cumulative impacts only in the Alaska and Pacific Regions. It was not clear whether the Service planned to consider separately the cumulative effects on migratory species in the Atlantic and Gulf of Mexico Regions or whether the Service had concluded that it was unnecessary to consider possible cumulative impacts in those Regions. Therefore, the Commission recommended that, if no separate analysis or document is planned, the DSEIS either be revised to indicate why analysis of possible cumulative impacts in the Atlantic and Gulf Regions was considered unnecessary or that it be expanded to consider possible cumulative impacts on marine mammals and other migratory species in those OCS Regions.

In its letter the Commission also noted that, with respect to the Alaska and Pacific OCS Regions, the DSEIS considered potential cumulative impacts on some, but not all migratory marine mammals. For instance, it did not address cumulative impacts on many small cetaceans or pinnipeds known to migrate through those Regions. Therefore, the Commission also recommended that the DSEIS be modified to indicate why the Minerals Management Service believed it unnecessary to consider possible cumulative impacts on all migratory species or that the document be expanded to do so. The Commission further recommended that the DSEIS be expanded to: (a) better reflect

the uncertainty and range of possible impacts on marine mammals; and (b) identify and describe the steps that will be taken to verify predicted effects and to detect and mitigate possible unforeseen effects on migratory marine mammals and other components of the ecosystem of which they are a part.

Alaska OCS Mining Program
Proposed Lease Sale, Norton Sound

A lease sale of submerged lands for purposes of mineral exploration and development was originally scheduled by the Minerals Management Service for July 1989. The proposed sale involved 178,282 acres (or 40 blocks), 5 to 22 km offshore Nome, Alaska, in water depths of 20-30 meters. The Minerals Management Service's Draft Environmental Impact Statement (DEIS) on the proposed sale was provided to the Commission and others for review and comment in November 1988.

The Commission, in consultation with its Committee of Scientific Advisors, reviewed the DEIS and, by letter of 13 January 1989, provided comments to the Service. In its letter, the Commission noted that the DEIS provided a reasonably thorough review and analysis of available information regarding possible impacts from fuel spills, acoustic disturbances, dredging, and other activities associated with the proposed action that could affect endangered and non-endangered marine mammals in the lease sale area. However, the Commission noted that the DEIS did not provide a complete evaluation of information on the status of all marine mammal species likely to be found in or near the proposed lease sale area.

Mining activities of the type and scale envisioned in the DEIS have not been conducted previously in the Alaska OCS region or in Federal waters. In light of the lack of previous experience, the DEIS identified a number of potential mitigation measures that would help ensure that possible impacts on marine mammals and other marine resources were detected and avoided. In its letter, the Commission recommended that these measures be incorporated as part of the proposed action and that the Service consider adopting an additional stipulation to require that discharged mining wastes be shunted directly to the seabed in order to protect surface waters from contamination by fine sediments and dissolved metals that may affect living marine resources.

Because of uncertainties associated with the mining technology to be used, the volume and levels of pollutants in mining waste discharges, and the total resource potential of the proposed lease sale area, the Commission considered it particularly important to ensure that baseline information and monitoring programs provide an adequate basis for detecting

possible unforeseen impacts and for verifying assessments of predicted levels of expected impacts. The Commission therefore recommended that Stipulation No. 1 concerning the development and implementation of a management-related monitoring and studies program be adopted as part of the proposed action. The Commission further recommended that, if it had not already done so, the Minerals Management Service consult with the National Marine Fisheries Service and the Fish and Wildlife Service to ensure that baseline information and planned monitoring programs are adequate to detect any changes in time to take steps to mitigate possible impacts on marine mammals and other living marine resources. Finally, the Commission recommended that the DEIS be expanded to identify and describe the types of monitoring programs that will be undertaken by the Alaska Regional Studies Program as well as by the lessee during the post-lease sale period to ensure detection and mitigation of possible unforseen effects.

At the end of 1989, the Commission was advised that the Minerals Management Service had decided to substantially modify the Draft Statement to address certain public health issues and other concerns. The Commission will review the Service's new or revised DEIS when it is made available for comment.

The Minerals Management Service's Environmental Studies Program

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

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.

Alaska Region

At the request of the Minerals Management Service's Alaska OCS office, the Commission wrote to the office on 7 September 1989 to provide comments on the draft Alaska Regional Studies Plan for Fiscal Years 1991-1992. In its letter, the Commission reiterated a number of comments made in its 29 September 1988 letter to the Service on the draft Alaska Regional Studies Plan for Fiscal Year 1990. Specifically, the Commission again noted that the Service's proposal to use satellite tags to identify at-sea habitat important to northern fur seals and Steller sea lions may duplicate or overlap work being done by the National Marine Fisheries Service and the Alaska Department of Fish and Game. Therefore, the Commission suggested that, if the Service had not already done so, it consult both agencies to determine what was being done with regard to the two species and how the resources of those agencies might be used to complement or help implement the Minerals Management Service's proposed studies.

As in its comments on the Fiscal Year 1990 Plan, the Commission again suggested in its September 1989 letter that the draft Studies Plan be expanded to include studies to:
(a) determine the number of female polar bears that den on land and on ice near existing and proposed lease sale areas, and
(b) assess the likely effectiveness of measures that possibly could be taken to avoid or minimize interactions between bears and people as a result of OCS activities. The Commission suggested that, if the Minerals Management Service had not already done so, it consult with the Fish and Wildlife Service and the Alaska Department of Fish and Game to determine the critical uncertainties in this area and the studies needed to resolve them.

Workshop on Sea Turtles and Marine Mammals of the Gulf of Mexico

As noted above, the Marine Mammal Commission works with the various regional offices of the Minerals Management Service to help identify priority marine mammal studies for the regional Environmental Studies Programs. During 1989, the Commission devoted particular attention to study needs in the Gulf of Mexico Region.

As has been discussed in previous Annual Reports, the Marine Mammal Commission, along with the National Marine Fisheries Service, has advised the Minerals Management Service that available data are inadequate to reliably assess impacts of oil and gas exploration and development on marine mammals and sea turtles in the Gulf of Mexico. To respond to these concerns, and similar concerns regarding sea turtles, the Minerals Management

Service convened a meeting in November 1988 to identify and determine how best to obtain needed information. Participants in the meeting, including representatives of the Marine Mammal Commission, agreed that it would be desirable to hold a workshop to identify critical information needs concerning marine mammals and sea turtles in the Gulf of Mexico; describe the research that would be required to obtain needed information; and estimate the time, money, and other resources that would be required to do the described research.

The Workshop on Sea Turtles and Marine Mammals in the Gulf of Mexico was held 1-3 August 1989 in New Orleans. Participants included representatives of the Fish and Wildlife Service, the National Marine Fisheries Service, the Marine Mammal Commission, the Minerals Management Service, the Army Corps of Engineers, state agencies, the academic community, and environmental and industry groups. Objectives of the Workshop were to:

- -- review the existing state of knowledge of marine mammals and sea turtles in the Gulf of Mexico;
- -- review ways in which marine mammals and sea turtles have been or could be affected, either directly or indirectly, by activities and events associated with various human activities in the Gulf of Mexico;
- -- identify the types and specificity of data needed to support endangered species consultations or management decisions;
- -- discuss and reach consensus on the most immediate data still needed for endangered species consultations; and
- -- identify and discuss the advantages and disadvantages of various methods that might be used to obtain needed data.

Because a recovery plan is in place for endangered West Indian manatees and consultations between the Fish and Wildlife Service and the National Marine Fisheries Service take place periodically pursuant to section 7 of the Endangered Species Act, the Workshop did not consider information needs relative to this endangered species.

Workshop Results -- A draft report of the Workshop was circulated to participants in mid-October 1989, and representatives of the Commission contributed to and commented on the draft report. With respect to marine mammals, the draft noted, among other things, that a number of human activities and pollutants are or could be affecting marine mammals and their habitat in the Gulf of Mexico. These include: offshore oil and gas exploration and development and associated coastal development; commercial fishing; lost and discarded fishing gear and other persistent debris; marine pollution from oil spills,

agricultural runoff, industrial effluents; live-capture and removal of animals for purposes of public display and scientific research; illegal shooting; and whale and porpoise watching and feeding. Participants also noted that marine mammals and sea turtles and the ecosystems of which they are a part could be affected by natural events such as red tides, hurricanes, and climate change.

Workshop participants concluded that the basic biology, ecology, and demography of most marine mammal species inhabiting the Gulf of Mexico either are unknown or are poorly known. They also noted that the extent to which marine mammals in the Gulf have been or are being affected by coastal and offshore development, commercial fisheries, environmental pollution, other human activities, and natural variables is not known. The following were determined to be the most critical research needs:

-- Assessing and developing programs to detect and monitor the effects of human activities on the endangered sperm whale and other cetaceans throughout the Gulf of Mexico;
-- Determining and monitoring levels of environmental contaminants and natural biotoxins in representative marine mammals in the Gulf;
-- Determining and monitoring the number and species of marine mammals being caught and killed incidentally in commercial fisheries in the Gulf;
-- Determining and monitoring the demography and dynamics of bottlenose dolphin populations in the Gulf;
-- Completing bottlenose dolphin stock discreteness studies;
-- Evaluating and improving the Gulf of Mexico Marine Mammal Stranding Network; and
-- Characterizing and monitoring key components of important marine mammal habitats in the Gulf.

To follow up on some of the Workshop findings, on 30 August 1989, the Commission wrote to the Minerals Management Service focusing on some of the preliminary conclusions of the Workshop participants. In its letter, the Commission pointed out that Workshop participants had concluded: (1) that much of what is known about the diversity, relative abundance, basic biology, and general health of marine mammals in the northern Gulf of Mexico has been derived from studies of live and dead stranded animals; and (2) that studies of beached and stranded animals might also usefully contribute to (a) assessing and monitoring the fate and effects of environmental contaminants on marine mammals and other components of the marine ecosystem, and (b) determining and monitoring the species and numbers of marine mammals being caught and killed incidentally during commercial fishing operations in the Gulf of Mexico.

In its letter, the Commission noted that information from stranded animals was being obtained through volunteer efforts carried out under the Southeast Regional Marine Mammal Stranding Network authorized by the National Marine Fisheries Service, and that, for various reasons, the responses to strandings can vary within and between areas and years. The Commission suggested that the level of information being obtained through the stranding program could be greatly improved by strengthening the operation of the network through production of training videos to help train volunteers in such tasks as taking basic measurements and collecting, recording, and reporting data; organizing meetings of key network participants to discuss and agree on methods for collecting and reporting data, holding training sessions, identifying weaknesses in the network, and generally improving cooperation; expanding information and education programs to ensure that the public is aware of the scientific value and interest in beached and stranded animals; setting up "index" beaches to be monitored at regular intervals to determine the proportion of beached and stranded animals that are found, reported, and investigated; and providing basic equipment and supplies to key network members or centers.

In its letter, the Commission offered to make funds available to help support a meeting of key network members to better define and determine how best to accomplish the other suggested tasks. It then explored the possibility that the Minerals Management Service might also be able to provide funds to support other suggested projects.

On 14 September 1989, the Minerals Management Service responded to the Commission's 30 August letter, stating that it concurred with the Commission that the stranding network could potentially be strengthened through jointly funded projects, as outlined in the Commission's letter. The Service agreed to commit funds to co-sponsor a meeting of key network members and for the preparation and distribution of training videos. Additional funding was also contributed by the National Marine Fisheries Service. As is described in Chapter XI, the funds were used to convene a workshop on regional marine mammal stranding networks and a meeting of the Southeast Regional Stranding Network, and to purchase equipment and supplies for the Marine Mammal Stranding Network in Texas.

The Commission looks forward to working with the Minerals Management Service, the National Marine Fisheries Service, and others on this important task.

CHAPTER X

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 Fish and Wildlife Service, the Minerals Management Service, and other Federally-funded agencies; convenes meetings and workshops to review, plan, and coordinate marine mammal research; and, contracts for studies to help identify, 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 a broad spectrum of Federal departments and agencies. To determine the precise nature of this research, assess ways in which it can best be used to facilitate marine mammal conservation and protection, and 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 1989, the Commission requested information from 22 Federal agencies, departments, and offices, most of which had conducted or supported research relevant to the conservation and protection of marine mammals in previous years. Those departments, agencies, and offices were the Department of Agriculture, the Department of the Air Force, the Department of the Army, the Department of the Navy, the Department of Energy, the Department of State, the Environmental Protection Agency, the Minerals Management Service, the National Aeronautics and Space Administration, the National Institutes of Health, the National Marine Fisheries Service, the National Ocean Service, the National Park Service, the National Science Foundation, the Office of Oceanography and Marine Assessment, the National Ocean

Pollution Program Office, the National Sea Grant College Program, the Naval Ocean Systems Center, the Office of Naval Research, the Office of Ocean and Coastal Resources Management, the Smithsonian 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 1989 survey had been received from most of the agencies by December. After the information provided has been compiled and verified, the Commission, in consultation with its Committee of Scientific Advisors, will evaluate it and make such recommendations as may be appropriate to better develop, focus, and coordinate agency programs. The survey results are summarized annually in the Commission sponsored report "Survey of Federally-Funded Marine Mammal Research and Studies" (see below).

Research Program Reviews, Workshops, and Planning Meetings

In 1989, the Commission, in consultation with its Committee of Scientific Advisors, reviewed, commented on, and/or made recommendations on actions concerning: the Hawaiian monk seal, the North Pacific fur seal, the bottlenose dolphin, the Steller sea lion, the West Indian manatee, California and Alaska sea otter populations, the tuna/porpoise issue, other marine mammal-fisheries interactions, and entanglement of marine mammals in lost and discarded fishing gear and other marine debris. In addition, the Commission convened, co-sponsored, and/or participated in meetings and workshops to: review and evaluate efforts to implement the Hawaiian Monk Seal Recovery Plan; develop recovery plans for endangered right and humpback whales; describe programs that should be initiated to identify and protect important polar bear habitats and to minimize the possibility that polar bears will be attracted to and shot in order to protect workers at oil drill sites along the Arctic coast of Alaska; begin development of a research plan to assess the impacts of the Exxon Valdez oil spill on marine mammals and other wildlife; continue efforts to develop a coordinated, interagency Arctic research program; determine critical data needs with regard to marine mammals and sea turtles in the Gulf of Mexico; review the Southeast Fisheries Center's Marine Mammal Research Program; determine how the National Marine Mammal Stranding Program might be improved; assess available information and determine additional research needed to resolve uncertainties concerning the apparent link between natural biotoxins and the mass mortalities of humpback whales and bottlenose dolphins along the eastern coast of the United States in 1987-1988; review progress and determine what more needs to be done to more effectively prevent and deal with problems being caused by lost and discarded fishing gear and other hazardous marine debris; discuss tentative plans for development of a marine mammal tissue

bank; identify additional boat speed regulations and other measures needed to prevent further decline of manatee populations in Florida; review measures being taken by the National Marine Fisheries Service to encourage foreign tuna fishing fleets to reduce the incidental take of porpoise to levels comparable to that achieved by the U.S. fleet; and determine how the National Marine Fisheries Service's Antarctic Marine Living Resources Research Program can best be used to encourage effective implementation of the Convention on the Conservation of Antarctic Marine Living Resources.

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 659 projects, ranging in amounts from several hundred dollars to $150,000. The average contract amount has been about $6,696. The total amounts of contracts awarded have been:

FY	Amount	FY	Amount
1974	$258,787	1982	$107,117
1975	$446,628	1983	$211,982
1976	$497,449	1984	$327,854
1976-77*	$132,068	1985	$226,160
1977	$523,504	1986	$132,611
1978	$407,678	1987	$134,975
1979	$219,897	1988	$124,603
1980	$396,640	1989	$ 90,927
1981	$173,652		
		TOTAL:	$4,412,532

*Three-month transition period.

From time to time, the Commission's investment in research activities is in the form of transfers of funds to and from other Federal agencies, particularly the National Marine Fisheries Service, the Fish and Wildlife Service, and the Minerals Management Service. When such funds are transferred from the Commission to another agency, the Commission provides detailed

scopes of work that 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 1989 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 1989 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.

Marine Mammal Strandings

Marine mammals that strand live or die and wash up on beaches provide valuable and sometimes unique sources of information concerning the distribution, relative abundance, morphology, diseases, and natural history of marine mammals and, in some cases, may be indicators of the status of marine mammal populations and the ecosystems of which they are a part. Studies of stranded animals may also contribute to assessing and monitoring the fate and effects of environmental contaminants (e.g., anthropogenic hydrocarbons, fertilizers, herbicides, pesticides from agricultural runoffs, industrial effluent, lost and discarded fishing gear, etc.), and determining and monitoring the species and numbers of marine mammals being caught and killed incidentally during commercial fishing operations.

As described in Chapter IX, the Minerals Management Service, in consultation with the Commission and the National Marine Fisheries Service, held a workshop in New Orleans on 1-3 August 1989 to identify information needed to assess and mitigate the effects of human activities on marine mammals and sea turtles in the Gulf of Mexico. The workshop participants noted the value of information that can be derived from stranded animals and recommended, among other things, that steps be taken to evaluate and improve the operation of the Gulf of Mexico Marine Mammal Stranding Network. In response to these recommendations, the Marine Mammal Commission, in consultation with and with funding provided, in part, by the Minerals Management Service and the National Marine Fisheries Service, contracted for the three projects described below.

Workshop To Evaluate Regional Marine Mammal Stranding Networks
(James G. Mead, Ph.D., Smithsonian Institution, Washington, D.C.)

Following a Commission-sponsored workshop in 1977, six regional marine mammal stranding networks were established to facilitate reporting and study of both live and dead stranded marine mammals. The effectiveness of the networks has varied due to insufficient and irregular support, difficulties with staffing, and inconsistent coordination and communication among regional coordinators and response team members. To better define and determine how to correct these problems, the Marine Mammal Commission sponsored the workshop on 16-17 November 1989 in Washington, D.C., to: (a) review and identify ways that the organization and administration of the networks might be improved; (b) review and determine how protocols for collecting, recording, reporting, and storing data from dead stranded marine mammals might be improved; (c) determine topic areas where video cassettes could be used to improve training of network volunteers; (d) identify deficiencies in expendable equipment, supplies, and travel budgets that may be compromising the effectiveness of the various networks; and (e) estimate the annual funding that would be required to maintain basic stocks of expendable equipment and supplies and to reimburse network volunteers for travel expenses necessary to ensure effective operation of the networks. Participants included representatives from the Commission, the Smithsonian Institution, the New England Aquarium, Sea World (Orlando, Florida), Texas A&M University, the Los Angeles County Museum of Natural History, the National Marine Fisheries Service, and the Minerals Management Service. The workshop report is expected to be completed early in 1990. It will be sent to the regional stranding network coordinators, agencies with responsibility for conservation of marine mammals, and other interested institutions and persons to advise them of steps that can be taken to improve operations of the network.

Meeting of Key Members of the Southeast Regional Stranding Network
(Daniel Odell, Ph.D., Marine Research Center, Sea World, Orlando, Florida)

Studies of marine mammals found beached and stranded along the coast of the southeast Atlantic and Gulf states are carried out by members of the Southeast Regional Marine Mammal Stranding Network as authorized by the National Marine Fisheries Service and the Fish and Wildlife Service. The network is staffed by volunteers and their response to strandings has varied both within and between years and areas. The causes of this variability include differences in the ways that beached and stranded animals are located and reported (beaches in populated areas, for example, may be surveyed regularly, at least at certain times of the year, whereas beaches in remote areas may be

surveyed only occasionally); the particular interest, training, and experience of individual network members; and the availability of basic equipment and supplies necessary to collect, store, and analyze specimen materials. The purposes of this meeting, to be held early in 1990, are to determine possible ways: to improve organization and administration of the network, particularly coordination and communication among key network members in different geographical locales; instruct key network members in the best procedures for determining and documenting the cause of death of stranded marine mammals, particularly those that may have been caught and killed or injured incidental to commercial fishing operations; identify deficiencies in expendable equipment and supplies and travel budgets that are compromising the effectiveness of the network; determine the annual funding that would be required to maintain basic stocks of expendable equipment and supplies and to reimburse volunteers for travel expenses necessary to insure continued and effective operation of the network, and, as possible, list equipment, supply, and travel budget needs for each geographic component of the network; and develop instructional video tapes for distribution to other regional networks to assist in training volunteers. The meeting results will be reviewed by the Commission and its Committee of Scientific Advisors to determine if similar meetings of the key members of other networks also might be useful.

Expendable Equipment and Supplies in Support of the Texas Marine Mammal Stranding Network
(Gina Baron, Texas A&M University, Galveston, Texas)

As noted above, the effectiveness of regional stranding networks often is compromised by the limited support available for expendable equipment and supplies (e.g., scalpel blades, specimen bags and bottles, film, etc.). The purpose of this grant was to provide for a one-time purchase of basic stocks of expendable equipment and supplies to improve operation of this network, at least in the short term.

West Indian Manatee

Human-related mortality and injury and habitat destruction and degradation pose significant threats to West Indian manatee populations in Florida and elsewhere. To help mitigate these threats, the Marine Mammal Commission either contracted for or helped support studies to: coordinate and expand public information and education programs on the plight of the manatee; develop a plan to protect manatee habitat in areas subject to rapid development; and undertake research relative to manatee survival and reproductive biology.

Continued Studies of Manatees in Southeast United States and Puerto Rico
(Whitney Tilt, National Fish and Wildlife Foundation, Washington, D.C.)

In 1988, the Commission sponsored studies to: determine whether sectioning and analysis of bone samples could be used to determine the age of manatees; develop and use a geographic information system to assist in identifying and protecting critical manatee habitats; and determine the movements and seasonal habitat use patterns of manatees. These projects and related studies conducted by the Fish and Wildlife Service, the National Marine Fisheries Service, and the Florida Department of Natural Resources contributed to the development of conservation programs for manatees and their habitats in Florida and Puerto Rico. In 1989, the Commission provided funds to the National Fish and Wildlife Foundation to assist it in augmenting Federal and State efforts to: (a) initiate bone-aging studies to determine the age structure and the age-specific survival and reproductive rates of manatees in the southeastern United States; (b) digitize maps and support other efforts to expedite development of a computerized geographic information system for use in identifying and determining how best to regulate human activities that may adversely affect manatees and their habitat in Florida and adjacent states; and (c) use satellite-linked radio tracking technology to determine the habitat use patterns and critical habitats of manatees in the United States and Puerto Rico. The results of these projects will be used by the Fish and Wildlife Service and the Florida Department of Natural Resources, in consultation with the Commission, to evaluate and improve manatee conservation programs.

Popular Article on the West Indian Manatee
(Robin Meadows, Martinez, California)

The plight of the endangered West Indian manatee is among the most pressing of wildlife conservation issues. The largest known extant concentration of manatees is in Florida (see Chapter III). In 1988, 32 percent of the 134 manatees known to have died in Florida were killed by collisions with boats and barges. Also, as Florida's human population swells, less and less habitat remains for manatees. To better inform the public about the need to protect manatees from collisions with vessels and to conserve valuable manatee habitat, the Commission contracted for a popular article aimed at increasing public awareness of how human activities affect manatees in Florida and the steps that are being taken to protect them. The article discusses aspects of natural history and behavior which render the manatee vulnerable to loss of critical habitat and collisions with recreational and commercial vessel traffic. It stresses the need for controlling vessel speeds in manatee "zones" and conserving important sea-

grass beds as foraging areas for this species. This article will be published in the popular natural history literature in 1990.

Additional Commission-Sponsored Research and Study Projects

Workshop on Measures to Assess and Mitigate the Adverse Effects of Arctic Oil and Gas Activities on Polar Bears

(Jack W. Lentfer, Convener, Homer, Alaska)

Oil and gas exploration and development may have adverse effects on polar bears and their habitat. Also, these and other human activities in the Arctic increase the potential for bear-human interactions which, in turn, may result in the death or injury of both polar bears and people. In recognition of these concerns, the Marine Mammal Commission sponsored a workshop on 24-25 January 1989 in Anchorage, Alaska, to identify and describe additional research needed to reliably assess the possible effects of oil and gas exploration and development on polar bears and their habitat, and to identify and assess the likely utility of measures that could be taken to avoid or minimize the adverse effects of bear-human interactions on both bears and people. Participants included representatives of the Fish and Wildlife Service, the Minerals Management Service, the Commission, the Inuvialuit Game Council of Canada, the Canadian Wildlife Service, the Alaska Department of Renewable Resources, the Alaska Department of Fish and Game, and the North Slope Borough. The workshop report, expected to be completed early in 1990, is intended to be used by interested and responsible Federal and State agencies, industry, and Native groups to identify and cooperatively undertake actions necessary to insure the health and welfare of polar bear populations in Alaska.

Second International Conference on Marine Debris

(Suzanne Montgomery, Woodstock, Virginia, and Burr Heneman, Bolinas, California)

In November 1984, the National Marine Fisheries Service, based on the recommendation and with the financial support of the Marine Mammal Commission, convened the Workshop on the Fate and Impact of Marine Debris in Honolulu, Hawaii. The workshop was international in scope and provided the first comprehensive review of information regarding the entanglement, death, and injury of marine life in lost or discarded fishing gear and other debris in the ocean (see Chapter VI). The workshop alerted agencies and organizations in the United States and around the world to the significance of the problem and prompted intensive actions to assess and mitigate its effects. Much new information has been developed since the 1984 Workshop and, late in 1986, the Commission recommended that the Service begin planning a second

international conference to review progress and identify future priority needs. The Service agreed and, as described in Chapter VI, the Second International Conference on Marine Debris was held in Honolulu on 2-7 April 1989. The contractors helped prepare formal reports of certain conference working groups and the executive summary for the Conference report. The reports will be used in many parts of the world to identify priority research and management tasks to reduce debris pollution in the ocean.

Workshop on Gillnets and Small Cetaceans
(William F. Perrin, Ph.D., Convener, International Whaling Commission, Cambridge, England)

In 1985, the Scientific Committee of the International Whaling Commission noted that several species of special concern (e.g., gray, humpback, and right whales) were being taken incidentally in gillnet fisheries. The Committee recommended that a workshop be convened to examine the question of incidental take of cetaceans in gillnet and other fixed-net fisheries. The workshop, which will be held early in 1990 at the Southwest Fisheries Center, National Marine Fisheries Service, La Jolla, California, is expected to provide a comprehensive description of cetacean conservation problems being caused by incidental takes in gillnets and a series of recommended actions to better define and resolve these problems. The Marine Mammal Commission provided funds to partially support the cost of the workshop.

International Workshop on Population Ecology and Management of Walruses
(Francis H. Fay, Ph.D., Institute of Marine Science, Fairbanks, Alaska)

The Pacific walrus population inhabits areas under the jurisdiction of both the United States and the Soviet Union. For this reason, effective management of the walrus population requires a joint U.S.-Soviet effort. To foster better communications among scientists and managers and to encourage the development of a comprehensive walrus research and management plan, the investigator is organizing and convening an international workshop to review available information concerning the biology, ecology, and management of walruses. The workshop, cosponsored by the Marine Mammal Commission, the Fish and Wildlife Service, and the University of Alaska, will be held on 26-30 March 1990 in Seattle, Washington. It will include participants from Canada, Scandinavia, the Soviet Union, and the United States. The workshop report, expected to be completed by summer 1990, will be distributed to government agencies and other institutions in the United States and the Soviet Union to assist in developing a cooperative walrus conservation program.

Training Session in the Care and Maintenance of Captive Marine Mammals
(Joseph R. Geraci, D.V.M., Ph.D., University of Guelph, Guelph, Ontario)

The Animal Welfare Act requires periodic inspection of facilities holding marine mammals for research or public display. To advise Animal Plant and Health Inspection Service inspectors on critical aspects of marine mammal biology, husbandry practices, food and water quality standards, and other standards established under the Animal Welfare Act, the Commission convened a faculty of distinguished scientists to conduct a short course on captive marine mammal husbandry. The contractor, an authority on marine mammal biology and pathology, was sponsored by the Commission to teach in the program.

Evaluation of Airships for Marine Mammal Studies
(James H.W. Hain, Ph.D., Associated Scientists at Woods Hole, Woods Hole, Massachusetts)

Field observations of marine mammals, particularly cetaceans, are hampered by the fact that these species spend much of their life underwater and by adverse weather conditions. Although recent advances in remote sensing technology are providing new ways of obtaining information on the behavior and movements of marine mammals at sea, direct observation remains the primary means of scientific investigation. Available information suggests that airships may have advantages over fixed-wing aircraft and helicopters for certain kinds of data collection. In 1989, the Commission contracted for a pilot investigation of existing and next-generation airships and how these may be used in marine mammal research. Preliminary results indicate that airships have the capability to work slowly through an area and to remain on site within an area for prolonged periods. They are reasonably economical and maneuverable. They may be configured to carry various instrumentation and sensors, and provide quite stable photographic platforms. The contractor will continue to evaluate the utility of airships for cetacean research and report his findings in 1990.

Food Chains in Relation to Biomass Yields, Ecosystem Models, and Management Strategies in Large Marine Ecosystems
(American Association for the Advancement of Science, Washington, D.C.)

The primary objective of the Marine Mammal Protection Act is to maintain the health and stability of the marine ecosystem, and, whenever consistent with this primary objective, to obtain optimum sustainable marine mammal populations, keeping in mind the carrying capacity of the habitat in the ecosystems of which

marine mammal populations are a part. In this regard, marine mammals compete for and depend upon many of the same fish and shellfish resources that are harvested commercially. Consequently, marine mammals may be affected indirectly as well as directly by commercial fisheries. Although there have been significant advances in understanding food chain dynamics and the application of the best available management techniques, fisheries stocks continue to collapse under the stress of high levels of fishing, increasing pollution, and natural environmental perturbations. Some scientists are questioning the traditional view that an understanding of food chain dynamics is the key to fishery yields in large marine ecosystems. To examine this possibility, the Commission contributed partial support for a symposium that will bring together experts in theoretical ecology, resource biology, and fisheries management to, among other things, evaluate possible alternative strategies for management other than reliance on food chain dynamics. The findings of the symposium will be relevant to the conservation of marine mammal populations as well as the fisheries resources themselves. The symposium will be held 15-20 February 1990 in New Orleans in conjunction with the annual meeting of the American Association for the Advancement of Science.

Toxic Dinoflagellates and Marine Mammal Mortalities
(Alan W. White, Ph.D., Sea Grant Program, Woods Hole, Massachusetts)

Two events in 1987-1988 involved unprecedented mortalities of humpback whales and bottlenose dolphins, species that have never been associated with typical mass strandings (see the Annual Report for Calendar Year 1988). Late in 1987, at least 14 humpback whales died in less than five weeks in Massachusetts and Cape Cod Bays. During an eight-month period between July 1987 and February 1988, at least 740 bottlenose dolphins died along the Atlantic coast from New Jersey to northern Florida. The unusual characteristics of these two events were such that standard protocols for examining stranded animals were expanded to include analysis for dinoflagellate neurotoxins that have in the past been associated with mass kills of fish and other marine animals. Evidence of neurotoxin poisoning was found in both cases (see Chapter III). On 8-9 May 1989 a group of experts was convened at the Woods Hole Oceanographic Institution to review and assess the evidence for the possible link between natural biotoxins and the whale and dolphin mortalities, to identify possible threats to humans, and to recommend research needs and priorities. The Commission assisted in compiling background information for this workshop and provided funds to assist in the publication and distribution of the workshop report. The report, completed in November 1989, is being used by the National Marine Fisheries Service, in consultation with the Commission and other involved agencies, to assist in planning and developing programs

to assess the effects of biotoxins on marine mammals and other marine organisms, particularly those that may be eaten by humans.

Survey of Benthic Communities in Prince William Sound
(John S. Oliver, Ph.D., ABA Consultants, Capitola, California)

As noted in Chapter IV, on 24 March 1989, the oil tanker Exxon Valdez grounded in Alaska's Prince William Sound, spilling about 11 million gallons of North Slope crude oil. The oil moved through the southwest portion of the Sound and along the coast of the western Gulf of Alaska, causing extensive harm to wildlife and other natural resources. A major question is how and to what extent the oil affected habitats and will persist in them, particularly those harboring benthic and other communities of prey species utilized by marine mammals (e.g., sea otters). To help obtain information needed to answer this question, the Commission supported the contractor's baseline surveys of benthic invertebrate communities in Prince William Sound and adjacent areas. The survey results will be compared with the results of later surveys to help determine how the released oil affected the distribution, composition, densities, and replacement rates of representative species of benthic flora and fauna in areas contacted by the oil.

Distribution of Humpback Whales Off the West Coast of Makalawena, Hawaii
(Mari Smultea, Moss Landing Marine Laboratory, Moss Landing, California)

The recovery of endangered humpback whales in the North Pacific Ocean may be affected by increasing vessel traffic and other human activities around their breeding and calving areas in Hawaii. In 1988, the Commission contracted for a study to gather baseline information on humpback whale behavior and habitat use patterns in waters adjacent to a relatively undeveloped area of the Hawaiian Islands. The draft report from this study provided information on the distribution and abundance of social groupings of whales, including mother-calf pairs, that will be of value for detecting possible future changes in the whales' use of this area. The research results raised a number of questions regarding the comparison of "normal, undisturbed" behavior of humpbacks to the behavior of whales exposed to existing human activities in the Makalawena area and the degree to which whales may become acclimated to disturbance from other whales as well as from human activities. The Commission therefore provided additional funds to undertake additional analyses. The final report, expected to be completed early in 1990, will present the results of these additional analyses. It will also provide baseline information on the distribution and behavior of humpback

whales for use as a base of comparison as human activities increase in this area.

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

As noted earlier, 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 1989, most agencies had responded to the Commission's request for information on their Fiscal Year 1989 and Fiscal Year 1990 marine mammal research programs. Early in 1990, the contractor will prepare a report summarizing the information provided by the agencies. A copy of the 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 this report and, as appropriate, recommend actions to agencies to better develop, focus, and coordinate 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.

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 under the Animal Welfare Act in response to the Commission's recommendations of 20 October 1974. As discussed in the Commission's previous 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 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. A variance may be 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, the Animal and Plant Health Inspection Service consulted with 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 possible 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.

On several occasions in 1987 and early in 1988, the Commission wrote to the Animal and Plant Health Inspection Service regarding the issue of holding captive animals in isolation, that is, without the companionship of other animals of like or compatible species of the same order. On 15 April 1988, the Commission again wrote to the Service recommending that it undertake an investigation to identify facilities maintaining

marine mammals in isolation. The Commission expressed its belief that maintenance of captive marine mammals in isolation is inappropriate except for purposes of medical treatment or on a temporary basis in other special situations, as determined necessary by an attending veterinarian. The Service did not respond to the Commission's 15 April 1988 letter. On 17 February 1989, the Commission wrote to the Service regarding a report that a manatee was being held in captivity in violation of the Service's Standards. In its letter, the Commission requested that the Service advise it of the status of the investigation recommended in the Commission's 15 April letter.

On 9 March 1989, the Service responded to the Commission, noting that it was investigating alleged violations of the Standards. The Service also noted that a field survey of facilities had been conducted, but that the results had not yet been compiled and reviewed. By letter of 2 May 1989, the Commission advised the Service that it was looking forward to receipt of the field survey report identifying facilities maintaining marine mammals in isolation. At the end of 1989, the Commission had not yet received the report of the field survey.

On 18 October 1988, the Commission wrote to the Animal and Plant Health Inspection Service recommending that the Service, in consultation with representatives of the National Marine Fisheries Service, the Fish and Wildlife Service, the environmental community, the public display industry, the research community, inspecting veterinarians from the Service's field offices, and the Commission, define more clearly and, if necessary, revise its existing regulations. The Commission noted that such a review was necessary in order to: facilitate compliance by public display and research facilities; assist Animal and Plant Health Inspection Service officials in conducting facility inspections; and improve the effectiveness and fairness of the administration and enforcement of the regulations. The Service did not respond to the Commission's 18 October letter and, in its 2 May 1989 letter, the Commission again requested that the Service undertake such a review and offered to help in any way possible. No response to the Commission's letter had been received at the end of 1989. However, during the National Marine Fisheries Service's 29 November 1989 permit review workshop on marine mammal care and maintenance, representatives of the Animal and Plant Health Inspection Service concurred that a review of its standards was needed.

The Commission also addressed the need to revise and augment the Animal and Plant Health Inspection Service's marine mammal care and maintenance standards in its 24 August 1989 comments on the National Marine Fisheries Service's permit program discussion paper. Among other things, the Commission recommended that the Services consider: (1) clarifying and expanding the Standards

with respect to ventilation, lighting, shade, isolation and separation of animals, and water quality; (2) establishing standards for emergency and contingency plans, staff training, air and water temperature requirements, water turnover rates, and water turbidity, salinity, and pH; (3) defining what constitutes temporary holding; (4) enhancing recordkeeping requirements, (5) prohibiting food deprivation as a training technique; (6) revising minimum space requirements for pools and enclosures; and (7) adopting specific regulations for travelling exhibitions.

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 April 1985 and November 1988, for example, the Commission, in cooperation with the two Services, sponsored a training seminar for Animal and Plant Health Inspection Service inspectors. Seminar topics included a survey of the biology and physiology of marine mammals, a review of maintenance requirements for captive marine mammals, and discussion of how best to carry out the duties and responsibilities of inspectors. A third training seminar, originally planned for 1989, is expected to be held in mid-1990.

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 Care and Use Committees at research facilities to inspect periodically all animal study areas and to review research procedures 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 or distress in the subject animals, be exempted from the regulatory provisions.

The final rules revising parts 1 and 2 of the Animal Welfare Act regulations were published in the Federal Register on 31 August 1989 and became effective on 30 October 1989. Among other things, the regulations:

-- require a semi-annual review of each research facility's program for humane care and use of animals (including review of provisions requiring that pain and distress are minimized) by the facility's Institutional Animal Care and Use Committee. In addition, a semi-annual inspection of the research facility's animal facilities must be conducted by the Committee.

-- exempt Federal research facilities from the requirement to register with the Animal and Plant Health Inspection Service, but require such facilities to meet the same standards as non-federal research facilities. Deficiencies must be reported to the head of the Federal agency conducting the research who shall be responsible for corrective action.

-- exempt field studies (defined in the final rule as "any study conducted on free-living wild animals in their natural habitat, which does not involve an invasive procedure, and which does not harm or materially alter the behavior of the animals under study,") from Committee review and inspection.

-- require each research facility to establish and maintain a program of adequate veterinary care including: appointment of an attending veterinarian; availability of appropriate facilities, personnel, and services; the use of appropriate methods to prevent, control, diagnose, and treat diseases and injuries; availability of emergency, weekend, and holiday care; daily observation of all animals to assess their health and well-being; guidance to principal investigators and other personnel concerning the care and use of animals, particularly with respect to handling, immobilization, anesthesia, analgesia, tranquilizing, and euthanasia; and pre-procedural and post-procedural care in accordance with established veterinary practice; and

-- direct the principal investigator to provide written assurance to the Committee that the proposed research activities do not unnecessarily duplicate previous experiments.

In revising parts 1 and 2 of its Animal Welfare Act regulations, the Service found it necessary to consider changes to Part 3, the standards for care and maintenance. Although revisions to the standards were proposed in a 15 March 1989 Federal Register notice, none of those changes would affect the requirements applicable to marine mammal facilities.

National Environmental Policy Act

The Progressive Animal Welfare Society and other environmental and animal rights groups filed suit against the Navy and the Department of Commerce on 3 April 1989 challenging the Navy's decision to utilize bottlenose dolphins from the Gulf of Mexico in the cold waters of Puget Sound. Among other things, the plaintiffs contended that the decision was procedurally deficient in that the Navy did not prepare an environmental assessment or an environmental impact statement. Similarly, plaintiffs claimed that the Department of Commerce violated the National Environmental Policy Act by not preparing an environmental document before issuing the requested permits and concurrence letters to the Navy.

In a motion to dismiss the National Environmental Policy Act claims, the Navy argued that the Act does not require an assessment of the project's impacts on itself, but only on the pre-existing environment. That is, while the impacts of removing dolphins from the wild and the effect on the Puget Sound environment of introducing those dolphins must be considered, the Navy argued that the effect of keeping the dolphins in captivity on the dolphins themselves need not be evaluated.

On 2 November 1989, the District Court denied the Navy's motion ruling that the decision to deploy dolphins in Puget Sound "is a major federal action that requires an analysis of the effect of such use on the dolphins themselves." This decision could be applicable to other situations where marine mammals are held in captivity and seems to require that Federal agencies that issue marine mammal permits or that maintain marine mammals, in fulfilling their National Environmental Policy Act responsibilities, consider the effects of captivity on the animals.

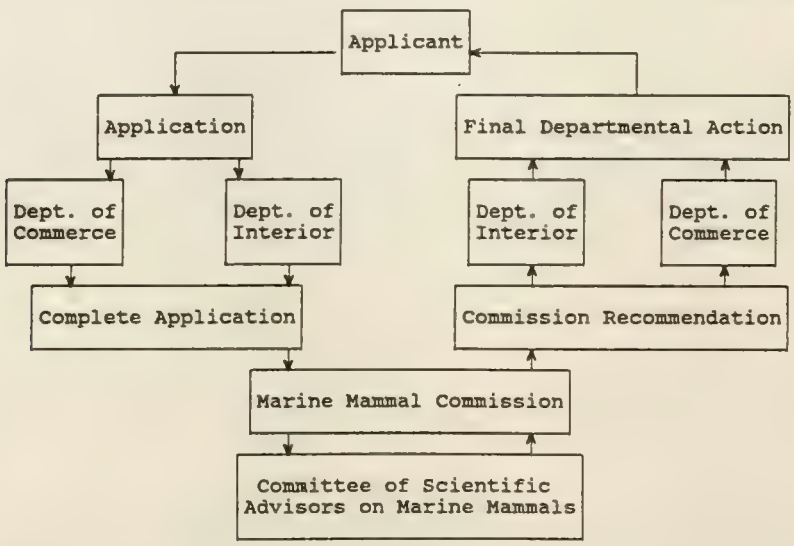
CHAPTER XII

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 marine mammal involved, for the taking or importation 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 permit. 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 1989, the Commission made recommendations on 22 applications submitted to the Department of Commerce, including five applications that were received in 1988 but which did not receive final action until 1989, and two applications submitted to the Department of the Interior. The Commission's average review time for complete applications was 43 days (median, 42.5 days). Not included in the preceding statistics are recommendations on eight applications that were awaiting final action by the Department of Commerce and two applications awaiting final action by the Department of the Interior at year's end and two applications that were under Commission review at year's end. The Commission, in consultation with its Committee of Scientific Advisors, also made recommendations on 27 requests to modify permits and other related permit actions during 1989. The average time required for Commission review of these matters was 34 days.

For the 22 applications processed by the Department of Commerce during 1989, it took an average of 178 days (median, 159 days) from the date the application was received by the Department until final action was taken. The two permit applications submitted to the Department of the Interior were processed in an average of 72 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 145 and 70 days, respectively, compared to 116 and 87 days, respectively, in 1988.

Permit System Review

During the 1988 reauthorization of the Marine Mammal Protection Act, considerable attention was given to revising the Act's permit provisions. As noted in Chapter II of this Report, the provisions were amended, including the addition of authority for permits to enhance the survival and recovery of marine species and stocks. As an outgrowth of the interest in permit issues and because of the need to update its regulations and implement the amendments, the National Marine Fisheries Service undertook a comprehensive review of its permit program in 1988.

The first formal step in the Service's permit review was publication, in March 1989, of a discussion paper entitled "Permit Policies and Procedures for Scientific Research and

Public Display under the Marine Mammal Protection Act and the Endangered Species Act." The discussion paper explained the permit requirements of the Acts and the applicable implementing regulations, as well as relevant policies adopted by the Service. Specific chapters were included on public display permits, scientific research permits, enhancement permits, and the relationship between permits and the National Environmental Policy Act, which presented additional information and posed several questions for public comment.

By letter of 24 August 1989, the Commission provided extensive comments on the discussion paper. Among other things, the Commission: recommended that the Service consider updating the introductory chapters of the discussion paper to serve as a resource document on the permit process; suggested a definition of public display; recommended that amendments to the Animal and Plant Health Inspection Service's marine mammal care and maintenance regulations be amended or augmented; provided comments on the Service's interim policy on education and conservation programs required of public display permit holders; supplied an attachment detailing its views concerning the basic information requirements for scientific research permit applications and subsequent reports; proposed criteria for reviewing enhancement permits; recommended that the Service review and revise its legal interpretation of the status of progeny from pre-Act marine mammals held in captivity; recommended that the Federal agencies sharing responsibility for marine mammal management develop strategies for improved communication, seek consistency in developing, interpreting, and implementing regulations, and adopt a more consistent approach to administration of the permit process in general; and commented that the Service should consider whether capture and temporary maintenance of marine mammals pending completion of a permanent facility is appropriate and, if so, under what conditions.

Beginning in October 1989, the Service convened a series of working sessions on various aspects of its permit program to solicit additional public comment and to foster greater discussion of the major issues. The first session sought to define public display. Subsequent workshops addressed scientific research permits, care and maintenance standards for captive marine mammals, and public display education and conservation programs. A special presentation on the permit review and on scientific permits in particular was made by the Service at the Eighth Biennial Conference on the Biology of Marine Mammals, held by the Society for Marine Mammalogy in December 1989. The Service is planning two working sessions in January 1990 on the application of the National Environmental Policy Act to the permit process.

Based upon its discussion paper, comments on the discussion paper, and information generated at the working sessions, the

Service will be revising its permit regulations. The Service hopes to have a draft proposed rule available for interagency review in March 1990.

At the close of 1989, the Commission was drafting a letter to the Service identifying other steps that should be taken to streamline and improve the permit process, including those changes that can be implemented without amending the regulations. That letter is expected to be sent early in January 1990.

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.

In a related letter, also sent to the Service on 28 October 1987, the Commission recommended that the Service prepare a general policy statement concerning such requests and provide a draft to the Commission and the National Marine Fisheries Service for review. Specifically, the Commission suggested development of a policy requiring that, whenever possible, applications requesting specimens for mounted displays be met by sources that do not require a direct lethal take and that permits authorizing lethal takes for such purposes be issued only when specimens cannot possibly be obtained from other sources. 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. Late in 1987, the Service prepared a draft policy statement and provided it to the Commission and the National Marine Fisheries Service.

In August 1988, the Commission learned that effective identification of possible alternative sources of suitable specimens to satisfy the request noted above was not taking place, possibly because of poor communication and coordination between the Service's Permit Office in Washington, D.C., and its Alaska Regional Office. A formal policy statement concerning such requests had not yet been adopted by the Service and, by letter of 18 August 1988, the Commission recommended that the

Permit Office immediately request that its Alaska Regional Office inform individuals involved in walrus research and management of appropriate steps to report the existence of possible specimens that could be used to satisfy the applicant's request without sacrificing an animal. By memorandum of 20 September 1988, the Alaska Regional Office informed the Service's Permit Office of its intention to meet requests for museum specimens of marine mammals from salvaged carcasses or other appropriate sources whenever opportunities permitted doing so.

On 11 January 1989, the Commission transmitted a letter to the Service on implementation of the newly enacted amendments to the Marine Mammal Protection Act. Among other things, the amendments set forth a principle that lethal research on marine mammals not be authorized if non-lethal alternatives are available. Consistent with that provision, the Commission suggested in its letter that the principle be extended to public display permits. Under such an extension, directed killing to obtain display specimens could not be authorized unless it could be shown that all non-lethal, alternative sources of specimens had been exhausted. In this regard, the Commission believes that the Service's draft policy statement on lethal taking for public display, developed late in 1987, is consistent with the recent amendments, and it recommended that the Service take steps to adopt a formal policy as soon as possible. At the close of 1989, the Service had yet to formalize its policy. The Commission intends to raise the matter again in a letter on the Service's permit program that was in preparation at year's end.

APPENDIX A

COMMISSION RECOMMENDATIONS: CALENDAR YEAR 1989

10 January	Commerce, commenting to the National Oceanic and Atmospheric Administration on its marine mammal permit program; expressing support for the Service's policy to permit facilities holding unreleasable animals taken under section 109(h) of the Marine Mammal Protection Act to maintain them permanently; and recommending that the process of authorizing placement of such animals be open to public review.
11 January	Interior, commenting to the Fish and Wildlife Service on implementation of the 1988 amendments to the Marine Mammal Protection Act and recommending, among other things, that the Service: work with the National Marine Fisheries Service to agree on respective responsibilities as regards authorization of interim exemptions under the amendments; advise the Commission of its plans to develop conservation plans for depleted marine mammal species under its jurisdiction; consider preparing conservation plans for non-depleted species of marine mammals under its jurisdiction; and take steps to adopt its draft policy on lethal taking for public display.
11 January	Commerce, modification of public display permit, Sea Life Park, Inc.
11 January	Commerce, commenting to the National Marine Fisheries Service on the death of a bottlenose dolphin held in a temporary facility; requesting additional information on the incident; and recommending that the Service ask the Animal and Plant Health Inspection Service to pay particular attention to types of netting used in this and other temporary holding facilities.
12 January	Commerce, commenting to the National Marine Fisheries Service on implementation of the 1988 amendments to the Marine Mammal Protection Act; recommending that it promptly develop standards for issuing public display, scientific research, and enhancement permits; and further recommending that it consider suspending review of public display permit applications until certain standards have been developed.
13 January	Interior, commenting to the Minerals Management Service on the Draft Environmental Impact Statement (DEIS) on the Alaska Outer Continental Shelf Mining Program, Norton Sound Lease Sale; noting that the DEIS provided a reasonably thorough review and analysis of information on possible impacts of activities on marine mammals in the sale area, but that it did not provide a complete evaluation of information on the status of all marine mammal species likely to be in the proposed sale area; recommending that the DEIS be expanded to consider effects on additional marine mammal species and additional mitigation measures; and further recommending that, if it had not already done so, the Service consult with the National Marine Fisheries Service and the Fish and Wildlife Service to ensure that baseline information and monitoring programs are adequate to detect changes and mitigate possible impacts on marine mammals and other living marine resources.
13 January	Commerce, commenting to the National Marine Fisheries Service on its efforts to classify fisheries as category I, category II, or category III according to the frequency with which they may incidentally take marine mammals; noting that certain fisheries with potentially substantial incidental take rates had been classified as category II because of a lack of evidence to support a category I listing; and recommending that criteria for a category I listing be expanded to include fisheries that, based on analogy with a fishery listed in category I, are likely to frequently take marine mammals.
18 January	Commerce, scientific research permit application, Riviera Hotel.
13 February	State, commenting to the Office of Oceans and Polar Affairs on a paper entitled "International Arctic Science Committee–Founding Articles"; expressing concern that the proposed organization addressed in the Articles would not be open to the

	scientific community at large; and recommending that the Articles be expanded to provide flexibility in establishing scientific working groups.
14 February	Commerce, scientific research permit application, Center for Coastal Marine Studies.
14 February	Commerce, scientific research permit application, William A. Watkins.
14 February	Interior, public display permit application, Worthington Jefferson Township Public Library.
14 February	Interior, modification of scientific research permit, Fish and Wildlife Service.
17 February	Agriculture, commenting to the Animal and Plant Health Inspection Service on a report of a manatee being maintained at a marine mammal holding facility; requesting that the Service provide an account of the animal's captive maintenance history; and recommending that the Service promptly inspect the facility and its animal husbandry program.
21 February	Interior, public display permit application, John G. Shedd Aquarium.
21 February	Commerce, modification of scientific research permit, Dinnes Memorial Veterinary Hospital.
21 February	Commerce, scientific research permit application, Karen W. Pryor.
21 February	Interior, scientific research permit application, California Department of Fish and Game.
21 February	Defense, forwarding to the Department of the Navy a Review Team report on the Navy's marine mammal facilities and programs; concluding that allegations of inhumane treatment of animals were substantially lacking; and recommending that the Department assign a high-level employee in the Pentagon to be responsible for the Navy's marine mammal program.
27 February	Commerce, commenting to the National Marine Fisheries Service on proposed changes in the National Standard Guidelines for Fishery Conservation and Management; recommending that a proposed provision to allow over-fishing be deleted or expanded to specify precise circumstances under which this could occur; and further recommending that the final rule more clearly indicate how the Service and regional Fishery Management Councils will define over-fishing.
3 March	Commerce, scientific research permit application, Dan R. Salden.
3 March	National Fish and Wildlife Foundation, recommending it provide funding support for a project to expand satellite and radio-tagging of manatees.
3 March	Commerce, commenting to the National Marine Fisheries Service on a proposed list of fisheries to implement the interim exemptions authorized by the 1988 amendments to the Marine Mammal Protection Act and reiterating recommendations put forth in the Commission's 13 January 1989 letter.
8 March	Florida Department of Natural Resources, commenting in support of a proposal to add a site important to manatees on Sebastian Creek in Brevard and Indian River Counties to the Conservation and Recreation Lands Program acquisition list; and urging that the State also continue to take steps to acquire other areas identified as important manatee habitat.
8 March	Commerce, commenting to the National Marine Fisheries Service on cetaceans being maintained in inadequate holding facilities and recommending that the animals be transferred to other facilities that meet or exceed established standards.
10 March	Commerce, commenting to the National Oceanic and Atmospheric Administration on the need and possible approaches for marking nautical charts with the location of boat speed regulatory zones and restricted access areas designated to protect manatees.
10 March	Commerce, recommending that the National Marine Fisheries Service convene the Hawaiian Monk Seal Recovery Team and offering funds to help do so.

10 March	Commerce, commenting to the National Marine Fisheries Service on draft regulations on the incidental take of marine mammals in commercial fisheries, and recommending, among other things, that the draft be expanded to: define the phrase "standard observation period"; specify the information that vessel owners or operators will be required to collect; expand the criteria for a category I listing to include fisheries that, by analogy with a fishery listed in category I, would be likely to take marine mammals frequently; provide a voluntary observer program for category II and III vessels; prohibit category III vessels from taking marine mammals intentionally; and give the Service authority to require that fishermen retain and return to port certain critically needed biological specimens.
16 March	Interior, modification of scientific research permit, Fish and Wildlife Service.
17 March	State, commenting on a draft convention to establish an international scientific organization for the North Pacific Ocean; urging that it proceed with efforts to negotiate such a convention; and recommending, among other things, that the draft be modified to have the proposed scientific organization provide advice on the scientific basis for conserving living resources.
20 March	Commerce, scientific research permit application, LGL Limited.
21 March	Commerce, commenting to the National Marine Fisheries Service on the interim final rule to implement amendments to the Marine Mammal Protection Act on the tuna/porpoise issue and recommending, among other things, that the Service require that a set be aborted once it was apparent that it could not be completed to "sack-up" within 30 minutes after sunset and that the interim final rule be adopted as a permanent final rule with certain modifications.
28 March	Commerce, public display permit application, Sea World Inc.
28 March	Commerce, commenting to the National Marine Fisheries Service on a proposed research task to monitor high seas driftnet fishing and expressing concurrence with the proposed allocation of funds to support it.
4 April	Interior, commenting to the Fish and Wildlife Service on possible effects of the *Exxon Valdez* oil spill in Prince William Sound on the Alaska sea otter population and other marine mammals; suggesting certain response actions; and recommending, among other things, that the Service: radio-tag and track a representative sample of sea otters to determine their fate after being oiled; sample benthic communities before and after being contaminated to determine how sea otter prey are affected by the spill and chemical dispersants; identify important habitats to be protected by oil containment booms; capture and relocate large numbers of otters if the spill reached certain high-density sea otter areas; establish additional facilities to clean and rehabilitate oiled otters; identify areas to release rehabilitated otters; radio-tag and track a subset of rehabilitated otters to determine their fate; identify and survey beaches to gather information on the number of animals washing up dead; and organize and convene a planning meeting or workshop to identify studies needed to document the long-term effects of the spill on sea otters and other marine mammals and to describe the time, money, and special logistic needed.
11 April	Commerce, scientific research permit application, Miami Seaquarium.
12 April	Commerce, public display permit application, Ouwehands Dierenpark.
13 April	Army Corps of Engineers, recommending that it assist the State of Florida in posting advisory and regulatory signs to protect the West Indian manatee along sections of the Intracoastal Waterway.
27 April	Commerce, scientific research permit application, North Gulf Oceanic Society.
27 April	Commerce, scientific research permit application, Howard E. Winn.
27 April	Commerce, scientific research permit application, Thomas F. Albert.
2 May	Agriculture, commenting to the Animal and Plant Health Inspection Service on the need to organize an inter-agency review of standards for maintaining marine mammals in captivity, and offering to assist in the review.

10 May	Commerce, public display permit application, Clare and Peter Harrison.
10 May	Commerce, scientific research permit application, C. Scott Baker.
12 May	Commerce, scientific research permit application, Center for Coastal Studies.
17 May	Interior, scientific research permit application, John G. Morris.
18 May	Commerce, scientific research permit application, Envirosphere Company.
18 May	State, commenting to the Bureau of Oceans and International Environmental and Scientific Affairs on an agreement negotiated with Japan pursuant to the Driftnet Impact Monitoring, Assessment and Control Act of 1987 and recommending that it be accepted.
23 May	Commerce, scientific research permit application, Burke Memorial Museum.
23 May	Commerce, commenting to the National Marine Fisheries Service on its investigation of problems identified at a public display facility and urging that the Service thoroughly evaluate the situation with respect to hepatitis B.
23 May	Commerce, commenting to the National Marine Fisheries Service on population assessments and quota recommendations for bottlenose dolphins and recommending, among other things, that the Service convene a workshop of independent scientists to develop estimates of the numbers of bottlenose dolphins being caught and killed or injured incidental to commercial fisheries and that, pending results of the workshop, live captures and removals be authorized at existing levels except in areas where the authorized level of take combined with incidental take in commercial fisheries might exceed two percent of the minimum population estimate.
24 May	Commerce, modification of scientific research permit, D. A. Glockner-Ferrari and M. J. Ferrari.
25 May	Agriculture, commenting to the Animal and Plant Health Inspection Service on maintenance of dolphins at various facilities in Florida and recommending that the Service inspect all facilities maintaining only animals obtained prior to enactment of the Marine Mammal Protection Act to ensure they are in compliance with applicable regulations.
26 May	State, commenting on a revised draft protocol on specially protected areas and wildlife for the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, and suggesting certain revisions.
12 June	Commerce, modification of scientific research permit, Michael Hunt.
12 June	Commerce, scientific research permit application, Oregon Department of Fish and Wildlife.
12 June	Commerce, scientific research permit application, Audrey Dianne Kopec.
12 June	Commerce, scientific research permit application, Bernie R. Tershy.
12 June	Commerce, scientific research permit application, Bruce R. Mate.
12 June	Interior, commenting to the Minerals Management Service on its Call for Information on proposed oil and gas lease sales in the central, western, and eastern Gulf of Mexico; noting that: ecological information was not sufficient for most marine mammals to determine how proposed activities might affect the stocks; the bottlenose dolphin is the marine mammal species most likely to be affected by the proposed action; bottlenose dolphins appear to be composed of a number of discrete "local" populations or subpopulations; and possible cumulative effects of incidental take in commercial fishing operations and habitat degradation must be considered when assessing the possible effects on local bottlenose dolphin populations in the Gulf of Mexico; recommending that, if not already done, it consult with the National Marine Fisheries Service to: (a) obtain information on the ecology and status of bottlenose dolphin populations that could be affected by the proposed action; and (b) determine the research and monitoring programs required to accurately assess and detect possible effects of the proposed action on these

	populations and their habitat; and further recommending that, if not already done, it consult with the Fish and Wildlife Service pursuant to section 7 of the Endangered Species Act to determine measures needed to detect, avoid, and mitigate possible unforeseen effects on West Indian manatees.
21 June	Interior, commenting to the Fish and Wildlife Service on the final revised Florida Manatee Recovery Plan and expressing its concurrence with the plan.
22 June	Interior, scientific research permit application, Fish and Wildlife Service.
22 June	Commerce, public display permit application, Dolphin Services.
23 June	Commerce, commenting to the National Marine Fisheries Service on a request by its National Marine Mammal Laboratory to continue fur seal studies under an existing permit; noting that available information is inadequate to determine whether the proposed studies constitute *bona fide* scientific research, as required by the 1988 amendments to the Marine Mammal Protection Act; and requesting that the Laboratory and other permit applicants be advised that a permit modification is required before carrying out studies that differ in any significant way from those described in the original permit application.
26 June	Commerce, commenting to the National Marine Fisheries Service on its intent to prepare an environmental impact statement on "swim-with-a-dolphin" programs; expressing support for its decision to do so; and suggesting certain information and issues to be addressed in the statement.
30 June	Environmental Protection Agency, expressing support for a proposed project to educate recreational boaters and fishermen in the Gulf of Mexico on proper ways of disposing of ship-generated trash and urging that the Agency undertake similar efforts to encourage marina and harbor operators to provide garbage reception facilities and services.
12 July	Commerce, commenting to the National Marine Fisheries Service on proposed observer coverage in the foreign tuna purse seine fleet; expressing its opinion that observer coverage for foreign fleets should be set at 100 percent; and recommending, among other things, that the Departments of Commerce and State seek to obtain as close to 100 percent observer coverage as possible by the Inter-American Tropical Tuna Commission.
13 July	Commerce, scientific research permit application, National Marine Mammal Laboratory.
13 July	Transportation, commenting to the Coast Guard on a petition by the Environmental Defense Fund to limit boat speeds in Martin County, Florida, to protect manatees, and recommending that, if not already done, it consult with the Fish and Wildlife Service pursuant to section 7 of the Endangered Species Act.
13 July	Interior, commenting to the Fish and Wildlife Service on a petition submitted by the Environmental Defense Fund to the Coast Guard to limit boat speeds in Martin County, Florida to protect manatees, and recommending that, if not already done, it consult with the Coast Guard pursuant to section 7 of the Endangered Species Act.
13 July	Commerce, commenting to the National Marine Fisheries Service on an experimental design to test effects of seal bombs on dolphins and recommending, among other things, that the Service seek comments on the criteria to judge the significance of experimental results.
14 July	Commerce, scientific research permit application, Paul K. Dayton and Timothy J. Ragen.
14 July	Commerce, scientific research permit application, Southwest Fisheries Center.
28 July	Commerce, scientific research permit application, Douglas Wartzok.
28 July	Commerce, public display permit application, Miami Seaquarium.
31 July	Commerce, scientific research permit application, Bruce R. Mate.

1 August	Interior, commenting to the Fish and Wildlife Service on the status of West Indian manatees in Florida and recommending that the Service: (1) work with the State of Florida to acquire lands along the lower Sebastian River as a possible addition to the Pelican Islands National Wildlife Refuge; (2) appoint a person to serve as manatee coordinator for the Service in the Jacksonville, Florida, Field Office, and that two additional staff members be hired to help implement the manatee Recovery Plan; (3) increase the budget for the Sirenia Project by at least $150,000 for each of the next five years to expand radio-tagging studies; and (4) provide an additional $20,000 to the Sirenia Project to help develop a geographic information system for manatees.
2 August	Commerce, scientific research permit application, Southwest Fisheries Center.
4 August	Commerce, commenting to the National Marine Fisheries Service on proposed rules to establish marine mammal mortality performance standards for tuna purse seine vessel operators; noting, among other things, that prior to 1989 U.S. tuna fishermen were allowed to conduct sundown sets, which have a higher mortality than daylight sets and which are now prohibited without special permission; and recommending that the Service exclude such sets from the data used to calculate the five-year average against which performance is judged.
14 August	Interior, scientific research permit application, Fish and Wildlife Service.
14 August	Interior, scientific research permit application, California Department of Fish and Game.
15 August	Commerce, public display permit application, Golden Nugget-Strip Corp.
15 August	Commerce, commenting to the National Marine Fisheries Service on a public display permit application; seeking an explanation as to why certain actions were taken before the Commission had responded to the Service's request for comments; and recommending that the Service suspend authorization to collect animals under the permit unless it had: consulted with the applicant to determine if there was an alternative maintenance plan that would be less stressful for the animals; made collection of animals contingent on construction and inspection of temporary facilities; and determined if the proposed holding facility was safe and in compliance with requirements of the Marine Mammal Protection Act.
24 August	Commerce, commenting to the National Marine Fisheries Service on a discussion paper on Permit Policies and Procedures for Scientific Research and Public Display; recommending that: introductory chapters be updated to provide a resource document on the permit process; the Animal and Plant Health Inspection Service's marine mammal care and maintenance regulations be amended or augmented; the legal interpretation of the status of progeny from pre-Act marine mammals held in captivity be reviewed; the Federal agencies sharing responsibility for marine mammal management develop strategies to improve communication and administrative consistency in the permit process; and suggesting that the Service determine whether and under what conditions it would be appropriate to capture and temporarily maintain marine mammals pending completion of a permanent facility.
25 August	Commerce, public display permit applications, Sea Life Park and John G. Shedd Aquarium.
29 August	Commerce, scientific research permit application, Southwest Fisheries Center.
7 September	Commerce, scientific research permit application, Kenneth S. Norris, Randall S. Wells, Jan S. Ostman, Carl R. Schilt, and William T. Doyle.
11 September	Department of the Air Force, commenting on the Draft Environmental Impact Statement for the Construction and Operation of Space Launch Complex 7 at Vandenberg Air Force Base, California; noting, among other things, that the DEIS does not provide a complete assessment of possible impacts of the proposed action on marine mammals; suggesting that it expand the proposed action to include both short- and long-term monitoring studies to verify predicted effects and detect

	possible unforeseen effects of the proposed action on marine mammals; and recommending that, if not already done, it consult with the National Marine Fisheries Service and the Fish and Wildlife Service to identify marine mammal monitoring studies needed to verify predicted effects and detect the possible unforeseen effects.
11 September	Florida Department of Natural Resources, expressing support for its proposed actions to improve boating safety and manatee protection in Florida; recommending that the proposals be adopted promptly; and further recommending that any additional analyses be directed at fine-tuning the program to ensure that manatee protection efforts do not unnecessarily interfere with boating and other legitimate water uses.
12 September	Interior, scientific research permit application, Envirosphere Company.
13 September	Commerce, commenting to the National Marine Fisheries Service on an amendment to the Fishery Management Plans for groundfish in the Gulf of Alaska and the Bering Sea/Aleutian Islands area that would, in part, establish experimental seasonal fishing closures in certain areas to protect walrus, establish a new system for reporting marine mammal/fishery interactions, and institute a framework observer program for domestic fishing vessels; agreeing that seasonal closures to protect walrus are warranted; noting that the criteria and research to determine the effectiveness of the closures had not been identified; recommending that the Service clarify: (a) the criteria for evaluating the effectiveness of proposed and alternative actions; (b) the range of research and monitoring studies needed to assess the effectiveness of the proposed and alternative actions; and (c) the potential benefits to the fishery of preventing harvests of spawning fish in Togiak Bay; and further recommending that the Service carefully review the details of proposed and alternative data reporting and observer programs to ensure that they are consistent with requirements of the 1988 amendments to the Marine Mammal Protection Act.
15 September	Interior, scientific research permit application, Alaska Fish and Wildlife Research Center.
15 September	State of Florida, commenting to the Governor and Cabinet of Florida on proposed recommendations put forth by the Florida Department of Natural Resources to protect West Indian manatees and urging that they be implemented promptly.
25 September	Transportation, forwarding to the Coast Guard a draft paper proposing that certain sections of the Guidelines for Implementing Annex V of the Convention for the Prevention of Pollution from Ships be expanded and recommending that the Coast Guard consider the draft as the basis for a U.S. submission to the next meeting of the Marine Environment Protection Committee of the International Maritime Organization.
27 September	Interior, modification of scientific research permit, Charles Monnett.
27 September	Commerce, scientific research permit application, Sigma Chemical Company.
27 September	Commerce, scientific research permit application, J. Ward Testa.
29 September	The Trustee Council, commenting on a State/Federal damage assessment plan for the *Exxon Valdez* oil spill; noting that the plan provides a comprehensive overview of studies to assess natural resource damage resulting from the spill, but that it does not contain sufficient information to judge the likelihood that the component studies will in fact provide a reliable assessment of natural resource damage or whether the cost estimates are reasonable; recommending that, if it had not already done so, the Council: (a) develop comprehensive project descriptions, including descriptions and justifications of study designs, sample sizes, and cost estimates; (b) have the project descriptions reviewed by knowledgeable experts not associated with the damage assessment program; (c) revise the plan to take account of the expert review; and (d) arrange for periodic meetings of the principal investigators to exchange information and study results and to coordinate planning.
2 October	Commerce, scientific research permit application, Thomas N. James.
2 October	Interior, modification of scientific research permit, Fish and Wildlife Service.

5 October	Commerce, commenting to the National Marine Fisheries Service on the proposal to list the North Pacific fur seal on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora and recommending that it: (a) withdraw the listing proposal; (b) require the National Marine Mammal Laboratory to provide a detailed description and analysis of data on the status and trends of the Pribilof Islands' fur seal population through at least 1988; and (c) convene a workshop to review the status of populations and other assessments done by the Laboratory.
10 October	Interior, commenting to the Fish and Wildlife Service on the need to support manatee research and management programs and recommending that the Service allocate at least $245,000 of a special appropriation for work on recovery of manatees and other endangered species, as follows: $150,000 for equipment and services to radio-tag and track manatees; $15,000 to help develop a geographic information system for manatees; and at least $80,000 to support additional staff members to help implement the West Indian Manatee Recovery Plan, conduct section 7 consultations, review local manatee protection plans, and establish new boat speed regulatory zones.
12 October	Commerce, commenting to the National Marine Fisheries Service on an amendment to the Reef Fish Fishery Management Plan; endorsing the Plan's proposal to ban the use of entangling nets; and recommending that the Plan be revised to reflect requirements set forth in the 1988 amendments to the Marine Mammal Protection Act to report interactions between marine mammals and fishing operations.
12 October	Commerce, scientific research permit application, Joseph R. Mobley.
13 October	Commerce, modification of scientific research permit, Southwest Fisheries Center.
13 October	Commerce, scientific research permit application, Geochemical and Environmental Research Group.
17 October	Interior, commenting to the Minerals Management Service on the "Draft Supplemental Environmental Impact Statement: 5-Year Outer Continental Shelf Oil and Gas Leasing Program, Mid-1987 to Mid-1992"; and recommending that the Statement be expanded to: (a) better reflect the uncertainty and range of possible impacts on marine mammals; and (b) identify and describe steps to be taken to verify predicted effects and to detect and mitigate possible unforeseen effects on migratory marine mammals and other components of the ecosystem.
24 October	Interior, recommending to the Mineral Management Service that it consult with the Fish and Wildlife Service on use of a sea otter population model to identify research needs in response to the *Exxon Valdez* oil spill.
1 November	State, commenting to the Bureau of Oceans and International Environmental and Scientific Affairs on provisions of the Driftnet Impact Monitoring, Assessment, and Control Act; noting that the Act requires negotiations with nations conducting high seas driftnet activities in the North Pacific to ensure the acquisition of statistically reliable data on the effects of the fisheries on U.S. marine resources; and recommending that steps be taken immediately to describe the Japanese, Korean, and Taiwanese programs that would be necessary to insure that data collected are statistically reliable.
1 November	Commerce, commenting to the National Marine Fisheries Service on its proposed observer program for foreign tuna fleets in 1990 and subsequent years, and repeating points and recommendations contained in its 12 July 1989 letter on the proposed alternative observer program for the 1989 season.
1 November	State of Florida, commenting to the Governor and Cabinet of Florida in support of recommendations set forth by the Florida Department of Natural Resources to protect and conserve the West Indian manatee.
2 November	Transportation, commenting to the Coast Guard in support of proposed rules to implement Annex V regulations for the disposal of garbage from ships in the United

States, and recommending that the requirement for ships to maintain records of all discharges specify the kinds of information to be recorded.

20 November — Commerce, public display permit application, Moscow Zoo.

20 November — Interior, modification of scientific research permit, Natural History Museum of Los Angeles County.

20 November — Interior, renewal of scientific research permit, Fish and Wildlife Service.

20 November — Commerce, modification of scientific research permit, Center for Coastal Marine Studies.

30 November — Commerce, commenting to the National Marine Fisheries Service on the draft Humpback Whale National Recovery Plan; noting that the Plan did not identify recommended research and management actions in sufficient detail to effectively guide development of actual recovery activities; recommending that the Service: revise the Plan's statement of goals to indicate immediate, intermediate, and ultimate goals; revise and expand the Plan outline and narrative to provide a clearer indication of specific research and management actions necessary to rebuild each of the three separate populations in U.S. waters; and develop an implementation schedule setting forth target initiation and completion dates, estimated costs, relative priorities, and responsible agencies for research and management.

1 December — Commerce, modification of scientific research permit, Northwest and Alaska Fisheries Center.

5 December — State, commenting to the Bureau of Oceans and International Environmental and Scientific Affairs on the Protocol concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region; noting, among other things, that the Protocol as currently drafted raised questions as to what, if anything, it would obligate parties to do and that certain provisions could be interpreted to impose prohibitions that would be more restrictive than those under the Endangered Species Act, Marine Mammal Protection Act, and other relevant U.S. legislation; and recommending that the United States seek the agreement of other parties on convening a meeting of experts within a year of concluding the Protocol to identify and begin background work on priority issues that will have to be considered by the scientific and technical advisory committee to be established when the Protocol enters into force.

11 December — Commerce, commenting to the National Marine Fisheries Service on the Service's Hawaiian monk seal program; commending the program staff and others for accomplishments in protecting the Hawaiian monk seal; and recommending, among other things, that: the Hawaiian Monk Seal Recovery Team update the Recovery Plan by 1 March 1990; the Service add a marine mammal veterinarian and a marine mammal physiologist to the Recovery Team and publish a schedule of annual Recovery Team meetings; the Service focus mobbing behavior research on identifying the age classes of seals and the individual animals involved before implementing responsive management objectives; consideration be given to expanding the Head Start Project to Midway Island; the Service consult with other agencies on actions to rebuild the Tern Island seawall and to remove abandoned fuel from the island; a population model be developed to produce population projections, evaluate management strategies, and identify critical data gaps; all field personnel carry copies of issued permits into the field and that they be given clear written and verbal guidance as to precisely what steps should be taken to minimize any disturbance to the seals; the Service seek help in developing a training program for individuals involved in caring for captive Hawaiian monk seals; protocols on animal care and reintroducing seals back into the wild be developed; necropsies be performed by a veterinarian with marine mammal experience; arrangements be made with a reputable laboratory to promptly work up, on a routine basis, specimen material taken from captive or wild monk seals; holding facilities for seals at the Kewalo Basin not be used unless rebuilt; the Service promptly hire a biometrician to work on monk seal data, a full-time data manager, and an administrative assistant for the monk seal recovery program; the Service promptly develop a three-year

budget that provides for support of the Hawaiian monk seal program at a level sufficient to allow an organized and rational approach to all issues.

15 December — Commerce, scientific research permit application, Elizabeth A. Mathews and Daniel J. McSweeney.

20 December — Commerce, commenting to the National Marine Fisheries Service on the apparent decline of the Steller sea lion population and recommending that the Service act immediately on a petition for an emergency listing as endangered under the Endangered Species Act, and draft and distribute a conservation plan for the Steller sea lion by March 1990.

21 December — Commerce, scientific research permit application, James B. Atkinson.

21 December — Commerce, commenting to the National Marine Fisheries Service on its proposal to designate the coastal migratory stock of bottlenose dolphins along the U.S. mid-Atlantic coast as depleted under the Marine Mammal Protection Act; suggesting that further studies be done to determine the relationship between nearshore and offshore stocks of bottlenose dolphins and the present size and productivity of the nearshore stock; and recommending that the Service develop a conservation plan for the stock before taking final action on the proposed depletion designation.

22 December — Commerce, commenting to the National Marine Fisheries Service on the Fiscal Year 1990 Marine Entanglement Research Program Plan and recommending that the Service proceed with implementing the Plan.

28 December — Commerce, commenting to the National Marine Fisheries Service on plans to develop alternative quota recommendations for live capture and removals of bottlenose dolphins from the wild, and recommending, among other things, that a workshop be convened to discuss the theoretical merits and practical value of the two percent rule for both bottlenose dolphins and other small cetaceans commonly taken in live-capture operations.

28 December — Commerce, commenting to the National Marine Fisheries Service on a review of the tuna-porpoise review meeting and recommending, among other things, that the Service: advise the Commission of steps taken since 1984 to advise foreign governments and fishing fleets of the "comparability" requirements established by the 1984 and 1988 amendments to the Marine Mammal Protection Act; work with the Department of State to encourage the Inter-American Tropical Tuna Commission to revise its objectives in light of the requirements of the Marine Mammal Protection Act and to advise other fishing nations of the U.S. objectives with regard to incidental take of porpoises and other marine mammals; and expand the proposed performance standards to indicate how vessel operator performance will be evaluated and the sanctions that would be imposed against vessel owners who repeatedly fail to meet performance standards.

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)

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)

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[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.

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)

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APPENDIX C

SELECTED LITERATURE PUBLISHED ELSEWHERE RESULTING FROM COMMISSION-SPONSORED ACTIVITIES

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